# LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

# ADMINISTRATIVE RECORD

**Volume 24**

**2022**

**Bate Stamp Numbers**
**01116703 – 01118242**

**Prepared for**

**Department of the Army**
**Longhorn Army Ammunition Plant**

**1976–2022**

VOLUME 24

2022

A. Title: (Cont'd) Report – Appendix F Labs to Quarterly Evaluation Report, 4th Quarter (October-December) 2021, Groundwater Treatment Plant, Longhorn Army Ammunition Plant, Karnack, Texas, May 2022
Author(s): Bhate Environmental Associates, Inc.
Recipient: U.S. Army Corps of Engineers
Date: May 25, 2022
Bate Stamp: 01116703 – 01116833

B. Title: Transmittal Letter – Draft Technical Memorandum to EPA, Proposed Revisions to LHAAP-04 and LHAAP-16, Remedial Action Operation Groundwater Monitoring Programs, Longhorn Army Ammunition Plant, Karnack, Texas, May 2022
Author(s): Department of the Army
Recipient: U.S. Environmental Protection Agency
Date: June 1, 2022
Bate Stamp: 01116834 – 01116834

C. Title: Transmittal Letter – Draft Technical Memorandum to TCEQ, Proposed Revisions to LHAAP-04 and LHAAP-16, Remedial Action Operation Groundwater Monitoring Programs, Longhorn Army Ammunition Plant, Karnack, Texas, May 2022
Author(s): Department of the Army
Recipient: Texas Commission on Environmental Quality
Date: June 1, 2022
Bate Stamp: 01116835 – 01116835

D. Title: Minutes – Final Monthly Managers' Meeting (MMM), Longhorn Army Ammunition Plant (LHAAP), May 18, 2022
Author(s): Department of the Army
Recipient: All Parties
Date: June 3, 2022
Bate Stamp: 01116836 – 01116840

E. Title: Minutes – Final Minutes, Quarterly Restoration Advisory Board (RAB) Meeting, Longhorn Army Ammunition Plant, January 2022
Author(s): Bhate Environmental Associates, Inc.
Recipient: All Parties
Date: June 22, 2022
Bate Stamp: 01116841 – 01116889

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2022

F. Title: Presentation – January 2022 Restoration Advisory Board (RAB) Meeting Presentation from George Rice re Metals, Longhorn Army Ammunition Plant, Karnack, Texas
Author(s): George Rice
Recipient: All Parties
Date: June 22, 2022
Bate Stamp: 01116890 – 01116905

G. Title: Report – Quarterly Evaluation Report, 1st Quarter (January - March) 2022, Groundwater Treatment Plant, Longhorn Army Ammunition Plant, Karnack, Texas, June 2022
Author(s): Bhate Environmental Associates, Inc.
Recipient: U.S. Army Corps of Engineers
Date: June 29, 2022
Bate Stamp: 01116906 – 01118242

**ALS Houston, US** Date: 14-Jan-22

## CERTIFICATIONS,ACCREDITATIONS & LICENSES

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas | 21-022-0 | 26-Mar-2022 |
| Florida | E87611-33 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 14-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**Work Order:** HS21120895

## SAMPLE TRACKING

| Lab Samp ID | Client Sample ID | Action | Date | Person | New Location |
|---|---|---|---|---|---|
| HS21120895-01 | LH18/24-SP140_121421 | Login | 12/15/2021 4:26:41 PM | PMG | MET012 |
| HS21120895-01 | LH18/24-SP140_121421 | Login | 12/15/2021 4:26:41 PM | PMG | Sub |
| HS21120895-01 | LH18/24-SP140_121421 | Login | 12/15/2021 4:26:41 PM | PMG | WET393 |
| HS21120895-01 | LH18/24-SP140_121421 | Login | 12/15/2021 4:26:41 PM | PMG | EXT163 |
| HS21120895-01 | LH18/24-SP140_121421 | Login | 12/15/2021 4:26:41 PM | PMG | WET393 |
| HS21120895-01 | LH18/24-SP140_121421 | Login | 12/15/2021 4:26:41 PM | PMG | WET393 |
| HS21120895-01 | LH18/24-SP140_121421 | Login | 12/15/2021 4:26:41 PM | PMG | B048 |
| HS21120895-02 | Trip Blank | Login | 12/15/2021 4:26:41 PM | PMG | B048 |

**ALS Houston, US** Date: 14-Jan-22

## Sample Receipt Checklist

**Work Order ID:** HS21120895 **Date/Time Received:** **15-Dec-2021 10:40**

**Client Name:** Bhate Environmental **Received by:** **Paresh M. Giga**

**Completed By:** /S/ Paresh M. Giga (eSignature) 15-Dec-2021 16:29 (Date/Time) **Reviewed by:** /S/ Corey Grandits (eSignature) 16-Dec-2021 16:49 (Date/Time)

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

| | Yes | No | Not Present |
|---|---|---|---|
| Shipping container/cooler in good condition? | ☑ | ☐ | ☐ |
| Custody seals intact on shipping container/cooler? | ☑ | ☐ | ☐ |
| Custody seals intact on sample bottles? | ☐ | ☐ | ☑ |
| VOA/TX1005/TX1006 Solids in hermetically sealed vials? | ☐ | ☐ | ☑ |
| Chain of custody present? | ☑ | ☐ | |
| Chain of custody signed when relinquished and received? | ☑ | ☐ | |
| Samplers name present on COC? | ☑ | ☐ | |
| Chain of custody agrees with sample labels? | ☑ | ☐ | |
| Samples in proper container/bottle? | ☑ | ☐ | |
| Sample containers intact? | ☑ | ☐ | |
| Sufficient sample volume for indicated test? | ☑ | ☐ | |
| All samples received within holding time? | ☑ | ☐ | |
| Container/Temp Blank temperature in compliance? | ☑ | ☐ | |

COC IDs:none

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 1.2C U/c | IR31 |
| Cooler(s)/Kit(s): | 47525 | |
| Date/Time sample(s) sent to storage: | 12/15/2021 16:40 | |

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



**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:** GROUNDWATER TREATMENT PLANT QUARTERLY INFLUENT SAMPLES

**Prepared By:** Scott Beesinger

**P. O. Number**

**HS21120895**

Bhate Environmental Associates, Inc.
Groundwater Treatment Plant Quarterly Influent Sam

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | ROD Volatiles | Total Metals | Oil & Grease | Chemical Oxygen Demand | Chloride & Sulfate | 1, 4 - DIOXANE | Perchlorate | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP140_121421 | Water | 12/14/21 / 14:00 | | 4 | 3 | | 1 | | | | | | | | HCL | |
| LH18/24-SP140_121421 | Water | 12/14/21 / 14:00 | | 1 | | 1 | | | | | | | | | HNO3 | |
| LH18/24-SP140_121421 | Water | 12/14/21 / 14:00 | | 2 | | | | | 1 | 1 | | | | | NONE | |
| LH18/24-SP140_121421 | Water | 12/14/21 / 14:00 | | 1 | | | | 1 | | | | | | | H2SO4 | |
| LH18/24-SP140_121421 | Water | 12/14/21 / 14:00 | | 1 | | | | | | | 1 | | | | NONE | |
| Trip Blank | Water | 12/14/21 | | 2 | 2 | | | | | | | | | | HCL | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Analyses

Additional Remarks: **STANDARD TURN AROUND TIME**

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 12/14/21 | 14:30 | 12/15/2021 | 10.40. | | | | | | | |

**For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Remarks: 47525 OK. 1.20 A31 C11-00

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

01116707

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

47525

**CUSTODY SEAL**

Date: 12/14/21 Time: 1430
Name: Scott Beesinger
Company: BHate

Seal Broken By: GM
Date: 12/15/21

47525 DEC 15 2021

47525

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 23NOV21
ACTWGT: 1.00 LB MAN
CAD: 0221247/CAFE3507
DIMS: 26x14x14 IN

TO SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: GWTP-BO 81976-RG

FedEx Express

TRK# 0221 5300 5225 3790

PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

3923207 14Dec2021 GGGA 560G3/E934/1023

December 23, 2021

Service Request No:E2101276

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS21120895**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory December 15, 2021
For your reference, these analyses have been assigned our service request number **E2101276.**

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.:** | E2101276 |
| **Project:** | HS21120895 | **Date Received:** | 12/15/21 |
| **Sample Matrix:** | W | | |

## CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV. 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 12/15/21.

The sample was received in good condition and is 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:**

EQ2100690: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in addition to a MS/MSD for these extraction batches. The LCS-DLCS recoveries are within QC limits. 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 **Service Request:**E2101276
**Project:** HS21120895

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2101276-001 | LH18/24-SP140_121421 | 12/14/2021 | 1400 |

# Service Request Summary

**Folder #:** **E2101276**
Client Name: ALS Environmental - US
Project Name: HS21120895
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 12/15/21
Internal Due Date: 12/30/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21120895
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON ClO4 DOD/6850 |
|---|---|---|---|---|
| E2101276-001 | LH18/24-SP140_121421 | Water | 12/14/21 1400 | **IV** |

## Folder Comments:

Send DWELR confirmation to Middletown PM for PADEP samples.

# Service Request Summary

| | | | |
|---|---|---|---|
| **Folder #:** | **E2101276** | Project Chemist: | Corey Grandits |
| Client Name: | ALS Environmental - US | Originating Lab: | HOUSTON |
| Project Name: | HS21120895 | Logged By: | CGRANDITS |
| Project Number: | | Date Received: | 12/15/21 |
| | | Internal Due Date: | 12/30/2021 |
| **Report To:** | Ragen Giga<br>ALS Environmental - US<br>10450 Stancliff Rd Suite 210<br>Houston, TX 77099<br>USA | QAP: | LAB QAP |
| | | Qualifier Set: | Lab Standard |
| | | Formset: | Lab Standard |
| | | Merged?: | Y |
| Phone Number: | | Report to MDL?: | Y |
| Cell Number: | | P.O. Number: | HS21120895 |
| Fax Number: | | EDD: | No EDD Specified |
| E-mail: | ragenp.giga@alsglobal.com | | |

1 120 mL-Plastic Bottle Natural WM Unpreserved

**Location:** EHRMS-AirArch 1

**Pressure Gas:**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 1 | Level IV due 1/6 |

# 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 |
|---|---|---|
| Arkansas Department of Environmental Quality | 19-028-0 | 6/30/2022 |
| Arkansas Department of Environmental Quality | 21-022-0 | 3/26/2022 |
| Florida Department of Health | E87611-33 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Louisiana Department of Health and Hospitals | LA028-2021 | 12/31/2021 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Minnesota Department of Health | 2021671 | 12/31/2021 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 5/1/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
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Houston, TX 77099
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**F:** +1 281 530 5887
**www.alsglobal.com**

# Subcontract Chain of Custody

**SAMPLING STATE:** **Colorado** **COC ID:** **17698**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

| | |
|---|---|
| **Company:** | ALS Houston |
| **Contact:** | Ragen Giga |
| **Address:** | 10450 Stancliff Rd, Ste 210 |
| **Phone:** | +1 281 530 5656 |
| **Email:** | RagenP.Giga@ALSGlobal.com |
| **Alternate Contact:** | 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:** | HS21120895 |
| **TSR:** | Sonia West |

| | LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | | | DUE DATE |
| **1.** | **HS21120895-01** | **LH18/24-SP140_121421** | **Water** | **14 Dec 2021 14:00** |
| | SUB_Perch-6850 | | | 30 Dec 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: | NR | Date/Time: | |
| Received By: | [illegible] | Date/Time: | 12.15.21 1817 |
| Cooler ID(s): | | Temperature(s): | |

ALS Environmental

# Cooler Receipt Form

Project Chemist: CG

Client/Project: ALS-H

Thermometer ID: IR31

Date/Time Received: 12-15-21 Initials: CG

Date/Time Logged in: 12-15-21 Initials: CG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL (X) ALS Courier ○ Client
2. Samples received in: (X) Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes (X) No
   Were they intact? ○ Yes ○ No (X) N/A
   Were they signed and dated? ○ Yes ○ No (X) N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts (X) Baggies ○ Bubble Wrap ○ Gel Packs (X) 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 | | 12-15-21 | | CG | 4.4 | (X) |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? (X) Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? (X) Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? (X) Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? (X) Yes ○ No
10. Did sample labels and tags agree with custody documents? (X) Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

ALS Environmental - Houston HRMS

10450 Stancliff Rd., Suite 210
Houston, TX 77099
**T:** +1 713 266 1599
**F:** +1 713 266 1599
**www.alsglobal.com**

# SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

**Cooler Custody Seals (desirable, mandatory if specified in SAP):**

- ✓ Intact on outside of cooler, signed and dated

**Chain-of-Custody (COC) documentation (mandatory):**

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

**Sample Integrity (mandatory):**

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

**Temperature Requirement (varies by sample matrix):**

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

# Preparation Information Benchsheets

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

# Preparation Information Benchsheet

**Prep Run#:** 392837 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 12/16/21 13:43

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2101270-001 | MW-2_120921 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 2 | E2101270-002 | MW-2_120921_a | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 3 | E2101270-003 | 18CPTMW01SW_120921 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 4 | E2101270-004 | MW3_120921 | .02 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 5 | E2101270-005 | 18WW10_120921 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 6 | E2101270-006 | MW17_120921 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 7 | E2101270-007 | 18CPTMW14_120921 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 8 | E2101270-008 | AWDI_120921 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 9 | E2101274-001 | LH18/24-SP650_121421_AIX | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 10 | E2101275-001 | LH18/24-SP650_121421_AIX | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 11 | E2101276-001 | LH18/24-SP140_121421 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 12 | EQ2100690-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 13 | EQ2100690-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 14 | EQ2100690-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 15 | EQ2100690-04 | MW3_120921 MS | .02 | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 16 | EQ2100690-05 | MW3_120921 DMS | .02 | 6850/ClO4 DOD | | | Liquid | 10mL | |

## Spiking Solutions

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 214765 Logbook Ref: Sodium Perchlorate Expires On: 12/11/2022

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E2101270-001 | 100.00µL | E2101270-002 | 100.00µL | E2101270-003 | 100.00µL | E2101270-004 | 100.00µL | E2101270-005 | 100.00µL | E2101270-006 | 100.00µL |
| E2101270-007 | 100.00µL | E2101270-008 | 100.00µL | E2101274-001 | 100.00µL | E2101275-001 | 100.00µL | E2101276-001 | 100.00µL | EQ2100690-01 | 100.00µL |
| EQ2100690-02 | 100.00µL | EQ2100690-03 | 100.00µL | EQ2100690-04 | 100.00µL | EQ2100690-05 | 100.00µL | | | | |

Name: Perchlorate Intermediate Stock1 Inventory ID 219595 Logbook Ref: Perchlorate Expires On: 03/15/2022

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| EQ2100690-02 | 1.00µL | EQ2100690-03 | 1.00µL | EQ2100690-04 | 1.00µL | EQ2100690-05 | 1.00µL |

## Preparation Materials

Water HPLC Grade 08/03/2021 Water (218530) 537M Glass Culture Tubes 537M Glass Tubes (218064) 6850 0.45um syringe filters 6850 Syringe Filters (219639)

## Preparation Steps

Step: Preparation
Started: 12/16/21 13:43
Finished: 12/16/21 14:15
By: GRIVERA
Comments

# *Preparation Information Benchsheet*

**Prep Run#:** 392837
**Team:** Semivoa GCMS/GRIVERA

**Prep WorkFlow:** GenExt28Day
**Prep Method:** Method

**Status:** Prepped
**Prep Date/Time:** 12/16/21 13:43

Comments:

Reviewed By: GR Date: 12/16/21

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:** | E2101276 |
| **Project:** | HS21120895 | **Date Collected:** | 12/14/21 1400 |
| **Sample Matrix:** | Water | **Date Received:** | 12/15/21 |
| **Sample Name:** | LH18/24-SP140_121421 | **Units:** | µg/L |
| **Lab Code:** | E2101276-001 | **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 | **9910** | | 100 | 50.0 | 25.0 | 1000 | 12/16/21 | 12/21/21 16:25 | 392837 | 749910 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2101276 |
| **Project:** | HS21120895 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2100690-01 | **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 | 12/16/21 | 12/17/21 12:13 | 392837 | 749485 | |

# 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:** | E2101276 |
| **Project:** | HS21120895 | **Date Analyzed:** | 12/17/21 |
| **Sample Matrix:** | Water | | |

**Lab Control Sample Summary**
**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

| | | | |
|---|---|---|---|
| **Analytical Method:** | 6850 | **Units:** | µg/L |
| **Prep Method:** | Method | **Basis:** | NA |
| | | **Extraction Lot:** | 392837 |

| | Lab Control Sample EQ2100690-02 | | | Duplicate Lab Control Sample EQ2100690-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.119 | 0.100 | 119 | 0.107 | 0.100 | 107 | 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:** | E2101276 |
| **Project:** | HS21120895 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2100690-02 | **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 | **0.119** | | 0.100 | 0.0500 | 0.0250 | 1 | 12/16/21 | 12/17/21 13:29 | 392837 | 749485 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2101276 |
| **Project:** | HS21120895 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2100690-03 | **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 | **0.107** | | 0.100 | 0.0500 | 0.0250 | 1 | 12/16/21 | 12/17/21 12:28 | 392837 | 749485 | |

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December 31, 2021

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS21121302**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia Olive,

ALS Environmental received 2 sample(s) on Dec 22, 2021 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: JUMOKE.LAWAL**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 31-Dec-21

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS21121302

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS21121302-01 | LH18/24-SP650_122121 | Water | | 21-Dec-2021 14:00 | 22-Dec-2021 11:35 | ☐ |
| HS21121302-02 | LH18/24-SP650_122121_AIX | Water | | 21-Dec-2021 14:00 | 22-Dec-2021 11:35 | ☐ |

**ALS Houston, US** Date: 31-Dec-21

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS21121302

**CASE NARRATIVE**

## Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached

## WetChemistry by Method E415.1

### Batch ID: R398509

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E350.3

### Batch ID: R398473

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E365.3

### Batch ID: R398225

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

**ALS Houston, US** Date: 31-Dec-21

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS21121302 |
| Sample ID: | LH18/24-SP650_122121 | Lab ID:HS21121302-01 |
| Collection Date: | 21-Dec-2021 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **AMMONIA AS N BY E350.3(ISE)** | | **Method:E350.3** | | | | | | Analyst: MZD |
| **Nitrogen, Ammonia (As N)** | **72** | a | **1.0** | **2.0** | **2.0** | **mg/L** | 10 | 28-Dec-2021 12:30 |
| **ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978** | | **Method:E365.3** | | | | | | Analyst: MZD |
| **Phosphorus, Total Orthophosphate (As P)** | **11.1** | a | **0.250** | **0.625** | **0.625** | **mg/L** | 25 | 22-Dec-2021 15:18 |
| **TOTAL ORGANIC CARBON BY E415.1** | | **Method:E415.1** | | | | | | Analyst: JAC |
| **Organic Carbon, Total** | **8.04** | a | **0.500** | **1.00** | **1.00** | **mg/L** | 1 | 29-Dec-2021 04:09 |

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

**ALS Houston, US** Date: 31-Dec-21

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS21121302 |
| Sample ID: | LH18/24-SP650_122121_AIX | Lab ID:HS21121302-02 |
| Collection Date: | 21-Dec-2021 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 23-Dec-2021 13:51 |

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

**ALS Houston, US** Date: 31-Dec-21

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS21121302

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** R398225 ( 0 ) | **Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978 | | | | **Matrix:** Water | |
| HS21121302-01 | LH18/24-SP650_122121 | 21 Dec 2021 14:00 | | | 22 Dec 2021 15:18 | 25 |
| **Batch ID:** R398308 ( 0 ) | **Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) | | | | **Matrix:** Water | |
| HS21121302-02 | LH18/24-SP650_122121_AIX | 21 Dec 2021 14:00 | | | 23 Dec 2021 13:51 | 1 |
| **Batch ID:** R398473 ( 0 ) | **Test Name :** AMMONIA AS N BY E350.3(ISE) | | | | **Matrix:** Water | |
| HS21121302-01 | LH18/24-SP650_122121 | 21 Dec 2021 14:00 | | | 28 Dec 2021 12:30 | 10 |
| **Batch ID:** R398509 ( 0 ) | **Test Name :** TOTAL ORGANIC CARBON BY E415.1 | | | | **Matrix:** Water | |
| HS21121302-01 | LH18/24-SP650_122121 | 21 Dec 2021 14:00 | | | 29 Dec 2021 04:09 | 1 |

**ALS Houston, US** Date: 31-Dec-21

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS21121302

**QC BATCH REPORT**

**Batch ID:** R398225 ( 0 ) **Instrument:** UV-2450 **Method:** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978

**MBLK** Sample ID: **MBLK-R398225** Units: **mg/L** Analysis Date: **22-Dec-2021 15:18**
Client ID: Run ID: **UV-2450_398225** SeqNo: **6436229** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.0250 | 0.0250 | | | | | | | | U |

**LCS** Sample ID: **LCS-R398225** Units: **mg/L** Analysis Date: **22-Dec-2021 15:18**
Client ID: Run ID: **UV-2450_398225** SeqNo: **6436228** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.232 | 0.0250 | 0.25 | 0 | 92.8 | 85 - 115 | | | | |

**MS** Sample ID: **HS21121302-01MS** Units: **mg/L** Analysis Date: **22-Dec-2021 15:18**
Client ID: **LH18/24-SP650_122121** Run ID: **UV-2450_398225** SeqNo: **6436231** PrepDate: DF: **25**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 16.32 | 0.625 | 6.25 | 11.08 | 84.0 | 80 - 120 | | | | |

**MSD** Sample ID: **HS21121302-01MSD** Units: **mg/L** Analysis Date: **22-Dec-2021 15:18**
Client ID: **LH18/24-SP650_122121** Run ID: **UV-2450_398225** SeqNo: **6436230** PrepDate: DF: **25**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 16.28 | 0.625 | 6.25 | 11.08 | 83.2 | 80 - 120 | 16.32 | 0.307 | 20 | |

**The following samples were analyzed in this batch:** HS21121302-01

**ALS Houston, US** Date: 31-Dec-21

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS21121302

**QC BATCH REPORT**

**Batch ID: R398473 ( 0 )** **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

**MBLK** Sample ID: **MBLK-R398473** Units: **mg/L** Analysis Date: **28-Dec-2021 12:30**
Client ID: Run ID: **WetChem_HS_398473** SeqNo: **6442620** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 0.20 | 0.20 | | | | | | | | U |

**LCS** Sample ID: **LCS-R398473** Units: **mg/L** Analysis Date: **28-Dec-2021 12:30**
Client ID: Run ID: **WetChem_HS_398473** SeqNo: **6442619** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 9.573 | 0.20 | 10 | 0 | 95.7 | 80 - 120 | | | | |

**MS** Sample ID: **HS21121282-01MS** Units: **mg/L** Analysis Date: **28-Dec-2021 12:30**
Client ID: Run ID: **WetChem_HS_398473** SeqNo: **6442622** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 11.2 | 0.20 | 10 | 0.413 | 108 | 80 - 120 | | | | |

**MSD** Sample ID: **HS21121282-01MSD** Units: **mg/L** Analysis Date: **28-Dec-2021 12:30**
Client ID: Run ID: **WetChem_HS_398473** SeqNo: **6442621** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 11.21 | 0.20 | 10 | 0.413 | 108 | 80 - 120 | 11.2 | 0.0803 | 20 | |

**The following samples were analyzed in this batch:** HS21121302-01

**ALS Houston, US** Date: 31-Dec-21

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS21121302

**QC BATCH REPORT**

**Batch ID:** R398509 ( 0 ) **Instrument:** TOC_04 **Method:** TOTAL ORGANIC CARBON BY E415.1

**MBLK** Sample ID: **MBLK-12282021** Units: **mg/L** Analysis Date: **29-Dec-2021 00:25**
Client ID: Run ID: **TOC_04_398509** SeqNo: **6443582** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 1.00 | 1.00 | | | | | | | | U |

**LCS** Sample ID: **LCS-12282021** Units: **mg/L** Analysis Date: **29-Dec-2021 00:41**
Client ID: Run ID: **TOC_04_398509** SeqNo: **6443583** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 10.14 | 1.00 | 10 | 0 | 101 | 85 - 115 | | | | |

**LCSD** Sample ID: **LCSD-12282021** Units: **mg/L** Analysis Date: **29-Dec-2021 00:57**
Client ID: Run ID: **TOC_04_398509** SeqNo: **6443584** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 10.2 | 1.00 | 10 | 0 | 102 | 85 - 115 | 10.14 | 0.59 | 20 | |

**MS** Sample ID: **HS21121302-01MS** Units: **mg/L** Analysis Date: **29-Dec-2021 04:25**
Client ID: **LH18/24-SP650_122121** Run ID: **TOC_04_398509** SeqNo: **6443596** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 19.46 | 1.00 | 10 | 8.037 | 114 | 80 - 120 | | | | |

**The following samples were analyzed in this batch:** HS21121302-01

**ALS Houston, US** Date: 31-Dec-21

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** **HS21121302**

## 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 |
| Florida | E87611-33 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 31-Dec-21

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS21121302

## SAMPLE TRACKING

| Lab Samp ID | Client Sample ID | Action | Date | Person | New Location |
|---|---|---|---|---|---|
| HS21121302-01 | LH18/24-SP650_122121 | Login | 12/22/2021 12:24:21 PM | JRM | WET357 |
| HS21121302-01 | LH18/24-SP650_122121 | Login | 12/22/2021 12:24:21 PM | JRM | WET357 |
| HS21121302-01 | LH18/24-SP650_122121 | Login | 12/22/2021 12:24:21 PM | JRM | WET248 |
| HS21121302-02 | LH18/24-SP650_122121_AIX | Login | 12/22/2021 12:24:21 PM | JRM | Sub |

**ALS Houston, US** Date: 31-Dec-21

## Sample Receipt Checklist

**Work Order ID:** HS21121302 **Date/Time Received:** **22-Dec-2021 11:35**

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

**Completed By:** /S/ Jared R. Makan (eSignature) 22-Dec-2021 12:26 (Date/Time) **Reviewed by:** /S/ Ragen Giga (eSignature) 23-Dec-2021 14:43 (Date/Time)

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

| | Yes | No | Not Present |
|---|---|---|---|
| Shipping container/cooler in good condition? | ☑ | ☐ | ☐ |
| Custody seals intact on shipping container/cooler? | ☑ | ☐ | ☐ |
| Custody seals intact on sample bottles? | ☐ | ☐ | ☑ |
| VOA/TX1005/TX1006 Solids in hermetically sealed vials? | ☐ | ☐ | ☑ |
| Chain of custody present? | ☑ | ☐ | 1 Page(s) |
| Chain of custody signed when relinquished and received? | ☑ | ☐ | |
| Samplers name present on COC? | ☑ | ☐ | |
| Chain of custody agrees with sample labels? | ☑ | ☐ | |
| Samples in proper container/bottle? | ☑ | ☐ | |
| Sample containers intact? | ☑ | ☐ | |
| Sufficient sample volume for indicated test? | ☑ | ☐ | |
| All samples received within holding time? | ☑ | ☐ | |
| Container/Temp Blank temperature in compliance? | ☑ | ☐ | |

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 2.1°C UC/C | IR31 |
| Cooler(s)/Kit(s): | 47839 | |
| Date/Time sample(s) sent to storage: | 12/22/2021 12:26 | |

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

Page 1 of 1

**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:** GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

**Prepared By:** Scott Beesinger

**P.O. Number**

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | AMMONIA-N | TOTAL ORGANIC CARBON | ORTHO-PHOSPHATE | PERCHLORATE | | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_122121 | Water | 12/21/21 / 14:00 | | 3 | X | X | | | | | | | | | H2SO4 | |
| LH18/24-SP650_122121 | Water | 12/21/21 / 14:00 | | 1 | | | X | | | | | | | | NONE | |
| LH18/24–SP650_122121_AIX | Water | 12/21/21 / 14:00 | | 1 | | | | X | | | | | | | NONE | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Analyses

Additional Remarks: **24 Hour TAT on Perchlorate. Standard TAT on other parameters**

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 12/21/21 | 14:30 | J. Ramirez | 12/22/21 | 11:35 | | | | | | |

**For Lab Use Only**

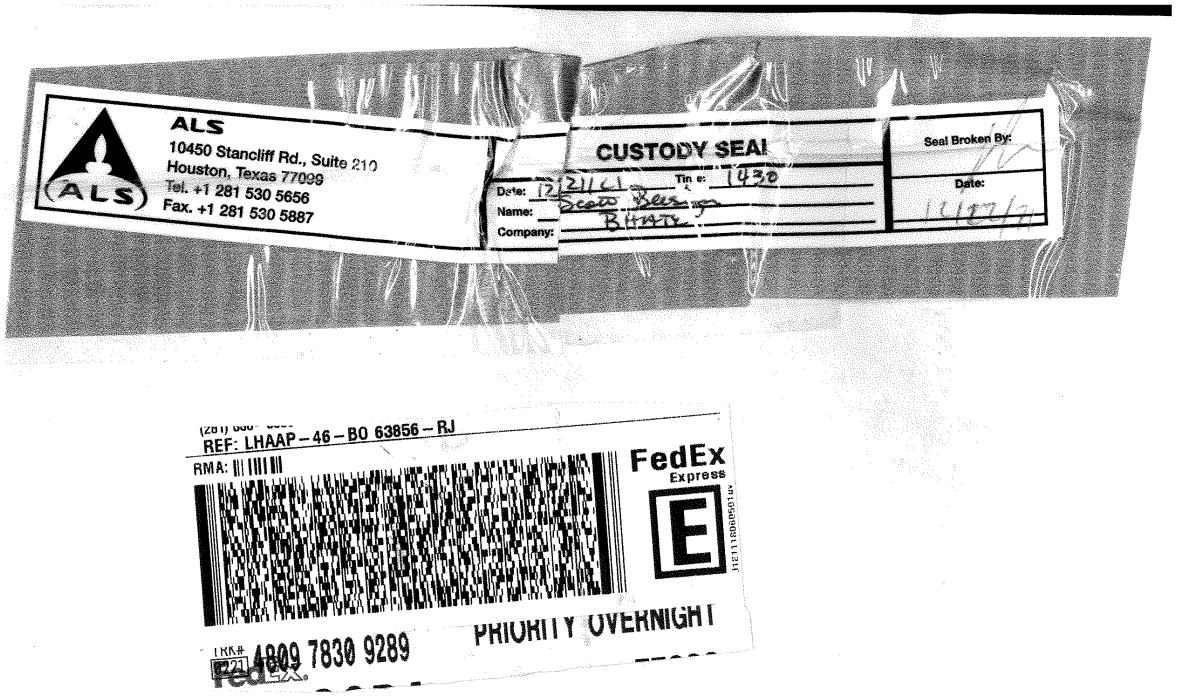
| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Remarks: Cooler 47839 1231
Temp 2.1°C CFO

**HS21121302**

Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Weekly Samples

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY SEAL
Date:
Time:
Name:
Company:
Seal Broken By:
Date:
REF: LHAAP – 46 – BO 63856 – RJ
RMA:
FedEx
Express
TRK# 4809 7830 9289
PRIORITY OVERNIGHT

December 23, 2021

Service Request No:E2101294

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS21121302**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory December 22, 2021
For your reference, these analyses have been assigned our service request number **E2101294.**

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.:** | E2101294 |
| **Project:** | HS21121302 | **Date Received:** | 12/22/21 |
| **Sample Matrix:** | W | | |

## CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV. 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 12/22/21.

The sample was received in good condition and is 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:**

EQ2100700: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for these extraction batches. The LCS-DLCS recoveries are within QC limits.

DoD Certification is held for the method/matrix/analytes provided in this report.

*The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*

**Client:** ALS Environmental - US **Service Request:**E2101294
**Project:** HS21121302

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2101294-001 | LH18/24-SP650_122121_AIX | 12/21/2021 | 1400 |

# Service Request Summary

**Folder #:** **E2101294**
Client Name: ALS Environmental - US
Project Name: HS21121302
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 12/22/21
Internal Due Date: 12/23/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21121302
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**
**Rush**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON CIO4 DOD/6850 |
|---|---|---|---|---|
| E2101294-001 | LH18/24-SP650_122121_AIX | Water | 12/21/21 1400 | **IV** |

## Folder Comments:

Send DWELR confirmation to Middletown PM for PADEP samples.

# Service Request Summary

**Folder #:** **E2101294**
Client Name: ALS Environmental - US
Project Name: HS21121302
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 12/22/21
Internal Due Date: 12/23/2021
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21121302
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**
**Rush**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 1 | Level IV due 1/14 |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| + | Possible Tedlar bag artifact. |
| A | TIC is a suspected aldol-condensation product |
| B | Analyte found in the associated method blank as well as in the sample. |
| BC | Reported results are not blank corrected. |
| BH | The back section of the tube yielded higher results than the front. |
| BT | Results indicated possible breakthrough; back section >=10% front section. |
| C | Result identification confirmed. |
| D | Compound identified in an analysis at a secondary dilution factor |
| D | Spike was diluted out |
| DE | Reported results are corrected for desorption efficiency. |
| E | Estimated value. Concentration above calibration range |
| E | The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample. |
| F | The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard. |
| H | The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard. |
| H1 | Sample analysis performed past holding time. See case narrative. |
| H2 | Initial analysis within holding time. Reanalysis for the required dilution was past holding time. |
| H3 | Sample was received and analyzed past holding time. |
| H4 | Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative. |
| I | Internal standard not within the specified limits. See case narrative. |
| J | Estimated Value. Concentration found below MRL. |
| K | A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate. |
| K | Analyte was detected above the method reporting limit prior to normalization. |
| K | The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result. |
| L | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard. |
| L1 | Laboratory control sample recovery outside the specified limits; results may be biased high. |
| L2 | Laboratory control sample recovery outside the specified limits; results may be biased low. |
| L3 | Laboratory control sample recovery outside the specified limits. |
| M | Matrix interference; results may be biased high. |
| M | The duplicate injection precision not met. |
| M1 | Matrix interference due to coelution with a non-target compound; results may be biased high. |
| N | Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search. |
| N | The Matrix Spike sample recovery is not within control limits. See case narrative. |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| O | The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard. |
| P | Indicates chlorodiphenyl ether interference present at the retention time of the target compound. |
| P | Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns |
| Q | Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria. |
| R | Duplicate Precision not met. |
| R1 | Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated. |
| S | Surrogate recovery not within specified limits. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| T | Analyte is a tentatively identified compound, result is estimated. |
| U | Compound was analyzed for, but was not detected (ND). |
| V1 | The continuing calibration verification standard was outside (biased high) the specified limits for this compound. |
| V2 | The continuing calibration verification standard was outside (biased low) the specified limits for this compound. |
| W | Result quantified, but the corresponding peak was detected outside the generated retention time window. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| X | See case narrative. |
| Y | Recovery outside limits |
| Y | The chromatogram resembles a petroleum product but does not match the calibration standard. |
| Z | The chromatogram does not resemble a petroleum product. |
| i | The MRL/MDL has been elevated due to a matrix interference. |

# ALS Laboratory Group

## Acronyms

| | |
|---|---|
| Cal | Calibration |
| Conc | CONCentration |
| Dioxin(s) | Polychlorinated dibenzo-p-dioxin(s) |
| EDL | Estimated Detection Limit |
| EMPC | Estimated Maximum Possible Concentration |
| Flags | Data qualifiers |
| Furan(s) | Polychlorinated dibenzofuran(s) |
| g | Grams |
| ICAL | Initial CALibration |
| ID | IDentifier |
| Ions | Masses monitored for the analyte during data acquisition |
| L | Liter (s) |
| LCS | Laboratory Control Sample |
| DLCS | Duplicate Laboratory Control Sample |
| MB | Method Blank |
| MCL | Method Calibration Limit |
| MDL | Method Detection Limit |
| mL | Milliliters |
| MS | Matrix Spiked sample |
| DMS | Duplicate Matrix Spiked sample |
| NO | Number of peaks meeting all identification criteria |
| PCDD(s) | Polychlorinated dibenzo-p-dioxin(s) |
| PCDF(s) | Polychlorinated dibenzofuran(s) |
| ppb | Parts per billion |
| ppm | Parts per million |
| ppq | Parts per quadrillion |
| ppt | Parts per trillion |
| QA | Quality Assurance |
| QC | Quality Control |
| Ratio | Ratio of areas from monitored ions for an analyte |
| % Rec. | Percent recovery |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| RT | Retention Time |
| SDG | Sample Delivery Group |
| S/N | Signal-to-noise ratio |
| TEF | Toxicity Equivalence Factor |
| TEQ | Toxicity Equivalence Quotient |

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ALS Environmental

## State Certifications, Accreditations, and Licenses

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas Department of Environmental Quality | 19-028-0 | 6/30/2022 |
| Arkansas Department of Environmental Quality | 21-022-0 | 3/26/2022 |
| Florida Department of Health | E87611-33 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Louisiana Department of Health and Hospitals | LA028-2021 | 12/31/2021 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Minnesota Department of Health | 2021671 | 12/31/2021 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 5/1/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

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Houston, TX 77099
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**F:** +1 281 530 5887
**www.alsglobal.com**

# Subcontract Chain of Custody

**SAMPLING STATE:** **Dept of Defense**

**COC ID:** **17758**

**RUSH**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

**Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

| | |
|---|---|
| **Company:** | ALS Houston |
| **Contact:** | Ragen Giga |
| **Address:** | 10450 Stancliff Rd, Ste 210 |
| **Phone:** | +1 281 530 5656 |
| **Email:** | RagenP.Giga@ALSGlobal.com |
| **Alternate Contact:** | 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:** | HS21121302 |
| **TSR:** | Sonia West |

| | LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | | | DUE DATE |
| **1.** | **HS21121302-02** | **LH18/24-SP650_122121_AIX** | **Water** | **21 Dec 2021 14:00** |
| | 6850-Perch. DOD Level II & Level IV in separate pdf | | | 23 Dec 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. [illegible] Date/Time: 12/22/21 12:50

Received By: [illegible] Date/Time: 12/22/21 1240

Cooler ID(s): Temperature(s):

ALS Environmental

# Cooler Receipt Form

Project Chemist: CH

Client/Project: ALS-H

Thermometer ID: 1791

Date/Time Received: 12-22-21 Initials: CH

Date/Time Logged in: 12-22-21 Initials: CH

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☒ Courier (ALS) ○ Client

2. Samples received in: ☒ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ☒ No

Were they intact? ○ Yes ○ No ☒ N/A

Were they signed and dated? ○ Yes ○ No ☒ N/A

If yes, how many and where?

4. Packing Material: ○ Inserts ☒ Baggies ○ Bubble Wrap ○ Gel Packs ☒ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

| Cooler Tracking Number | COC ID | Date Opened | Time Opened | Opened By | Temp. °C | Temp Blank? |
|---|---|---|---|---|---|---|
| NA | | 12-22-21 | 1230 | CH | 2.1 | ☒ |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☒ Yes ○ No

7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☒ Yes ○ No

8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☒ Yes ○ No

9. Were appropriate bottles/containers and volumes received for the requested tests? ☒ Yes ○ No

10. Did sample labels and tags agree with custody documents? ☒ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

ALS Environmental - Houston HRMS

10450 Stancliff Rd., Suite 210
Houston, TX 77099
**T:** +1 713 266 1599
**F:** +1 713 266 1599
**www.alsglobal.com**

# SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

**Cooler Custody Seals (desirable, mandatory if specified in SAP):**

- ✓ Intact on outside of cooler, signed and dated

**Chain-of-Custody (COC) documentation (mandatory):**

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

**Sample Integrity (mandatory):**

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

**Temperature Requirement (varies by sample matrix):**

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

# Preparation Information Benchsheets

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

# Preparation Information Benchsheet

**Prep Run#:** 393157 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** **Prep Date/Time:** 12/23/21 08:48

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2101277-001 | 126_121421 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 2 | E2101277-002 | 109_121421 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 3 | E2101277-003 | 18CPTMW07_121421 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 4 | E2101277-004 | 18CPTMW24_121421 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 5 | E2101277-005 | CO8_121421 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 6 | E2101277-006 | 18DPTMW04_121421 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 7 | E2101277-007 | 125_121421 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 8 | E2101278-001 | 18CPTMW03SW_121321 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 9 | E2101278-002 | 18DPTMW05_121321 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 10 | E2101278-003 | MW21_121321 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 11 | E2101278-004 | 18CPTMW10DW_121321 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 12 | E2101278-005 | 18CPTMW10DW_121321_a | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 13 | E2101278-006 | 18CPTMW10SW_121321 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 14 | E2101278-007 | 18ww08_121321 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 15 | E2101278-008 | 18CPTMW19_121321 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 16 | E2101294-001 | LH18/24-SP650_122121_AIX | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 17 | EQ2100700-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 18 | EQ2100700-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 19 | EQ2100700-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |

## Spiking Solutions

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 214765 Logbook Ref: Sodium Perchlorate Expires On: 12/11/2022

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E2101277-001 | 100.00µL | E2101277-002 | 100.00µL | E2101277-003 | 100.00µL | E2101277-004 | 100.00µL | E2101277-005 | 100.00µL | E2101277-006 | 100.00µL |
| E2101277-007 | 100.00µL | E2101278-001 | 100.00µL | E2101278-002 | 100.00µL | E2101278-003 | 100.00µL | E2101278-004 | 100.00µL | E2101278-005 | 100.00µL |
| E2101278-006 | 100.00µL | E2101278-007 | 100.00µL | E2101278-008 | 100.00µL | E2101294-001 | 100.00µL | EQ2100700-01 | 100.00µL | EQ2100700-02 | 100.00µL |
| EQ2100700-03 | 100.00µL | | | | | | | | | | |

Name: Perchlorate Intermediate Stock1 Inventory ID 219595 Logbook Ref: Perchlorate Expires On: 03/15/2022

| | | | |
|---|---|---|---|
| EQ2100700-02 | 1.00µL | EQ2100700-03 | 1.00µL |

## Preparation Materials

| | | | | | |
|---|---|---|---|---|---|
| Water HPLC Grade | 08/03/2021 Water (218530) | 537M Glass Culture Tubes | 537M Glass Tubes (218064) | 6850 0.45um syringe filters | 6850 Syringe Filters (219639) |

# *Preparation Information Benchsheet*

**Prep Run#:** 393157 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** **Prep Date/Time:** 12/23/21 08:48

## Preparation Steps

Step: Preparation
Started: 12/23/21 08:48
Finished: 12/23/21 09:50
By: GRIVERA
Comments

Comments:

Reviewed By: GR Date: 12/23/21

Chain of Custody

Relinquished By: Date:

Received By: Date:

Extracts Examined
Yes No

# Analytical Results

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd., Suite 210, Houston, TX 77099
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:** | E2101294 |
| **Project:** | HS21121302 | **Date Collected:** | 12/21/21 1400 |
| **Sample Matrix:** | Water | **Date Received:** | 12/22/21 |
| **Sample Name:** | LH18/24-SP650_122121_AIX | **Units:** | µg/L |
| **Lab Code:** | E2101294-001 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.168** | | 0.100 | 0.0500 | 0.0250 | 1 | 12/23/21 | 12/23/21 10:25 | 393157 | 750095 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2101294 |
| **Project:** | HS21121302 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2100700-01 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | ND | U | 0.100 | 0.0500 | 0.0250 | 1 | 12/23/21 | 12/23/21 10:01 | 393157 | 750095 | |

# 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:** | E2101294 |
| **Project:** | HS21121302 | **Date Analyzed:** | 12/23/21 |
| **Sample Matrix:** | Water | | |

**Lab Control Sample Summary**
**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

| | | | |
|---|---|---|---|
| **Analytical Method:** | 6850 | **Units:** | µg/L |
| **Prep Method:** | | **Basis:** | NA |
| | | **Extraction Lot:** | 393157 |

| | Lab Control Sample EQ2100700-02 | | | Duplicate Lab Control Sample EQ2100700-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.0987 | 0.100 | 99 | 0.0991 | 0.100 | 99 | 84 - 119 | <1 | 15 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2101294 |
| **Project:** | HS21121302 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2100700-02 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.0987** | J | 0.100 | 0.0500 | 0.0250 | 1 | 12/23/21 | 12/23/21 10:09 | 393157 | 750095 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2101294 |
| **Project:** | HS21121302 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2100700-03 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.0991** | J | 0.100 | 0.0500 | 0.0250 | 1 | 12/23/21 | 12/23/21 10:17 | 393157 | 750095 | |

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January 04, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS21121521**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia Olive,

ALS Environmental received 2 sample(s) on Dec 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: JUMOKE.LAWAL**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 04-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS21121521

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS21121521-01 | LH18/24-SP650_122821 | Water | | 28-Dec-2021 14:00 | 29-Dec-2021 10:40 | ☐ |
| HS21121521-02 | LH18/24-SP650_122821_AIX | Water | | 28-Dec-2021 14:00 | 29-Dec-2021 10:40 | ☐ |

**ALS Houston, US** Date: 04-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS21121521

**CASE NARRATIVE**

## Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached

## WetChemistry by Method E350.3

### Batch ID: R398756

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E415.1

### Batch ID: R398730

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E365.3

### Batch ID: R398608

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

**ALS Houston, US** Date: 04-Jan-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS21121521 |
| Sample ID: | LH18/24-SP650_122821 | Lab ID:HS21121521-01 |
| Collection Date: | 28-Dec-2021 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **AMMONIA AS N BY E350.3(ISE)** | | **Method:E350.3** | | | | | | Analyst: YP |
| **Nitrogen, Ammonia (As N)** | **90** | a | **1.0** | **2.0** | **2.0** | **mg/L** | 10 | 03-Jan-2022 15:36 |
| **ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978** | | **Method:E365.3** | | | | | | Analyst: MZD |
| **Phosphorus, Total Orthophosphate (As P)** | **7.17** | a | **0.100** | **0.250** | **0.250** | **mg/L** | 10 | 29-Dec-2021 13:40 |
| **TOTAL ORGANIC CARBON BY E415.1** | | **Method:E415.1** | | | | | | Analyst: JAC |
| **Organic Carbon, Total** | **14.5** | a | **0.500** | **1.00** | **1.00** | **mg/L** | 1 | 31-Dec-2021 03:54 |

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

**ALS Houston, US** Date: 04-Jan-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS21121521 |
| Sample ID: | LH18/24-SP650_122821_AIX | Lab ID:HS21121521-02 |
| Collection Date: | 28-Dec-2021 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 29-Dec-2021 16:41 |

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

**ALS Houston, US** Date: 04-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS21121521

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** R398577 ( 0 ) | **Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) | | | | **Matrix:** Water | |
| HS21121521-02 | LH18/24-SP650_122821_AIX | 28 Dec 2021 14:00 | | | 29 Dec 2021 16:41 | 1 |
| **Batch ID:** R398608 ( 0 ) | **Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978 | | | | **Matrix:** Water | |
| HS21121521-01 | LH18/24-SP650_122821 | 28 Dec 2021 14:00 | | | 29 Dec 2021 13:40 | 10 |
| **Batch ID:** R398730 ( 0 ) | **Test Name :** TOTAL ORGANIC CARBON BY E415.1 | | | | **Matrix:** Water | |
| HS21121521-01 | LH18/24-SP650_122821 | 28 Dec 2021 14:00 | | | 31 Dec 2021 03:54 | 1 |
| **Batch ID:** R398756 ( 0 ) | **Test Name :** AMMONIA AS N BY E350.3(ISE) | | | | **Matrix:** Water | |
| HS21121521-01 | LH18/24-SP650_122821 | 28 Dec 2021 14:00 | | | 03 Jan 2022 15:36 | 10 |

**ALS Houston, US** Date: 04-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS21121521

**QC BATCH REPORT**

**Batch ID:** R398608 ( 0 ) **Instrument:** UV-2450 **Method:** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978

**MBLK** Sample ID: **MBLK-R398608** Units: **mg/L** Analysis Date: **29-Dec-2021 13:40**
Client ID: Run ID: **UV-2450_398608** SeqNo: **6446097** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.0250 | 0.0250 | | | | | | | | U |

**LCS** Sample ID: **LCS-R398608** Units: **mg/L** Analysis Date: **29-Dec-2021 13:40**
Client ID: Run ID: **UV-2450_398608** SeqNo: **6446096** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.213 | 0.0250 | 0.25 | 0 | 85.2 | 85 - 115 | | | | |

**MS** Sample ID: **HS21121521-01MS** Units: **mg/L** Analysis Date: **29-Dec-2021 13:40**
Client ID: **LH18/24-SP650_122821** Run ID: **UV-2450_398608** SeqNo: **6446099** PrepDate: DF: **10**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 9.29 | 0.250 | 2.5 | 7.17 | 84.8 | 80 - 120 | | | | |

**MSD** Sample ID: **HS21121521-01MSD** Units: **mg/L** Analysis Date: **29-Dec-2021 13:40**
Client ID: **LH18/24-SP650_122821** Run ID: **UV-2450_398608** SeqNo: **6446098** PrepDate: DF: **10**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 9.29 | 0.250 | 2.5 | 7.17 | 84.8 | 80 - 120 | 9.29 | 0 | 20 | |

**The following samples were analyzed in this batch:** HS21121521-01

**ALS Houston, US** Date: 04-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS21121521

**QC BATCH REPORT**

**Batch ID: R398730 ( 0 )** **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON BY E415.1**

**MBLK** Sample ID: **MBLK-12302021** Units: **mg/L** Analysis Date: **31-Dec-2021 00:25**
Client ID: Run ID: **TOC_04_398730** SeqNo: **6448841** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 1.00 | 1.00 | | | | | | | | U |

**LCS** Sample ID: **LCS-12302021** Units: **mg/L** Analysis Date: **31-Dec-2021 00:41**
Client ID: Run ID: **TOC_04_398730** SeqNo: **6448842** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 10.42 | 1.00 | 10 | 0 | 104 | 85 - 115 | | | | |

**LCSD** Sample ID: **LCSD-12302021** Units: **mg/L** Analysis Date: **31-Dec-2021 00:57**
Client ID: Run ID: **TOC_04_398730** SeqNo: **6448843** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 10.57 | 1.00 | 10 | 0 | 106 | 85 - 115 | 10.42 | 1.43 | 20 | |

**MS** Sample ID: **HS21121044-01MS** Units: **mg/L** Analysis Date: **31-Dec-2021 01:30**
Client ID: Run ID: **TOC_04_398730** SeqNo: **6448845** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 16.02 | 1.00 | 10 | 4.645 | 114 | 80 - 120 | | | | |

**The following samples were analyzed in this batch:** HS21121521-01

**ALS Houston, US** Date: 04-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS21121521

**QC BATCH REPORT**

**Batch ID: R398756 ( 0 )** **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

**MBLK** Sample ID: **MBLK-R398756** Units: **mg/L** Analysis Date: **03-Jan-2022 15:36**
Client ID: Run ID: **WetChem_HS_398756** SeqNo: **6449325** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 0.20 | 0.20 | | | | | | | | U |

**LCS** Sample ID: **LCS-R398756** Units: **mg/L** Analysis Date: **03-Jan-2022 15:36**
Client ID: Run ID: **WetChem_HS_398756** SeqNo: **6449324** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 10.58 | 0.20 | 10 | 0 | 106 | 80 - 120 | | | | |

**MS** Sample ID: **HS21121542-05MS** Units: **mg/L** Analysis Date: **03-Jan-2022 15:36**
Client ID: Run ID: **WetChem_HS_398756** SeqNo: **6449327** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 20.1 | 0.20 | 10 | 9.205 | 109 | 80 - 120 | | | | |

**MSD** Sample ID: **HS21121542-05MSD** Units: **mg/L** Analysis Date: **03-Jan-2022 15:36**
Client ID: Run ID: **WetChem_HS_398756** SeqNo: **6449326** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 20 | 0.20 | 10 | 9.205 | 108 | 80 - 120 | 20.1 | 0.524 | 20 | |

**The following samples were analyzed in this batch:** HS21121521-01

**ALS Houston, US** Date: 04-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** **HS21121521**

## 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 |
| Florida | E87611-33 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 04-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS21121521

## SAMPLE TRACKING

| Lab Samp ID | Client Sample ID | Action | Date | Person | New Location |
|---|---|---|---|---|---|
| HS21121521-01 | LH18/24-SP650_122821 | Login | 12/29/2021 11:38:18 AM | JRM | WET097 |
| HS21121521-01 | LH18/24-SP650_122821 | Login | 12/29/2021 11:38:18 AM | JRM | WET097 |
| HS21121521-01 | LH18/24-SP650_122821 | Login | 12/29/2021 11:38:18 AM | JRM | WET097 |
| HS21121521-02 | LH18/24-SP650_122821_AIX | Login | 12/29/2021 11:38:18 AM | JRM | Sub |

**ALS Houston, US** Date: 04-Jan-22

## Sample Receipt Checklist

**Work Order ID:** HS21121521 **Date/Time Received:** **29-Dec-2021 10:40**

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

**Completed By:** /S/ Jared R. Makan (eSignature) 29-Dec-2021 11:40 (Date/Time) **Reviewed by:** /S/ Ragen Giga (eSignature) 29-Dec-2021 19:15 (Date/Time)

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

| | Yes | No | Not Present |
|---|---|---|---|
| Shipping container/cooler in good condition? | ☑ | ☐ | ☐ |
| Custody seals intact on shipping container/cooler? | ☑ | ☐ | ☐ |
| Custody seals intact on sample bottles? | ☐ | ☐ | ☑ |
| VOA/TX1005/TX1006 Solids in hermetically sealed vials? | ☐ | ☐ | ☑ |
| Chain of custody present? | ☑ | ☐ | 1 Page(s) |
| Chain of custody signed when relinquished and received? | ☑ | ☐ | |
| Samplers name present on COC? | ☑ | ☐ | |
| Chain of custody agrees with sample labels? | ☑ | ☐ | |
| Samples in proper container/bottle? | ☑ | ☐ | |
| Sample containers intact? | ☑ | ☐ | |
| Sufficient sample volume for indicated test? | ☑ | ☐ | |
| All samples received within holding time? | ☑ | ☐ | |
| Container/Temp Blank temperature in compliance? | ☑ | ☐ | |

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 1.2°C UC/C | IR31 |
| Cooler(s)/Kit(s): | Red | |
| Date/Time sample(s) sent to storage: | 12/29/2021 11:40 | |

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

Page 1 of 1

**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:** GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

**Prepared By:** Scott Beesinger

**P.O. Number**

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | AMMONIA-N | TOTAL ORGANIC CARBON | ORTHO-PHOSPHATE | PERCHLORATE | | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_122821 | Water | 12/28/21 / 14:00 | | 3 | X | X | | | | | | | | | H2SO4 | |
| LH18/24-SP650_122821 | Water | 12/28/21 / 14:00 | | 1 | | | X | | | | | | | | NONE | |
| LH18/24–SP650_122821_AIX | Water | 12/28/21 / 14:00 | | 1 | | | | X | | | | | | | NONE | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Analyses

Additional Remarks: **24 Hour TAT on Perchlorate. Standard TAT on other parameters**

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 12/28/21 | 14:30 | | | | | | | | | |

**For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| J. Jimenez | 12/29/21 | 10:40 | | | | | | | |

Remarks: Cooler-Red Temp 1.2°C 1123 CFO

**HS21121521**

Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Weekly Samples

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

TRK# 4809 7830 8113 PRIORITY OVERNIGHT

FedEx

AB SGRA

77099
TX-US
IAH

3923207 28Dec2021 GGGA 56DG3/E934/1D23

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

CUSTODY SEAL

Date: 12/28/21 Time: 1430
Name: [illegible]
Company: [illegible]

Seal Broken By: Jm
Date: 12/29/21

December 29, 2021

Service Request No:E2101308

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS21121521**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory December 29, 2021
For your reference, these analyses have been assigned our service request number **E2101308.**

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**
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Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

**ALS Environmental**

| | | | |
|---|---|---|---|
| **Client:** | ALS Houston | **Service Request No.:** | E2101308 |
| **Project:** | HS21121521 | **Date Received:** | 12/29/21 |
| **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

One sample was received for analysis at ALS Environmental in Houston on 12/29/21.

The sample was received in good condition and is 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:**

EQ2100710: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for these extraction batches. The LCS-DLCS recoveries are within QC limits.

DoD Certification is held for the method/matrix/analytes provided in this report.

*The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*

**Client:** ALS Environmental - US **Service Request:**E2101308
**Project:** HS21121521

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2101308-001 | LH18/24-SP650_122821_AIX | 12/28/2021 | 1400 |

# Service Request Summary

**Folder #:** **E2101308**
Client Name: ALS Environmental - US
Project Name: HS21121521
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 12/29/21
Internal Due Date: 1/3/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21121521
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**
**Rush**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON CIO4 DOD/6850 |
|---|---|---|---|---|
| E2101308-001 | LH18/24-SP650_122821_AIX | Water | 12/28/21 1400 | **IV** |

# Service Request Summary

**Folder #:** **E2101308**
Client Name: ALS Environmental - US
Project Name: HS21121521
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 12/29/21
Internal Due Date: 1/3/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS21121521
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**
**Rush**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 1 | Level IV due 1/20 |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| + | Possible Tedlar bag artifact. |
| A | TIC is a suspected aldol-condensation product |
| B | Analyte found in the associated method blank as well as in the sample. |
| BC | Reported results are not blank corrected. |
| BH | The back section of the tube yielded higher results than the front. |
| BT | Results indicated possible breakthrough; back section >=10% front section. |
| C | Result identification confirmed. |
| D | Compound identified in an analysis at a secondary dilution factor |
| D | Spike was diluted out |
| DE | Reported results are corrected for desorption efficiency. |
| E | Estimated value. Concentration above calibration range |
| E | The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample. |
| F | The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard. |
| H | The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard. |
| H1 | Sample analysis performed past holding time. See case narrative. |
| H2 | Initial analysis within holding time. Reanalysis for the required dilution was past holding time. |
| H3 | Sample was received and analyzed past holding time. |
| H4 | Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative. |
| I | Internal standard not within the specified limits. See case narrative. |
| J | Estimated Value. Concentration found below MRL. |
| K | A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate. |
| K | Analyte was detected above the method reporting limit prior to normalization. |
| K | The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result. |
| L | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard. |
| L1 | Laboratory control sample recovery outside the specified limits; results may be biased high. |
| L2 | Laboratory control sample recovery outside the specified limits; results may be biased low. |
| L3 | Laboratory control sample recovery outside the specified limits. |
| M | Matrix interference; results may be biased high. |
| M | The duplicate injection precision not met. |
| M1 | Matrix interference due to coelution with a non-target compound; results may be biased high. |
| N | Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search. |
| N | The Matrix Spike sample recovery is not within control limits. See case narrative. |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| O | The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard. |
| P | Indicates chlorodiphenyl ether interference present at the retention time of the target compound. |
| P | Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns |
| Q | Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria. |
| R | Duplicate Precision not met. |
| R1 | Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated. |
| S | Surrogate recovery not within specified limits. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| T | Analyte is a tentatively identified compound, result is estimated. |
| U | Compound was analyzed for, but was not detected (ND). |
| V1 | The continuing calibration verification standard was outside (biased high) the specified limits for this compound. |
| V2 | The continuing calibration verification standard was outside (biased low) the specified limits for this compound. |
| W | Result quantified, but the corresponding peak was detected outside the generated retention time window. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| X | See case narrative. |
| Y | Recovery outside limits |
| Y | The chromatogram resembles a petroleum product but does not match the calibration standard. |
| Z | The chromatogram does not resemble a petroleum product. |
| i | The MRL/MDL has been elevated due to a matrix interference. |

# ALS Laboratory Group

## Acronyms

| | |
|---|---|
| Cal | Calibration |
| Conc | CONCentration |
| Dioxin(s) | Polychlorinated dibenzo-p-dioxin(s) |
| EDL | Estimated Detection Limit |
| EMPC | Estimated Maximum Possible Concentration |
| Flags | Data qualifiers |
| Furan(s) | Polychlorinated dibenzofuran(s) |
| g | Grams |
| ICAL | Initial CALibration |
| ID | IDentifier |
| Ions | Masses monitored for the analyte during data acquisition |
| L | Liter (s) |
| LCS | Laboratory Control Sample |
| DLCS | Duplicate Laboratory Control Sample |
| MB | Method Blank |
| MCL | Method Calibration Limit |
| MDL | Method Detection Limit |
| mL | Milliliters |
| MS | Matrix Spiked sample |
| DMS | Duplicate Matrix Spiked sample |
| NO | Number of peaks meeting all identification criteria |
| PCDD(s) | Polychlorinated dibenzo-p-dioxin(s) |
| PCDF(s) | Polychlorinated dibenzofuran(s) |
| ppb | Parts per billion |
| ppm | Parts per million |
| ppq | Parts per quadrillion |
| ppt | Parts per trillion |
| QA | Quality Assurance |
| QC | Quality Control |
| Ratio | Ratio of areas from monitored ions for an analyte |
| % Rec. | Percent recovery |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| RT | Retention Time |
| SDG | Sample Delivery Group |
| S/N | Signal-to-noise ratio |
| TEF | Toxicity Equivalence Factor |
| TEQ | Toxicity Equivalence Quotient |

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ALS Environmental

## State Certifications, Accreditations, and Licenses

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas Department of Environmental Quality | 19-028-0 | 6/30/2022 |
| Arkansas Department of Environmental Quality | 21-022-0 | 3/26/2022 |
| Florida Department of Health | E87611-33 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Louisiana Department of Health and Hospitals | LA028-2021 | 12/31/2021 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Minnesota Department of Health | 2021671 | 12/31/2021 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 5/1/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
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Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

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**F:** +1 281 530 5887
**www.alsglobal.com**

# Subcontract Chain of Custody

**SAMPLING STATE:** **Dept of Defense** **COC ID: 17784**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

| | |
|---|---|
| **Company:** | ALS Houston |
| **Contact:** | Ragen Giga |
| **Address:** | 10450 Stancliff Rd, Ste 210 |
| **Phone:** | +1 281 530 5656 |
| **Email:** | RagenP.Giga@ALSGlobal.com |
| **Alternate Contact:** | 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:** | HS21121521 |
| **TSR:** | Houston House Acct |

| | LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | | | DUE DATE |
| **1.** | **HS21121521-02** | **LH18/24-SP650_122821_AIX** | **Water** | **28 Dec 2021 14:00** |
| | 6850-Perch. DOD Level II & Level IV in separate pdf | | | 30 Dec 2021 |

**Comments:** Please analyze for the analysis listed above.
Send report to the emails shown above.

**QC Level:** DOD IV (DoD Data Package)

**RUSH**

Relinquished By: J. Macnar Date/Time: 12/29/21 11:50

Received By: Date/Time: 12/29/21 11:50

Cooler ID(s): Temperature(s): 2.7

ALS Environmental

# Cooler Receipt Form

Project Chemist: CH

Client/Project: ALS-H

Thermometer ID: IR31

Date/Time Received: 12-24-21 Initials: CH

Date/Time Logged in: 12-24-21 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? |
|---|---|---|---|---|---|---|
| NA | | 12-24-21 | 1140 | CH | 2.7 | ☒ |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☒ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☒ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☒ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☒ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☒ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

ALS Environmental - Houston HRMS

10450 Stancliff Rd., Suite 210
Houston, TX 77099
**T:** +1 713 266 1599
**F:** +1 713 266 1599
**www.alsglobal.com**

# SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

**Cooler Custody Seals (desirable, mandatory if specified in SAP):**

- ✓ Intact on outside of cooler, signed and dated

**Chain-of-Custody (COC) documentation (mandatory):**

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

**Sample Integrity (mandatory):**

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

**Temperature Requirement (varies by sample matrix):**

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

# Preparation Information Benchsheets

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

# *Preparation Information Benchsheet*

**Prep Run#:** 393304 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** **Prep Date/Time:** 12/29/21 14:42

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2101308-001 | LH18/24-SP650_122821_AIX | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 2 | EQ2100710-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 3 | EQ2100710-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 4 | EQ2100710-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |

## Spiking Solutions

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 214765 Logbook Ref: Sodium Perchlorate Expires On: 12/11/2022

E2101308-001 100.00µL EQ2100710-01 100.00µL EQ2100710-02 100.00µL EQ2100710-03 100.00µL

Name: Perchlorate Intermediate Stock1 Inventory ID 219595 Logbook Ref: Perchlorate Expires On: 03/15/2022

EQ2100710-02 1.00µL EQ2100710-03 1.00µL

## Preparation Materials

Water HPLC Grade 08/03/2021 Water (218530) 537M Glass Culture Tubes 537M Glass Tubes (218064) 6850 0.45um syringe filters 6850 Syringe Filters (219639)

## Preparation Steps

Step: Preparation
Started: 12/29/21 14:42
Finished: 12/29/21 14:50
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 12/29/21

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:** | E2101308 |
| **Project:** | HS21121521 | **Date Collected:** | 12/28/21 1400 |
| **Sample Matrix:** | Water | **Date Received:** | 12/29/21 |
| **Sample Name:** | LH18/24-SP650_122821_AIX | **Units:** | µg/L |
| **Lab Code:** | E2101308-001 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.0932** | J | 0.200 | 0.100 | 0.0500 | 2 | 12/29/21 | 12/29/21 15:58 | 393304 | 750447 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2101308 |
| **Project:** | HS21121521 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2100710-01 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | ND | U | 0.100 | 0.0500 | 0.0250 | 1 | 12/29/21 | 12/29/21 14:55 | 393304 | 750447 | |

# 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:** | E2101308 |
| **Project:** | HS21121521 | **Date Analyzed:** | 12/29/21 |
| **Sample Matrix:** | Water | | |

**Lab Control Sample Summary**
**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

| | | | |
|---|---|---|---|
| **Analytical Method:** | 6850 | **Units:** | µg/L |
| **Prep Method:** | | **Basis:** | NA |
| | | **Extraction Lot:** | 393304 |

| | Lab Control Sample EQ2100710-02 | | | Duplicate Lab Control Sample EQ2100710-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.105 | 0.100 | 105 | 0.106 | 0.100 | 106 | 84 - 119 | 1 | 15 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2101308 |
| **Project:** | HS21121521 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2100710-02 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.105** | | 0.100 | 0.0500 | 0.0250 | 1 | 12/29/21 | 12/29/21 15:18 | 393304 | 750447 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2101308 |
| **Project:** | HS21121521 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2100710-03 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.106** | | 0.100 | 0.0500 | 0.0250 | 1 | 12/29/21 | 12/29/21 15:26 | 393304 | 750447 | |

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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January 11, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS21121523**

Laboratory Results for: **Longhorn GW Treatment Plant Bi-Weekly Samples**

Dear Marcia Olive,

ALS Environmental received 2 sample(s) on Dec 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: JUMOKE.LAWAL**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 11-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**Work Order:** HS21121523

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS21121523-01 | LH18/24-SP650_122821 | Water | | 28-Dec-2021 14:00 | 29-Dec-2021 10:40 | ☐ |
| HS21121523-02 | Trip Blank | Water | | 28-Dec-2021 14:00 | 29-Dec-2021 10:40 | ☐ |

**ALS Houston, US** Date: 11-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**Work Order:** HS21121523

**CASE NARRATIVE**

## GCMS Volatiles by Method SW8260

### Batch ID: R398935

#### Sample ID: HS21121538-04MS

- MS and MSD are for an unrelated sample

## WetChemistry by Method SW9056

### Batch ID: R400170

#### Sample ID: LH18/24-SP650_122821 (HS21121523-01MS)

- 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)

**ALS Houston, US** Date: 11-Jan-22

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS21121523
Sample ID: LH18/24-SP650_122821 Lab ID:HS21121523-01
Collection Date: 28-Dec-2021 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| 1,1,1,2-Tetrachloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 1,1,1-Trichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 1,1-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 1,1-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 1,1-Dichloropropene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 1,2,3-Trichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 1,2,3-Trichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 1,2,4-Trichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 1,2,4-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 1,2-Dibromo-3-chloropropane | 1.0 | U | 0.20 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 1,2-Dibromoethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 1,2-Dichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 1,2-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 1,2-Dichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 1,3,5-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 1,3-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 1,3-Dichloropropane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 1,4-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 2,2-Dichloropropane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 2-Butanone | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 2-Chlorotoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 2-Hexanone | 2.0 | U | 1.0 | 2.0 | 2.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 4-Chlorotoluene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 4-Isopropyltoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| 4-Methyl-2-pentanone | 2.0 | U | 0.70 | 2.0 | 2.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Acetone | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Benzene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Bromobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Bromochloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Bromodichloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Bromoform | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Bromomethane | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Carbon disulfide | 2.0 | U | 0.60 | 2.0 | 2.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Carbon tetrachloride | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Chlorobenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Chloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Chloroform | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |

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

**ALS Houston, US** Date: 11-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Sample ID: LH18/24-SP650_122821
Collection Date: 28-Dec-2021 14:00

**ANALYTICAL REPORT**
WorkOrder:HS21121523
Lab ID:HS21121523-01
Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| Chloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| **cis-1,2-Dichloroethene** | **2.1** | | **0.20** | **0.50** | **1.0** | **ug/L** | 1 | 05-Jan-2022 16:11 |
| cis-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Dibromochloromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Dibromomethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Dichlorodifluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Ethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Hexachlorobutadiene | 1.0 | U | 1.0 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Isopropylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| m,p-Xylene | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Methylene chloride | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| n-Butylbenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| n-Propylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Naphthalene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| o-Xylene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| sec-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Styrene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| tert-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Tetrachloroethene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Toluene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| trans-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| trans-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Trichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Trichlorofluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| Vinyl chloride | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 16:11 |
| *Surr: 1,2-Dichloroethane-d4* | *83.1* | | | **0** | *81-118* | *%REC* | *1* | *05-Jan-2022 16:11* |
| *Surr: 4-Bromofluorobenzene* | *98.7* | | | **0** | *85-114* | *%REC* | *1* | *05-Jan-2022 16:11* |
| *Surr: Dibromofluoromethane* | *89.9* | | | **0** | *80-119* | *%REC* | *1* | *05-Jan-2022 16:11* |
| *Surr: Toluene-d8* | *107* | | | **0** | *89-112* | *%REC* | *1* | *05-Jan-2022 16:11* |
| **ANIONS BY SW9056A** | | **Method:SW9056** | | | | | | Analyst: YP |
| **Chloride** | **794** | | **4.00** | **10.0** | **10.0** | **mg/L** | 20 | 10-Jan-2022 18:22 |
| **Sulfate** | **21.5** | | **0.200** | **0.500** | **0.500** | **mg/L** | 1 | 10-Jan-2022 17:59 |

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

**ALS Houston, US** Date: 11-Jan-22

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS21121523
Sample ID: Trip Blank Lab ID:HS21121523-02
Collection Date: 28-Dec-2021 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| 1,1,1,2-Tetrachloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 1,1,1-Trichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 1,1-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 1,1-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 1,1-Dichloropropene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 1,2,3-Trichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 1,2,3-Trichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 1,2,4-Trichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 1,2,4-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 1,2-Dibromo-3-chloropropane | 1.0 | U | 0.20 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 1,2-Dibromoethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 1,2-Dichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 1,2-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 1,2-Dichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 1,3,5-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 1,3-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 1,3-Dichloropropane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 1,4-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 2,2-Dichloropropane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 2-Butanone | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 2-Chlorotoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 2-Hexanone | 2.0 | U | 1.0 | 2.0 | 2.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 4-Chlorotoluene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 4-Isopropyltoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| 4-Methyl-2-pentanone | 2.0 | U | 0.70 | 2.0 | 2.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Acetone | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Benzene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Bromobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Bromochloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Bromodichloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Bromoform | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Bromomethane | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Carbon disulfide | 2.0 | U | 0.60 | 2.0 | 2.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Carbon tetrachloride | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Chlorobenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Chloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Chloroform | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |

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

**ALS Houston, US** Date: 11-Jan-22

Client: Bhate Environmental Associates, Inc.

**ANALYTICAL REPORT**

Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS21121523

Sample ID: Trip Blank Lab ID:HS21121523-02

Collection Date: 28-Dec-2021 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| Chloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| cis-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| cis-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Dibromochloromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Dibromomethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Dichlorodifluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Ethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Hexachlorobutadiene | 1.0 | U | 1.0 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Isopropylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| m,p-Xylene | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Methylene chloride | 1.0 | U | 0.40 | 1.0 | 2.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| n-Butylbenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| n-Propylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Naphthalene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| o-Xylene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| sec-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Styrene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| tert-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Tetrachloroethene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Toluene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| trans-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| trans-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Trichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Trichlorofluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| Vinyl chloride | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 05-Jan-2022 12:50 |
| *Surr: 1,2-Dichloroethane-d4* | *83.9* | | | **0** | *81-118* | *%REC* | *1* | *05-Jan-2022 12:50* |
| *Surr: 4-Bromofluorobenzene* | *97.2* | | | **0** | *85-114* | *%REC* | *1* | *05-Jan-2022 12:50* |
| *Surr: Dibromofluoromethane* | *90.4* | | | **0** | *80-119* | *%REC* | *1* | *05-Jan-2022 12:50* |
| *Surr: Toluene-d8* | *108* | | | **0** | *89-112* | *%REC* | *1* | *05-Jan-2022 12:50* |

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

**ALS Houston, US** Date: 11-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS21121523

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** R398935 ( 0 ) | **Test Name :** VOLATILES ORGANICS BY METHOD 8260C | | | | **Matrix:** Water | |
| HS21121523-01 | LH18/24-SP650_122821 | 28 Dec 2021 14:00 | | | 05 Jan 2022 16:11 | 1 |
| HS21121523-02 | Trip Blank | 28 Dec 2021 14:00 | | | 05 Jan 2022 12:50 | 1 |
| **Batch ID:** R400170 ( 0 ) | **Test Name :** ANIONS BY SW9056A | | | | **Matrix:** Water | |
| HS21121523-01 | LH18/24-SP650_122821 | 28 Dec 2021 14:00 | | | 10 Jan 2022 18:22 | 20 |
| HS21121523-01 | LH18/24-SP650_122821 | 28 Dec 2021 14:00 | | | 10 Jan 2022 17:59 | 1 |

**ALS Houston, US** Date: 11-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS21121523

**QC BATCH REPORT**

**Batch ID:** R398935 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220105** Units: **ug/L** Analysis Date: **05-Jan-2022 12:05**
Client ID: Run ID: **VOA9_398935** SeqNo: **6453855** PrepDate: DF: **1**

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

**ALS Houston, US** Date: 11-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS21121523

**QC BATCH REPORT**

**Batch ID:** R398935 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220105** Units: **ug/L** Analysis Date: **05-Jan-2022 12:05**
Client ID: Run ID: **VOA9_398935** SeqNo: **6453855** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 2.0 | 2.0 | | | | | | | | U |
| Carbon tetrachloride | 1.0 | 1.0 | | | | | | | | U |
| Chlorobenzene | 1.0 | 1.0 | | | | | | | | U |
| Chloroethane | 1.0 | 1.0 | | | | | | | | U |
| Chloroform | 0.50 | 1.0 | | | | | | | | U |
| Chloromethane | 0.50 | 1.0 | | | | | | | | U |
| cis-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| cis-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Dibromochloromethane | 1.0 | 1.0 | | | | | | | | U |
| Dibromomethane | 0.50 | 1.0 | | | | | | | | U |
| Dichlorodifluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Ethylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Hexachlorobutadiene | 1.0 | 1.0 | | | | | | | | U |
| Isopropylbenzene | 1.0 | 1.0 | | | | | | | | U |
| m,p-Xylene | 1.0 | 2.0 | | | | | | | | U |
| Methylene chloride | 2.0 | 2.0 | | | | | | | | U |
| Naphthalene | 1.0 | 1.0 | | | | | | | | U |
| n-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| n-Propylbenzene | 1.0 | 1.0 | | | | | | | | U |
| o-Xylene | 1.0 | 1.0 | | | | | | | | U |
| sec-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Styrene | 1.0 | 1.0 | | | | | | | | U |
| tert-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Tetrachloroethene | 1.0 | 1.0 | | | | | | | | U |
| Toluene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Trichloroethene | 0.50 | 1.0 | | | | | | | | U |
| Trichlorofluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Vinyl chloride | 0.50 | 1.0 | | | | | | | | U |
| *Surr: 1,2-Dichloroethane-d4* | *42.1* | *1.0* | *50* | *0* | *84.2* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *49.74* | *1.0* | *50* | *0* | *99.5* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *44.98* | *1.0* | *50* | *0* | *90.0* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *54.22* | *1.0* | *50* | *0* | *108* | *89 - 112* | | | | |

**ALS Houston, US** Date: 11-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS21121523

**QC BATCH REPORT**

**Batch ID:** R398935 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220105** Units: **ug/L** Analysis Date: **05-Jan-2022 11:21**
Client ID: Run ID: **VOA9_398935** SeqNo: **6453854** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 21.03 | 1.0 | 20 | 0 | 105 | 78 - 124 | | | | |
| 1,1,1-Trichloroethane | 18.47 | 1.0 | 20 | 0 | 92.3 | 74 - 131 | | | | |
| 1,1,2,2-Tetrachloroethane | 19.54 | 1.0 | 20 | 0 | 97.7 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 20.47 | 1.0 | 20 | 0 | 102 | 80 - 119 | | | | |
| 1,1-Dichloroethane | 18.12 | 1.0 | 20 | 0 | 90.6 | 77 - 125 | | | | |
| 1,1-Dichloroethene | 19.03 | 1.0 | 20 | 0 | 95.1 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 19.1 | 1.0 | 20 | 0 | 95.5 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 20.62 | 1.0 | 20 | 0 | 103 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 18.74 | 1.0 | 20 | 0 | 93.7 | 73 - 122 | | | | |
| 1,2,4-Trichlorobenzene | 21.14 | 1.0 | 20 | 0 | 106 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 20.8 | 1.0 | 20 | 0 | 104 | 76 - 124 | | | | |
| 1,2-Dibromo-3-chloropropane | 18.34 | 1.0 | 20 | 0 | 91.7 | 62 - 128 | | | | |
| 1,2-Dibromoethane | 20.57 | 1.0 | 20 | 0 | 103 | 77 - 121 | | | | |
| 1,2-Dichlorobenzene | 20.56 | 1.0 | 20 | 0 | 103 | 80 - 119 | | | | |
| 1,2-Dichloroethane | 17.5 | 1.0 | 20 | 0 | 87.5 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 20.83 | 1.0 | 20 | 0 | 104 | 78 - 122 | | | | |
| 1,3,5-Trimethylbenzene | 20.87 | 1.0 | 20 | 0 | 104 | 75 - 124 | | | | |
| 1,3-Dichlorobenzene | 20.53 | 1.0 | 20 | 0 | 103 | 80 - 119 | | | | |
| 1,3-Dichloropropane | 20.32 | 1.0 | 20 | 0 | 102 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 19.61 | 1.0 | 20 | 0 | 98.0 | 79 - 118 | | | | |
| 2,2-Dichloropropane | 18.71 | 1.0 | 20 | 0 | 93.6 | 60 - 139 | | | | |
| 2-Butanone | 35.23 | 2.0 | 40 | 0 | 88.1 | 56 - 143 | | | | |
| 2-Chlorotoluene | 20.37 | 1.0 | 20 | 0 | 102 | 79 - 122 | | | | |
| 2-Hexanone | 39.67 | 2.0 | 40 | 0 | 99.2 | 57 - 139 | | | | |
| 4-Chlorotoluene | 20.47 | 1.0 | 20 | 0 | 102 | 78 - 122 | | | | |
| 4-Isopropyltoluene | 20.69 | 1.0 | 20 | 0 | 103 | 77 - 127 | | | | |
| 4-Methyl-2-pentanone | 39.69 | 2.0 | 40 | 0 | 99.2 | 67 - 130 | | | | |
| Acetone | 33.57 | 2.0 | 40 | 0 | 83.9 | 39 - 160 | | | | |
| Benzene | 20.35 | 1.0 | 20 | 0 | 102 | 79 - 120 | | | | |
| Bromobenzene | 20.85 | 1.0 | 20 | 0 | 104 | 80 - 120 | | | | |
| Bromochloromethane | 20.18 | 1.0 | 20 | 0 | 101 | 78 - 123 | | | | |
| Bromodichloromethane | 19.21 | 1.0 | 20 | 0 | 96.0 | 79 - 125 | | | | |
| Bromoform | 18.35 | 1.0 | 20 | 0 | 91.7 | 66 - 130 | | | | |
| Bromomethane | 20.59 | 1.0 | 20 | 0 | 103 | 53 - 141 | | | | |

**ALS Houston, US** Date: 11-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS21121523

**QC BATCH REPORT**

**Batch ID:** R398935 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220105** Units: **ug/L** Analysis Date: **05-Jan-2022 11:21**
Client ID: Run ID: **VOA9_398935** SeqNo: **6453854** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 38.46 | 2.0 | 40 | 0 | 96.1 | 64 - 133 | | | | |
| Carbon tetrachloride | 18.21 | 1.0 | 20 | 0 | 91.0 | 72 - 136 | | | | |
| Chlorobenzene | 20.68 | 1.0 | 20 | 0 | 103 | 82 - 118 | | | | |
| Chloroethane | 19.19 | 1.0 | 20 | 0 | 96.0 | 60 - 138 | | | | |
| Chloroform | 18.25 | 1.0 | 20 | 0 | 91.3 | 79 - 124 | | | | |
| Chloromethane | 18.97 | 1.0 | 20 | 0 | 94.8 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 20.41 | 1.0 | 20 | 0 | 102 | 78 - 123 | | | | |
| cis-1,3-Dichloropropene | 18.81 | 1.0 | 20 | 0 | 94.1 | 75 - 124 | | | | |
| Dibromochloromethane | 18.88 | 1.0 | 20 | 0 | 94.4 | 74 - 126 | | | | |
| Dibromomethane | 19.27 | 1.0 | 20 | 0 | 96.4 | 79 - 123 | | | | |
| Dichlorodifluoromethane | 18.55 | 1.0 | 20 | 0 | 92.8 | 32 - 152 | | | | |
| Ethylbenzene | 20.42 | 1.0 | 20 | 0 | 102 | 79 - 121 | | | | |
| Hexachlorobutadiene | 21.42 | 1.0 | 20 | 0 | 107 | 66 - 134 | | | | |
| Isopropylbenzene | 21 | 1.0 | 20 | 0 | 105 | 72 - 131 | | | | |
| m,p-Xylene | 42.46 | 2.0 | 40 | 0 | 106 | 80 - 121 | | | | |
| Methylene chloride | 18.95 | 2.0 | 20 | 0 | 94.7 | 74 - 124 | | | | |
| Naphthalene | 19.04 | 1.0 | 20 | 0 | 95.2 | 61 - 128 | | | | |
| n-Butylbenzene | 20.69 | 1.0 | 20 | 0 | 103 | 75 - 128 | | | | |
| n-Propylbenzene | 20.12 | 1.0 | 20 | 0 | 101 | 76 - 126 | | | | |
| o-Xylene | 21.37 | 1.0 | 20 | 0 | 107 | 78 - 122 | | | | |
| sec-Butylbenzene | 20.55 | 1.0 | 20 | 0 | 103 | 77 - 126 | | | | |
| Styrene | 22.13 | 1.0 | 20 | 0 | 111 | 78 - 123 | | | | |
| tert-Butylbenzene | 20.38 | 1.0 | 20 | 0 | 102 | 78 - 124 | | | | |
| Tetrachloroethene | 21.06 | 1.0 | 20 | 0 | 105 | 74 - 129 | | | | |
| Toluene | 21.08 | 1.0 | 20 | 0 | 105 | 80 - 121 | | | | |
| trans-1,2-Dichloroethene | 19.16 | 1.0 | 20 | 0 | 95.8 | 75 - 124 | | | | |
| trans-1,3-Dichloropropene | 17.83 | 1.0 | 20 | 0 | 89.1 | 73 - 127 | | | | |
| Trichloroethene | 21.03 | 1.0 | 20 | 0 | 105 | 79 - 123 | | | | |
| Trichlorofluoromethane | 17.76 | 1.0 | 20 | 0 | 88.8 | 65 - 141 | | | | |
| Vinyl chloride | 18.2 | 1.0 | 20 | 0 | 91.0 | 58 - 137 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *44.88* | *1.0* | *50* | *0* | *89.8* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *52.7* | *1.0* | *50* | *0* | *105* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *49.51* | *1.0* | *50* | *0* | *99.0* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *52.7* | *1.0* | *50* | *0* | *105* | *89 - 112* | | | | |

**ALS Houston, US** Date: 11-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS21121523

**QC BATCH REPORT**

**Batch ID:** R398935 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS21121538-04MS** Units: **ug/L** Analysis Date: **05-Jan-2022 13:57**
Client ID: Run ID: **VOA9_398935** SeqNo: **6453859** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 23.18 | 1.0 | 20 | 0 | 116 | 78 - 124 | | | | |
| 1,1,1-Trichloroethane | 20.3 | 1.0 | 20 | 0 | 101 | 74 - 131 | | | | |
| 1,1,2,2-Tetrachloroethane | 21.2 | 1.0 | 20 | 0 | 106 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 22.42 | 1.0 | 20 | 0 | 112 | 80 - 119 | | | | |
| 1,1-Dichloroethane | 18.49 | 1.0 | 20 | 0 | 92.4 | 77 - 125 | | | | |
| 1,1-Dichloroethene | 19.63 | 1.0 | 20 | 0 | 98.1 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 22.23 | 1.0 | 20 | 0 | 111 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 21.92 | 1.0 | 20 | 0 | 110 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 20.61 | 1.0 | 20 | 0 | 103 | 73 - 122 | | | | |
| 1,2,4-Trichlorobenzene | 22.5 | 1.0 | 20 | 0 | 113 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 22.63 | 1.0 | 20 | 0 | 113 | 76 - 124 | | | | |
| 1,2-Dibromo-3-chloropropane | 19.34 | 1.0 | 20 | 0 | 96.7 | 62 - 128 | | | | |
| 1,2-Dibromoethane | 23.01 | 1.0 | 20 | 0 | 115 | 77 - 121 | | | | |
| 1,2-Dichlorobenzene | 22.46 | 1.0 | 20 | 0 | 112 | 80 - 119 | | | | |
| 1,2-Dichloroethane | 20.07 | 1.0 | 20 | 0 | 100 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 21.88 | 1.0 | 20 | 0 | 109 | 78 - 122 | | | | |
| 1,3,5-Trimethylbenzene | 22.98 | 1.0 | 20 | 0 | 115 | 75 - 124 | | | | |
| 1,3-Dichlorobenzene | 22.08 | 1.0 | 20 | 0 | 110 | 80 - 119 | | | | |
| 1,3-Dichloropropane | 21.95 | 1.0 | 20 | 0 | 110 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 21.57 | 1.0 | 20 | 0 | 108 | 79 - 118 | | | | |
| 2,2-Dichloropropane | 19.32 | 1.0 | 20 | 0 | 96.6 | 60 - 139 | | | | |
| 2-Butanone | 35.86 | 2.0 | 40 | 0 | 89.6 | 56 - 143 | | | | |
| 2-Chlorotoluene | 22.2 | 1.0 | 20 | 0 | 111 | 79 - 122 | | | | |
| 2-Hexanone | 42.05 | 2.0 | 40 | 0 | 105 | 57 - 139 | | | | |
| 4-Chlorotoluene | 21.99 | 1.0 | 20 | 0 | 110 | 78 - 122 | | | | |
| 4-Isopropyltoluene | 23.07 | 1.0 | 20 | 0 | 115 | 77 - 127 | | | | |
| 4-Methyl-2-pentanone | 43.1 | 2.0 | 40 | 0 | 108 | 67 - 130 | | | | |
| Acetone | 31.86 | 2.0 | 40 | 0 | 79.6 | 39 - 160 | | | | |
| Benzene | 22.67 | 1.0 | 20 | 0 | 113 | 79 - 120 | | | | |
| Bromobenzene | 22.37 | 1.0 | 20 | 0 | 112 | 80 - 120 | | | | |
| Bromochloromethane | 20.51 | 1.0 | 20 | 0 | 103 | 78 - 123 | | | | |
| Bromodichloromethane | 21.04 | 1.0 | 20 | 0 | 105 | 79 - 125 | | | | |
| Bromoform | 19.61 | 1.0 | 20 | 0 | 98.1 | 66 - 130 | | | | |
| Bromomethane | 19.29 | 1.0 | 20 | 0 | 96.4 | 53 - 141 | | | | |

**ALS Houston, US** Date: 11-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS21121523

**QC BATCH REPORT**

**Batch ID:** R398935 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS21121538-04MS** Units: **ug/L** Analysis Date: **05-Jan-2022 13:57**
Client ID: Run ID: **VOA9_398935** SeqNo: **6453859** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 36.47 | 2.0 | 40 | 0 | 91.2 | 64 - 133 | | | | |
| Carbon tetrachloride | 22.46 | 1.0 | 20 | 0 | 112 | 72 - 136 | | | | |
| Chlorobenzene | 23.91 | 1.0 | 20 | 0 | 120 | 82 - 118 | | | | S |
| Chloroethane | 19.54 | 1.0 | 20 | 0 | 97.7 | 60 - 138 | | | | |
| Chloroform | 19.07 | 1.0 | 20 | 0 | 95.4 | 79 - 124 | | | | |
| Chloromethane | 18.55 | 1.0 | 20 | 0 | 92.7 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 28.06 | 1.0 | 20 | 7.723 | 102 | 78 - 123 | | | | |
| cis-1,3-Dichloropropene | 19.64 | 1.0 | 20 | 0 | 98.2 | 75 - 124 | | | | |
| Dibromochloromethane | 20.88 | 1.0 | 20 | 0 | 104 | 74 - 126 | | | | |
| Dibromomethane | 21.44 | 1.0 | 20 | 0 | 107 | 79 - 123 | | | | |
| Dichlorodifluoromethane | 14.76 | 1.0 | 20 | 0 | 73.8 | 32 - 152 | | | | |
| Ethylbenzene | 23.31 | 1.0 | 20 | 0 | 117 | 79 - 121 | | | | |
| Hexachlorobutadiene | 23.16 | 1.0 | 20 | 0 | 116 | 66 - 134 | | | | |
| Isopropylbenzene | 24.49 | 1.0 | 20 | 0 | 122 | 72 - 131 | | | | |
| m,p-Xylene | 48.07 | 2.0 | 40 | 0 | 120 | 80 - 121 | | | | |
| Methylene chloride | 19.22 | 2.0 | 20 | 0 | 96.1 | 74 - 124 | | | | |
| Naphthalene | 20.5 | 1.0 | 20 | 0 | 102 | 61 - 128 | | | | |
| n-Butylbenzene | 22.59 | 1.0 | 20 | 0 | 113 | 75 - 128 | | | | |
| n-Propylbenzene | 22.92 | 1.0 | 20 | 0 | 115 | 76 - 126 | | | | |
| o-Xylene | 24.54 | 1.0 | 20 | 0 | 123 | 78 - 122 | | | | S |
| sec-Butylbenzene | 23.77 | 1.0 | 20 | 0 | 119 | 77 - 126 | | | | |
| Styrene | 24.49 | 1.0 | 20 | 0 | 122 | 78 - 123 | | | | |
| tert-Butylbenzene | 23.81 | 1.0 | 20 | 0 | 119 | 78 - 124 | | | | |
| Tetrachloroethene | 24.27 | 1.0 | 20 | 0 | 121 | 74 - 129 | | | | |
| Toluene | 23.7 | 1.0 | 20 | 0 | 119 | 80 - 121 | | | | |
| trans-1,2-Dichloroethene | 19.39 | 1.0 | 20 | 0 | 96.9 | 75 - 124 | | | | |
| trans-1,3-Dichloropropene | 18.82 | 1.0 | 20 | 0 | 94.1 | 73 - 127 | | | | |
| Trichloroethene | 28.95 | 1.0 | 20 | 5.532 | 117 | 79 - 123 | | | | |
| Trichlorofluoromethane | 18.46 | 1.0 | 20 | 0 | 92.3 | 65 - 141 | | | | |
| Vinyl chloride | 18.23 | 1.0 | 20 | 0 | 91.2 | 58 - 137 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *40.86* | *1.0* | *50* | *0* | *81.7* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *51.87* | *1.0* | *50* | *0* | *104* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *45.37* | *1.0* | *50* | *0* | *90.7* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *53.87* | *1.0* | *50* | *0* | *108* | *89 - 112* | | | | |

**ALS Houston, US** Date: 11-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS21121523

**QC BATCH REPORT**

**Batch ID:** R398935 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS21121538-04MSMSD** Units: **ug/L** Analysis Date: **05-Jan-2022 14:19**
Client ID: Run ID: **VOA9_398935** SeqNo: **6453860** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 23.78 | 1.0 | 20 | 0 | 119 | 78 - 124 | 23.18 | 2.53 | 20 | |
| 1,1,1-Trichloroethane | 19.76 | 1.0 | 20 | 0 | 98.8 | 74 - 131 | 20.3 | 2.68 | 20 | |
| 1,1,2,2-Tetrachloroethane | 21.66 | 1.0 | 20 | 0 | 108 | 71 - 121 | 21.2 | 2.14 | 20 | |
| 1,1,2-Trichloroethane | 22.41 | 1.0 | 20 | 0 | 112 | 80 - 119 | 22.42 | 0.0315 | 20 | |
| 1,1-Dichloroethane | 18.43 | 1.0 | 20 | 0 | 92.1 | 77 - 125 | 18.49 | 0.343 | 20 | |
| 1,1-Dichloroethene | 19.76 | 1.0 | 20 | 0 | 98.8 | 71 - 131 | 19.63 | 0.694 | 20 | |
| 1,1-Dichloropropene | 21.43 | 1.0 | 20 | 0 | 107 | 78 - 125 | 22.23 | 3.65 | 20 | |
| 1,2,3-Trichlorobenzene | 23.23 | 1.0 | 20 | 0 | 116 | 69 - 129 | 21.92 | 5.79 | 20 | |
| 1,2,3-Trichloropropane | 21.16 | 1.0 | 20 | 0 | 106 | 73 - 122 | 20.61 | 2.62 | 20 | |
| 1,2,4-Trichlorobenzene | 23.07 | 1.0 | 20 | 0 | 115 | 69 - 130 | 22.5 | 2.51 | 20 | |
| 1,2,4-Trimethylbenzene | 23.32 | 1.0 | 20 | 0 | 117 | 76 - 124 | 22.63 | 2.98 | 20 | |
| 1,2-Dibromo-3-chloropropane | 19.2 | 1.0 | 20 | 0 | 96.0 | 62 - 128 | 19.34 | 0.727 | 20 | |
| 1,2-Dibromoethane | 22.85 | 1.0 | 20 | 0 | 114 | 77 - 121 | 23.01 | 0.687 | 20 | |
| 1,2-Dichlorobenzene | 21.97 | 1.0 | 20 | 0 | 110 | 80 - 119 | 22.46 | 2.22 | 20 | |
| 1,2-Dichloroethane | 19.76 | 1.0 | 20 | 0 | 98.8 | 73 - 128 | 20.07 | 1.55 | 20 | |
| 1,2-Dichloropropane | 22.19 | 1.0 | 20 | 0 | 111 | 78 - 122 | 21.88 | 1.39 | 20 | |
| 1,3,5-Trimethylbenzene | 23.06 | 1.0 | 20 | 0 | 115 | 75 - 124 | 22.98 | 0.339 | 20 | |
| 1,3-Dichlorobenzene | 22.71 | 1.0 | 20 | 0 | 114 | 80 - 119 | 22.08 | 2.81 | 20 | |
| 1,3-Dichloropropane | 22.33 | 1.0 | 20 | 0 | 112 | 80 - 119 | 21.95 | 1.74 | 20 | |
| 1,4-Dichlorobenzene | 22 | 1.0 | 20 | 0 | 110 | 79 - 118 | 21.57 | 1.98 | 20 | |
| 2,2-Dichloropropane | 19.05 | 1.0 | 20 | 0 | 95.2 | 60 - 139 | 19.32 | 1.43 | 20 | |
| 2-Butanone | 35.37 | 2.0 | 40 | 0 | 88.4 | 56 - 143 | 35.86 | 1.35 | 20 | |
| 2-Chlorotoluene | 22.64 | 1.0 | 20 | 0 | 113 | 79 - 122 | 22.2 | 1.96 | 20 | |
| 2-Hexanone | 42.76 | 2.0 | 40 | 0 | 107 | 57 - 139 | 42.05 | 1.67 | 20 | |
| 4-Chlorotoluene | 22.32 | 1.0 | 20 | 0 | 112 | 78 - 122 | 21.99 | 1.52 | 20 | |
| 4-Isopropyltoluene | 23.11 | 1.0 | 20 | 0 | 116 | 77 - 127 | 23.07 | 0.183 | 20 | |
| 4-Methyl-2-pentanone | 43.33 | 2.0 | 40 | 0 | 108 | 67 - 130 | 43.1 | 0.528 | 20 | |
| Acetone | 31.97 | 2.0 | 40 | 0 | 79.9 | 39 - 160 | 31.86 | 0.343 | 20 | |
| Benzene | 22.31 | 1.0 | 20 | 0 | 112 | 79 - 120 | 22.67 | 1.57 | 20 | |
| Bromobenzene | 22.37 | 1.0 | 20 | 0 | 112 | 80 - 120 | 22.37 | 0.0305 | 20 | |
| Bromochloromethane | 19.91 | 1.0 | 20 | 0 | 99.6 | 78 - 123 | 20.51 | 2.93 | 20 | |
| Bromodichloromethane | 20.63 | 1.0 | 20 | 0 | 103 | 79 - 125 | 21.04 | 1.98 | 20 | |
| Bromoform | 20.03 | 1.0 | 20 | 0 | 100 | 66 - 130 | 19.61 | 2.14 | 20 | |
| Bromomethane | 18.64 | 1.0 | 20 | 0 | 93.2 | 53 - 141 | 19.29 | 3.41 | 20 | |

**ALS Houston, US** Date: 11-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS21121523

**QC BATCH REPORT**

**Batch ID:** R398935 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS21121538-04MSMSD** Units: **ug/L** Analysis Date: **05-Jan-2022 14:19**
Client ID: Run ID: **VOA9_398935** SeqNo: **6453860** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 36.48 | 2.0 | 40 | 0 | 91.2 | 64 - 133 | 36.47 | 0.0426 | 20 | |
| Carbon tetrachloride | 21.76 | 1.0 | 20 | 0 | 109 | 72 - 136 | 22.46 | 3.18 | 20 | |
| Chlorobenzene | 23.46 | 1.0 | 20 | 0 | 117 | 82 - 118 | 23.91 | 1.91 | 20 | |
| Chloroethane | 19.85 | 1.0 | 20 | 0 | 99.3 | 60 - 138 | 19.54 | 1.6 | 20 | |
| Chloroform | 18.6 | 1.0 | 20 | 0 | 93.0 | 79 - 124 | 19.07 | 2.48 | 20 | |
| Chloromethane | 18.36 | 1.0 | 20 | 0 | 91.8 | 50 - 139 | 18.55 | 1 | 20 | |
| cis-1,2-Dichloroethene | 27.37 | 1.0 | 20 | 7.723 | 98.2 | 78 - 123 | 28.06 | 2.51 | 20 | |
| cis-1,3-Dichloropropene | 19.49 | 1.0 | 20 | 0 | 97.4 | 75 - 124 | 19.64 | 0.786 | 20 | |
| Dibromochloromethane | 20.94 | 1.0 | 20 | 0 | 105 | 74 - 126 | 20.88 | 0.314 | 20 | |
| Dibromomethane | 21.06 | 1.0 | 20 | 0 | 105 | 79 - 123 | 21.44 | 1.76 | 20 | |
| Dichlorodifluoromethane | 14.41 | 1.0 | 20 | 0 | 72.0 | 32 - 152 | 14.76 | 2.46 | 20 | |
| Ethylbenzene | 23.27 | 1.0 | 20 | 0 | 116 | 79 - 121 | 23.31 | 0.144 | 20 | |
| Hexachlorobutadiene | 23.74 | 1.0 | 20 | 0 | 119 | 66 - 134 | 23.16 | 2.45 | 20 | |
| Isopropylbenzene | 24.65 | 1.0 | 20 | 0 | 123 | 72 - 131 | 24.49 | 0.673 | 20 | |
| m,p-Xylene | 48.93 | 2.0 | 40 | 0 | 122 | 80 - 121 | 48.07 | 1.78 | 20 | S |
| Methylene chloride | 18.98 | 2.0 | 20 | 0 | 94.9 | 74 - 124 | 19.22 | 1.26 | 20 | |
| Naphthalene | 21.18 | 1.0 | 20 | 0 | 106 | 61 - 128 | 20.5 | 3.26 | 20 | |
| n-Butylbenzene | 23.13 | 1.0 | 20 | 0 | 116 | 75 - 128 | 22.59 | 2.34 | 20 | |
| n-Propylbenzene | 23.06 | 1.0 | 20 | 0 | 115 | 76 - 126 | 22.92 | 0.638 | 20 | |
| o-Xylene | 24.66 | 1.0 | 20 | 0 | 123 | 78 - 122 | 24.54 | 0.478 | 20 | S |
| sec-Butylbenzene | 23.7 | 1.0 | 20 | 0 | 118 | 77 - 126 | 23.77 | 0.307 | 20 | |
| Styrene | 24.63 | 1.0 | 20 | 0 | 123 | 78 - 123 | 24.49 | 0.592 | 20 | S |
| tert-Butylbenzene | 23.74 | 1.0 | 20 | 0 | 119 | 78 - 124 | 23.81 | 0.272 | 20 | |
| Tetrachloroethene | 25.35 | 1.0 | 20 | 0 | 127 | 74 - 129 | 24.27 | 4.36 | 20 | |
| Toluene | 24.07 | 1.0 | 20 | 0 | 120 | 80 - 121 | 23.7 | 1.56 | 20 | |
| trans-1,2-Dichloroethene | 19.67 | 1.0 | 20 | 0 | 98.3 | 75 - 124 | 19.39 | 1.43 | 20 | |
| trans-1,3-Dichloropropene | 18.67 | 1.0 | 20 | 0 | 93.3 | 73 - 127 | 18.82 | 0.782 | 20 | |
| Trichloroethene | 28.82 | 1.0 | 20 | 5.532 | 116 | 79 - 123 | 28.95 | 0.431 | 20 | |
| Trichlorofluoromethane | 18.44 | 1.0 | 20 | 0 | 92.2 | 65 - 141 | 18.46 | 0.114 | 20 | |
| Vinyl chloride | 17.87 | 1.0 | 20 | 0 | 89.3 | 58 - 137 | 18.23 | 2.03 | 20 | |
| *Surr: 1,2-Dichloroethane-d4* | *40.74* | *1.0* | *50* | *0* | *81.5* | *81 - 118* | *40.86* | *0.302* | *20* | |
| *Surr: 4-Bromofluorobenzene* | *51.77* | *1.0* | *50* | *0* | *104* | *85 - 114* | *51.87* | *0.21* | *20* | |
| *Surr: Dibromofluoromethane* | *44.8* | *1.0* | *50* | *0* | *89.6* | *80 - 119* | *45.37* | *1.27* | *20* | |
| *Surr: Toluene-d8* | *54.13* | *1.0* | *50* | *0* | *108* | *89 - 112* | *53.87* | *0.476* | *20* | |

**ALS Houston, US** Date: 11-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS21121523

**QC BATCH REPORT**

| Batch ID: | R398935 ( 0 ) | Instrument: | VOA9 | Method: | VOLATILES ORGANICS BY METHOD 8260C |
|---|---|---|---|---|---|

**The following samples were analyzed in this batch:** HS21121523-01 HS21121523-02

**ALS Houston, US** Date: 11-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS21121523

**QC BATCH REPORT**

**Batch ID:** R400170 ( 0 ) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

**MBLK** Sample ID: **MBLK** Units: **mg/L** Analysis Date: **10-Jan-2022 14:51**
Client ID: Run ID: **ICS-Integrion_400170** SeqNo: **6459453** 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: **10-Jan-2022 14:58**
Client ID: Run ID: **ICS-Integrion_400170** SeqNo: **6459454** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 19.16 | 0.500 | 20 | 0 | 95.8 | 80 - 120 | | | | |
| Sulfate | 19.15 | 0.500 | 20 | 0 | 95.7 | 80 - 120 | | | | |

**MS** Sample ID: **HS21121523-01MS** Units: **mg/L** Analysis Date: **10-Jan-2022 18:07**
Client ID: **LH18/24-SP650_122821** Run ID: **ICS-Integrion_400170** SeqNo: **6459472** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 789.5 | 0.500 | 10 | 797 | -74.4 | 80 - 120 | | | | SEO |
| Sulfate | 30.67 | 0.500 | 10 | 21.47 | 92.1 | 80 - 120 | | | | |

**MS** Sample ID: **HS21121455-09MS** Units: **mg/L** Analysis Date: **10-Jan-2022 17:37**
Client ID: Run ID: **ICS-Integrion_400170** SeqNo: **6459468** PrepDate: DF: **20**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 438.8 | 10.0 | 200 | 231 | 104 | 80 - 120 | | | | |
| Sulfate | 218.2 | 10.0 | 200 | 16.27 | 101 | 80 - 120 | | | | |

**MSD** Sample ID: **HS21121523-01MSD** Units: **mg/L** Analysis Date: **10-Jan-2022 18:14**
Client ID: **LH18/24-SP650_122821** Run ID: **ICS-Integrion_400170** SeqNo: **6459473** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 841.9 | 0.500 | 10 | 797 | 449 | 80 - 120 | 789.5 | 6.42 | 20 | SEO |
| Sulfate | 32.65 | 0.500 | 10 | 21.47 | 112 | 80 - 120 | 30.67 | 6.25 | 20 | |

**ALS Houston, US** Date: 11-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS21121523

**QC BATCH REPORT**

**Batch ID:** **R400170 ( 0 )** **Instrument:** **ICS-Integrion** **Method:** **ANIONS BY SW9056A**

**MSD** Sample ID: **HS21121455-09MSD** Units: **mg/L** Analysis Date: **10-Jan-2022 17:44**
Client ID: Run ID: **ICS-Integrion_400170** SeqNo: **6459469** PrepDate: DF: **20**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 394.4 | 10.0 | 200 | 231 | 81.7 | 80 - 120 | 438.8 | 10.7 | 20 | |
| Sulfate | 195.5 | 10.0 | 200 | 16.27 | 89.6 | 80 - 120 | 218.2 | 10.9 | 20 | |

**The following samples were analyzed in this batch:** HS21121523-01

**ALS Houston, US** Date: 11-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** **HS21121523**

## QUALIFIERS, ACRONYMS, UNITS

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

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

| Unit Reported | Description |
|---|---|
| mg/L | Milligrams per Liter |

## CERTIFICATIONS,ACCREDITATIONS & LICENSES

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas | 21-022-0 | 26-Mar-2022 |
| Florida | E87611-33 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 11-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**Work Order:** HS21121523

## SAMPLE TRACKING

| Lab Samp ID | Client Sample ID | Action | Date | Person | New Location |
|---|---|---|---|---|---|
| HS21121523-01 | LH18/24-SP650_122821 | Login | 12/29/2021 11:57:16 AM | JRM | WET218 |
| HS21121523-01 | LH18/24-SP650_122821 | Login | 12/29/2021 11:57:16 AM | JRM | B037 |
| HS21121523-02 | Trip Blank | Login | 12/29/2021 11:57:16 AM | JRM | B037 |

**ALS Houston, US** Date: 11-Jan-22

## Sample Receipt Checklist

**Work Order ID:** HS21121523 **Date/Time Received:** **29-Dec-2021 10:40**

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

**Completed By:** /S/ Jared R. Makan (eSignature) 29-Dec-2021 19:21 (Date/Time) **Reviewed by:** /S/ Ragen Giga (eSignature) 29-Dec-2021 19:24 (Date/Time)

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

| | Yes | No | Not Present |
|---|---|---|---|
| Shipping container/cooler in good condition? | ☑ | ☐ | ☐ |
| Custody seals intact on shipping container/cooler? | ☑ | ☐ | ☐ |
| Custody seals intact on sample bottles? | ☐ | ☐ | ☑ |
| VOA/TX1005/TX1006 Solids in hermetically sealed vials? | ☐ | ☐ | ☑ |
| Chain of custody present? | ☑ | ☐ | 1 Page(s) |
| Chain of custody signed when relinquished and received? | ☑ | ☐ | |
| Samplers name present on COC? | ☑ | ☐ | |
| Chain of custody agrees with sample labels? | ☑ | ☐ | |
| Samples in proper container/bottle? | ☑ | ☐ | |
| Sample containers intact? | ☑ | ☐ | |
| Sufficient sample volume for indicated test? | ☑ | ☐ | |
| All samples received within holding time? | ☑ | ☐ | |
| Container/Temp Blank temperature in compliance? | ☑ | ☐ | |

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 1.2c uc/c | IR31 |
| Cooler(s)/Kit(s): | Red | |
| Date/Time sample(s) sent to storage: | 12/29/2021 12:30 | |

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



**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:** GROUNDWATER TREATMENT PLANT BI-WEEKLY SAMPLES

**Prepared By:** Scott Beesinger

**P.O Number**

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | VOC | CHLORIDE, SULFATE | | | | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_122821 | Water | 12/28/21 / 14:00 | | 3 | 3 | | | | | | | | | | HCL | |
| LH18/24-SP650_122821 | Water | 12/28/21 / 14:00 | | 1 | | 1 | | | | | | | | | NONE | |
| Trip Blank | Water | 12/28/21 | | 2 | 2 | | | | | | | | | | HCL | |
| | | | | | | | | | | | | | | | | |
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Analyses

Additional Remarks: **Standard TAT on all parameters**

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 12/28/21 | 14:30 | | | | | | | | | |

**9For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| J. Mason | 12/29/21 | 10:40 | | | | | | | |

Remarks: Cooler - Red Temp 1.2°C MS1 CFO

**HS21121523**

Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Bi-Weekly Samples

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

TRK# 0221 4809 7830 8113

PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

3923707 280ec2021 GGGA 560G3/E934/1B23

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

| CUSTODY SEAL | | Seal Broken By: |
|---|---|---|
| Date: 12/28/21 | Time: 1430 | Jon |
| Name: [illegible] | | Date: |
| Company: [illegible] | | 12/29/21 |

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

June 1, 2022

DAIN-ISE

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

**Re: Draft Technical Memorandum, Proposed Revisions to LHAAP-04 and LHAAP-16 Remedial Action Operation Groundwater Monitoring Programs, Longhorn Army Ammunition Plant, Karnack, Texas, May 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. Review comments are requested by June 13, 2022.

The document was prepared by the Bhate Environmental Associates, Inc., (Bhate) team, on behalf of the Army as part of Bhate's Performance Based Remediation contract for the facility. 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
K. Nemmers, Bhate, Lakewood, CO
P. Srivastav, APTIM, Houston, TX
L. Sierocinski, USAEC, San Antonio, TX

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

June 1, 2022

DAIN-ISE

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

**Re: Draft Technical Memorandum, Proposed Revisions to LHAAP-04 and LHAAP-16 Remedial Action Operation Groundwater Monitoring Programs, Longhorn Army Ammunition Plant, Karnack, Texas, May 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. Review comments are requested by June 13, 2022.

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

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P. Srivastav, APTIM, Houston, TX
L. Sierocinski, USAEC, San Antonio, TX

**Subject:** **Final Monthly Managers' Meeting (MMM), Longhorn Army Ammunition Plant (LHAAP)**
**Location of Meeting:** **WebEx Conference Call**
**Date of Meeting:** **18 May 2022 – 10:00 AM Central Daylight Time (CDT)**

**Attendees:**

| | |
|---|---|
| Army BRAC: | Rose M. Zeiler (RMZ) |
| USEPA: | Brian Follin (BF) and Chris Braun with USGS in support of the USEPA |
| TCEQ: | April Palmie (AP) |
| USACE: | Aaron Williams (AW) |
| USFWS: | Paul Bruckwicki (PB) |
| Bhate: | Kim Nemmers (KN) and Zack Beck (ZB) |
| APTIM: | William Foss (WF) |
| TLI: | Jonathan Tatman (JT) |

**Defense Environmental Restoration Program (DERP) Performance-Based Remediation Update**

- Open action item for Bhate/APTIM is to prepare the Updated 2022 Sampling Plan for regulatory concurrence. KN said that the Updated 2022 Sampling Plan is scheduled for submittal in June 2022.

**Groundwater Treatment Plant (GWTP) –** ZB stated that overall performance of the fluidized bed reactor (FBR) has improved through April into early May 2022. ZB said that perchlorate samples collected on the FBR effluent (before the ion exchange vessels) have continued to decline from elevated perchlorate detections noted in March 2022, with the most recent perchlorate concentrations at 37.5 micrograms per liter (µg/L) as of 26 April 2022. ZB stated that the treated groundwater continues to go through the ion exchange vessels before discharge to Harrison Bayou. ZB said that weekly perchlorate samples are also being collected between the ion exchange vessels to confirm adequate treatment prior to discharge to the Harrison Bayou given the reduced treatment efficiency by the FBR. ZB said that additional granular activated carbon is ordered to further enhance the FBR treatment.

ZB said that power was lost to the GWTP on 5 May 2022 due to serve weather. Heavy rain and high winds knocked over a pine tree, which damaged the overhead power lines and cross arms on one power pole that supplies power to the GWTP. ZB said that a load breaker was also blown on the Army transformer at the GWTP when the tree damaged the overhead power lines. ZB said that restoration of power was delayed due to the heavy rains, which had saturated the work area beneath the power pole and overhead power lines and limited access. ZB said that power was restored the following week on 11 May 2022, when the ground dried out allowing safe access to the work area. ZB said that the GWTP was brought back online on 11 May 2022, at which point normal operation resumed. ZB said that no additional major GWTP repairs have occurred since 22 April 2022.

**Field Work –** WF stated that the Year 5 semi-annual LHAAP-37 groundwater sampling is being completed in May 2022, with an anticipated completion date of 18 May 2022. KN said that bush hogging at site LHAAP-58 will be completed in May 2022, in preparation for the next sampling event scheduled for June 2022. WF said that landfill mowing and pulling of 40-50 saplings at LHAAP-12 was completed in May 2022.

KN asked everyone to refer to the Document and Issues (DI) Tracking Table dated 18 May 2022.

- **Task 1** (Project Management) – KN said that the April 2022 MMM minutes were issued to the regulators on 29 April 2022. ZB said that Texas Commission on Environmental Quality

(TCEQ) has provided approval of the April 2022 MMM minutes via email, but that United States Environmental Protection Agency (USEPA) was still reviewing. AP confirmed TCEQ approval of the April 2022 MMM minutes. KN said that the next MMM and Restoration Advisory Board (RAB) is scheduled for 22 June 2022. KN said that the June MMM will be held in person at the LHAAP Army trailer. KN said that a call-in option will be available for those not attending in person.

- **Task 4** (LHAAP-04) – WF stated that the Year 2 Annual, Remedial Action – Operation (RA-O) in under preparation with a tentative submittal date in May to early June 2022. WF said that the Year 3 semiannual 2 RA-O Sampling Event is scheduled for August 2022. WF said that, prior to the next semi-annual sampling event, a memorandum will be prepared to propose revisions to the sampling network at both LHAAP-04 and LHAAP-16. WF said that the recommended sampling at LHAAP-16 will outline the Year 3 sampling that was not addressed in the Remedial Action Work Plan (RAWP).
- **Task 5** (LHAAP-12) – WF said that the Draft 2021 Annual RA-O Report was submitted to the Regulators on 3 May 2022.
- **Task 6** (LHAAP-16) – WF restated that a memorandum is under preparation to provide a recommended sampling network for the Year 3 Semiannual 1 RA-O Sampling Event. WF said that the Year 3 Semiannual RA-O Sampling Event is scheduled for July 2022. WF said that the Draft Final Year 1 RA-O Report was issued as Final on 19 April 2022. However, TCEQ identified missing pages in the Final document and requested the response to comment (RTC) file be attached. WF said that the requested revisions to the Final Year 1 RA-O Report are scheduled to be released in May 2022. WF said that the Year 2 RA-O Report is under preparation and will tentatively be submitted to the Regulators in June 2022.
- **Task 9** (LHAAP-37) – WF said that the Year 4 RA-O Report has gone Final with approvals of the Draft Final received from TCEQ and USEPA in February 2022. WF said that the Year 5 Second Semi-Annual sampling is being performed in May 2022 with the validated data to be presented at the July 2022 MMM.
- **Task 10** (LHAAP-46) – WF said that the Year 7 RA-O Report has gone Final with approvals of the Draft Final received from TCEQ and USEPA in February 2022 and is being incorporated in the Administrative Record (AR). WF said that the Year 8 Annual RA-O groundwater sampling was completed in February 2022, and the validated data is included in the May 2022 data validation package. WF discussed the Year 8 Annual RA-O analytical results. WF said that three wells were sampled with a bailer. WF said that these wells had previously been dry, but had on average about six to eight inches of water allowing sample collection with a bailer. WF said that each of the three wells were non detect for contaminates of concern, so there is no change to the plume configuration. WF said that LHSMW21 concentrations have continued to show a slight increasing trend. WF said that installation of a down gradient shallow zone well was recommended in the Year 7 RA-O Report to ensure contamination isn't continuing to migrate to the north. WF said that the groundwater analytical data remained stable at the remainder of the LHAAP-46 monitoring wells.
- **Task 11** (LHAAP-50) **–** WF stated the Year 2 Quarter 4 sampling was completed in April 2022. The validated data for the April 2022 event will be presented in the June 2022 MMM. WF said that the Year 7 RA-O Report has gone Final on 1 April 2022 with no comments received on the Draft Final document.
- **Task 12** (LHAAP-58) – KN stated that the next sampling semiannual event for LHAAP-58 is scheduled for June 2022. The validated data for the June 2022 semiannual sampling event will be included in the August 2022 MMM. KN said that the LHAAP-58 Year 8 RA-O Report will follow. AW said that a contract modification is being worked on to ensure RA-

O can continue at multiple sites including LHAAP-58. AW said that Army has identified the need for two additional monitoring wells at LHAAP-58. AW said that one downgradient well is being considered to confirm the downgradient plume extent and a second well upgradient of LHSWW20 to determine if there is potential source further upgradient.

- **Task 13** (LHAAP-67) – WF stated that the Draft Year 8 Annual RA-O Report was transmitted for regulatory review on 3 May 2022.
- **Task 14** (LHAAP-001-R-01 and LHAAP-003-R-01) – KN said that no current activities under the performance base remediation contract are ongoing, however, continued inspections will be included under the upcoming contract modification.
- **Task 16** (GWTP) **–** KN said that the revisions to the Army Draft 4th Quarter 2021 GWTP Report are being completed to include improvements to the potentiometric surface maps. The Draft 4th Quarter 2021 GWTP Report is expected to be ready for regulatory review in May 2022. The 1st Quarter 2022 GWTP Report is under preparation as well and is expected to be ready for regulatory review in June 2022.
- **Task 17** (LHAAP-18/24) – KN said next semi-annual sampling event is scheduled to be completed in June 2022 pending contract modification.
- **Task 18** (Surface Water) – KN said that that the 2nd Quarter 2022 surface water samples were collected in April 2022, and the analytical results are included in the May 2022 validated data package.
- **Task 19:** (2021 Land Use Control Management Plan) – No discussion.
- **Administrative Record (AR) –** WF said that the October – December 2021 AR is being printed. WF said that the printed copies will be reviewed and sent out in June 2022. WF said that the list of the January – March 2022 AR documents is under Army review.

**Update on other DERP Sites:**

- **LHAAP 18/24 –** AW stated that the 30-percent (Conceptual Design) LHAAP-18/24 Remedial Design was submitted to the regulators on 25 April 2022. AW said that an extension request has been submitted to the regulators for the 60-percent Remedial Design with a submittal due date of 25 August 2022. AW said that a meeting is planned on 22 June 2022 to discuss the details of the 60-percent Remedial Design.
- **LHAAP-29** – AW said that the additional LHAAP-29 Pre-Design Investigation (PDI) Field Work was completed on 25 March 2022. AW said that the Draft PDI Report is under preparation with regulatory submittal in June 2022. AW said that 30-percent Remedial Design is scheduled for regulatory submittal in July 2022.
- **LHAAP-47** – AW said that the Revised Draft Final Record of Decision (ROD) was revised based on TCEQ comments. AW said that the Army is awaiting TCEQ approval of the RTCs. AP said that the review of the RTCs will be completed in the next few weeks. BF asked for a timeline on how long routing of signatures will take. RMZ said that once TCEQ approves the RTCs, the ROD will be finalized for Army signature. RMZ anticipates Army signatures to occur relatively quickly. AP said that typically the USEPA will wait for TCEQ concurrence which will take approximately 30 days after Army signature.
- **LHAAP-17** – JT said that the trenching operations have been completed and backfill and site restoration is complete. JT said that the majority of the grass seed has already begun to germinate across the majority of the site. JT said that all the engineering erosion control has remained in place despite the severe weather and heavy rainfall recently received. JT said that Draft Remedial Action Completion Report is under preparation. ZB said that the groundwater extraction system installation is scheduled for completion in June 2022. ZB said that construction of the extraction system infrastructure is ongoing. ZB said that Ark-La-Tex is tentatively scheduled to install overhead power to the site in May 2022. ZB said

that the final step for getting the groundwater extraction system operational is wiring and setting up the programmable logic control (PLC). The PLC telemetry system will integrate the LHAAP-17 extraction system into the GWTP control. ZB said that a baseline groundwater sampling event was completed in April 2022, with the results included in the May 2022 validated data package. ZB said that monitoring wells 17WW01, 17WW02, 17WW03, 17WW06, and 130 were sampled for perchlorate as part of the baseline groundwater sampling event in April 2022. ZB said that the highest perchlorate detections were at 17WW02 and 17WW06. As presented in the RAWP, extraction well pumps will be installed for both 17WW02 and 17WW06. ZB said that a third extraction well at 17WW01 was considered as part of the Remedial Design if baseline perchlorate analytical results were above 20,000 µg/L. ZB said that perchlorate was detected at 289 µg/L in 17WW01 with the submersible pump placed mid screen, which was not consistent with the RAWP. ZB said that historical results indicated higher perchlorate concentrations at a deeper depth in 17WW01. Therefore, a second sample from 17WW01 was collected at a depth of 28 feet with perchlorate detected at 46.8 µg/L. ZB said that April 2022 perchlorate results indicate that a third extraction well will not be required at 17WW01. RMZ asked when groundwater sampling will begin after the extraction system is operational. ZB said that monthly groundwater sampling will be conducted for the first three months, and then quarterly sampling for an additional year. JT said that the TCEQ waste stream audit has been completed and there were no additional findings required. AP said that monitoring of the perchlorate plume overtime will be good to see if there is rebound given the decrease in perchlorate concentrations. KN said that it appears the perchlorate plume has not migrated in comparison to historical concentrations.

**DERP Other (Per- and Polyfluoroalkyl Substance [PFAS] Update):** RMZ said that the PFAS contract was recently awarded and that the Site Inspection (SI) will need to be completed by 2023. RMZ said that another ROD may be necessary. AP asked if a Quality Assurance Project Plan (QAPP) will be necessary for this effort. RMZ said that the new contract includes a QAPP for the SI effort. RMZ said that the PFAS SI field work is planned for this summer. RMZ said an update will be provided with the details. BF requested the update via email.

**DERP Other (LHAAP-18/24 Handoff):** RMZ expressed her concerns with keeping the GWTP operating for the foreseeable future because the GWTP doesn't accomplish the remedial action objectives and is truly just an interim measure. RMZ said that the ROD provides flexibility with respect to the remedial elements and their areas, depths, and methods. RMZ would like to hear what the Regulators have to say in June 2022.

**Schedule Next Managers' Meeting:** RMZ said that Army Environmental Command would like a site tour in the morning of 22 June 2022 at 10:00 – 10:30 CDT, so a meeting for LHAAP-18/24 could be in the afternoon after a brief MMM. KN said that Scott Beesinger and Kennie Moore can be available for the driving site tour. KN recommended moving the June MMM to the afternoon after lunch. Therefore, the next MMM will be held on Wednesday, 22 June 2022 at approximately 2:00 pm CDT at the LHAAP Army trailer, followed by the LHAAP-18/24 meeting. The next RAB will be held on 22 June 2022, at 6:00 pm at the Karnack Community Center. KN said that the June 2022 RAB slides are under preparation and should be available in early June 2022 for regulatory review.

Meeting concluded at approximately 10:55 am CDT.

**ACRONYM LIST**

| | |
|---|---|
| AP | April Palmie |
| APTIM | APTIM Federal Services, LLC |
| AR | Administrative Record |
| AW | Aaron Williams |
| BF | Brian Follin |
| Bhate | Bhate Environmental Associates, Inc. |
| BRAC | Base Realignment and Closure |
| CDT | Central Daylight Time |
| DERP | Defense Environmental Restoration Program |
| DI | Documents and Issues |
| FBR | Fluidized Bed Reactor |
| GWTP | Groundwater Treatment Plant |
| KN | Kim Nemmers |
| LHAAP | Longhorn Army Ammunition Plant |
| µg/L | Micrograms per Liter |
| MMM | Monthly Managers' Meeting |
| PA | Preliminary Assessment |
| PB | Paul Bruckwicki |
| PDI | Pre-Design Investigation |
| PFAS | Per- and Polyfluoroalkyl Substance |
| PLC | Programmable Logic Controller |
| JT | Jonathan Tatman |
| QAPP | Quality Assurance Project Plan |
| RAB | Restoration Advisory Board |
| RA-O | Remedial Action – Operation |
| RAWP | Remedial Action Work Plan |
| RMZ | Rose M. Zeiler |
| ROD | Record of Decision |
| RTC | Response to Comments |
| SI | Site Inspection |
| TCEQ | Texas Commission on Environmental Quality |
| TLI | TLI Solutions |
| USACE | United States Army Corps of Engineers |
| USEPA | United States Environmental Protection Agency |
| WF | William (Bill) Foss |
| ZB | Zack Beck |

**Subject: Final Minutes, Quarterly Restoration Advisory Board (RAB) Meeting**
**Longhorn Army Ammunition Plant (LHAAP)**
**Location of Meeting: Karnack Community Center**
**Date of Meeting: January 19, 2022, 6:00 PM Central Standard Time (CST)**

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**Meeting Participants:**

| | |
|---|---|
| Army BRAC: | Rose M. Zeiler |
| USACE: | Aaron Williams, Chelsea Montoya |
| USAEC: | Ana C. Nieves, Lena Sierocinski |
| Bhate: | Kim Nemmers, Zack Beck (on the phone) |
| APTIM: | Bill Foss |
| HDR, Inc. | Philip Werner (on the phone) |
| TLI: | Kyra Donnell (on the phone), Brian Gentry |
| USEPA Region 6: | Brian Follin, Janetta Coats (on the phone) |
| TCEQ: | April Palmie (on the phone) |
| RAB: | Present: Deon Hall, John Fortune, Sharon McAvoy, Charles Dixon Richard LeTourneau, Nigel R. Shivers, Judy VanDeventer, Terry Britt, and Donna Burney (on the phone)<br>Absent: Tom Walker |
| Public: | USEPA Technical Advisory Group: George Rice (Caddo Lake Institute [CLI]), Vickie Pace, Robert Speight, Dwayne and Bennie Meyers, Nicolette Ledbury, Carter Mize, Marilyn Winters |

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A color copy of the slide presentation and handouts (see list at end of meeting minutes) were provided for meeting attendees.

**Welcome and Introduction**

Ms. Judy VanDeventer welcomed everyone to the RAB Meeting. Ms. Rose Zeiler explained that a website has been established for LHAAP which includes a schedule and administrative record of documents (www.longhornaap.com).

**Membership Update**

Ms. Zeiler stated that the RAB membership list has remained the same since the removal of Mr. John Pollard a couple of years ago due to his lack of participation. She explained that a letter had been sent to him certified mail but that no response was received.

Ms. Zeiler presented a suggestion to changing the frequency of meetings to three times a year. Ms. VanDeventer asked if another meeting could be scheduled should something come up. Ms. Zeiler confirmed that additional meetings could be scheduled. Ms. VanDeventer said she was not opposed if additional meetings could be requested. RAB members present accepted the change to meetings three times a year. The proposal is to meet February, June, and November on the

third Wednesday of the month. Ms. Zeiler explained that the reason for skipping to November instead of October is the difficulty in obtaining travel funding with the fiscal year ending in September for the Federal Government. She said that depending on when holidays fall in November that the meeting would be adjusted that month. Ms. Zeiler said that the next meeting will be Wednesday, 15 June, 2022, with this proposal acceptance. Ms. VanDeventer asked if anything is expected to come up between now and June to which Ms. Zeiler said she could not think of anything, but she would let her know if anything comes up.

**Minutes (October 2021 RAB Meeting)**

Ms. Zeiler verified that there were no comments or changes to the October meeting. Motion to approve the October 2021 RAB meeting minutes was provided by Mr. Deon Hall with Mr. Charles Dixon seconding the motion.

**RAB Public Involvement**

Ms. Kim Nemmers provided an overview of the process for joining the RAB. Anyone in the public can become a RAB member. She explained that there is an application to become a RAB member on the website for LHAAP. Potential members are voted on during the RAB meetings based on the applications received. She said that the purpose of a RAB member was to attend and participate in the RAB meetings regularly and communicate to the community what the RAB member learned at the RAB meetings. Ms. Nemmers encouraged participation of the public attending the RAB regardless of whether they are part of the board.

**Documents in Progress**

Ms. Nemmers introduced the three contractors performing work at LHAAP. She explained which sites each of the contractors were managing. Ms. Nemmers explained that the only site with overlap is LHAAP-18/24, which Bhate manages as an interim remedy and for which HDR, Inc. is developing a final remedial design. She then explained where the LHAAP sites are in the CERCLA process and pointed out how far along the sites are in that process.

Ms. Nemmers presented the documents and field work completed in the past three months. Ms. Nemmers explained that Remedial Action-Operation (RA-O) is predominantly groundwater monitoring at LHAAP. Sites with RA-O have remedies in place, such that the groundwater monitoring is completed to evaluate those remedies. An annual report is then produced to document the monitoring. Ms. Nemmers explained that when a remedy is first put into place that quarterly groundwater sampling is performed for two years, followed by semi-annual sampling for another two years and then annual groundwater sampling thereafter. She said that a quarterly report is prepared for the groundwater treatment plant (GWTP) and that the groundwater monitoring wells are sampled every six months at LHAAP-18/24. Ms. Nemmers pointed out that each of the reports are then posted on the Administrative Record (AR). Ms. Nemmers said that the surface water is sampled quarterly and an annual report is produced. She stated that the handout for the surface water sampling was provided and included that quarterly data also. Ms. Nemmers explained that each report is prepared by the contractor, then reviewed by the Army and Regulators. Following resolution of comments from Army and Regulators, the

reports are finalized and placed into the AR.

**LHAAP-04**

Mr. Bill Foss explained that LHAAP-04 was a pilot wastewater treatment plant. He presented the historic extent of the perchlorate plume prior to implementation of the remedial action. Mr. Foss pointed to the portion of the site excavated in 2010 for soil contamination. In November 2019, emulsified vegetable oil (EVO) was injected into the groundwater aquifer. He explained that the EVO injections targeted the higher perchlorate concentrations and the downgradient portion of the perchlorate plume. He explained that some detections of perchlorate were present above the cleanup goal, during the first sampling (February 2020) event after the remedial action implementation. However, perchlorate has not been detected above the cleanup goal in the following sampling events with the most recent quarterly sampling events not having any perchlorate detected in any of the monitoring wells sampled. Mr. Foss explained that seven quarters of groundwater sampling has been completed as of November 2022. Mr. Foss said that aquifer geochemistry is being observed going back to normal without detections in perchlorate. He explained that to treat the perchlorate, reducing conditions were created to allow the bacteria proper environment to degrade the perchlorate. Observations that the geochemistry is returning to natural conditions signifies that the remedy has worked. Mr. Foss pointed out that dissolved oxygen is increasing, and the oxidation reduction potential is going from negative (reducing) to positive. We are seeing the conditions returning to normal and perchlorate concentrations remain non-detect, which is a good sign.

**GWTP Update**

Ms. Nemmers then provided an overview of the Groundwater Treatment Plant (GWTP), which currently treats groundwater from LHAAP-18/24. She presented a handout with a graph of the amount of treated groundwater discharged each month. She explained that the amount of treated groundwater varies based on rainfall and where the groundwater can discharge to. Ms. Nemmers explained that, currently, there has not been much precipitation, so the treated groundwater is discharged to a holding pond. She explained that the water to be discharged to the holding pond receives additional treatment, which reduces the discharge rate from the GWTP. Higher volumes of discharged water means that the bayou has a lot of flow and treated groundwater is being discharged from both the GWTP and the holding pond.

Ms. Nemmers presented the surface water sampling and explained that a handout was provided for the meeting. Surface water is sampled for perchlorate quarterly when the bayous are flowing. Ms. Nemmers explained that the locations of the samples collected are presented in the handout.

**LHAAP-18/24, -29 and -47 Status**

Mr. Aaron Williams, with USACE, then provided an update on LHAAP-18/24, LHAAP-29 and LHAAP-47, which are the three remaining LHAAP sites that don't have final remedy in place. He explained that HDR, Inc. was the contractor working on these sites.

- LHAAP-18/24 was further investigated in support of active treatment, with focus on the

northeast corner and inside boundary of the site. The draft report from that investigation has been prepared and should be draft final in February 2022. The remedial design (RD) for the site is planned to be drafted by May 2022 using the additional investigation data.

- LHAAP-29 is following a similar path with additional investigation being completed to support the RD and eliminate any data gaps. After reviewing the additional data collected, an additional mobilization will be completed to address remaining data gaps. A draft report will then be prepared and is expected to be issued by June 2022. Mr. Williams explained that some re-analysis of sample data was also completed at LHAAP-29 to verify results and determine if additional sampling was required.
- LHAAP-47 has a Record of Decision (ROD) that was prepared with comments received by the Regulators. The revised, Draft Final ROD is being prepared, incorporating Regulatory input, by the end of January 2022.

**LHAAP-17 Remedial Action**

Mr. Brian Gentry, MMG-TLI Joint Venture, discussed the ongoing work being performed at LHAAP-17. Mr. Gentry showed the previous excavations completed by Bhate and APTIM, when munitions were encountered and work stopped. Mr. Gentry stated that the remedy selected in the 2016 ROD included; excavation and off-site disposal of soil; groundwater extraction; monitored natural attenuation; and land use controls to maintain the remedy and prohibit groundwater use, until chemical of concern (COC) concentrations are reduced to levels supportive of Unlimited Use/Unrestricted Exposure (UU/UE). A total of 13 excavation areas (A, B, C, D, E, F, G, H, J, K, L, M, and N) are identified in the ROD. Excavation began in August 2019 and a work stoppage occurred on 30 September 2019, due to the presence of munitions hazards not previously known to be present. Of the 13 excavation areas, seven areas (A, B, C, D, E, F, and G) were confirmed to be clean and backfilled in August 2020.

Munitions and Explosives of Concern (MEC) was determined to present an imminent and substantial threat, a Time Critical Removal Action (TCRA) was determined appropriate, and an Action Memorandum approved. Following work plan approvals, TCRA site work began in October 2021. Site work to date has included: boundary survey, vegetation removal, erosion control repair, identification and importing of backfill, draining of standing water, robotic sifting of existing soil piles to remove potential MEC, excavation and over-excavation (where needed) of remaining areas (H, J, K, L, M, and N), staging of excavated and sifted soils, backfilling in areas previously determined clean, and off-site disposal of sifted soils.

Mr. Gentry explained excavation and sifting of the soils is being completed robotically so that an exclusion zone (EZ) can be established where no people are allowed. He explained how the sifting plant works using magnets. The metal material removed is then evaluated by hand to determine if munitions are present. The material is separated into two different categories for metals debris; Metals without munitions are considered non-munitions debris. He then presented the portion of excavation required following the 2019-work stoppage. Mr. Gentry explained that approval of confirmation sample results is required prior to backfilling. Inspection and certification of all metallic debris removed from the ground is completed with determination that the material is

non-munitions debris, munition debris or a MEC items. Explosive disposal is required for MEC items. Mr. Gentry explained that material potentially presenting an explosives hazard (MPPEH) is stored temporarily on site, and that 52 items of MPPEH have been identified. Near the end of the project or when the allowed storage amount exceeds 9 pounds net explosive weight the MPPEH will be detonated. The buried explosion module (BEM) will be used for the explosion of the MPPEH. Mr. Gentry then showed a photo of the sift plant. Ms. Zeiler asked for Mr. Gentry to further explain the sift plant. Mr. Gentry then explained the photo on slide 27 stating that you can tell the excavator is robotic based on the two antennas. He said that the operators are in a container box to operate the excavator. The soil is then dumped into the sift plant. There are three belts on the sift plant. The first belt is the "overs" or the material that cannot go through the screens of the sift plant. Next is the mid belt which sifts material through a smaller screen but not as small as necessary. The last belt is the fines belt which has the soil that has gone through all of the screens and any material less than 1-inch in diameter.

Mr. Gentry outlined what has been completed to date. Mr. Gentry explained that the only area that has not been over excavated is area J. Confirmation sampling is on-going. Soils that have gone through the screening process are starting to go offsite. Upon approval of the confirmation samples, backfilling will begin. Mr. Gentry showed Area J where soil has not yet been excavated. Mr. Dwayne Meyers asked what happens to the excavated and sifted soil. Mr. Gentry said that the soil is trucked out. Mr. Foss stated that the soils are being sent to East Texas Regional outside of Henderson, Texas. Mr. Meyers asked about the process of offsite disposal, as it seems that the issue is just being transferred from one location to another. Mr. Gentry explained that the soils sent off site do not have munition hazards but still have constituent hazards for perchlorate, DNT, trinitrotoluene (TNT). Mr. Meyers asked if the landfill is permitted to take the waste as it seems that one problem is being moved to another location. Ms. Zeiler said that the landfill is able to take the wastes. She said that the constituents are not high levels. Mr. Meyers asks why the soil could not be placed at LHAAP. Ms. Zeiler said that a permit would be needed and the Army would be responsible for life-long management of the landfill at LHAAP. Mr. Meyers asked for confirmation that the Army retains liability for the waste. Ms. Zeiler confirmed.

Mr. Meyers asked if there is onsite borrow fill. Ms. Zeiler said that onsite borrow material used to be used but is hard to find as the land is turned over to the US Fish and Wildlife. Ms. Nemmers explained that all the soil brought on site gets tested to make sure it meets criteria before it is used. She stated that the purpose of the remediation was to hand the land back to the US Fish and Wildlife.

Mr. Gentry stated that 3,955 cubic yards of soil have been excavated for screening and offsite disposal. To date, 2,742 cubic yards of soil has been exported offsite. A total of 6,026 cubic yards of soil have been imported from offsite. A total of 52 munitions items that potentially present an explosive hazard have been identified. Non-munitions debris (e.g. fence posts, rebar) removed to date is approximately 31,449 pounds. To date, 11,448 munition debris, with potential MEC characteristics have been found.

Mr. Gentry stated that backfill is being staged onsite for future backfilling. Mr. Gentry outlined

the project schedule. He explained that the next activity involves scanning the entire property for any subsurface metallic materials that need to be further investigated as they could be munitions. Any targets identified by the scan will be excavated and evaluated. Then a groundwater extraction system will be installed. Full site restoration/demobilization is anticipated around 20 April 2022.

Ms. Zeiler explained that there are three types of soil sampling being performed to verify the remediation meets acceptable criteria. She says that wall and floor samples are being collected to verify that the cleanup levels are met, excavated soil is sampled to characterize the waste prior to disposal and offsite backfill sources are sampled to make sure they are clean.

Mr. Meyers asked if the munitions were scattered on the ground or buried. Ms. Zeiler stated that the munitions were not scattered. Mr. Gentry stated that the munitions and munitions debris being discovered appeared to have been burned, which was a common way to dispose of these types of munitions in the past. When a munition item is discovered and it cannot be determined through visual observation whether the munition item contains energetic material or not, then the item is managed as MEC and is placed into on-site storage for disposal. There are currently 52 munition items being stored onsite for disposal. Mr. Terry Britt asked for clarification between explosives and munitions. Mr. Gentry clarified that munitions contain energetic fillers which may be explosives. The majority of the munitions being discovered at LHAAP -17, however, contain pyrotechnic or illumination type fillers and contain very little explosives.

Ms. Zeiler stated that although LHAAP produced bulk TNT that it was a short lived production that ended after World War II. Then, primary production at LHAAP shifted to pyrotechnics and illuminants. Mr. Meyers asked if the Army kept records on where these pits (at LHAAP-17) were located. Ms. Zeiler said that although LHAAP-17 was a known site, not all of the activities were known. She went on to state that the burning and burying of munitions was not known but the presence of explosives constituents in the soil was known. Ms. VanDeventer asked if anything was ever found from the rocket motors to which Ms. Zeiler said nothing was ever found.

Mr. Carter Mize from the Marshall News Messenger asked how old the materials are that are being removed and how old the plant is itself. Ms. Zeiler stated that the plant was constructed in 1942 for the World War II effort. She said that the plant produced TNT for the World War II efforts. Ms. VanDeventer said that Universal Match came in 1952 to produce pyrotechnics. Rocket motors were also produced. The plant operated until 1997. Ms. Zeiler said that what is interesting about LHAAP is that it was an Intermediate-range Nuclear Forces (INF) static firing site and that Russian officials visited Longhorn to witness the static firing. The INF buildings where these activities took place are historic site candidates.

**Presentation on Metals at LHAAP by the USEPA Technical Advisory Group (TAG)**

Ms. Zeiler introduced Mr. George Rice, who works for the USEPA TAG in support of helping the community understand technical issues. Mr. George Rice then provided a presentation of metals at LHAAP, explaining that he has also prepared a report that was printed as a handout. He indicated that the presentation is a highlight of that report. Mr. Rice explained the most common

way metals infiltrate into the soil, which is when a release occurs. Mr. Rice explained the difference between metal and nonmetal contamination. During the presentation, Mr. Rice presented his review of LHAAP metals data, including the quality of the data and the analysis. He identified arsenic as a metal of concern and noted that it is present in groundwater at eight sites. The evaluation by Mr. Rice included data from the 1990s to the present (LHAAP-03, LHAAP-16, LHAAP-18/24, LHAAP-29, LHAAP-47, LHAAP-49, LHAAP-54 and LHAAP-58). While Mr. Rice agreed with the focus of remediation of non-metals at LHAAP due the higher concentrations of non-metals, he expressed concerns regarding elevated metals at the site not being addressed.

Mr. Meyers asked if the nine contaminants listed are tested for drinking water. Mr. Robert Speight stated that if a contaminant has a maximum contaminate level (MCL), then it is sampled. Mr. Rice said that MCLs are established for most of the contaminants discussed. Based on Mr. Meyers' concerns about contaminants presented at LHAAP, Mr. Rice stated that groundwater contamination has not migrated offsite onto private property, to the best of his knowledge. Mr. Speight stated that the Army has tested wells at the Caddo Lake water supply wells over the years to make sure there is no migration of contamination. Mr. Rice said that there were concerns regarding private wells pumping up gradient of LHAAP that may draw contamination towards the wells, but there is no evidence of that. Ms. Zeiler explained that the Army has done modeling also and used different pumping rates to assess and didn't see any impacts or significant radius of influence.

**Next RAB Meeting Schedule and Closing Remarks**

Mrs. Zeiler thanked the RAB, and since the schedule regarding the next meeting was already discussed asked if everyone was ready to adjourn.

**Adjourn**

Mr. Hall made a motion to adjourn, which was seconded by Mr. John Fortune. The meeting adjourned at 7:18 pm CST.

**January 2022 Meeting Attachments and Handouts:**

- Color copy of Bhate presentation slides
- GWTP – Processed Groundwater Volumes Handout
- Surface Water Sampling Handout

# Longhorn Army Ammunition Plant Quarterly Restoration Advisory Board Meeting

**January 19, 2022**
**6:00 PM CST**

APTIM

bhate

# Restoration Advisory Board Meeting

## Abbreviations and Acronyms

| | |
|---|---|
| # | Number |
| lbs | pounds |
| µg/L | Micrograms per liter |
| COC | Chemical of concern |
| DERP | Defense Environmental Restoration Program |
| DPT | Direct push technology |
| GPW | Goose Prairie Creek Water Sample |
| GWP-Ind | Industrial Groundwater Use Protection |
| GWGW Ing | Residential groundwater use |
| GWTP | Groundwater Treatment Plant |
| HBW | Harrison Bayou Water Sample |
| J | Estimated laboratory value |
| LHAAP | Longhorn Army Ammunition Plant |

| | |
|---|---|
| MDAS | Material documented as safe |
| MEC | Munitions and explosives of concern |
| mg/L | Milligrams per liter |
| MPPEH | Material Potentially Presenting an Explosive Hazard |
| MSC | Medium-Specific Concentration |
| mV | Millivolt |
| NEW | Net Explosives Weight |
| PCL | Protective Concentration Level |
| RAB | Restoration Advisory Board |
| PDI | Pre-Design Investigation |
| RA(O) | Remedial Action Operation |
| TCRA | Time Critical Removal Action |
| TRRP | Texas Risk Reduction Program |
| UU/UE | Unlimited Use/Unrestricted Exposure |

# Restoration Advisory Board Meeting

## Agenda

06:00 Welcome and Introduction

06:05 Open Items {RMZ}
- Ongoing Outreach/Website
- Restoration Advisory Board (RAB) Administrative Issues
  - o Membership Update
  - o Change in Meeting Frequency
  - o Minutes (October 2021 RAB Meeting)

06:15 Defense Environmental Restoration Program (DERP) Update {Bhate}
- Documents and Field Work Completed since last RAB
- Three Month Look ahead
- LHAAP-04
- Groundwater Treatment Plant (GWTP) Update

06:25 Other DERP Update
- LHAAP-18/24, -29, and -47 Status {HDR}
- LHAAP-17 Status {MMG-TLI Joint Venture}

06:40 Caddo Lake Institute Metals Presentation (George Rice)

06:55 Next RAB Meeting Schedule and Closing Remarks {RMZ}

# Restoration Advisory Board Meeting

## RAB Administrative Issues

- Membership Update
  - Persons interested in being new members
- Change in Meeting Frequency
- Minutes (October 2021 RAB Meeting)

# Restoration Advisory Board Meeting

## The Army Wants You to be Informed

- The Army is committed to protecting human health and the environment; key to that commitment is engaging the community and increasing public participation in environmental restoration at the Longhorn Army Ammunition Plant (LHAAP)
- You are encouraged to:
  - Attend RAB Meetings and/or become a member of the RAB
  - Visit the Longhorn environmental website at www.longhornaap.com.
- The website is regularly updated to indicate the upcoming field events at each site including groundwater sampling, monitoring well installations, soil sampling, or remediation activities.
  - Make suggestions for improving communication – the Army welcomes and appreciates community feedback
- There are three contractors working at LHAAP: Bhate/APTIM; HDR, Inc.; and MMG-TLI Joint Venture. The work conducted by these contractors will be presented in the following slides in that order.

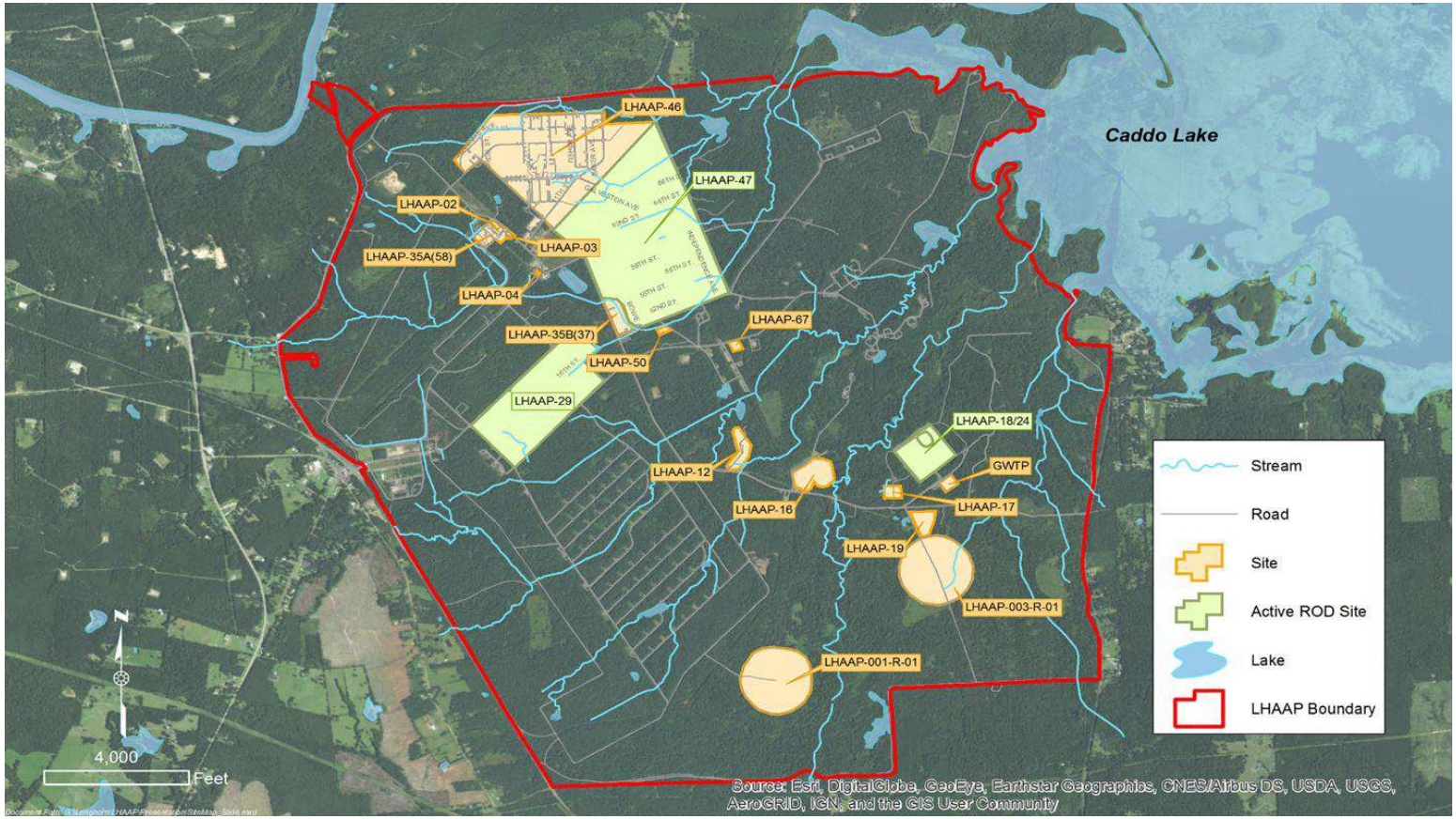
# Restoration Advisory Board Meeting

## LHAAP Environmental Contractors

- Bhate/APTIM: LHAAP-02, -03, -04, -12, -16, -37, -46, -50, -58, -67, -001-R-01, -001-R-03, and -18/24 (interim remedy)
- HDR: LHAAP-18/24, -29, and -47
- MMG-TLI Joint Venture: LHAAP-17

# Restoration Advisory Board Meeting

## Bhate/APTIM



# Restoration Advisory Board Meeting

## Documents in Process

| Site | Document |
|---|---|
| LHAAP-16 | Annual Remedial Action Operation (RA[O]) Report - with Regulators |
| LHAAP-37 | Annual RA(O) Report – resolving Regulator comments |
| LHAAP-46 | Annual RA(O) Report – with Regulators |
| LHAAP-50 | Annual RA(O) Report – with Regulators |
| LHAAP-58 | Annual RA(O) Report – resolving Regulator comments |
| GWTP | Quarterly Evaluation Report: Third Quarter (July-September 2021) – with Regulators<br>Quarterly Evaluation Report: Fourth Quarter (October – December 2021) – In Process |
| Surface Water | Annual Report – In Process |

# Restoration Advisory Board Meeting

## Completed Field Work Since Last RAB Meeting

| Site | Activity |
|---|---|
| LHAAP-04 | Year 2 Quarter 4 Performance Monitoring (November) |
| LHAAP-12 | 2021 Annual Groundwater Monitoring (December) |
| LHAAP-18/24 | Semi-Annual RA(O) Groundwater Monitoring (December) |
| LHAAP-37 | Year 5 Semi-Annual Event Number (#) 1 (November) |
| LHAAP-58 | Year 8 of RA(O) Groundwater Monitoring; Western Plume (December) |
| LHAAP-67 | Year 8 Annual Groundwater Monitoring (November) |
| Surface Water | Surface Water Sampling (December) |

# Restoration Advisory Board Meeting

## 3 Month Look Ahead – Documents by Bhate Team

| Site | Document |
|---|---|
| LHAAP-04 | Draft RA(O) Report to regulators |
| LHAAP-12 | Draft RA(O) Report to regulators |
| LHAAP-67 | Draft RA(O) Report to regulators |
| Surface Water | Technical Memorandum Summarizing 2021 Sampling |
| GWTP and LHAAP-18/24 | Quarterly Evaluation Report Fourth Quarter (October – December 2021) |

# Restoration Advisory Board Meeting

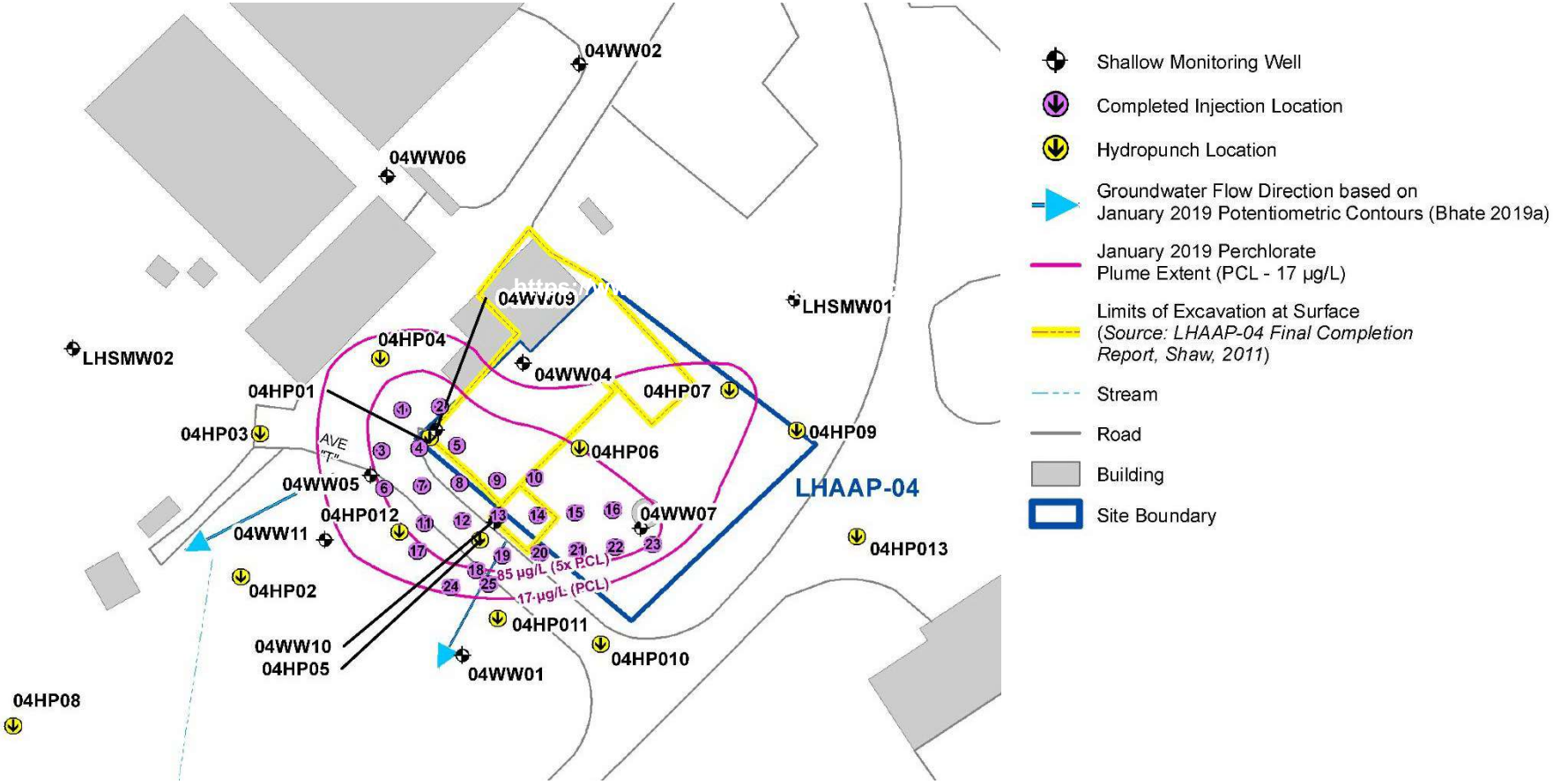
## 3 Month Look Ahead - Field Work by Bhate Team

| Site | Activity |
|---|---|
| LHAAP-04 | Year 3 Semi-Annual Sampling Event #1 (February) |
| LHAAP-16 | Year 2 Quarter 4 Performance Monitoring (January) |
| LHAAP-46 | Annual RA(O) Sampling (February) |
| LHAAP-50 | Year 2 Quarter 3 Performance Monitoring (January) |
| Surface Water | 1st Quarter Sampling |

# Restoration Advisory Board Meeting

## LHAAP-04 Remedy Update

### 2019 Plume and Injection Locations



# Restoration Advisory Board Meeting

## LHAAP-04 Performance Sampling (2019-2021)

### Sampling Results at Key Monitoring Locations

| | | Location Code | 04WW01 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sample Date | 1/22/2019 | 2/4/2020 | 5/4/2020 | 8/10/2020 | 11/4/2020 | 3/10/2021 | 5/24/2021 | 8/4/2021 | 11/4/2021 |
| Analyte | Units | PCL | Result | Result | Result | Result | Result | Result | Result | Result | Result |
| **Perchlorate** | | | | | | | | | | | |
| Perchlorate | µg/L | 17 | < 2 | 19 | < 0.05 | 0.561 J | 0.246 J | < 0.05 | < 0.05 | < 0.5 | < 0.2 |
| **Field Parameters** | | | | | | | | | | | |
| Dissolved Oxygen | mg/L | NV | 0.15 | 0.03 | 0.04 | 0.05 | 0.03 | 0.02 | 0.03 | 0.41 | 0.38 |
| Oxidation-Reduction Potential | mV | NV | 327 | -52 | -135 | -191 | -115 | -219 | -152 | -100 | -50 |

| | | Location Code | 04WW07 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sample Date | 1/22/2019 | 2/4/2020 | 5/5/2020 | 8/11/2020 | 11/4/2020 | 3/11/2021 | 5/25/2021 | 8/5/2021 | 11/9/2021 |
| Analyte | Units | PCL | Result | Result | Result | Result | Result | Result | Result | Result | Result |
| **Perchlorate** | | | | | | | | | | | |
| Perchlorate | µg/L | 17 | 110 | 86 | 3.51 | 0.557 J | < 0.05 | 0.169 | < 0.05 | < 0.5 | < 0.2 |
| **Field Parameters** | | | | | | | | | | | |
| Dissolved Oxygen | mg/L | NV | 1.83 | 0.05 | 2.12 | 0.04 | 0.03 | 0.04 | 0.02 | 0.46 | 3.46 |
| Oxidation-Reduction Potential | mV | NV | 338 | -260 | -314 | -112 | -105 | -436 | -311 | -158 | -34 |

| | | Location Code | 04WW10 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sample Date | 1/22/2019 | 2/4/2020 | 5/5/2020 | 8/11/2020 | 11/4/2020 | 3/11/2021 | 5/25/2021 | 8/5/2021 | 11/9/2021 |
| Analyte | Units | PCL | Result | Result | Result | Result | Result | Result | Result | Result | Result |
| **Perchlorate** | | | | | | | | | | | |
| Perchlorate | µg/L | 17 | 10,000 | < 2 | < 0.05 | 0.339 J+ | 0.0888 J | < 0.05 | < 0.05 | < 0.05 | < 0.2 |
| **Field Parameters** | | | | | | | | | | | |
| Dissolved Oxygen | mg/L | NV | 3.59 | 5.54 | 2.72 | 1.03 | 0.11 | 0.04 | 0.15 | 0.7 | 1.64 |
| Oxidation-Reduction Potential | mV | NV | 333 | -79 | -286 | -47 | -62 | -159 | -77 | -38 | -35 |

# Restoration Advisory Board Meeting

## LHAAP-04 Performance Sampling (2019-2021)

### Sampling Results at Key Monitoring Locations

| | | Location Code | 04WW05 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sample Date | 1/22/2019 | 2/4/2020 | 5/5/2020 | 8/11/2020 | 11/4/2020 | 3/10/2021 | 5/25/2021 | 8/5/2021 | 11/9/2021 |
| Analyte | Units | PCL | Result | Result | Result | Result | Result | Result | Result | Result | Result |
| **Perchlorate** | | | | | | | | | | | |
| Perchlorate | µg/L | 17 | 78 | < 2 | < 0.05 | 0.399 J | < 0.05 | < 0.05 | < 0.05 | < 0.5 | < 0.2 |
| **Field Parameters** | | | | | | | | | | | |
| Dissolved Oxygen | mg/L | NV | 1.62 | 0.09 | 0.22 | 0.14 | 0.15 | 0.08 | 0.08 | 0.48 | 0.52 |
| Oxidation-Reduction Potential | mV | NV | 163 | -88 | -90 | -66 | -36 | -320 | -60 | -16 | -4 |

| | | Location Code | 04WW09 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sample Date | 1/22/2019 | 2/4/2020 | 5/5/2020 | 8/11/2020 | 11/4/2020 | 3/11/2021 | 5/25/2021 | 8/5/2021 | 11/9/2021 |
| Analyte | Units | PCL | Result | Result | Result | Result | Result | Result | Result | Result | Result |
| **Perchlorate** | | | | | | | | | | | |
| Perchlorate | µg/L | 17 | 2,100 | 18 | 11.1 | 3.92 | 2.02 | < 0.05 | < 0.5 | < 0.5 | < 0.2 |
| **Field Parameters** | | | | | | | | | | | |
| Dissolved Oxygen | mg/L | NV | 5.78 | 0.08 | 0.04 | 0.03 | 0.02 | 0.09 | 0.04 | 0.33 | 0.22 |
| Oxidation-Reduction Potential | mV | NV | 326 | -74 | -16 | -87 | -91 | -21 | -246 | -127 | -85 |

Notes:

Blue highlighting indicates concentrations above the PCL.

< The analyte was not detected above the laboratory reporting limit shown.

J - Estimated: The concentration shown is estimated

J+ - The concentration shown is an estimate with a high bias

µg/L - micrograms per liter

mg/L - milligrams per liter

NV - No PCL value has been established for the analyte.

PCL - Texas Risk Reduction Program Tier 1 Groundwater Residential Protective Concentration Level.

mV - millivolts

# Restoration Advisory Board Meeting

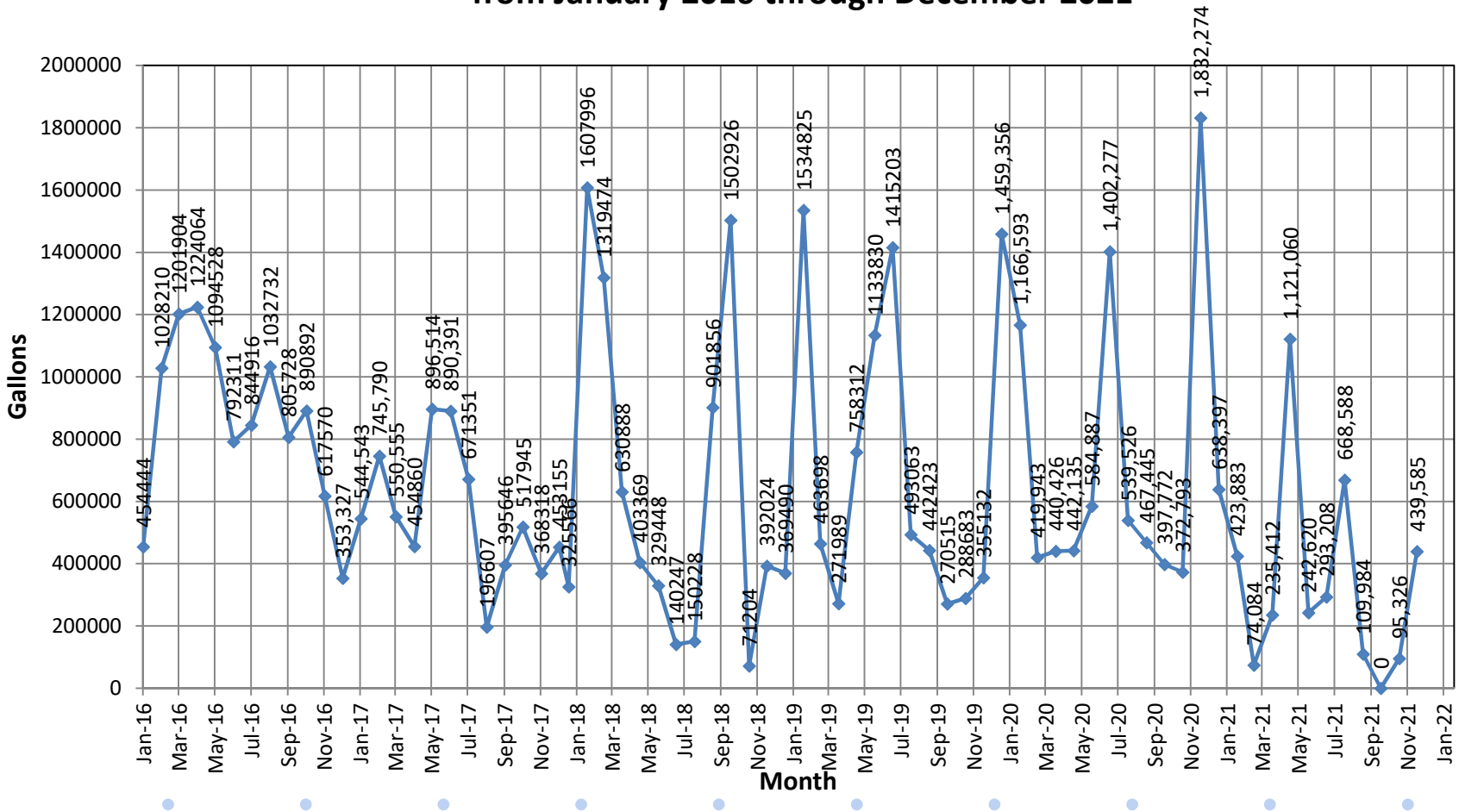
## LHAAP-04 Performance Sampling Summary

- Perchlorate in all wells below the cleanup goal for seven consecutive quarters
- Dissolved oxygen remains well below 1 milligram per liter (mg/L) in three of the five key locations, rising in all five locations
- Oxidation-reduction potential values remain negative, but are rising in all previously contaminated wells
- Semi-annual monitoring for Year 3 beginning in February 2022

# Restoration Advisory Board Meeting

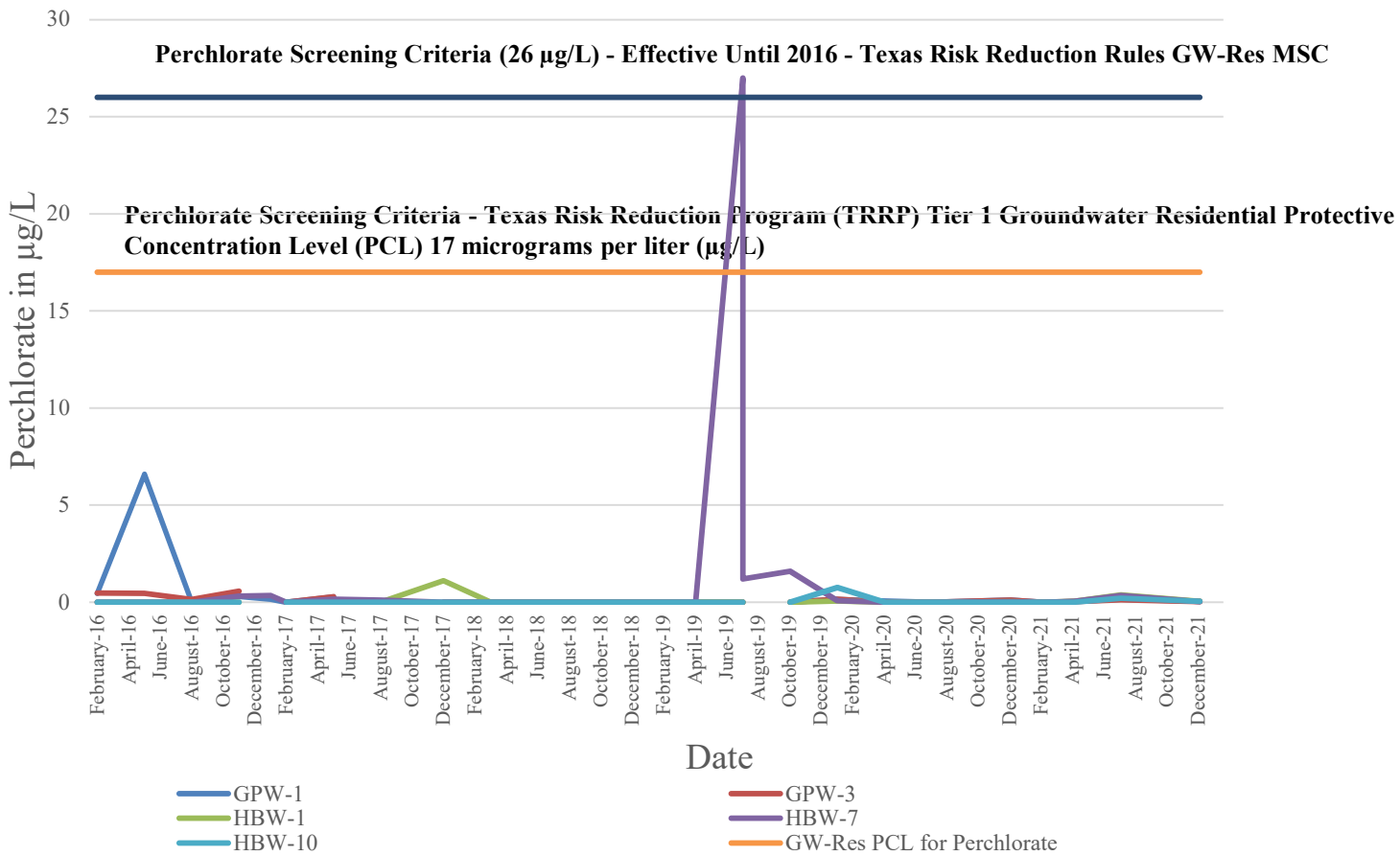
## GWTP Update

**Treated Groundwater Discharged Monthly from January 2016 through December 2021**



# Restoration Advisory Board Meeting

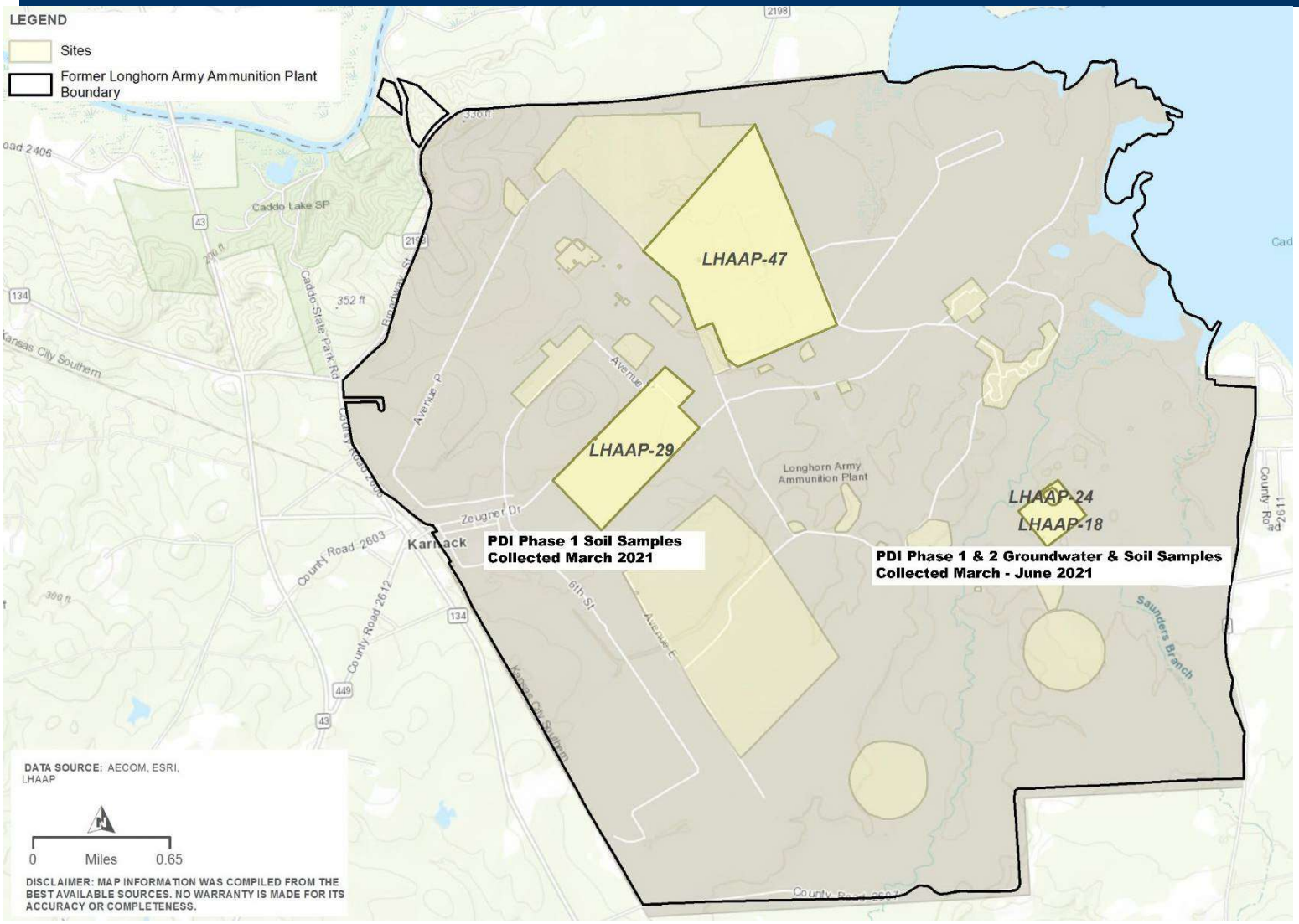
## Surface Water Sample Results




**Note: Surface water at HBW-7 had a detection of 27 µg/L from a sample collected on 11 July 2019. Surface water at HBW-7 was resampled 19 days later (30 July 2019) with a detection of 1.2 J µg/L.**

# Restoration Advisory Board Meeting

## HDR Update



# Restoration Advisory Board Meeting

## LHAAP-18/24, -29, and -47 Document Status, HDR

| Site | Document |
|---|---|
| LHAAP-18/24 | Draft Final Pre-Design Investigation (PDI) Report, January 2022 |
| LHAAP-18/24 | Draft Remedial Design, May 2022 |
| LHAAP-29 | Draft PDI Report, June 2022 |
| LHAAP-29 | Draft Remedial Design, September 2022 |
| LHAAP-47 | Draft Final Record of Decision (ROD), January 2022 |
| | |

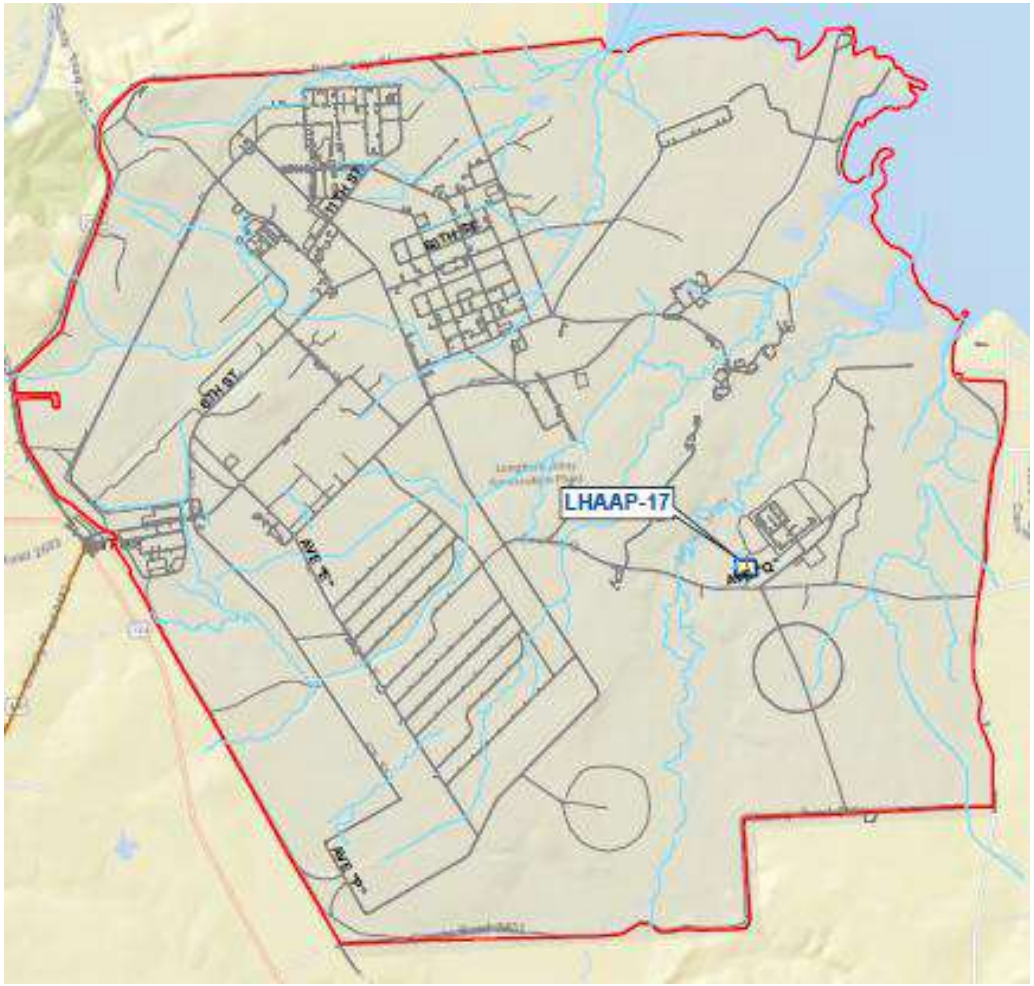
# Restoration Advisory Board Meeting

## Status of LHAAP-29 PDI Investigation

- ✓ Sample re-analysis results have been received and validated. Results are generally comparable.
- ✓ Proposed path forward is being developed for presentation to regulators for review and input.
- ✓ Proposed path forward will include additional field work to install more direct push technology (DPT) borings, sample collection, and analysis.

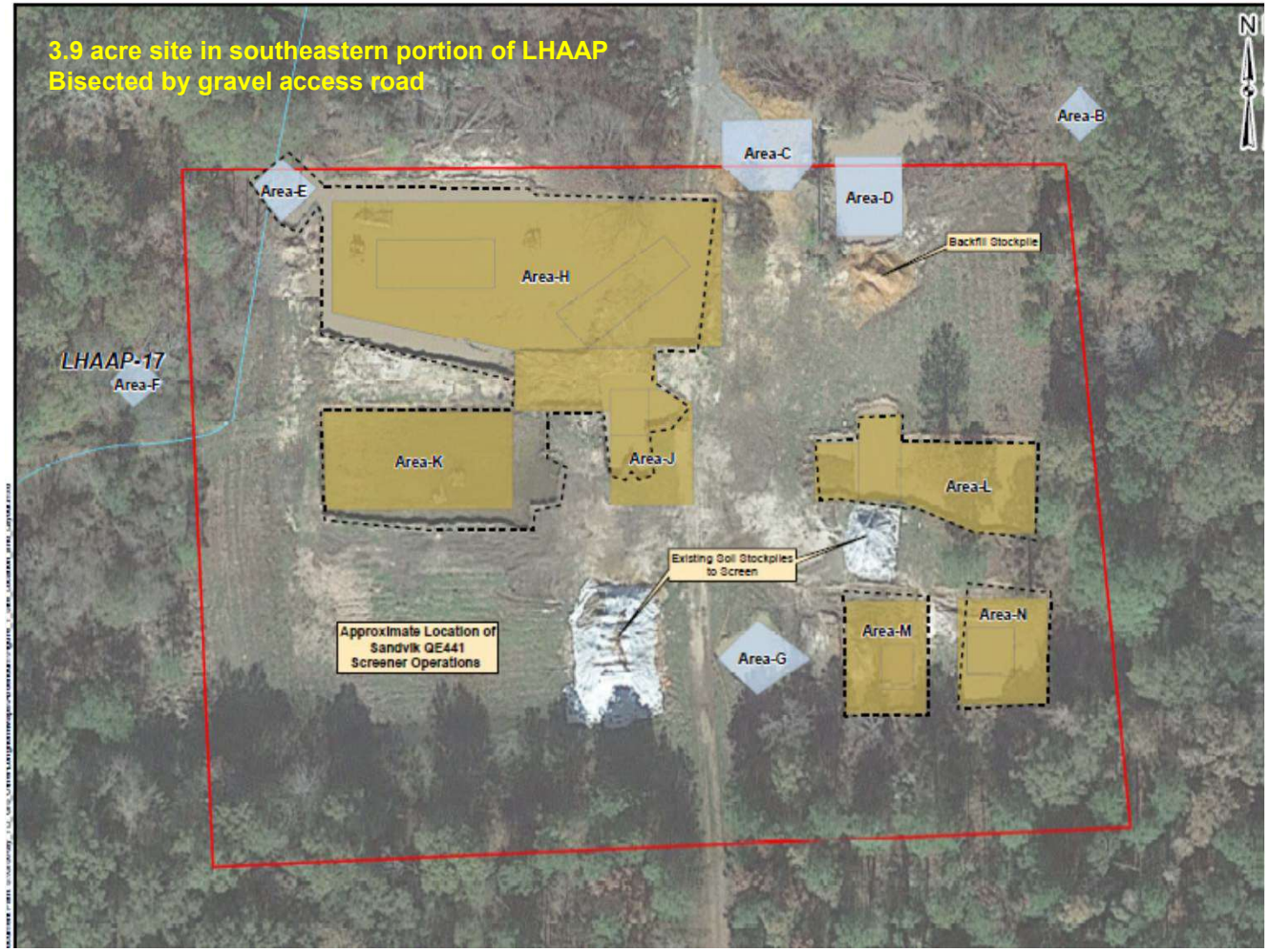
# Restoration Advisory Board Meeting

## MMG-TLI Joint Venture Update



# Restoration Advisory Board Meeting

## LHAAP-17



# Restoration Advisory Board Meeting

## LHAAP-17 Time Critical Removal Action

- The remedy selected in the 2016 ROD included excavation and off-site disposal of soil, groundwater extraction, monitored natural attenuation, and land use controls to maintain the remedy and prohibit groundwater use until chemical of concern (COC) concentrations are reduced to levels supportive of Unlimited Use/Unrestricted Exposure (UU/UE)
- 13 excavation areas (A, B, C, D, E, F, G, H, J, K, L, M, and N) are identified in the ROD
- Excavation began in August 2019 and a work stoppage occurred on 30 September 2019, due to the presence of munitions hazards not previously known to be present
- Of the 13 excavation areas, 7 (A, B, C, D, E, F, and G) were confirmed to be clean and backfilled in August 2020

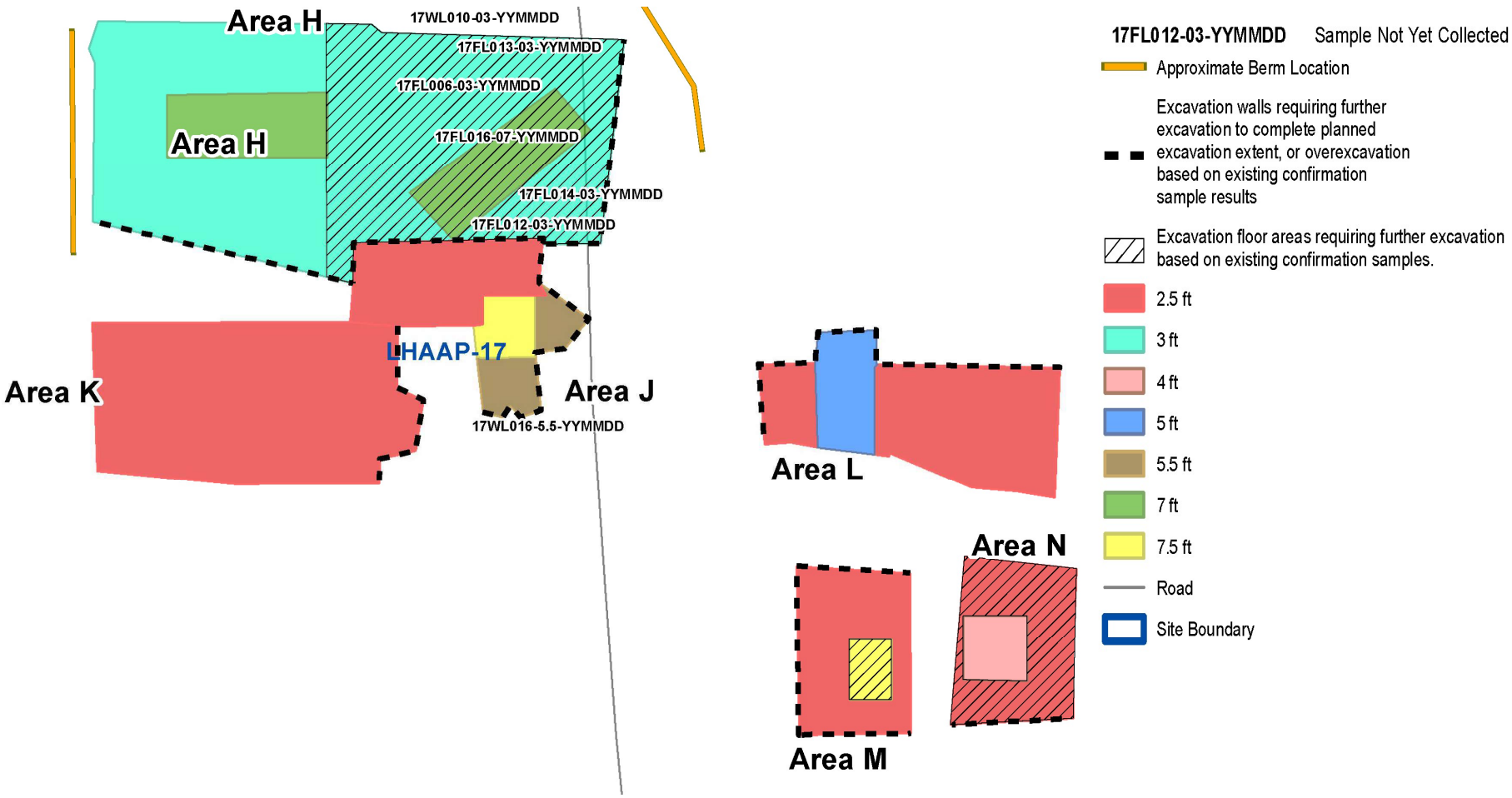
# Restoration Advisory Board Meeting

## LHAAP-17 Time Critical Removal Action

- Munitions and Explosives of Concern (MEC) presents an imminent and substantial threat, a Time Critical Removal Action (TCRA) was determined appropriate, and an Action Memorandum approved
- Following work plan approvals, TCRA site work began in October 2021
- Site work to date has included: boundary survey, vegetation removal, erosion control repair, identification and importing of backfill, draining of standing water, robotic sifting of existing soil piles to remove potential MEC, excavation and over-excavation (where needed) of remaining areas (H, J, K, L, M, and N), staging of excavated and sifted soils, backfilling in areas previously determined clean, and export of sifted soils

# Restoration Advisory Board Meeting

## LHAAP-17 Time Critical Removal Action



# Restoration Advisory Board Meeting

## LHAAP-17 Time Critical Removal Action

- **Key Design Elements Include:**
  - Remotely operated robotic equipment for excavation, soil movement, and sifting
  - Exclusion zones established to prohibit non-essential personnel from entering explosives safety arcs
  - Regulatory approval of validated sample results before backfilling newly excavated areas
  - Inspection and certification of all metallic debris to segregate material potentially presenting an explosives hazard (MPPEH), from material documented as safe (MDAS) and non-munitions related debris
  - Temporary storage of MPPEH for later disposal by detonation on-site
  - Soil/sandbag mitigation to reduce the potential for noise/vibration during detonations

# Restoration Advisory Board Meeting

## LHAAP-17 Screening/Sifting

# Restoration Advisory Board Meeting

## LHAAP-17 Time Critical Removal Action

- **Major Work Elements Completed or Started to Date:**
  - Boundary survey
  - Vegetation removal
  - Erosion control repair
  - Identification and importing of backfill
  - Draining of standing water in open excavations
  - Robotic sifting of all pre-existing soil piles to remove potential MEC
  - Excavation and over-excavation (where needed) of remaining areas (H, J, K, L, M, and N)
  - Confirmation sampling and analysis to confirm excavation extents
  - Staging of excavated and sifted soils
  - Backfilling in areas previously determined clean
  - Export of sifted soils

# Restoration Advisory Board Meeting

## LHAAP-17 Time Critical Removal Action

- **Major work elements yet to be completed:**
  - Complete excavations and receive regulatory approval to backfill all areas
  - When soils piles removed and excavated areas are backfilled, clear the soil surface of any potential munitions and any metal or debris that may interfere with digital geophysical mapping of the subsurface
  - Complete geophysical survey across the site to identify any remaining subsurface anomalies (i.e., targets) that may be MEC
  - Dig/remove identified targets
  - Conduct detonations of accumulated MEC
  - Install the groundwater extraction system components, when it is safe to do so
  - Site restoration

# Restoration Advisory Board Meeting

## LHAAP-17 Time Critical Removal Action

- **Status:**
  - All pre-existing soil piles have been sifted and soils staged for export
  - Over 3,000 cubic yards of soil have been excavated and approximately 2,500 cubic yards of this material has been sifted and staged for export
  - Portions of all areas, except Area J, have been excavated and confirmation samples are pending laboratory analysis and validation before backfill
  - 30 MEC items totaling 2.95 pounds (lbs) Net Explosives Weight (NEW) are in storage pending on-site detonation
  - An estimated 29,000 lbs of Non-Munitions Related debris and 10,000 lbs of Munitions Debris have been inspected and segregated for off-site recycling/disposal
  - Fieldwork is anticipated to be completed in April 2022

# Restoration Advisory Board Meeting

## LHAAP-17 Time Critical Removal Action

- **Estimated Schedule:**

| Activity | Anticipated Completion |
|---|---|
| Over-excavation | February 9 |
| Backfilling | February 25 |
| Export | February 25 |
| Surface Clearance | February 28 |
| Geophysical Survey | March 4 |
| Reacquisition & Digging of Anomalies | March 22 |
| Groundwater Extraction System Install | April 15 |
| Site Restoration/Demobilization | April 2 |

# Restoration Advisory Board Meeting

## LHAAP-17 Remote Excavation

# Restoration Advisory Board Meeting

## Next RAB Meeting Schedule & Closing Remarks

- Schedule Next RAB Meeting
- Other Issues/Remarks
- Thank you for coming

# Groundwater Treatment Plant - Processed Groundwater Volumes

The amount of groundwater treated is determined by measuring the number of gallons of processed water discharged.

## Processed Water Discharged Data (in gallons)

| Oct-07 | Nov-07 | Dec-07 | Jan-08 | Feb-08 | Mar-08 | Apr-08 | May-08 | Jun-08 | Jul-08 | Aug-08 | Sep-08 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,041,491 | 848,356 | 804,822 | 792,148 | 665,883 | 818,872 | 791,306 | 568,812 | 776,904 | 748,377 | 690,052 | 617,199 |

| Oct-08 | Nov-08 | Dec-08 | Jan-09 | Feb-09 | Mar-09 | Apr-09 | May-09 | Jun-09 | Jul-09 | Aug-09 | Sep-09 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 655,059 | 619,274 | 726,118 | 552,299 | 598,144 | 433,800 | 488,807 | 526,958 | 387,644 | 0 | 414,853 | 735,716 |

| Oct-09 | Nov-09 | Dec-09 | Jan-10 | Feb-10 | Mar-10 | Apr-10 | May-10 | Jun-10 | Jul-10 | Aug-10 | Sep-10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 808,322 | 636,306 | 727,492 | 391,898 | 695,343 | 802,656 | 894,731 | 962,121 | 1,257,977 | 1,314,924 | 1,041,495 | 1,136,547 |

| Oct-10 | Nov-10 | Dec-10 | Jan-11 | Feb-11 | Mar-11 | Apr-11 | May-11 | Jun-11 | Jul-11 | Aug-11 | Sep-11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 956,567 | 705,805 | 849,712 | 811,679 | 668,281 | 1,090,348 | 817,325 | 900,338 | 916,552 | 784,369 | 652,524 | 733,456 |

| Oct-11 | Nov-11 | Dec-11 | Jan-12 | Feb-12 | Mar-12 | Apr-12 | May-12 | Jun-12 | Jul-12 | Aug-12 | Sep-12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 748,102 | 658,250 | 684,903 | 865,453 | 725,000* | 730,000* | 980,000* | 630,000* | 0 | 0 | 0 | 349,012 |

| Oct-12 | Nov-12 | Dec-12 | Jan-13 | Feb-13 | Mar-13 | Apr-13 | May-13 | Jun-13 | Jul-13 | Aug-13 | Sep-13 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 617,037 | 607,610 | 560,436 | 869,710 | 751,213 | 641,708 | 699,776 | 746,885 | 392,719 | 962,890 | 843,913 | 716,057 |

| Oct-13 | Nov-13 | Dec-13 | Jan-14 | Feb-14 | Mar-14 | Apr-14 | May-14 | Jun-14 | Jul-14 | Aug-14 | Sep-14 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 813,974 | 727,442 | 706,416 | 552,657 | 738,691 | 844,095 | 811,346 | 972,913 | 611,505 | 626,253 | 573,601 | 575,376 |

| Oct-14 | Nov-14 | Dec-14 | Jan-15 | Feb-15 | Mar-15 | Apr-15 | May-15 | Jun-15 | Jul-15 | Aug-15 | Sep-15 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 440,877 | 572,479 | 634,890 | 614,073 | 516,592 | 1,111,859 | 1,108,336 | 822,637 | 1,020,313 | 1,002,887 | 951,758 | 306,467 |

| Oct-15 | Nov-15 | Dec-15 | Jan-16 | Feb-16 | Mar-16 | Apr-16 | May-16 | Jun-16 | Jul-16 | Aug-16 | Sep-16 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 128,586 | 209,088 | 120,234 | 454,444 | 1,028,210 | 1,201,904 | 1,224,064 | 1,094,528 | 792,311 | 844,916 | 1,032,732 | 805,728 |

| Oct-16 | Nov-16 | Dec-16 | Jan-17 | Feb-17 | Mar-17 | Apr-17 | May-17 | Jun-17 | Jul-17 | Aug-17 | Sep-17 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 890,892 | 617,570 | 353,327 | 544,543 | 745,790 | 550,555 | 454,860 | 896,514 | 890,391 | 528,538 | 195,198 | 961,324 |

| Oct-17 | Nov-17 | Dec-17 | Jan-18 | Feb-18 | Mar-18 | Apr-18 | May-18 | Jun-18 | Jul - 18 | Aug-18 | Sep-18 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 517,945 | 368,318 | 453,155 | 325,566 | 1,607,996 | 1,319,474 | 630,888 | 403,369 | 329,448 | 140,247 | 150,228 | 901,856 |

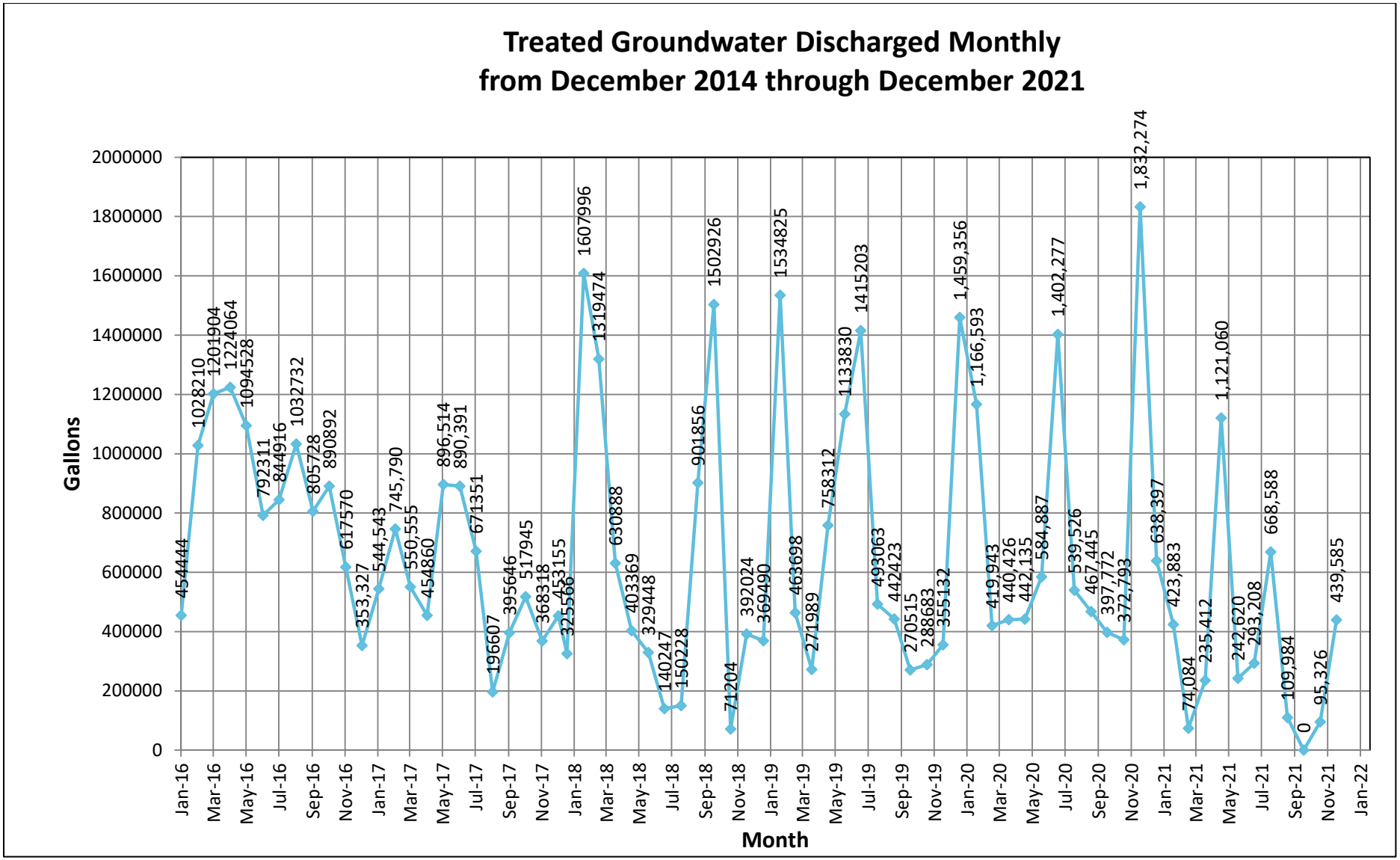
| Oct-18 | Nov-18 | Dec-18 | Jan-19 | Feb-19 | Mar-19 | Apr-19 | May-19 | Jun-19 | Jul - 19 | Aug-19 | Sep-19 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,502,926 | 71,204 | 392,024 | 369,490 | 1,534,825 | 463,698 | 271,989 | 758,312 | 1,133,830 | 1,415,203 | 493,063 | 442,423 |

| Oct-19 | Nov-19 | Dec-19 | Jan-20 | Feb-20 | Mar-20 | Apr-20 | May-20 | Jun-20 | Jul-20 | Aug-20 | Sep-20 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 270,515 | 288,683 | 355,132 | 1,459,356 | 1,166,593 | 419,943 | 440,426 | 442,135 | 584,887 | 1,402,277 | 539,526 | 467,445 |

| Oct-20 | Nov-20 | Dec-20 | Jan-21 | Feb-21 | Mar-21 | Apr-21 | May-21 | Jun-21 | Jul-21 | Aug-21 | Sep-21 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 397,772 | 372,793 | 1,832,274 | 638,397 | 423,883 | 74,084 | 235,412 | 1,121,060 | 242,620 | 293,208 | 668,588 | 109,984 |

| Oct-21 | Nov-21 | Dec-21 |
|---|---|---|
| 0 | 95,326 | 439,585 |

*Indicates Estimate


Treated Groundwater Discharged Monthly
from December 2014 through December 2021
Gallons
Month
2000000
1800000
1600000
1400000
1200000
1000000
800000
600000
400000
200000
0
Jan-16
Mar-16
May-16
Jul-16
Sep-16
Nov-16
Jan-17
Mar-17
May-17
Jul-17
Sep-17
Nov-17
Jan-18
Mar-18
May-18
Jul-18
Sep-18
Nov-18
Jan-19
Mar-19
May-19
Jul-19
Sep-19
Nov-19
Jan-20
Mar-20
May-20
Jul-20
Sep-20
Nov-20
Jan-21
Mar-21
May-21
Jul-21
Sep-21
Nov-21
Jan-22
454444
1028210
1201904
1224064
1094528
792311
844916
1032732
805728
890892
617570
353,327
544,543
745,790
550,555
454860
896,514
890,391
671351
196607
395646
517945
368318
453155
325566
1607996
1319474
630888
403369
329448
140247
150228
901856
1502926
71204
392024
369490
1534825
463698
271989
758312
1133830
1415203
493063
442423
270515
288683
355132
1,459,356
1,166,593
419,943
440,426
442,135
584,887
1,402,277
539,526
467,445
397,772
372,793
1,832,274
638,397
423,883
74,084
235,412
1,121,060
242,620
293,208
668,588
109,984
0
95,326
439,585

# Water Discharge Location and Volume (Gallons)

| Month | Total Combined to Harrison Bayou | LHAAP-18/24 Sprinklers | GWTP To INF Pond | INF Pond to Harrison Bayou | Contract Hauled Off-Site |
|---|---|---|---|---|---|
| Dec-16 | 0 | 236,688 | 0 | 0 | 0 |
| Jan-17 | 0 | 0 | 0 | 0 | 0 |
| Feb-17 | 0 | 0 | 0 | 0 | 14,355 |
| Mar-17 | 127,242 | 0 | 0 | 0 | 14,400 |
| Apr-17 | 113,038 | 0 | 236,821 | 0 | 0 |
| May-17 | 0 | 0 | 534,155 | 0 | 0 |
| Jun-17 | 958,404 | 0 | 294,550 | 490,574 | 0 |
| Jul-17 | 0 | 0 | 528,538 | 0 | 0 |
| Aug-17 | 0 | 0 | 195,197 | 0 | 0 |
| Sep-17 | 651,434 | 0 | 309,980 | 651,434 | 0 |
| Oct-17 | 0 | 0 | 517,945 | 0 | 0 |
| Nov-17 | 0 | 0 | 368,318 | 0 | 0 |
| Dec-17 | 560,350 | 0 | 453,155 | 560,350 | 0 |
| Jan-18 | 325,566 | 0 | 253,177 | 325,566 | 0 |
| Feb-18 | 1,607,996 | 0 | 62,017 | 1,430,634 | 0 |
| Mar-18 | 1,319,474 | 0 | 0 | 870,816 | 0 |
| Apr-18 | 630,888 | 0 | 0 | 630,888 | 0 |
| May-18 | 403,369 | 0 | 0 | 403,369 | 0 |
| Jun-18 | 193,669 | 0 | 135,779 | 0 | 0 |
| Jul -18 | 0 | 0 | 140,247 | 0 | 0 |
| Aug -18 | 49,409 | 0 | 100,819 | 0 | 0 |
| Sep-18 | 585,397 | 0 | 316,459 | 524,484 | 0 |
| Oct-18 | 1,409,106 | 0 | 93,820 | 1,016,285 | 0 |
| Nov-18 | 71,204 | 0 | 0 | 0 | 0 |
| Dec-18 | 392,024 | 0 | 0 | 0 | 0 |
| Jan-19 | 369,490 | 0 | 0 | 369,490 | 0 |
| Feb-19 | 1,534,825 | 0 | 0 | 1,326,485 | 0 |
| Mar-19 | 463,698 | 0 | 0 | 83,250 | 0 |
| Apr-19 | 271,989 | 0 | 0 | 0 | 0 |
| May-19 | 758,312 | 0 | 0 | 253,817 | 0 |
| Jun-19 | 1,133,830 | 0 | 0 | 847,918 | 0 |
| Jul-19 | 1,415,203 | 0 | 0 | 903,001 | 0 |
| Aug-19 | 374,629 | 0 | 118,434 | 0 | 0 |

| Month | Total Combined to Harrison Bayou | LHAAP-18/24 Sprinklers | GWTP To INF Pond | INF Pond to Harrison Bayou | Contract Hauled Off-Site |
|---|---|---|---|---|---|
| Sep-19 | 0 | 0 | 442,423 | 0 | 0 |
| Oct-19 | 0 | 0 | 270,515 | 0 | 0 |
| Nov-19 | 115,503 | 0 | 173,180 | 0 | 0 |
| Dec-19 | 318,248 | 0 | 36,884 | 0 | 0 |
| Jan-20 | 1,459,396 | 0 | 0 | 1,115,183 | 0 |
| Feb-20 | 1,166,593 | 0 | 0 | 741,954 | 0 |
| Mar-20 | 419,943 | 0 | 0 | 0 | 0 |
| Apr-20 | 440,426 | 0 | 0 | 0 | 0 |
| May-20 | 442,135 | 0 | 0 | 0 | 0 |
| June-20 | 584,887 | 0 | 0 | 0 | 0 |
| July-20 | 1,402,277 | 0 | 0 | 984,393 | 0 |
| Aug-20 | 216,197 | 0 | 323,359 | 0 | 0 |
| Sep-20 | 0 | 0 | 467,445 | 0 | 0 |
| Oct-20 | 0 | 0 | 397,772 | 0 | 0 |
| Nov-20 | 0 | 0 | 372,793 | 0 | 0 |
| Dec-20 | 1,832,274 | 0 | 60,199 | 1,571,432 | 0 |
| Jan-21 | 638,397 | 0 | 0 | 383,318 | 0 |
| Feb-21 | 423,883 | 0 | 0 | 259,875 | 0 |
| Mar-21 | 74,084 | 0 | 0 | 74,084 | 0 |
| Apr-21 | 235,412 | 0 | 0 | 0 | 0 |
| May-21 | 1,121,060 | 0 | 0 | 900,000 | 0 |
| Jun-21 | 242,620 | 0 | 0 | 0 | 0 |
| Jul-21 | 293,208 | 0 | 0 | 243,675 | 0 |
| Aug-21 | 668,588 | 0 | 0 | 561,527 | 0 |
| Sep-21 | 0 | 0 | 109,984 | 0 | 0 |
| Oct-21 | 0 | 0 | 0 | 0 | 0 |
| Nov-21 | 0 | 0 | 95,326 | 0 | 0 |
| Dec-21 | 271,500 | 0 | 168,085 | 271,500 | 0 |

# Harrison Bayou and Goose Prairie Creek – Perchlorate Data

Surface water samples are collected quarterly from each location in Harrison Bayou and Goose Prairie Creek, unless the sampling location is dry.

## Surface Water Sample Data (in micrograms per liter)

| Quarter | 3rd | 4th | 1st | 2nd | 3rd | 4th | 1st | 2nd | 3rd | 4th | 1st |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Creek Sample ID** | **Jul 1999** | **Sep 1999** | **Feb 2000** | **Apr 2000** | **Aug 2000** | **Dec 2000** | **Feb 2001** | **Apr 2001** | **July 2001** | **Oct 2001** | **Jan 2002** |
| GPW-1 | <1.0 U | - | 4 | <4.0 U | <4.0 U | <4.0 U | - | 2.65 | <4.0 U | <4.0 U | <4.0 U |
| GPW-3 | <1.0 U | <4.0 U | 17 | 8 | <4.0 U | <4.0 U | - | 2.28 | <4.0 U | <4.0 U | <4.0 U |
| HBW-1 | - | <8.0 U | 310 | 23 | - | - | <4.0 U | - | <4.0 U | <4.0 U | <4.0 U |
| HBW-7 | - | <8.0 U | 370 | 110 | - | - | <4.0 U | - | <4.0 U | <4.0 U | <4.0 U |
| HBW-10 | - | <8.0 U | 905 | 650 | <4.0 U | - | <4.0 U | - | <4.0 U | - | - |

| Quarter | 2nd | 3rd | 4th | 1st | 2nd | 3rd | 3rd | 4th | 2nd | 3rd | 4th |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Creek Sample ID** | **June 2002** | **Sept 2002** | **Dec 2002** | **Feb 2003** | **June 2003** | **Aug 2003** | **July 2004** | **Dec 2006** | **May 2007** | **Aug 2007** | **Dec 2007** |
| GPW-1 | <4.0 U | <4.0 U | 18.3 | 18.6 | 59.9 | - | 2.25 | - | <1.0 U | <1.0 U | 10.7 |
| GPW-3 | <4.0 U | <4.0 U | 5.49 | 12.6 | 14.7 | - | 2.2 | - | <1.0 U | <1.0 U | 7.48 |
| HBW-1 | <4.0 U | <4.0 U | <4.0 U | - | <4.0 U | 99.3 | <0.2 U | <1.0 U | <1.0 U | 122 | <1.0 U |
| HBW-7 | <4.0 U | <4.0 U | <4.0 U | - | <4.0 U | <4.0 U | <0.2 U | <1.0 U | <1.0 U | 1.02 | <1.0 U |
| HBW-10 | <4.0 U | <4.0 U | <4.0 U | - | <4.0 U | - | <0.2 U | <1.0 U | <1.0 U | <1.0 U | <1.0 U |

| Quarter | 1st | 2nd | 3rd | 4th | 2nd | 3rd | 3rd | 3rd | 4th | 1st | 2nd |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Creek Sample ID** | **Mar 2008** | **Jun 2008** | **Sep 2008** | **Dec 2008** | **May 2009** | **Jul 2009** | **Aug 2009** | **Sep 2009** | **Dec 2009** | **Mar 2010** | **Jun 2010** |
| GPW-1 | 27 | <0.5 U | <0.5 U | <0.22 U | 16 | <4 U | NS | <1.2 U | 3.7 | 1.3 J | <0.6 U |
| GPW-3 | 21.9 | 9.42 | 1.1 | <0.22 U | 8.9 | <4 U | NS | <0.6 U | 2.8 | 1.8 J | <0.6 U |
| HBW-1 | <0.5 U | <0.5 U | <0.5 U | <0.22 U | <0.55 U | <4 U | NS | <1.5 U | <0.275 U | 1.5 U | <0.6 U |
| HBW-7 | <0.5 U | <0.5 U | <0.5 U | <0.22 U | <0.55 U | <4 U | 24 | <1.2 U | <0.275 U | 1.5 U | <0.6 U |
| HBW-10 | <0.5 U | <0.5 U | <0.5 U | <0.22 U | <0.55 U | <4 U | NS | <1.5 U | <0.275 U | 1.2 U | <0.6 U |

| Quarter | 3rd | 4th | 1st | 2nd | 3rd | 4th | 1st | 2nd | 3rd | 4th | 1st |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Creek Sample ID** | **Sep 2010** | **Dec 2010** | **Mar 2011** | **Jun 2011** | **Sep 2011** | **Dec 2011** | **Mar 2012** | **Jun 2012** | **Not Applicable** | **Jan & Feb 2013** | **Mar 2013** |
| GPW-1 | Dry | <0.1 U | 8.7 | Dry | Dry | 1.76 | 0.163 J | Dry | NS | 1.65 | 0.735 |
| GPW-3 | Dry | 0.199 J | 0.673 | Dry | Dry | 1.31 | 0.261 | Dry | NS | 1.74 | 0.754 |
| HBW-1 | Dry | <0.1 U | <0.2 U | Dry | Dry | <0.1 U | <0.1 U | Dry | NS | <0.2 U | <0.2 U |
| HBW-7 | Dry | <0.1 U | <0.2 U | Dry | Dry | 0.171 J | <0.1 U | Dry | NS | <0.2 U | <0.2 U |
| HBW-10 | Dry | <0.1 U | <0.2 U | Dry | Dry | <0.1 U | <0.1 U | Dry | NS | <0.2 U | <0.2 U |

| Quarter | 2nd | 3rd | 4th | 1st | 2nd | 3nd | 4th | 1st | 2nd | 3rd | 4th |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Creek Sample ID** | **Jun 2013** | **Sept 2013** | **Dec 2013** | **Feb 2014** | **May 2014** | **Aug 2014** | **Nov 2014** | **Feb 2015** | **May 2015** | **Aug 2015** | **Nov 2015** |
| GPW-1 | Dry | <0.2 U | Dry | 0.766 | Dry | Dry | 0.244 J | 0.311 J | 0.156 J | Dry | 0.142 J |
| GPW-3 | Dry | <0.2 U | Dry | 1.15 | Dry | Dry | 0.276 J | 0.344 J | Dry | Dry | 0.311 J |
| HBW-1 | <0.2 U | <0.2 U | Dry | <0.2 U | Dry | Dry | <0.2 U | <0.2 U | Dry | Dry | <0.2 U |
| HBW-7 | <0.2 U | <0.2 U | Dry | 0.201 J | Dry | Dry | <0.2 U | 0.124 J | Dry | Dry | <0.2 U |
| HBW-10 | <0.2 U | <0.2 U | Dry | <0.2 U | Dry | Dry | <0.2 U | <0.2 U | Dry | Dry | <0.2 U |

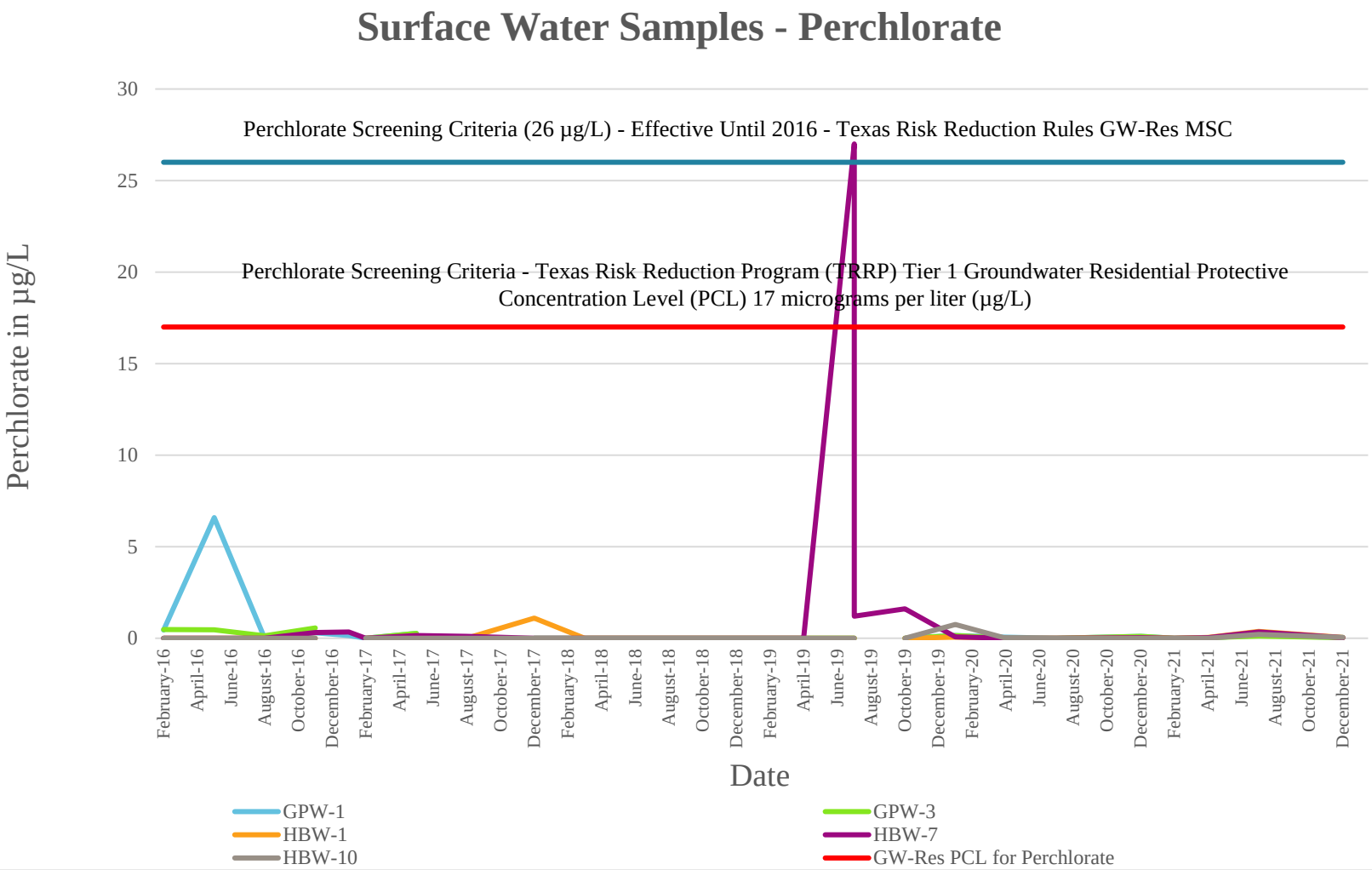
| Quarter | 1st | 2nd | 3rd | 4th | 1st | 2nd | 3rd | 4th | 1st | 2nd | 3rd |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Creek Sample ID** | **Feb 2016** | **May 2016** | **Aug 2016** | **Nov 2016** | **Feb 2017** | **May 2017** | **Aug 2017** | **Dec 2017** | **Mar 2018** | **Jun 2018** | **Aug 2018** |
| GPW-1 | 0.447 | 6.59 | <0.2 U | 0.301 J | <1 U | 0.263 | Dry | <2.0 U | <2.0 U | Dry | <2.0 U |
| GPW-3 | 0.474 | 0.457 | 0.141 | 0.563 | <1 U | 0.274 | Dry | <2.0 U | <2.0 U | Dry | <2.0 U |
| HBW-1 | <0.2 U | <0.2 U | <0.2 U | <0.2 U | <1 U | <0.2 U | <0.2 U | 1.1 J | <2.0 U | Dry | <2.0 U |
| HBW-7 | <0.2 U | <0.2 U | <0.2 U | 0.318 J | <1 U | 0.155 | <0.2 U | <2.0 U | <2.0 U | Dry | <2.0 U |
| HBW-10 | <0.2 U | <0.2 U | <0.2 U | <0.2 U | <1 U | <0.2 U | 0.111 J | <2.0 U | <2.0 U | Dry | <2.0 U |

NS – not sampled U – non-detect J – Estimated Dry – no surface water

| Quarter | 4th | 1st | 2nd | 3rd | 4th | 1st | 2nd | 3rd | 4th | 1st | 2nd | 3rd |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Creek Sample ID** | **Oct 2018** | **Jan 2019** | **Apr 2019** | **Jul 2019** | **Oct 2019** | **Jan 2020** | **Apr 2020** | **Jul 2020** | **Dec 2020** | **Feb 2021** | **Apr 2021** | **Jul 2021** |
| GPW-1 | <2.0 U | <2.0 U | <2.0 U | <2.0 U | <2.0 U | 0.163 | 0.0589 J | <0.05 U | 0.110 | <0.05 U | 0.0268 J | 0.154 |
| GPW-3 | <2.0 U | <2.0 U | <2.0 U | <2.0 U | <2.0 U | 0.156 | 0.0662 J | 0.0326 J | 0.108 | <0.05 U | 0.0321 J | 0.122 |
| HBW-1 | <2.0 U | <2.0 U | <2.0 U | <2.0 U | <2.0 U | 0.0600 J | <0.05 U | <0.05 U | 0.0374 J | <0.05 U | 0.0410 J | 0.369 |
| HBW-7 | <2.0 U | <2.0 U | <2.0 U | 27 (initial)/ 1.2 J (resample) | 1.6 J | 0.0761 J | <0.05 U | 0.0318 J | 0.0265 J | <0.05 U | 0.0373 J | 0.348 |
| HBW-10 | <2.0 U | <2.0 U | <2.0 U | <2.0 U | <2.0 U | 0.0782 J | <0.05 U | <0.05 U | <0.05 U | <0.05 U | <0.05 U | 0.207 |

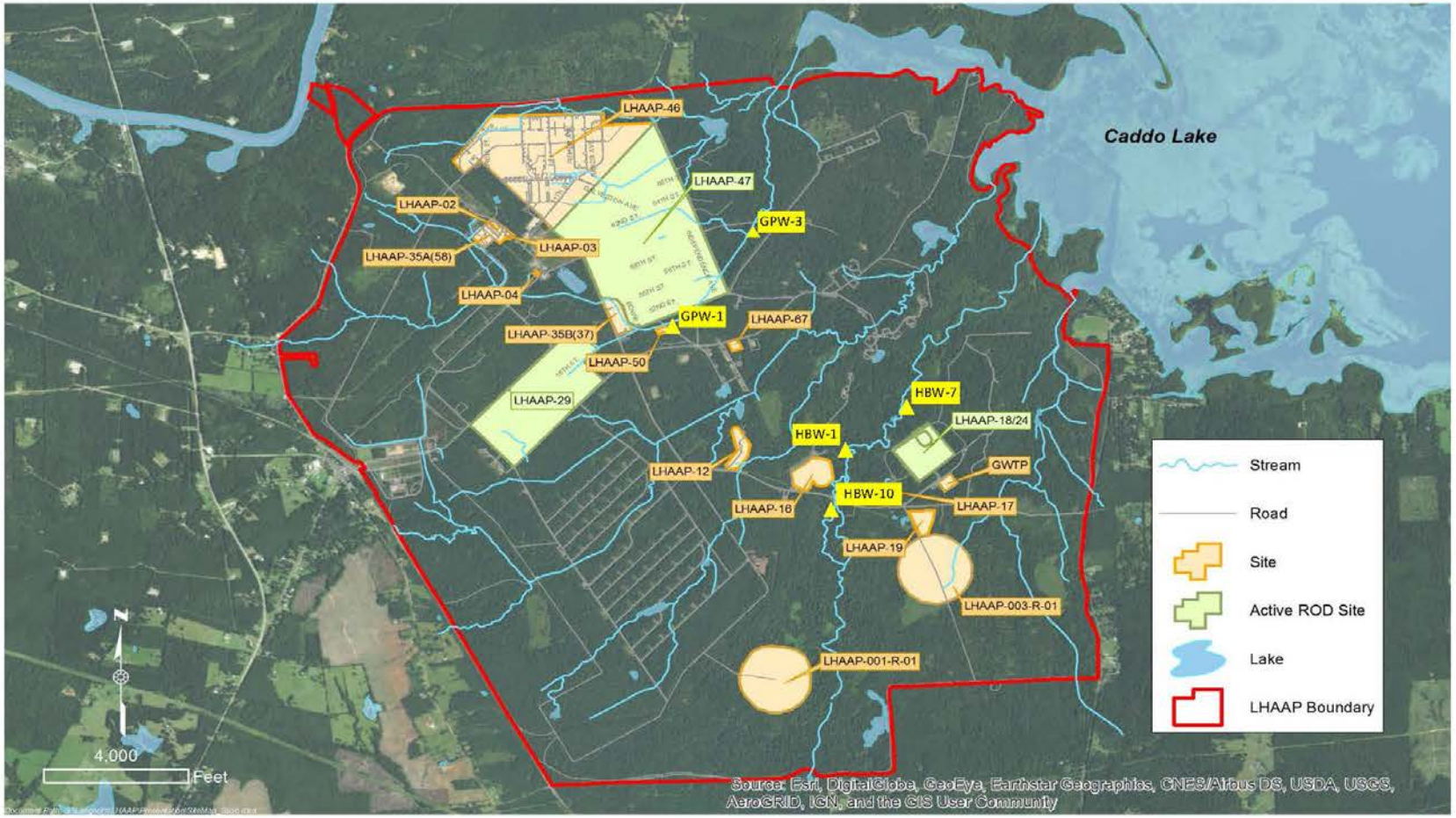
| Quarter | 4th |
|---|---|
| **Creek Sample ID** | **Dec 2021** |
| GPW-1 | 0.0394 J |
| GPW-3 | 0.0344 J |
| HBW-1 | 0.050 U |
| HBW-7 | 0.0359 J |
| HBW-10 | 0.0464 J |

NS – not sampled U – non-detect J – Estimated Dry – no surface water




Note: Surface water at HBW-7 had a detection of 27 µg/L from a sample collected on 11 July 2019. Surface water at HBW-7 was resampled 19 days later (30 July 2019) with a detection of 1.2 J µg/L.

# Longhorn Army Ammuntion Plant Creek Sampling Locations



# Metals in Groundwater at LHAAP

George Rice

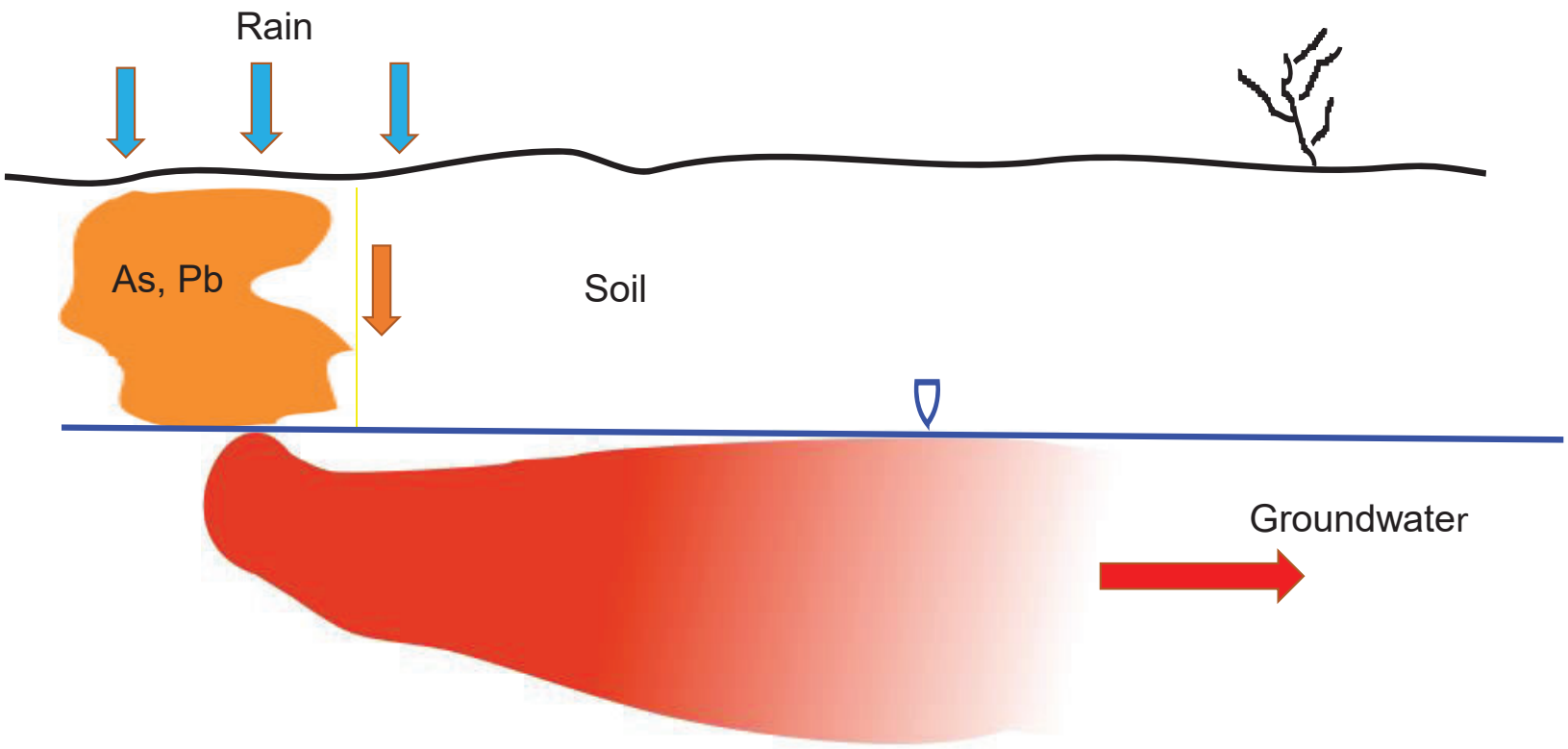
January 19, 2022

**Caddo Lake Institute**

# Toxic Metals at LHAAP

- Antimony (Sb)
- Arsenic (As, most common)
- Beryllium (Be)
- Cadmium (Cd)
- Chromium (Cr, artifact – SS wells)
- Lead (Pb)
- Mercury (Hg)
- Selenium (Se)
- Thallium (Tl)

# Common Contamination Mechanism



# Sites Contaminated with Metals in Groundwater

(last available analysis)

- Site 1: lead (1993)
- Site 3: arsenic (2019)*
- Site 11: lead (1994)
- Site 12: antimony, cadmium (?) (1998)
- Site 16: arsenic, thallium (2009)*
- Site 18/24: arsenic (2020)*
- Site 27: beryllium (2009)
- Site 29: arsenic, mercury, selenium (2008)*
- Site 47: arsenic (2018)
- Site 49: arsenic, selenium (2009)
- Site 50: antimony (1998)
- Site 54: arsenic (2009)
- Site 58: arsenic, selenium (2019)*
- Site 67: thallium (1998)

* Army will monitor metal concentrations at these sites but has no plans to cleanup

# Metals VS Non-Metal Contaminants

- Non-metals (TCE, TNT, Perchlorate, etc.) destroyed via biodegradation
- Metals cannot be destroyed

# Metals VS Non-Metal Contaminants

## Natural or Contamination?

- TCE, TNT, etc. are not natural - clearly the result of contamination
- Metals may be natural, or the result of contamination

# Metals in Manufactured Products

- Antimony – flares, semiconductors
- Arsenic – pesticides, semiconductors
- Beryllium - alloys, aircraft and rocket parts
- Cadmium - solders, pigments
- Chromium - flares, stainless steel
- Lead - fuses, batteries
- Mercury - pesticides, batteries
- Selenium - photoelectric devices, pigments
- Thallium - electronic devices, glass

# Determine Background Metal Concentrations

Purpose

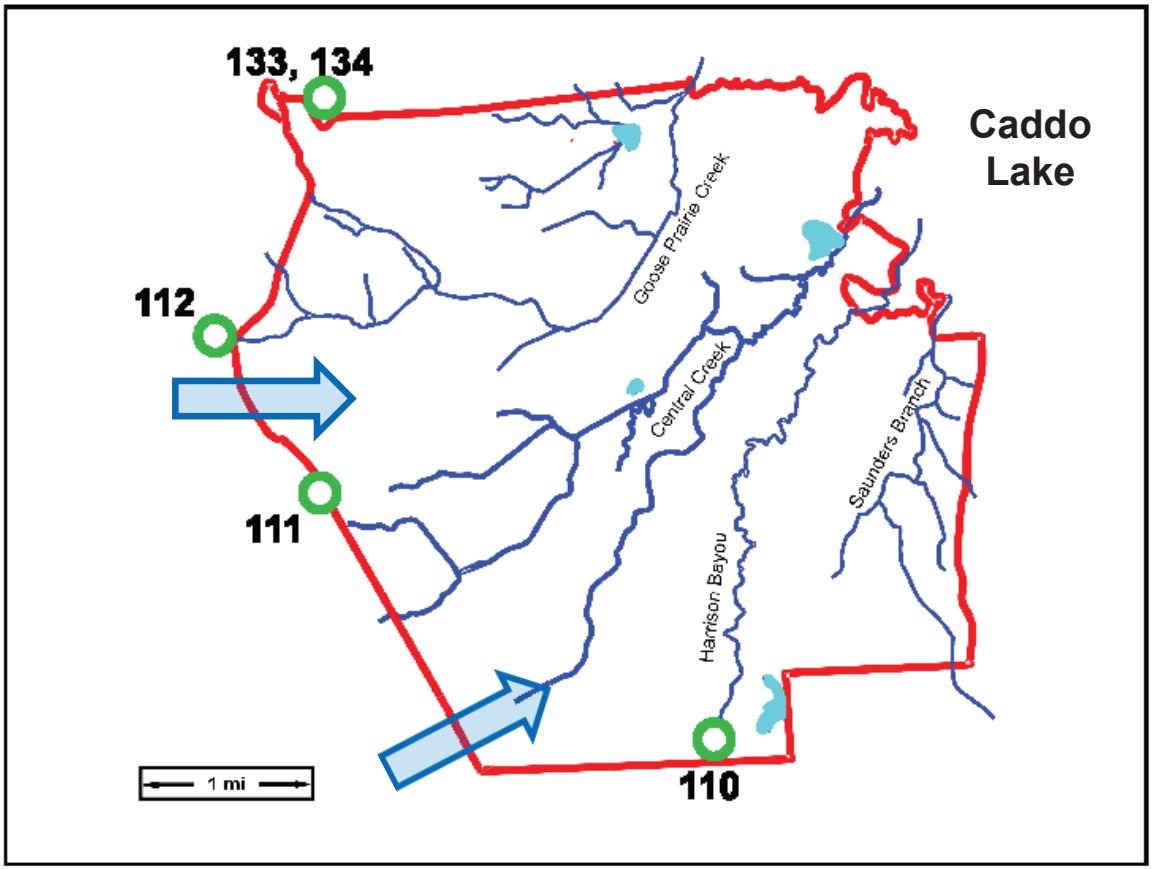
- ‘Natural’ concentrations
- Reasonable cleanup levels

Three attempts

- 1995, 2002, 2007

Five perimeter wells

# Perimeter Background Wells



# Background - Problems

- LHAAP-associated contaminants found in four of five background wells (e.g., methylene chloride, perchlorate, RDX)
- Wide range of background estimates (UTLs) (As: <1 µg/L – 340 µg/L )
- Non-sensical results (values of As and Sb less than detection limit)
- Disagreement between sample pairs: high concentrations VS non-detections (As, Cd, Sb)

## Recommendation

Re-do estimates of background values, or use MCLs as cleanup levels

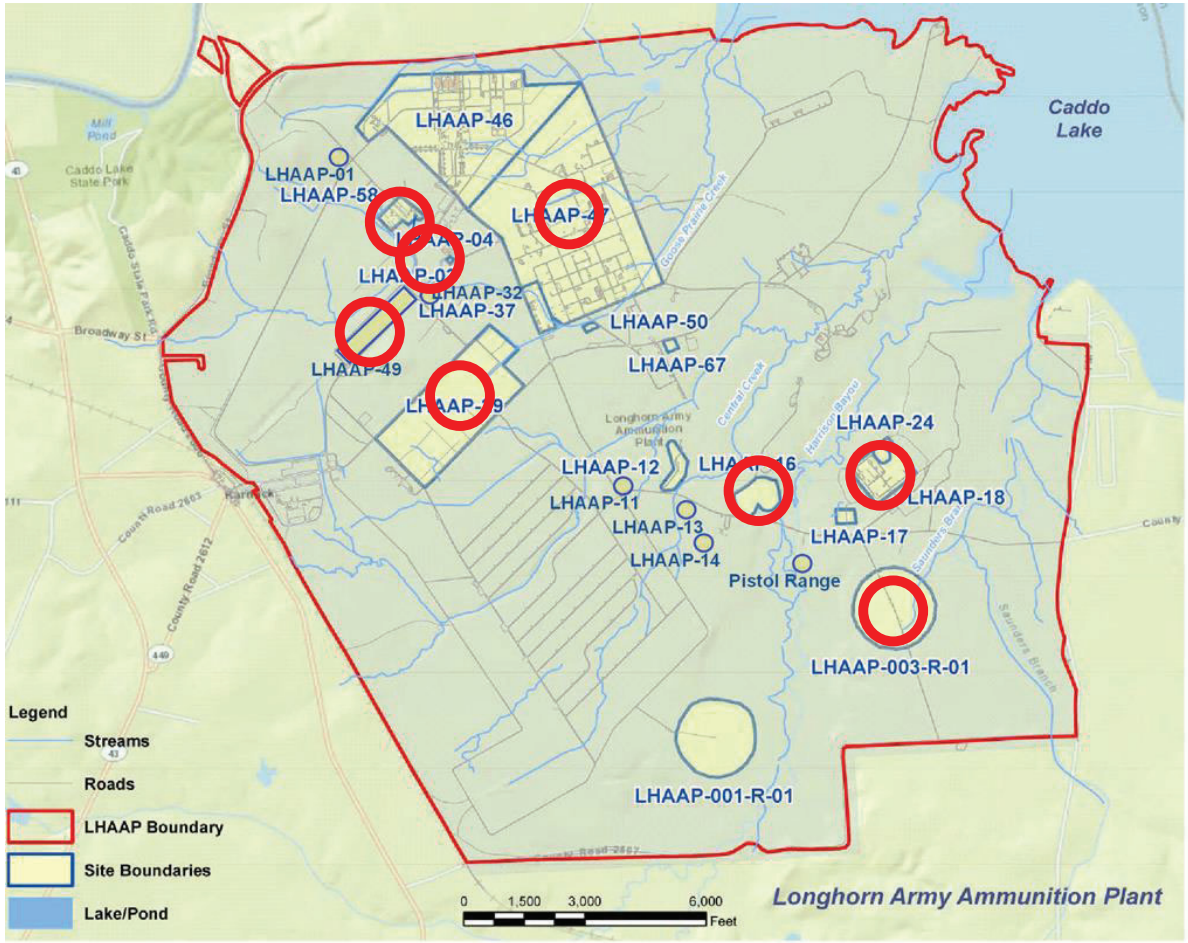
# Metals VS Non-Metal Contaminants

## Degree of Contamination

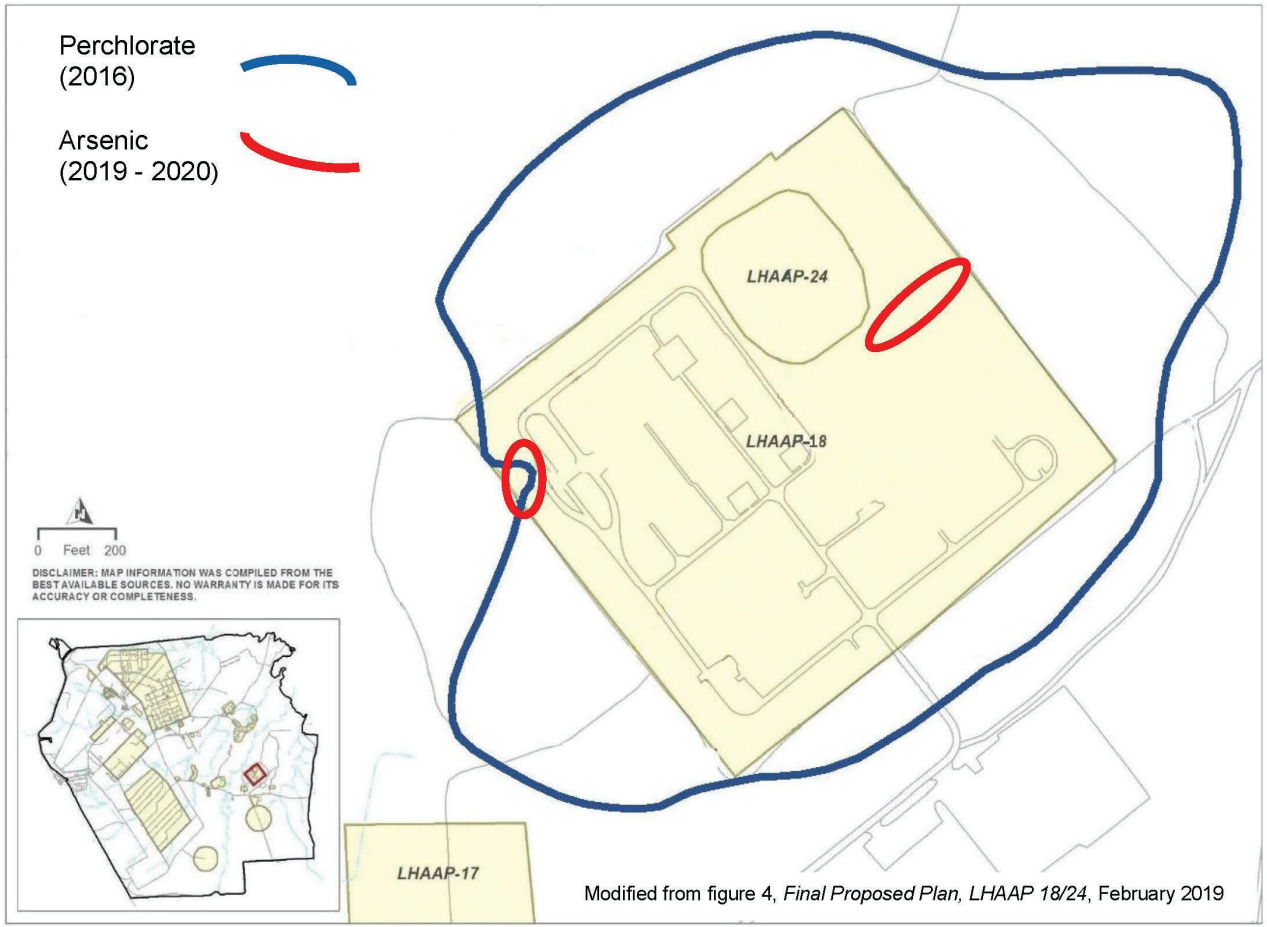
| | | |
|---|---|---|
| As (8 sites) | ~ 50 µg/L* | 5 X MCL (10 µg/L) |
| TCE (10 sites) | ~ 21,000 µg/L * | 4200 X MCL (5 µg/L) |
| Perchlorate (6 sites) | ~ 36,000 µg/L* | 2100 X MCL (17 µg/L) |

* Average of highest concentrations

# Sites With Arsenic Contamination



# LHAAP 18/24




Modified from figure 4, *Final Proposed Plan, LHAAP 18/24*, February 2019

# Cleanup of Metals at LHAAP

## Soils

- Site 3: excavated - arsenic and lead
- Site 4: excavated - mercury
- Pistol Range: excavated - lead

## Groundwater

- None - only as a side effect of other cleanups.
- No plans to cleanup

# Conclusions

- Army should re-do it's estimates of background concentrations or, use MCLs as cleanup levels.
- Army has reasonably focused on contamination by non-metals – TCE, perchlorate, etc.
- However, Army has paid too little attention to contamination by metals – which may persist after non-metals are cleaned up.
- 'Forgotten' sites should be resampled to determine if they are still contaminated.

**fin**

# QUARTERLY EVALUATION REPORT
# 1ST QUARTER (JANUARY – MARCH) 2022
# GROUNDWATER TREATMENT PLANT
# LONGHORN ARMY AMMUNITION PLANT
# KARNACK, TEXAS

**June 2022**

Prepared For:

**U.S. Army Corps of Engineers**
**Tulsa District**

**Contract No. W9128F-13-D-0012**
**Task Order No. W912BV17F0150**
**Bhate Project No. NWO1312.0150.016.0001.03**

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Appendix E Air Monitoring Analytical Laboratory Report
Appendix F Protocol for Discharging GWTP Effluent
Appendix G Air Data Tables, PID Readings, and Calibration Logs

# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AECOM | AECOM Technical Services, Inc. |
| AIX | Sample collected after the first IX vessel |
| AMCV(s) | Air Monitoring Comparison Value(s) |
| amsl | Above mean sea level |
| bgs | Below ground surface |
| Bhate | Bhate Environmental Associates, Inc. |
| BIX | Sample collected before the first IX vessel |
| BLOC | Bloc Design Build, LLC |
| COC(s) | Chemical(s) of concern |
| COD | Chemical oxygen demand |
| DCA | Dichloroethane |
| DCE | Dichloroethene |
| Envirogen | Envirogen Technologies |
| ESD | Explanation of Significant Difference |
| ESL(s) | Effects Screening Level(s) |
| FBR | Fluidized bed reactor |
| ft | Feet or foot |
| GAC | Granular activated carbon |
| gpd | Gallons per day |
| gph | Gallons per hour |
| gpm | Gallons per minute |
| GWTP | Groundwater Treatment Plant |
| HCl | Hydrochloric acid |
| HDPE | High density polyethylene |
| ICT(s) | Interception-collection trench(es) |
| IRA | Interim Remedial Action |
| IX | Ion exchange |
| J | Estimated concentration |
| lbs/hr | Pounds per hour |
| LHAAP | Longhorn Army Ammunition Plant |
| MCL(s) | Maximum Contaminant Level(s) |

| | |
|---|---|
| µg/L | Micrograms per liter |
| MC | Methylene chloride |
| $Mg(OH)_2$ | Magnesium hydroxide |
| mV | Millivolts |
| NA | Not applicable |
| NaOH | Sodium hydroxide |
| No. | Number |
| ORP | Oxidation-reduction potential |
| Palmetto | Palmetto Services |
| PCE | Tetrachloroethene |
| PCL(s) | Protective Concentration Level(s) |
| pH | Potential of Hydrogen |
| PID | Photoionization detector |
| PLC | Programmable Logic Controller |
| ppmv | Parts per million by volume |
| psi | Pounds per square inch |
| PVC | Polyvinyl chloride |
| ROD | Record of Decision |
| SWEPCO | Southwestern Electric Power Company |
| TAC | Texas Administrative Code |
| TCE | Trichloroethene |
| TCEQ | Texas Commission on Environmental Quality |
| tpy | Tons per year |
| USEPA | United States Environmental Protection Agency |
| VC | Vinyl chloride |
| VOC(s) | Volatile Organic Compound(s) |

# EXECUTIVE SUMMARY

The operation of the Groundwater Treatment Plant (GWTP) is part of the Interim Remedial Action (IRA) at Burning Ground Number (No.) 3, also referred to as Longhorn Army Ammunition Plant (LHAAP)-18/24. A historical pilot test for nearby landfill LHAAP-16 resulted in the installation of eight extraction wells which also contributed groundwater to the GWTP, but ceased after implementation of the final remedy in September 2019.

The groundwater remediation processing for Burning Ground No. 3 at LHAAP includes the following operable systems:

- Equalization tank (water storage) pretreatment system (metals removal);
- Air stripper system;
- Sludge treatment system (thickening, devolatilization, and belt filter press);
- Perchlorate treatment system (fluidized bed reactor [FBR] and ion exchange [IX] vessels);
- Various pumps, meters, piping, and valves tying the treatment systems together; and
- Programmable Logic Controller (PLC) that communicates the status of the operable systems, including the extraction wells, to a central computer that can then notify the operators of shut-downs and similar issues remotely.

Contaminated water from the extraction wells and interception-collection trenches (ICTs) is pumped into the GWTP and stored in the equalization storage tank. The contaminated water is then pumped to the pretreatment system for precipitation of metals. The sludge from the pretreatment system is delivered to the sludge treatment system to be thickened, air stripped of volatile organic compounds (VOCs), and filter pressed for burial in a landfill. The water from the pretreatment system is delivered to the air stripper system for air stripping of VOCs. Water from the air stripper is stored in the effluent storage tank for further treatment by the perchlorate system, which consists of a FBR and IX vessels.

To provide the integration necessary for proper process management, a stand-alone central PLC and operator console is used to control the operating systems of the GWTP. The belt filter press operates independently with a polymer pump and sludge feed pump interfaced with the central PLC.

The pretreatment system and air stripper system are equipped with instrument junction boxes and motor starter control panels. The control panels contain a transformer, run indication lights, motor starters, Hand or Automatic switches, and relays to interface with the central PLC. The control panels have monitors and/or logic to monitor the operating parameters and determine when abnormal conditions occur.

Interface relays will indicate to the central PLC that there is a problem within the systems. The central PLC will provide the logic for the proper action required for that specific set of circumstances.

Groundwater extraction, treatment, discharge, and monitoring activities consist of:

- Continuous extraction of groundwater from multiple ICTs and extraction wells at LHAAP-18/24;
- Treatment of extracted groundwater for heavy metals, chlorinated compounds, and perchlorate using precipitation, air stripping, and biological methods, respectively;
- Evaluation of the hydraulic effectiveness of the extraction system by groundwater monitoring;
- Monitoring and analysis of treated groundwater to ensure compliance with the discharge limits; and
- Discharge of treated water to Harrison Bayou or to a holding pond (INF Pond), or the treated water may be released as irrigation water on LHAAP-18/24.

The location of the extraction wells and ICTs are shown on **Figure A-1** in **Appendix A**. The process flow diagram of the GWTP is shown on **Figure A-2** in **Appendix A**.

**Figure ES-1** shows the monthly total volume of groundwater that was extracted from the ICT and extraction wells at LHAAP-18/24 between January 2014 and December 2021 and at LHAAP-16 between January 2014 and September 2019.

The GWTP was not operational from 24 May 2012 until 6 September 2012. This was related to meltdown of the scrubber system, associated with the catalytic oxidizer, due to system overheating. Overheating occurred when the blower became inoperable after the bearing on the scrubber blower unit was shattered and damaged the blower. This occurred around 1300 on 21 May 2012.

After developing an interim air monitoring plan and obtaining concurrence from the Texas Commission on Environmental Quality (TCEQ) and the United States Environmental Protection Agency (USEPA) to operate the GWTP without use of air abatement equipment, a pilot run of the GWTP was conducted on 6 September 2012. In that first pilot run, 85,170 gallons of water that had been stored in the influent equalization tank (TK-140) were treated. The treated water was re-circulated through the FBR to revive the FBR after 3 months of dormancy. Treated groundwater samples were collected and analyzed, respectively, for perchlorate, metals, and VOCs. Air samples were collected and analyzed for VOCs only.

On 19 September 2012, a second pilot run was performed at the GWTP and 107,264 gallons of water were treated. Based on the successful re-start of the GWTP, continuous groundwater extraction began again on 24 September 2012. While groundwater extraction occurs on a continuous basis, operation of the GWTP occurs intermittently due to the low volume of water available for treatment with respect to the design capacity of the GWTP. During the 3rd Quarter of 2012, groundwater extraction occurred only from LHAAP-18/24. Groundwater extraction from LHAAP-16 was not performed due to equipment failure. However, extraction from LHAAP-16 began in October 2012 and the extraction volumes increased steadily throughout the 4th Quarter of 2012, as pumping equipment was gradually repaired/replaced. The GWTP operated under normal conditions until September 2015.

On 14 September 2015, at 1115, the blower on the air stripper (BL-340) malfunctioned during routine operation. The wiring on the blower was repaired and the blower operated for less than 2 hours on 17 September 2015, when the blower malfunctioned again. It was determined that the blower needed to be replaced, and groundwater extraction and operation of the GWTP ceased beginning 18 September 2015, as the influent equalization tank (TK-140) became full. Beginning on 2 October 2015, it was determined that the GWTP could operate without the blower at a reduced extraction rate. The operation of the GWTP allowed extraction of groundwater from ICTs 12E, 13A, 13B, and 13C (13C was changed to ICT 13E on 12 October 2015), which were considered critical ICTs to prevent migration of contaminants to Harrison Bayou. Groundwater extraction was switched frequently between ICTs 12E, 13A, 13B, and 13E to ICTs 14B, 14C, and 14D beginning on 14 December 2015.

On 12 December 2016, flange bolts at TK-380 failed and allowed hydrochloric acid (HCl) to drain into the sump. The secondary containment area was washed down and the sump contents were transferred into the influent equalization tank (TK-140). Because of the acid release, extraction of groundwater from the ICTs was halted, and the GWTP was put into recycle mode (effluent sent back as influent) until the acid was neutralized and perchlorate, metals, and VOCs were below discharge criteria on 17 March 2017.

On 12 August 2017, severe storms caused a power outage at LHAAP-18/24. When electrical service was restored, the main transformer failed due to a manufacturing defect. A portable emergency generator was brought on-site on 21 August 2017, to allow the FBR to operate in full recycle mode. After a replacement transformer was installed on 12 September 2017, extraction began from ICTs-13B, -13C, -13D, -13E, -13F, -7, and extraction well EW-01 and the FBR was put into normal operation. Beginning on 21 September 2017, groundwater was extracted from all of the ICTs.

On 27 December 2018, severe storms caused a power outage in Karnack, Texas including LHAAP. When electrical service was restored, the main transformer failed due to a manufacturing defect. A portable emergency generator was brought on-site on 28 December 2018, to allow the FBR to operate in full recycle mode. After a temporary generator was connected to the well field on 11 February 2019, extraction began from LHAAP-18/24, and the GWTP was put into normal operation.

From 11 June to 17 June 2019, a double-walled pipe in the burning grounds (ICT-14C and ICT-14D) was found to be leaking at a joint and repaired. In addition, the line to well 18WW17 was cut off due to leaks identified following repair of the other section of pipe. The ground was too wet to dig and replace the other double-walled pipe at that time. From 28 October to 31 October 2019, a new double-walled pipe to well 18WW17 was installed.

Groundwater is no longer extracted from LHAAP-16 because injections were completed in September 2019 as part of the final remedial action. The only groundwater treated and discussed within this report is from LHAAP-18/24.

On 11 January 2020, a possible tornado and straight line winds came through the area and broke the power lines. The breaker was shut off at the transformer until power lines could be repaired on 14and 15 January 2020, by Ark-La-Tex Electric (Ark-La-Tex). On 18 January 2020, power was

lost to the GWTP and it was discovered that there was a blown fuse on the power lines. Ark-La-Tex was called to the site to replace the fuse and power was restored to the GWTP the same day.

On 29 March 2020, there was a power glitch that caused the air compressors to shut down. The air compressors and FBR were restarted on the same day. On 13 April 2020, two trees fell across a power line and caused a loss of power to the plant. Ark-La-Tex was on-site to remove the trees and power was restored on 14 April 2020 at 0945. On 2 May 2020, a tree fell across Southwestern Electric Power Company's (SWEPCO's) line inside the plant that feeds the GWTP. SWEPCO came out and removed the tree from the line. Power was restored the same day. On 29 December 2020, housing was built for the acetic acid pump associated with the FBR to prevent rainwater from causing it to shut down.

On 13 February 2021, inclement weather began and it stayed below freezing until 20 February 2021. The level transmitter on TK-650 froze, making the discharge pump inoperable. The level transmitter was thawed out and pumping was restarted. On 20 February, the air compressors were able to be started again and the FBR began recirculating but the oxidation-reduction potential (ORP) was greater than the normal operating requirements. From 21 February through 9 March 2021, repairs from the freeze were made on broken polyvinyl chloride (PVC) pipe, valves, fittings, and level transmitters. The ORP on the FBR remained elevated, and the FBR was in recycle until 25 March 2021 when the ORP returned to normal range and discharge to the Harrison Bayou was able to resume.

A power outage occurred on 12 May through 13 May 2021, due to downed power lines. On 14 May 2021, Ark-La-Tex Electric was on-site to replace the broken power pole and repair broken power lines. On 28 May 2021, a power outage occurred at 0430, due to a downed tree. SWEPCO restored power the following day on 29 May 2021. On 2 June 2021, elevated perchlorate effluent results, precipitated replacement on the acetic acid nutrient feed pump. Perchlorate effluent results dropped below discharge limits but not to expected concentrations. As a result, the FBR was placed in recycle from 18 June 2021 through the end of 2nd Quarter 2021.

In May 2021, an estimated 900,000 gallons of water was released from the INF Pond to the Harrison Bayou as a result of vandalism to the INF Pond. The exact timing of when the water was drained from the INF Pond is unknown, however, on 19 May 2021, the INF Pond valve was found opened which allowed a portion of the INF Pond to drain. The Harrison Bayou was at flood stage from 14 May through 19 May 2021 and had sufficient flow at the time to accept this volume of water. Furthermore, groundwater released to the INF Pond had been treated at the GWTP and was below the Protective Concentration Level (PCL) of 17 micrograms per liter (µg/L) for perchlorate and the discharge criteria required for release to Harrison Bayou. Therefore, there are no known adverse impacts to Harrison Bayou due to the unintentional release of water from the INF Pond. Additionally, surface water samples are collected from Harrison Bayou quarterly for perchlorate analysis to confirm there are no impacts to Harrison Bayou. Surface water samples analyzed for perchlorate in July 2021, were all well below the PCL with a maximum perchlorate detection of 0.369 µg/L.

On 15 July 2021, Bloc Design Build, LLC (BLOC) was on-site to wire in the new acid pump (P 390). On 29 July 2021, Envirogen Technologies (Envirogen) mobilized to the site to troubleshoot the

FBR. The plant was brought offline to diagnose why perchlorate effluent results remained elevated. Envirogen found the fluidization flow at 230 gallons per minute, and the inlet pressure to the FBR at 14 pounds per square inch (psi) as satisfactory. Envirogen determined that the inline potential of hydrogen (pH) probe was not calibrating properly and was providing an incorrect reading of 7.4. On 29 July 2021 the pH reading was 8.24 which is above the enhanced FBR operating parameters. Ideally, the pH should be between 7.1 and 7.4 in the reactor. A high pH can inhibit biological activity. Envirogen recommended the installation and calibration of a new pH probe. A new inline pH probe was ordered and replacement and calibration are planned for the 2nd Quarter of 2022. In the interim, a handheld pH meter is being used to verify pH conditions in the FBR, and the acid feed is manually being adjusted as necessary.

Additionally, Envirogen noted that the granular activated carbon (GAC) settled bed height was 6.33 feet and the expanded bed height was 9 feet. The design settled bed height for the GAC is 9 feet and the design expanded bed height is 15 feet, with the expanded bed height being a key performance indicator for the FBR. Therefore, Envirogen recommend the addition of two supersacks of GAC media. One supersack of GAC was delivered, pre-wetted, and loaded in the FBR on 29 July 2021. After the addition of one supersack of GAC, the settled bed height was measured at 9.1 feet and the expanded bed height was measured at 11.3 feet. Additional GAC has been ordered and will be added to the FBR when available. The GWTP was brought back online on 3 August 2021.

Palmetto Services (Palmetto) was on-site from 20 September through 24 September 2021 to replace the sand in the sand filter. The sand in the sand filter collects debris that is filtered out of the water as designed. However, over time the debris restricts the flow of water through the filter. Therefore, the GWTP was taken offline on 20 September 2021 to replace the sand. Palmetto removed the sand and screens, acid washed the screens, put the screens back in place, and then added new sand using a crane. Approximately 4.5 tons of 10 x 20 silica sand and 12 tons of 8 x 12 silica sand was placed into the sand filter. While the plant was down for the sand filter activities, the 10-inch PVC line between the clarifier effluent and the sludge tanks was replaced, and the polymer feed line was unclogged. However, before the GWTP could be operated again the HCl feed pump malfunctioned.

On 4 October 2021 the GWTP was unable to operate due to a malfunctioning pump motor on the HCl feed pump (P-390). On 5 October 2021 BLOC was on-site to diagnose the HCl pump motor (P-390) which was seized and inoperable. A new pump motor was ordered and on 14 October 2021, BLOC returned to wire in the new motor on the HCl pump (P-390).

Upon arrival at the GWTP on 5 October 2021, there was no power at the GWTP. A blown fuse was found on SWEPCO's transformer. SWEPCO replaced the fuse, however, only partial power was restored to GWTP on 5 October 2021. On 7 October 2021, Ark-La-Tex Electric was on-site to troubleshoot an electrical power issue and determined that the load break switch (commonly referred to as an arc strangler) was blown at the transformer at the GWTP and needed to be replaced. The load break switch malfunction had caused the fuse to fail, cutting power to the GWTP. The load break switch was replaced on 11 October 2021, and power was restored to the

GWTP. Once power was restored and the HCl pump was replaced as described above, the GWTP was brought back online on 18 October 2021.

On 29 December 2021, during routine INF Pond staff gauging, it was observed that there was vandalism to the locked access gate and an estimated 271,500 gallons of treated groundwater was released via the drain valve to the Harrison Bayou. It should be noted that on 27 December 2021, during routine staff gauging at the INF Pond the drain valve was closed, indicating that un-granted access and release of groundwater occurred sometime between the evening of 24 December 2021 and the morning of 27 December 2021.

On 19 January 2022, an additional unintentional release from the INF pond to the Harrison Bayou, was observed during a site walk as part of the in-person January 2022 Monthly Manager's Meeting. The exact date of the release was undetermined. Based on staff gauging logs, an estimated 161,500 gallons of treated groundwater was released via the drain valve to the Harrison Bayou. In response to the vandalism observed in December 2021 and January 2022, the access gate was repaired and locked by U.S. Fish and Wildlife personnel. Additional, security measures such as the use of video monitoring are being evaluated to prevent further vandalism. In March 2022, a severe storm blew down a tree damaging two power poles, but power was not lost at the time of the storm event. On 16 March 2022 and 17 March 2022, Arc-La-Tex arrived on-site to replace the power poles and to repair the power lines. As a result, power was shut off at the plant for approximately 24 hours from 16 March to 17 March 2022, to allow Arc-La-Tex to safely work with the power lines.

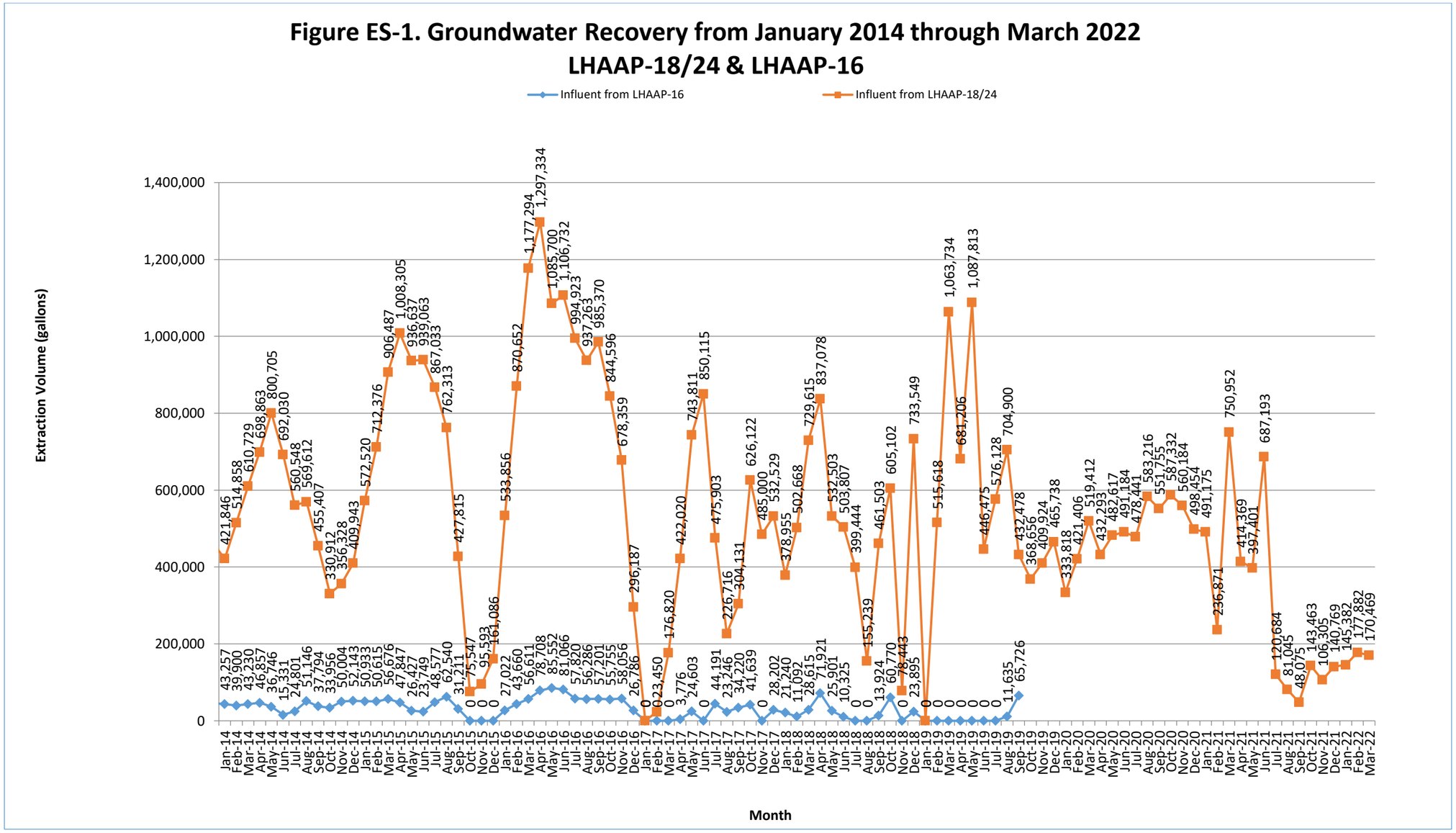
As shown on **Figure ES-1**, the total extracted groundwater volume from LHAAP-18/24 during the 1st Quarter of 2022 was 493,733 gallons. The extracted groundwater volume was measured on a monthly basis as the sum of the difference between the flow meter totalizer reading at each ICT between the beginning and end of each month. Extraction quantities in LHAAP-18/24 were 145,382 gallons in January 2022; 177,882 gallons in February 2022; and 170,469 gallons in March 2022. Additional extracted groundwater was transferred from adjacent site LHAAP-17. A total of 91,050 gallons of groundwater stored in frac tanks at LHAAP-17 was pumped to the GWTP sump.

The typical discharge flowrate from the GWTP was estimated as 144.8 gallons per minute (gpm) during the 1st Quarter of 2022. As shown in **Table ES-1**, approximately 297,445 gallons of groundwater was treated and discharged from the GWTP to the INF pond and approximately 190,898 gallons of groundwater was treated and discharged from the GWTP to the Harrison Bayou. No treated groundwater from the GWTP was returned to LHAAP-18/24 via the sprinkler system. **Table ES-1** also presents the INF Pond staff gauge readings by date, which is used to determine the freeboard available in the pond.

A quarterly GWTP influent sample was collected for perchlorate analysis on 15 February 2022 and had a concentration of 15,300 µg/L. Monthly GWTP influent samples were collected for perchlorate analysis on 5 January 2022, 2 February 2022, and 1 March 2022. The perchlorate levels were measured at 10,700 µg/L on 5 January 2022, 18,900 µg/L on 2 February 2022, and 16,800 µg/L on 1 March 2022. Considering the quarterly and monthly influent perchlorate results,

the average perchlorate concentration in the GWTP influent during the quarter was 15,425 µg/L. Grab perchlorate samples from the GWTP effluent were collected weekly after the first IX vessel to confirm perchlorate treatment prior to discharge to the INF Pond or the Harrison Bayou. None of the perchlorate concentrations in any effluent samples discharged to the INF Pond or the Harrison Bayou exceeded the PCL (17 µg/L) during the 1st Quarter 2022.

The water quantities treated each month since June 2012 and discharged into the Harrison Bayou are shown on **Figure ES-2**.




Note: Starting in September 2019, no groundwater was extracted subsequent to the final remedy of injections being implemented at LHAAP-16.

**Figure ES-2. Treated Groundwater Discharged Monthly from June 2012 through March 2022**

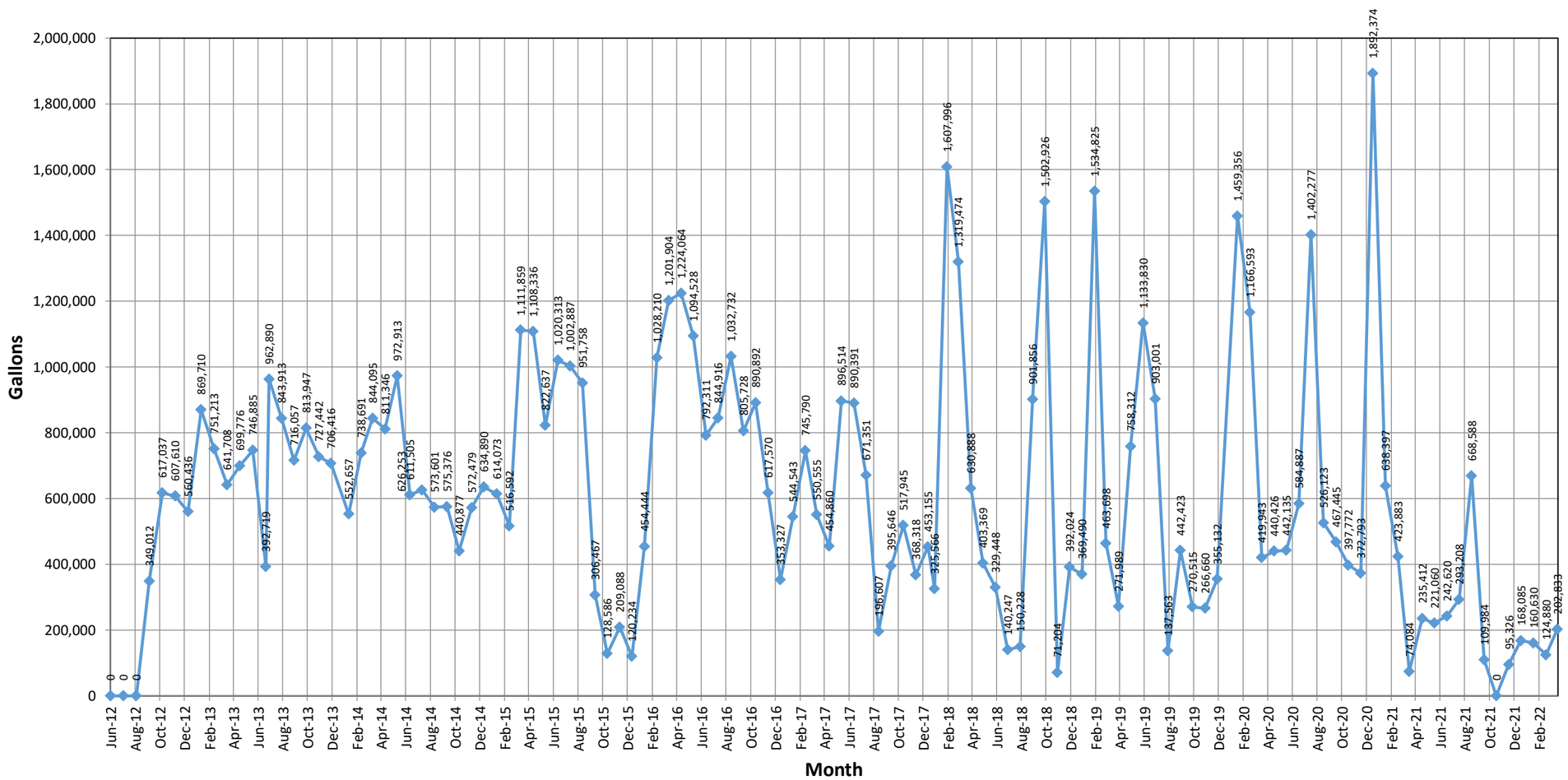


**Table ES-1. Discharge Information to Harrison Bayou during 1st Quarter 2022**

| DATE | Harrison Bayou Flow (gpm) | Maximum Rate Allowed (gpm) | Released From GWTP To Harrison Bayou | Released From INF Pond to Harrison Bayou | Released From GWTP to INF Pond | Combined Total Released to Harrison Bayou | INF Pond Staff Reading (6.20 = 3 ft. Freeboard) |
|---|---|---|---|---|---|---|---|
| 01/01/2022 | NA | NA | 0 | 0 | 0 | 0 | 1.42 |
| 01/02/2022 | NA | NA | 0 | 0 | 0 | 0 | 1.44 |
| 01/03/2022 | NA | NA | 0 | 0 | 0 | 0 | 1.46 |
| 01/04/2022 | NA | NA | 0 | 0 | 32,218 | 0 | 1.48 |
| 01/05/2022 | NA | NA | 0 | 0 | 0 | 0 | 1.46 |
| 01/06/2022 | NA | NA | 0 | 0 | 0 | 0 | 1.46 |
| 01/07/2022 | NA | NA | 0 | 0 | 0 | 0 | 1.44 |
| 01/08/2022 | NA | NA | 0 | 0 | 0 | 0 | 1.46 |
| 01/09/2022 | NA | NA | 0 | 0 | 0 | 0 | 1.48 |
| 01/10/2022 | NA | NA | 0 | 0 | 29,992 | 0 | 1.50 |
| 01/11/2022 | NA | NA | 0 | 0 | 1,163 | 0 | 1.51 |
| 01/12/2022 | NA | NA | 0 | 0 | 11,670 | 0 | 1.52 |
| 01/13/2022 | NA | NA | 0 | 0 | 10,082 | 0 | 1.53 |
| 01/14/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.00 |
| 01/15/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.00 |
| 01/16/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.00 |
| 01/17/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.00 |
| 01/18/2022 | NA | NA | 0 | 0 | 33,788 | 0 | 0.00 |
| 01/19/2022[1] | NA | NA | 0 | 161,500 | 10,663 | 0 | 0.00 |
| 01/20/2022 | NA | NA | 0 | 0 | 6,193 | 0 | 0.12 |
| 01/21/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.12 |
| 01/22/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.11 |
| 01/23/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.11 |
| 01/24/2022 | NA | NA | 0 | 0 | 24,861 | 0 | 0.25 |
| 01/25/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.33 |
| 01/26/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.33 |
| 01/27/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.33 |

| DATE | Harrison Bayou Flow (gpm) | Maximum Rate Allowed (gpm) | Released From GWTP To Harrison Bayou | Released From INF Pond to Harrison Bayou | Released From GWTP to INF Pond | Combined Total Released to Harrison Bayou | INF Pond Staff Reading (6.20 = 3 ft. Freeboard) |
|---|---|---|---|---|---|---|---|
| 01/28/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.32 |
| 01/29/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.32 |
| 01/30/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.32 |
| 01/31/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.31 |
| 02/01/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.31 |
| 02/02/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.31 |
| 02/03/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.32 |
| 02/04/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.32 |
| 02/05/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.32 |
| 02/06/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.31 |
| 02/07/2022 | NA | NA | 0 | 0 | 19,641 | 0 | 0.79 |
| 02/08/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.79 |
| 02/09/2022 | NA | NA | 0 | 0 | 2,815 | 0 | 0.95 |
| 02/10/2022 | NA | NA | 0 | 0 | 1,035 | 0 | 1.24 |
| 02/11/2022 | NA | NA | 0 | 0 | 0 | 0 | 1.49 |
| 02/12/2022 | NA | NA | 0 | 0 | 0 | 0 | 1.49 |
| 02/13/2022 | NA | NA | 0 | 0 | 0 | 0 | 1.49 |
| 02/14/2022 | NA | NA | 0 | 0 | 17,549 | 0 | 1.68 |
| 02/15/2022 | NA | NA | 0 | 0 | 6,397 | 0 | 1.77 |
| 02/16/2022 | NA | NA | 0 | 0 | 4,619 | 0 | 1.95 |
| 02/17/2022 | NA | NA | 0 | 0 | 2,557 | 0 | 2.02 |
| 02/18/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.02 |
| 02/19/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.02 |
| 02/20/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.02 |
| 02/21/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.01 |
| 02/22/2022 | NA | NA | 0 | 0 | 21,270 | 0 | 2.05 |
| 02/23/2022 | NA | NA | 0 | 0 | 11,716 | 0 | 2.08 |
| 02/24/2022 | NA | NA | 0 | 0 | 7,439 | 0 | 2.10 |

| DATE | Harrison Bayou Flow (gpm) | Maximum Rate Allowed (gpm) | Released From GWTP To Harrison Bayou | Released From INF Pond to Harrison Bayou | Released From GWTP to INF Pond | Combined Total Released to Harrison Bayou | INF Pond Staff Reading (6.20 = 3 ft. Freeboard) |
|---|---|---|---|---|---|---|---|
| 02/25/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.10 |
| 02/26/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.10 |
| 02/27/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.09 |
| 02/28/2022 | NA | NA | 0 | 0 | 29,842 | 0 | 2.15 |
| 03/01/2022 | NA | NA | 0 | 0 | 5,055 | 0 | 2.15 |
| 03/02/2022 | NA | NA | 8,343 | 0 | 6,880 | 8,343 | 2.16 |
| 03/03/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.16 |
| 03/04/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.15 |
| 03/05/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.15 |
| 03/06/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.14 |
| 03/07/2022 | NA | NA | 27,624 | 0 | 0 | 27,624 | 2.14 |
| 03/08/2022 | NA | NA | 6,765 | 0 | 0 | 6,765 | 2.21 |
| 03/09/2022 | NA | NA | 7,552 | 0 | 0 | 7,552 | 2.21 |
| 03/10/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.21 |
| 03/11/2022 | NA | NA | 6,591 | 0 | 0 | 6,591 | 2.21 |
| 03/12/2022 | NA | NA | 35,282 | 0 | 0 | 35,282 | 2.20 |
| 03/13/2022 | NA | NA | 7,002 | 0 | 0 | 7,002 | 2.29 |
| 03/14/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.29 |
| 03/15/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.29 |
| 03/16/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.28 |
| 03/17/2022 | NA | NA | 7,593 | 0 | 0 | 7,593 | 2.28 |
| 03/18/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.27 |
| 03/19/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.35 |
| 03/20/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.35 |
| 03/21/2022 | NA | NA | 28,412 | 0 | 0 | 28,412 | 2.34 |
| 03/22/2022 | NA | NA | 5,594 | 0 | 0 | 5,594 | 3.43 |
| 03/23/2022 | NA | NA | 4,759 | 0 | 0 | 4,759 | 3.43 |
| 03/24/2022 | NA | NA | 2,531 | 0 | 0 | 2,531 | 3.42 |

| DATE | Harrison Bayou Flow (gpm) | Maximum Rate Allowed (gpm) | Released From GWTP To Harrison Bayou | Released From INF Pond to Harrison Bayou | Released From GWTP to INF Pond | Combined Total Released to Harrison Bayou | INF Pond Staff Reading (6.20 = 3 ft. Freeboard) |
|---|---|---|---|---|---|---|---|
| 03/25/2022 | NA | NA | 0 | 0 | 0 | 0 | 3.42 |
| 03/26/2022 | NA | NA | 0 | 0 | 0 | 0 | 3.41 |
| 03/27/2022 | NA | NA | 0 | 0 | 0 | 0 | 3.41 |
| 03/28/2022 | NA | NA | 25,136 | 0 | 0 | 25,136 | 3.40 |
| 03/29/2022 | NA | NA | 5,897 | 0 | 0 | 5,897 | 3.40 |
| 03/30/2022 | NA | NA | 6,974 | 0 | 0 | 6,974 | 3.40 |
| 03/31/2022 | NA | NA | 4,843 | 0 | 0 | 4,843 | 3.39 |
| **TOTALS** | | | 190,898 | 161,500 | 297,445 | 352,398 | |

Notes: The maximum discharge rate from the INF Pond is 170 gallons per minute (gpm) and the maximum discharge rate from the GWTP is 30 gpm.
NA = Not applicable
Treated groundwater volume released over the weekend is included in the total for the next working day. These volumes are marked with an asterisk (*).
[1] Unintentional release of water from INF pond to Harrison Bayou due to unauthorized access and vandalism. The exact date of the release is undetermined. Discovered 19 January 2022

# 1 EVALUATION OF GROUNDWATER TREATMENT PLANT

The Groundwater Treatment Plant (GWTP) was constructed as part of the Interim Remedial Action (IRA) at Burning Ground Number (No.) 3, also referred to as Longhorn Army Ammunition Plant (LHAAP)-18/24, to treat groundwater extracted from interception-collection trenches (ICTs) and extraction wells. **Figure A-1** located in **Appendix A** presents the layout of the ICTs and extraction wells at LHAAP-18/24. The groundwater contamination at LHAAP-18/24 likely resulted from infiltration from an Unlined Evaporation Pond (UEP) that was used to store manufacturing wastewater, and from burning trenches and other industrial processes used to flash pyrotechnic, propellant, and explosive waste streams. The groundwater at LHAAP-18/24 is contaminated mainly with chlorinated ethenes and perchlorate, and with lesser concentrations of 1,4-dioxane.

The GWTP no longer receives flow from LHAAP-16 due to injections completed as a part of the final remedy implementation, which commenced in September 2019. The GWTP had previously received flow from eight extraction wells installed at LHAAP-16 as part of a historic treatability study. The extraction wells were installed in 1996 and 1997.

## 1.1 Treatment Configuration

The process flow diagram for the GWTP is presented in Appendix A, Figure A-2. Groundwater extraction, treatment, discharge, and monitoring activities consist of the following:

- Continuous extraction of groundwater from multiple ICTs and extraction wells located at LHAAP-18/24;
- Treatment of extracted groundwater for heavy metals, chlorinated compounds, and perchlorate using precipitation, air stripping, and biological methods, respectively;
- Evaluation of the hydraulic effectiveness of the extraction system by groundwater monitoring;
- Monitoring and analysis of treated groundwater to ensure compliance with the discharge limits; and discharge of treated water to Harrison Bayou or to a holding pond (INF Pond) or the treated water may be released as irrigation water on LHAAP-18/24.

Contaminated water from the extraction wells and ICTs is pumped into the GWTP and stored in the equalization storage tank. The contaminated water is then pumped to the pretreatment system for precipitation of metals. The sludge from the pretreatment system is delivered to the sludge treatment system to be thickened, air stripped of Volatile Organic Compounds (VOCs), and filter pressed for burial in a landfill. The water from the pretreatment system is delivered to the air stripper system for air stripping of VOCs. Water from the air stripper is stored in the effluent storage tank for further treatment by the perchlorate system, which consists of a Fluidized Bed Reactor (FBR) and ion exchange (IX) vessels. The process flow diagram for the GWTP is presented in **Appendix A, Figure A-2**.

To provide the integration necessary for proper process management, a stand-alone central Programmable Logic Controller (PLC) and operator console is used to control all of the operating

systems of the GWTP. The belt filter press operates independently with a polymer pump and sludge feed pump interfaced with the central PLC.

The pretreatment system and air stripper system are equipped with instrument junction boxes and motor starter control panels. The control panels contain a transformer, run indication lights, motor starters, Hand or Automatic switches, and relays to interface with the central PLC. The control panels have monitors and/or logic to monitor the operating parameters and determine when abnormal conditions occur.

Interface relays will indicate to the central PLC that there is a problem within the systems. The central PLC will provide the logic for the proper action required for that specific set of circumstances.

The GWTP was not operational between 24 May 2012 and 6 September 2012, due to malfunction of the scrubber unit associated with the catalytic oxidizer. Since 6 September 2012, the GWTP has operated without air abatement equipment. Although major repairs were conducted on the GWTP (e.g., replacement of level alarms, repair of the hydrochloric acid [HCl] tank, replacement of TK-650, replacement of malfunctioning valves and flow meters, replacement of metering pumps, repair or replacement of various system pumps, rust removal and repainting of various tanks, and replacement and repair of various extraction pumps, motors, and level switches), the GWTP treatment configuration has remained relatively unchanged. The only exception to this is that IX vessels were installed in November 2018 following the FBR to further remove perchlorate prior to discharging to the INF pond.

### 1.1.1 Historical GWTP Operation

Malfunction of the blower on the air stripper (BL-340), on 14 September 2015 and 17 September 2015, disrupted continuous extraction and routine operations of the GWTP, which lasted through 7 January 2016. Prior to this occurrence, the GWTP performed as designed and the GWTP was operated on an as needed basis (i.e., semi-continuous operational basis). During the 4th Quarter of 2015, groundwater was extracted from a limited number of ICTs (ICTs 12E, 13A, 13B, 13C, and/or 13E, or ICTs 14B, 14C, and 14D). Operation of the GWTP occurred on a batch basis through the FBR. After replacement of the blower, attempts were made to restore continuous operations to the FBR, but they remained predominantly on a batch basis throughout January 2016.

In December 2016, an HCl spill caused plant operations to shut down until the issue could be properly addressed. The FBR performance was challenged by the increased chlorides in the neutralized wastewater, but performance gradually returned to normal in the 1st Quarter of 2017. Groundwater extraction was gradually increased to full rates during the 2nd Quarter of 2017.

On 12 August 2017, severe storms caused a power outage at LHAAP-18/24. When electrical service was restored, the main transformer failed due to a manufacturing defect. A portable emergency generator was brought on-site on 21 August 2017, to allow the FBR to operate in full recycle mode. After a replacement transformer was installed on 12 September 2017, extraction

began from ICTs-13B, 13C, 13D, 13E, 13F, 7, and EW01 and the FBR was put into normal operation. Beginning on 21 September 2017, groundwater was extracted from all of the ICTs.

On 27 December 2018, severe storms caused a power outage in Karnack, Texas. When electrical service was restored, the main transformer was determined to have failed. A portable emergency generator was brought on-site on 28 December 2018, to allow the FBR to operate in full recycle mode. On 5 February 2019, the smaller generator mobilized in December 2018 was replaced with a larger generator capable of powering the LHAAP-18/24 well field and the entire GWTP.

On 8 February 2019, the transformer at the GWTP was tested to ensure that it could handle back feeding necessary to power the LHAAP-18/24 well field due to the necessary step-down in power from the generator. Following additional system modifications based upon the testing, the well field at LHAAP-18/24 had power restored on 11 February 2019, using the generator and transformer at the GWTP. From 28 October through 31 October 2019, Palmetto Services (Palmetto) was on-site to install new double walled pipe to 18WW17. The previous pipe had a leak and so the line had been stubbed off on 17 June 2019.

On 11 January 2020, a possible tornado and straight line winds came through the area and broke the power lines. The breaker was shut off at the transformer until power lines could be repaired on 14 and 15 January 2020, by Ark-La-Tex Electric (Ark-La-Tex). On 18 January 2020, power was lost to the GWTP and it was discovered that there was a blown fuse on the power lines. Ark-La-Tex was called to the site to replace the fuse and power was restored to the GWTP the same day. On 29 March 2020, there was a power glitch that caused the air compressors to shut down. The air compressors and FBR were restarted on the same day. On 13 April 2020, two trees fell across a power line and caused a loss of power to the plant. Ark-La-Tex removed the trees and restored power at 0945 on 14 April 2020. On 2 May 2020, a tree fell across Southwestern Electric Power Company's (SWEPCO's) line inside the plant that feeds the GWTP. SWEPCO came out and removed the tree from the line. Power was restored the same day. On 29 December 2020, housing was built for the acetic acid pump associated with the FBR to prevent rainwater from causing it to shut down.

On 13 February 2021, inclement weather began and it stayed below freezing until 20 February 2021. The level transmitter on TK-650 froze, making the discharge pump inoperable. The level transmitter was thawed out and pumping was restarted. On 20 February, the air compressors were able to be started again and the FBR began recirculating but the oxidation-reduction potential (ORP) was greater than the normal operating requirements. From 21 February through 9 March 2021, repairs from the freeze were made on broken polyvinyl chloride (PVC) pipes, valves, fittings, and level transmitters. The ORP on the FBR remained elevated and the FBR was in recycle mode until 25 March 2021 when the ORP returned to normal range and discharge to the Harrison Bayou was able to resume.

A power outage occurred on 12May through 13 May 2021, due to downed power lines. On 14 May 2021, Ark-La-Tex Electric was on-site to replace the broken power pole and repair broken power lines. On 28 May 2021, a power outage occurred at 0430, due to a downed tree. SWEPCO

restored power the following day on 29 May 2021. On 2 June 2021, elevated perchlorate effluent results, precipitated replacement on the acetic acid nutrient feed pump. Perchlorate effluent results dropped below discharge limits but not to expected concentrations. As a result, the FBR was placed in recycle mode from 18 June 2021 through the end of the 2nd Quarter 2021.

On 29 July 2021, Envirogen Technologies (Envirogen) mobilized to the site to troubleshoot the FBR. The plant was brought offline to diagnose why perchlorate effluent results remained elevated. Envirogen found the fluidization flow at 230 gallons per minute (gpm), and the inlet pressure to the FBR at 14 pounds per square inch (psi) as satisfactory. Envirogen determined that the inline potential of hydrogen (pH) probe was not calibrating properly and it was giving an incorrect reading of 7.4. At this time the pH reading was 8.24 which is above the enhanced FBR operating parameters. Ideally, the pH should be between 7.1 and 7.4 in the FBR. A high pH can inhibit biological activity. Envirogen recommended the installation and calibration of a new pH probe. A new inline pH probe was ordered, and replacement and calibration are planned for the 2nd Quarter of 2022. In the interim, a handheld pH meter is being used to verify pH conditions in the FBR, and the acid feed is manually being adjusted as necessary.

Additionally, Envirogen noted that the granulated activated carbon (GAC) settled bed height was 6.33 feet and the expanded bed height was 9 feet. The design settled bed height for the GAC is 9 feet and the design expanded bed height is 15 feet, with the expanded bed height being a key performance indicator for the FBR. Therefore, Envirogen recommended the addition of two supersacks of GAC media. One supersack of GAC was delivered, pre-wetted, and loaded in the FBR on 29 July 2021. After the addition of one supersack of GAC, the settled bed height was measured at 9.1 feet and the expanded bed height was measured at 11.3 feet. Additional GAC has been ordered and will be added to the FBR when available. The GWTP was brought back online on 3 August 2021.

Palmetto was on-site from 20 September through 24 September 2021 to replace sand in the sand filter. The sand in the sand filter collects debris that is filtered out of the water as designed. However, over time the debris restricts the flow of water through the filter. Therefore, the GWTP was taken offline on 20 September 2021 to replace the sand. Palmetto removed the sand and screens, acid washed the screens, put the screens back in place, and then added new sand using a crane. Approximately 4.5 tons of 10 x 20 silica sand and 12 tons of 8 x 12 silica sand was placed into the sand filter. While the plant was down for the sand filter activities, the 10-inch PVC line between the clarifier effluent and the sludge tanks was replaced, and the polymer feed line was unclogged. However, before the GWTP could be operated again, the HCl feed pump malfunctioned as discussed below in Section 1.1.2.

On 4 October 2021 the GWTP was unable to operate due to a malfunctioning pump motor on the HCl feed pump (P-390). On 5 October 2021 Bloc Design Build, LLC (BLOC) was on-site to diagnose the problem with the HCl pump motor (P-390) which was seized and inoperable. A new pump motor was ordered and on 14 October 2021 BLOC returned and wired in the new motor on the HCl pump (P-390).

Upon arrival at the GWTP on 5 October 2021, there was no power at the GWTP. A blown fuse was found on SWEPCO's transformer. SWEPCO replaced the fuse, however, only partial power was restored to the GWTP on 5 October 2021. On 7 October 2021, Ark-La-Tex Electric was on-site to troubleshoot the electrical power issue and determined that the load break switch (commonly referred to as an arc strangler) was blown at the transformer at the GWTP and needed to be replaced. The load break switch malfunction had caused the fuse to fail, cutting power to the GWTP. On 11 October 2021, Ark-La-Tex Electric was on-site to repair the load break switch and restore power to the GWTP. Following the restoration of power, and replacement of the HCl pump, the GWTP operation resumed on 18 October 2021.

### 1.1.2 1st Quarter 2022 GWTP Operation

In March 2022, a severe storm blew down a tree damaging two power poles, but power was not lost at the time of the storm event. On 16 March 2022 and 17 March 2022, Arc-La-Tex arrived on-site to replace the power poles and to repair the power lines. As a result, power was shut off at the plant for approximately 24 hours from 16 March to 17 March 2022, to allow Arc-La-Tex to safely work with the power lines.

In addition, the multiple repairs were completed on the ICT well field during the 1st Quarter 2022. ICT repairs are summarized in **Table A-1** in **Appendix A.**

In the 1st Quarter 2022, flow rates for the treatment processes for metals and VOCs ranged between 139 and 153 gpm with an average of approximately 144.8 gpm for the operating hours (i.e., this flow rate does not represent continuous flows). The GWTP operated for 158 hours during the quarter. The treatment configuration of the plant at these rates (with minor variations) is shown in the following tables.

**GWTP Metals Precipitation Operating Parameters**

| Pretreatment Settings | Tank 200-A $Mg(OH)_2$ Mixing | Tank 200-B NaOH Mixing | Tank 200-C Polymer Mixing | Tank 300 feed line to Air Stripper |
|---|---|---|---|---|
| pH Adjustment | 9.0 | 10.5 | NA | 5.0 to meet ≤ 8.0 release from stripper |
| Feed Pump Settings | Speed 100%<br>Stroke 100%<br>10 gph $Mg(OH)_2$ | Speed 100%<br>Stroke 100%<br>9.0 gph NaOH | Speed 90%<br>Stroke 100%<br>40 gph water | Speed 80%<br>Stroke 80%<br>10 gph HCl |
| Notes: gph - gallons per hour, NaOH - sodium hydroxide, $Mg(OH)_2$ - magnesium hydroxide, NA - not applicable, % - percent, ≤ - less than or equal to. | | | | |

**GWTP Air Compressors Operating Parameters**

| Air Compressors | K-700A | K-700B | K-701 |
|---|---|---|---|
| Air Pressure Settings | 88 psi | 88 psi | 105 psi |

**GWTP Stripper Operating Parameters**

| | |
|---|---|
| pH Setting | 7.4 |
| Inlet Pressure Gauge | Not operational |
| Stripper Pressure Gauge | Not operational |
| Air Flow Rate | Not operational |

**GWTP Fluidized Bed Reactor Operating Parameters**

| | |
|---|---|
| Carbon Bed Height | 12 feet and 8 to 11 inches |
| Recycle Flow Rate | 200 gpm |
| pH | 7.1 to 7.4 |
| Recycle ORP | <-430 mV |
| Note: mV – millivolts | |

## 1.2 Work Performed at the GWTP

Groundwater extraction, treatment, discharge, and monitoring activities consist of:

- Continuous extraction of groundwater from multiple ICTs and extraction wells at LHAAP-18/24;
- Treatment of extracted groundwater for heavy metals, chlorinated compounds, and perchlorate using precipitation, air stripping, and biological methods, respectively;
- Evaluation of the hydraulic effectiveness of the extraction system by groundwater monitoring;
- Monitoring and analysis of treated groundwater to ensure compliance with the discharge limits; and
- Discharge of treated water to Harrison Bayou or to a holding pond (INF Pond).

Work performed at the GWTP during the 1st Quarter of 2022 is described in the following subsections.

### 1.2.1 Major Maintenance

The major maintenance items that were completed at the GWTP during this quarterly reporting period are:

- On 16 March 2022 and 17 March 2022, replacement of two power poles damaged by a tree during a severe storm and reconnection of wires by subcontractor Ark-La-Tex Electric causing a 24-hr power outage at the plant while they worked.

### 1.2.2 Routine Maintenance

The following routine maintenance items were completed at the GWTP during 1st Quarter 2022:

- Performed housekeeping in GWTP office, Army trailer, around GWTP and containment area, and in GWTP Shop
- Removed and cleaned basket from 4-inch (”) strainer on discharge of FBR
- Repaired broken 1” PVC pipe and 1” PVC valve on HCL feed line to air stripper
- Repaired holes in manway on side of TK-200C
- Repaired broken 3” PVC pipe from sump to TK-140
- Replaced flow monitor on P-104
- Repaired all broken 4” and 1 ½” PVC pipes and fittings on the backwash line to the sand filter
- Backwashed sand filter
- Replaced batteries in weather station
- Collected quarterly air samples at GWTP
- Replaced electric hoist on tractor boom
- Collected quarterly surface water samples
- Removed debris and organized area behind sump
- Replaced air regulator on FV-172

#### 1.2.2.1 Lubrication

No lubrication maintenance was conducted during 1st Quarter 2022.

#### 1.2.2.2 Air Compressors

No air compressor maintenance was conducted during 1st Quarter 2022.

#### 1.2.2.3 Belt Press and Waste Disposal

No belt press or waste disposal was conducted during 1st Quarter 2022.

#### 1.2.2.4 Sand Filter

No maintenance or repairs were conducted on the sand filter (FL-290) during 1st Quarter 2022.

#### 1.2.2.5 Well Field at LHAAP-18/24

The following activities were conducted at the well field at LHAAP-18/24 during the reporting period:

- Measured monthly water levels
- Replaced flow meter on ICT 2, ICT 7, ICT 12B, 12C, 13A, and ICT 13C
- Replaced broken flow meter nipples on ICT 11 and ICT 14E
- Replaced pump and motor in ICT 8 and ICT 14D
- Replaced motor in ICT 14C
- Replaced pump, motor, and wiring harness in ICT 12D

#### 1.2.2.6 Miscellaneous Activities

No miscellaneous activities were performed during the reporting period.

### 1.2.3 Routine Maintenance (Potable Water Wells)

The following activity was conducted during the reporting period:

- Flushed potable water lines

## 1.3 Filter Cake Operations and Management

No filter cake operations took place during 1st Quarter 2022.

## 1.4 Fluidized Bed Reactor Operations

The operating parameters for the GWTP FBR are presented in **Table 1**. Measurements indicating pH or ORP values that fell outside of the optimal range are highlighted gray.

**Table 1. Enhanced Fluidized Bed Reactor Operating Parameters – 1st Quarter 2022**

| Date | pH (7.1-7.4) | ORP (< -430 mV) | Temperature (Degrees Fahrenheit) |
|---|---|---|---|
| 1/1/2022 | 7.7 | -505 | 62 |
| 1/2/2022 | 7.7 | -512 | 60 |
| 1/3/2022 | 7.7 | -517 | 58 |
| 1/4/2022 | 7.7 | -527 | 59 |
| 1/5/2022 | 7.7 | -457 | 58 |
| 1/6/2022 | 7.7 | -466 | 58 |
| 1/7/2022 | 7.7 | -496 | 58 |
| 1/8/2022 | 7.7 | -501 | 57 |
| 1/9/2022 | 7.7 | -526 | 57 |
| 1/10/2022 | 7.7 | -473 | 56 |
| 1/11/2022 | 7.7 | -516 | 55 |
| 1/12/2022 | 7.7 | -518 | 56 |
| 1/13/2022 | 7.7 | -480 | 55 |
| 1/14/2022 | 7.7 | -496 | 55 |
| 1/15/2022 | 7.7 | -495 | 54 |
| 1/16/2022 | 7.7 | -501 | 52 |
| 1/17/2022 | 7.7 | -519 | 56 |
| 1/18/2022 | 7.7 | -466 | 54 |
| 1/19/2022 | 7.7 | -475 | 56 |
| 1/20/2022 | 7.7 | -462 | 52 |
| 1/21/2022 | 7.7 | -490 | 51 |
| 1/22/2022 | 7.7 | -500 | 51 |
| 1/23/2022 | 7.7 | -504 | 50 |

| Date | pH (7.1-7.4) | ORP (< -430 mV) | Temperature (Degrees Fahrenheit) |
|---|---|---|---|
| 1/24/2022 | 7.7 | -475 | 50 |
| 1/25/2022 | 7.7 | -513 | 52 |
| 1/26/2022 | 7.7 | -523 | 51 |
| 1/27/2022 | 7.7 | -522 | 50 |
| 1/28/2022 | 7.7 | -524 | 51 |
| 1/29/2022 | 7.7 | -525 | 51 |
| 1/30/2022 | 7.7 | -525 | 51 |
| 1/31/2022 | 7.7 | -526 | 52 |
| 2/1/2022 | 7.7 | -486 | 56 |
| 2/2/2022 | 7.7 | -529 | 56 |
| 2/3/2022 | 7.6 | -483 | 53 |
| 2/4/2022 | 7.6 | -504 | 51 |
| 2/5/2022 | 7.6 | -513 | 50 |
| 2/6/2022 | 7.6 | -520 | 49 |
| 2/7/2022 | 7.6 | -528 | 50 |
| 2/8/2022 | 7.6 | -509 | 52 |
| 2/9/2022 | 7.6 | -475 | 52 |
| 2/10/2022 | 7.6 | -512 | 53 |
| 2/11/2022 | 7.6 | -515 | 53 |
| 2/12/2022 | 7.6 | -518 | 53 |
| 2/13/2022 | 7.6 | -521 | 52 |
| 2/14/2022 | 7.6 | -459 | 53 |
| 2/15/2022 | 7.6 | -476 | 54 |
| 2/16/2022 | 7.6 | -459 | 57 |
| 2/17/2022 | 7.6 | -450 | 60 |
| 2/18/2022 | 7.6 | -497 | 60 |
| 2/19/2022 | 7.6 | -490 | 59 |
| 2/20/2022 | 7.6 | -502 | 29 |
| 2/21/2022 | 7.6 | -518 | 60 |
| 2/22/2022 | 7.6 | -412 | 64 |
| 2/23/2022 | 7.6 | -458 | 60 |
| 2/24/2022 | 7.6 | -439 | 56 |
| 2/25/2022 | 7.6 | -441 | 56 |
| 2/26/2022 | 7.6 | -442 | 55 |
| 2/27/2022 | 7.6 | -444 | 54 |
| 2/28/2022 | 7.6 | -436 | 52 |
| 3/1/2022 | 7.6 | -473 | 54 |
| 3/2/2022 | 7.6 | -439 | 55 |

| Date | pH (7.1-7.4) | ORP (< -430 mV) | Temperature (Degrees Fahrenheit) |
|---|---|---|---|
| 3/3/2022 | 7.6 | -474 | 58 |
| 3/4/2022 | 7.6 | -488 | 59 |
| 3/5/2022 | 7.6 | -496 | 60 |
| 3/6/2022 | 7.7 | -503 | 61 |
| 3/7/2022 | 7.6 | -478 | 61 |
| 3/8/2022 | 7.6 | -495 | 57 |
| 3/9/2022 | 7.6 | -485 | 59 |
| 3/10/2022 | 7.6 | -495 | 59 |
| 3/11/2022 | 7.6 | -490 | 57 |
| 3/12/2022 | 7.6 | -475 | 57 |
| 3/13/2022 | 7.6 | -480 | 56 |
| 3/14/2022 | 7.6 | -492 | 57 |
| 3/15/2022 | 7.6 | -491 | 58 |
| 3/16/2022 | Power out | Power out | Power out |
| 3/17/2022 | 7.7 | -493 | 62 |
| 3/18/2022 | 7.6 | -490 | 62 |
| 3/19/2022 | 7.6 | -501 | 62 |
| 3/20/2022 | 7.6 | -508 | 61 |
| 3/21/2022 | 7.6 | -485 | 62 |
| 3/22/2022 | 7.6 | -516 | 63 |
| 3/23/2022 | 7.6 | -520 | 63 |
| 3/24/2022 | 7.6 | -495 | 61 |
| 3/25/2022 | 7.6 | -493 | 62 |
| 3/26/2022 | 7.6 | -495 | 62 |
| 3/27/2022 | 7.6 | -497 | 63 |
| 3/28/2022 | 7.7 | -509 | 66 |
| 3/29/2022 | 7.7 | -493 | 67 |
| 3/30/2022 | 7.7 | -496 | 67 |
| 3/31/2022 | 7.7 | -502 | 65 |
| Note: Shaded regions = pH outside of operating parameters | | | |

On 29 July 2021, Envirogen was on-site and identified that the inline pH probe was not working properly. As a result, pH was measured manually from 29 July 2021 through the end of the 1st Quarter 2022 reporting period. The elevated pH shaded grey in **Table 1** above was identified as one of the issues contributing to the poor performance of the FBR. The inline pH probe is on back order with delivery estimated for the 2nd Quarter of 2022.

## 1.5 Process Chemical Usage at GWTP

Approximate chemical consumption and the quantity delivered during the 1st Quarter of 2022 are shown in **Table 2**.

**Table 2. Chemical Usage and Delivery Table**

| Chemical | Usage 1st Quarter 2022 | Quantity Delivered 1st Quarter 2022 |
|---|---|---|
| Hydrochloric acid | 630 gallons | 0 |
| Sodium hydroxide (35%) | 900 gallons | 0 |
| Acetic acid (50%) | 2 drums = 110 gallons | 8 drums = 440 lbs |
| Phosphoric acid (75%) | 36.3 liters | 0 |
| Magnesium hydroxide | 215 gallons | 0 |
| Urea | 278.0 pounds (lbs) | 0 |
| Polymer (Magnafloc 110-L) | 10.8 liters | 0 |

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# 2 EVALUATION OF LHAAP-18/24 ICT EFFECTIVENESS

The ICT system at Burning Ground No. 3 is composed of 14 sections ranging in length from 100 feet (ft) to 1,300 ft. A total of approximately 5,000 linear ft of trench was installed within and around three sides of Burning Ground No. 3. The trench sections extend approximately 22 ft to 45 ft below ground surface (bgs). Most, but not all of the trenches are as deep as the confining clay layer of the shallow groundwater zone. High density polyethylene (HDPE) liners were installed outside of ICTs 12A-12E and 13A-13G, located on the southwestern and northwestern boundaries of LHAAP-18/24, respectively. The locations of the liners are shown on **Figure A-1** in **Appendix A**. **Table A-1** in **Appendix A** presents the depths of the ICTs.

## 2.1 Groundwater Elevation

Water levels from 92 monitoring wells and 11 piezometers are measured monthly to generate potentiometric surface maps that assist in monitoring the effectiveness of the groundwater extraction system on plume containment. Piezometer 12 (BGPZ-12) was damaged and plugged and abandoned in May 2013, and monitoring wells 18WW01 and 18WW16 were abandoned in August 2020. The groundwater contours are generated using the water levels from the shallow zone and Wilcox Formation wells. The water level data are presented in **Table 3**. No reinjection of treated groundwater or reapplication of groundwater to LHAAP-18/24 grounds via the existing irrigation system occurred during the 1st Quarter of 2022. Groundwater elevations measured during the 1st Quarter of 2022 are discussed in Section 2.2. Potentiometric surface maps based on the groundwater elevations measured during the 1st Quarter 2022 are contained in **Appendix B**.

## 2.2 Performance of Plume Capture

The intent of the ICTs is to control groundwater gradients, prevent off-site migration of contaminated groundwater, extract the most highly contaminated groundwater, and reduce the mass of contaminants in groundwater. Liners were installed in the ICTs on the northern (ICT 13) and western (ICT 12) site boundaries to limit migration of contaminated water from the site towards Harrison Bayou. At the same time, the liners reduce or prevent removal of contaminated groundwater that is outside the ICT containment area, between the site and Harrison Bayou. The ICTs are installed within the shallow subsurface at the site and capture primarily shallow groundwater (e.g., < 40 ft bgs).

In 2007 and 2008, in consultation with the Texas Commission on Environmental Quality (TCEQ) and the United States Environmental Protection Agency (USEPA), the Army ceased operations of ICTs 1, 3, 5, 10, 12A and 13G for groundwater extraction (note that extraction from ICT 12A was resumed after pump replacement in December 2012). Two other ICTs (ICT 6 and ICT 9) were changed from extraction ICTs to re-injection ICTs which ceased in July 2012. Groundwater extraction from well EW-1 located in the northeast central portion of the site began in October 2008 and well 18WW17 located to the northeast of the ICT containment area began in January 2008. **Table A-2** in **Appendix A** presents a summary of extraction equipment replacement since

2011, as dictated by poor extraction performance (malfunctioning pumps, poor pump positioning with respect to groundwater, non-operational level probes, scale build up, etc.). Further discussion of extraction performance of various ICTs and extraction wells is presented in Section 2.3.

Potentiometric surface maps of the shallow zone groundwater in the vicinity of LHAAP-18/24, based on groundwater elevations measured on 31 January, 23 February, and 28 March 2022, are shown on **Figures B-1, B-2, and B-3 in Appendix B**, respectively. The potentiometric surface maps of the shallow zone were contoured using the Kriging geostatistical interpolation method included in the Golden Software Surfer® data analysis software.

The HDPE liners in the ICTs, where present, continue to retard groundwater flow. Additional data was collected outside of the ICT boundaries during the December 2021 semi-annual sampling event for LHAAP-18/24. The additional information has been used to update and revise the potentiometric surface contours for the area located outside of the ICTs. The potentiometric surface maps for January through March 2022 continue to reflect high groundwater elevations in the northern/northwestern portion of the site with groundwater flowing radially from groundwater highs at monitoring wells located inside the ICT containment area. Monitoring wells MW-1 and 123, which are installed in the shallow zone, had groundwater elevations in March 2022 of 174.77 ft above mean sea level (amsl) and 173.91 ft amsl, respectively. Monitoring wells MW-1 and 123 are in close proximity to one another. From the groundwater high at monitoring wells MW-1 and 123, groundwater flows radially towards the surrounding ICTs which include ICT 13 to the north and northwest, and ICT 12 to the west and southwest.

The extracted groundwater volume was measured on a monthly basis as the sum of the difference between the flow meter totalizer reading at each ICT between the beginning and end of each month. During 1st Quarter 2022, approximately 493,733 gallons of groundwater were extracted from the ICTs for treatment, 145,382 gallons in January 2022; 177,882 in February 2022; and 170,469 gallons in March 2022 (**Table 5**). Note that the sum of the ICT totalizers doesn't matchup to the influent totalizer (FIT-140) at the groundwater treatment plant. As shown on **Figure 2-1** the influent totalizer volume for the 1st Quarter 2022 was 549,007 gallons. The influent totalizer biases are high because the reading assumes the pipe is completely full, which often is not the case.

During 1st Quarter 2022, approximately 190,898 gallons of treated groundwater was discharged to Harrison Bayou from the GWTP. Approximately 297,445 gallons of treated groundwater was discharged from GWTP to INF Pond. Additionally, treated groundwater from INF pond was unintentionally discharged into Harrison Bayou. On 19 January 2022, an additional unintentional release from the INF pond to the Harrison Bayou, was observed during a site walk as part of the in person January 2022 Monthly Manager's Meeting. The exact date of the release was undetermined. Based on staff gauging logs, an estimated 161,500 gallons of treated groundwater was released via the drain valve to the Harrison Bayou. In response to the vandalism observed in December 2021 and January 2022, the access gate was repaired and locked by U.S. Fish and Wildlife personnel. Additional security measures such as the use of video monitoring are being evaluated to prevent further vandalism. No treated groundwater from the

GWTP was returned to LHAAP-18/24 via the sprinkler system. **Table 4** presents the daily discharge rates and volume for the 1st Quarter of 2022.

Groundwater levels in Wilcox Formation wells (generally > 40 to 50 ft bgs) were measured during the 1st Quarter of 2022 groundwater gauging events. Wilcox Formation wells correspond generally to those wells previously identified as "intermediate" and "deep" wells. "Intermediate" wells are designated as Upper Wilcox Formation wells and "Deep" wells are designated as Lower Wilcox Formation wells. Generally, groundwater in the Upper and Lower Wilcox Formation wells are in hydraulic communication and so can be treated as a single hydrogeologic unit. Therefore, the groundwater elevations in Upper Wilcox wells were used to construct the potentiometric surface maps for the Wilcox Formation. It is noted that there are locations where groundwater elevation and contamination concentration data indicate a lack of hydraulic communication between the Upper and Lower Wilcox formation wells. However, the Upper and Lower Wilcox formation wells are generally treated as a single hydrogeologic unit for the purposes of this report. **Figures B-4, B-5, and B-6 in Appendix B** show the locations of the Wilcox Formation monitoring wells and the potentiometric surface of the Wilcox Formation, based on static water levels measured during the January, February, and March 2022 gauging events, respectively. Groundwater in the Wilcox Formation generally flows in a northerly direction, towards Caddo Lake and there is a downward vertical gradient between the overlying shallow zone and the Wilcox Formation. A groundwater high is present in the Wilcox Formation in the area of MW-14.

## 2.3 Quantity of Water Extracted from LHAAP-18/24

The average daily extraction rates from the ICTs were approximately 4,690 gallons per day (gpd) in January 2022, approximately 5,929 gpd in February 2022, and approximately 5,499 gpd in March 2022 (**Table 5**).

The volume of groundwater removed from LHAAP-18/24 during the 1st Quarter of 2022 measured approximately 549,007 gallons based on the influent totalizer (FIT-140). **Figure 2-1** shows the historical trends of extracted volumes based on the influent totalizer by quarter. Additionally, approximately 91,050 gallons of water was pumped from groundwater stored at LHAAP-17 in frac tanks to the GWTP and approximately 89,468 gallons of accumulated rainwater was added from the secondary containment into the GWTP. Generating a total of 729,525 gallons of influent groundwater to the GWTP.

In contrast to the approximate total of influent groundwater at the GWTP, the total estimated volume discharged to the Harrison Bayou and the INF Pond (**Table 4**) following treatment by the GWTP was 488,343 gallons discharged in the 1st Quarter of 2022. The difference between the total influent and total discharged volumes during the 1st Quarter of 2022 is approximately 241,182 gallons as of 31 March 2022. The discrepancy in influent and discharged volumes can be partially accounted for due to the storage capacity of the plant in the equalization tank (TK-140) and the effluent storage tank (TK-630), and to a lesser extent the volume of water loss by evaporative losses and water within the plant. Effluent from LHAAP-18/24 is pumped to the GWTP and is stored in the 300,000 gallon equalization tank (TK-140). The equalization tank stores water until it is run through the treatment process and acts as a batch tank. All the groundwater

that is pumped from LHAAP-18/24 doesn't necessarily run through the GWTP before the end of the reporting period. For example, at the end of the previous quarter in December 2021 approximately 158,673 gallons of water was already stored in the GWTP. Therefore, the storage capacity of the plant is estimated to account for the discrepancy between influent and effluent volumes.

As indicated by **Table 5**, 24 of 28 ICTs and wells produced water in the 1st Quarter 2022. ICTs 1, 3, 5, 10, and 13G did not produce water in the 1st Quarter of 2022. ICTs 1, 3, 5, and 10 were deactivated on 18 February 2008 as part of a pilot study for system optimization. ICT 13G is dry and no longer active.

ICT repairs completed in 1st Quarter 2022 included replacement of flow meter on ICT 2, ICT 7, ICT 12B, ICT 12C, ICT 13A, and ICT 13C ; Replacement of motor in ICT 8, ICT 12D, ICT 14C, and ICT 14D; Replacement of wiring harness in ICT 12D; Replacement of flow nipples on ICT 11 and ICT 14E.

## 2.4 Sampling Activities at LHAAP-18/24

No groundwater was sampled for offsite analysis at LHAAP-18/24 in the 1st Quarter 2022. The next sampling event will be completed in the 2nd Quarter of 2022.

## 2.5 Groundwater Treatment Plant Sampling and Analysis

Sampling and analysis were conducted in accordance with the requirements specified in the Final Revised Sampling and Analysis Plan (AECOM Technical Services [AECOM], Inc., September 2017). Besides the Record of Decision (ROD) sampling requirement, additional sample analyses are typically performed on the influent and effluent samples to monitor the effectiveness of the perchlorate treatment (FBR and/or IX vessels) process. Sections 2.5.1 through 2.5.4 present the results of analyses conducted during the 1st Quarter of 2022. The complete laboratory results are provided electronically as a separate file (**Appendix C**).

### 2.5.1 Weekly Perchlorate Sampling

**Table 6** presents the weekly effluent perchlorate results for the 1st Quarter of 2022. Throughout the 1st Quarter of 2022, the treated groundwater was sent through the IX vessels to provide additional water treatment for perchlorate prior to discharge. Perchlorate was not detected in the effluent samples collected during the 1st Quarter of 2022, above the Harrison Bayou Maximum Allowable Daily Discharge Perchlorate Concentration (589 µg/L). The effluent samples collected on 8 March 2022 (LH18/24-SP650_030822_BIX) and 15 March 2022 (LH18/24-SP650_031522_BIX) have perchlorate detections of 1,630 µg/L and 903 µg/L. Both March effluent samples were collected before the IX vessel (BIX) treatment and were not discharged without being treated by the IX process. As previously discussed, the water was sent through the IX vessels prior to discharge, therefore the treated groundwater from 8 March and 15 March 2022 effluent samples were also run through the IX vessels prior to discharge to the Harrison Bayou. The weekly effluent samples collected on 8 March 2022 (LH18/24-SP650_030822_AIX) and 15 March 2022 (LH18/24-SP650_031522_AIX) were collected after the first IX vessel (AIX)

and confirms that perchlorate was not detected in the treated groundwater discharged to the Harrison Bayou. Perchlorate was detected below the PCL (17 µg/L) in the remaining weekly effluent samples in January, February, and March 2022.

### 2.5.2 Monthly VOC Sampling

**Tables 7, 8, and 9** present the effluent VOC results for January, February, and March 2022. Sampling of the effluent for VOCs was conducted on a biweekly basis. The results were below the discharge limits. The tables also provide monthly influent concentrations for perchlorate.

### 2.5.3 Monthly Metals Sampling

**Tables 7, 8, and 9** present the monthly influent and effluent metals results for January, February, and March 2022. Sampling of the influent and effluent for metals is typically conducted on a monthly basis per the Final Installation-Wide Work Plan (Bhate, May 2018). None of the metals exceeded the effluent discharge limits.

### 2.5.4 Quarterly Sampling

Quarterly sampling of the effluent for VOCs, anions, chemical oxygen demand (COD), oil and grease, perchlorate, and metals was conducted on 15 February 2022 during this quarter and the results were below the MCLs. **Table 10** presents the quarterly analytical results for the 1st Quarter of 2022.

On 14 September 2021 (3rd Quarter of 2021), barium was detected at 2.66 µg/L just above the daily maximum discharge limit and MCL (2 µg/L). The September 2021 barium exceedance may have been a result of the September 2021 repairs completed on the GWTP, including replacement of sand in the sand filter. During the 4th Quarter of 2021, barium was detected at 0.534 µg/L on 9 November 2021 and 0.425 µg/L on 14 December 2021, below the daily maximum discharge limit and MCL (2 µg/L), confirming sufficient treatment by the GWTP. During the 1st Quarter 2022, barium was detected right above the daily average concentration limit (1 µg/L) at 1.05 µg/L but below the daily maximum concentration limit and MCL (2 µg/L) on 15 February 2022. This concentration result for 1st Quarter 2022 still meets discharge limits, sufficient treatment is still occurring at GWTP.

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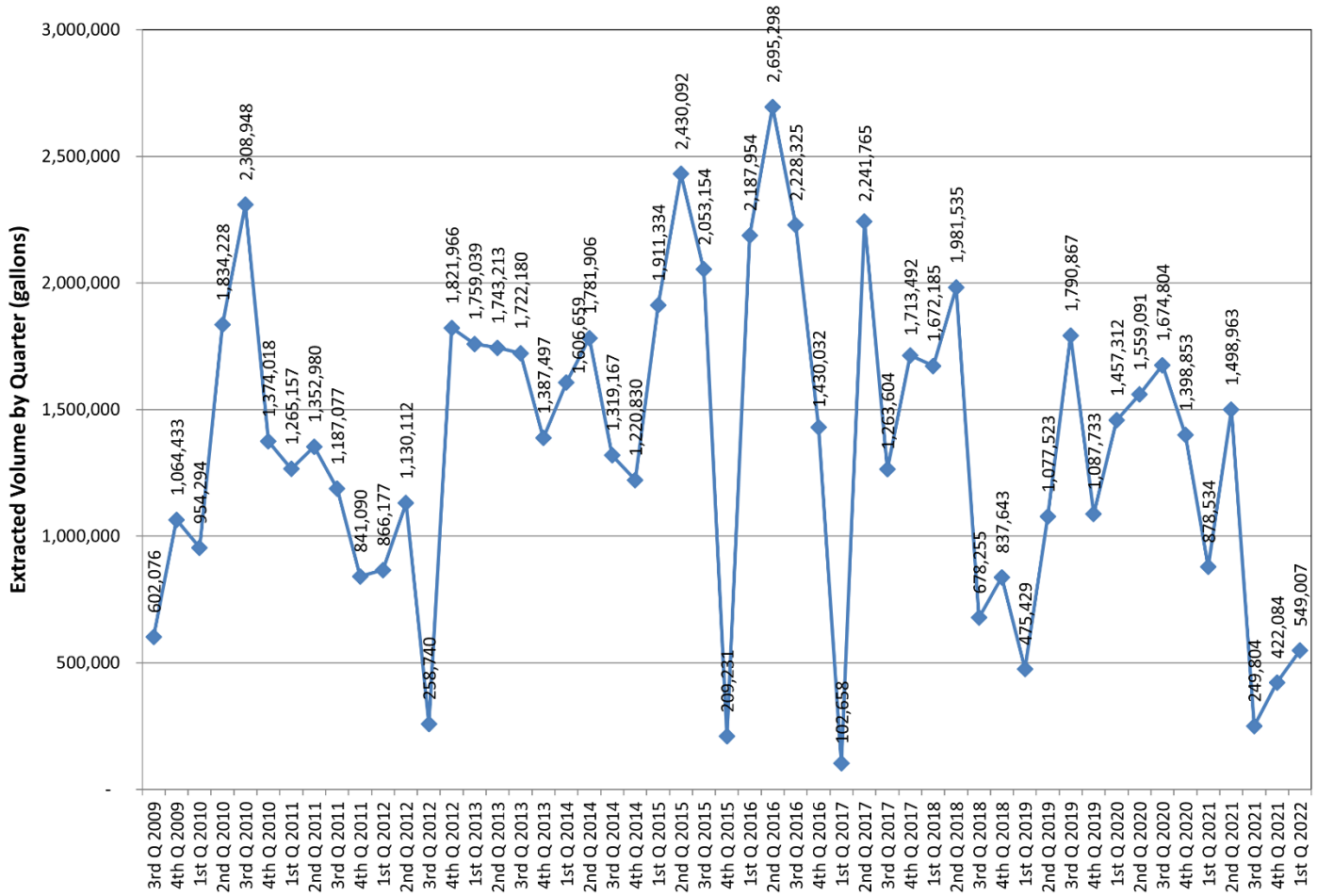
**Figure 2-1. Quarterly Extraction Rate**




Extraction rate beginning at 3rd Q 2013 is based on FIT-140 (influent totalizer)

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**Table 3. Groundwater Elevations at LHAAP-18/24 Piezometers, Monitoring Wells, and Surface Water**

| Location Identification | Type | Reference Elevation (ft amsl) | Depth to Water (ft) 01/31/2022 | Groundwater Elevation (ft amsl) 01/31/2022 | Depth to Water (ft) 02/23/2022 | Groundwater Elevation (ft amsl) 02/23/2022 | Depth to Water (ft) 03/28/2022 | Groundwater Elevation (ft amsl) 03/28/2022 |
|---|---|---|---|---|---|---|---|---|
| BGPZ-1 | Piezometer | 184.99 | 8.22 | 176.77 | 8.11 | 176.88 | 7.79 | 177.20 |
| BGPZ-2 | Piezometer | 184.39 | 14.49 | 169.90 | 14.37 | 170.02 | 14.18 | 170.21 |
| BGPZ-3 | Piezometer | 180.35 | 11.73 | 168.62 | 11.65 | 168.70 | 11.50 | 168.85 |
| BGPZ-4 | Piezometer | 177.77 | 9.82 | 167.95 | 9.69 | 168.08 | 9.51 | 168.26 |
| BGPZ-5 | Piezometer | 180.76 | 11.41 | 169.35 | 11.32 | 169.44 | 11.19 | 169.57 |
| BGPZ-6 | Piezometer | 197.82 | 27.50 | 170.32 | 27.42 | 170.40 | 27.30 | 170.52 |
| BGPZ-7 | Piezometer | 195.96 | 26.85 | 169.11 | 26.72 | 169.24 | 26.57 | 169.39 |
| BGPZ-8 | Piezometer | 197.08 | 28.68 | 168.40 | 28.59 | 168.49 | 28.40 | 168.68 |
| BGPZ-9 | Piezometer | 196.45 | 26.29 | 170.16 | 26.17 | 170.28 | 26.00 | 170.45 |
| BGPZ-10 | Piezometer | 197.00 | 28.17 | 168.83 | 28.09 | 168.91 | 27.95 | 169.05 |
| BGPZ-11 | Piezometer | 196.99 | 26.98 | 170.01 | 26.88 | 170.11 | 26.70 | 170.29 |
| BGPZ-12 | Piezometer | 188.17 | NA | Plugged | NA | Plugged | NA | Plugged |
| AWD-1 | Monitoring Well | 182.27 | 10.25 | 172.02 | 10.09 | 172.18 | 9.90 | 172.37 |
| AWD-2 | Monitoring Well | 186.78 | 14.05 | 172.73 | 14.21 | 172.57 | 14.08 | 172.70 |
| AWD-3 | Monitoring Well | 200.13 | 27.41 | 172.72 | 27.33 | 172.80 | 27.17 | 172.96 |
| AWD-4 | Monitoring Well | 193.89 | 21.58 | 172.31 | 21.85 | 172.04 | 21.69 | 172.20 |
| MW-1 | Monitoring Well | 199.22 | 24.75 | 174.47 | 24.61 | 174.61 | 24.45 | 174.77 |
| MW-2 | Monitoring Well | 196.73 | 24.82 | 171.91 | 24.74 | 171.99 | 24.60 | 172.13 |
| MW-3 | Monitoring Well | 196.54 | 26.19 | 170.35 | 25.93 | 170.61 | 25.78 | 170.76 |
| MW-4 | Monitoring Well | 197.27 | 27.10 | 170.17 | 25.98 | 171.29 | 25.81 | 171.46 |
| MW-5 | Monitoring Well | 194.97 | 24.95 | 170.02 | 24.81 | 170.16 | 24.66 | 170.31 |
| MW-6 | Monitoring Well | 192.18 | 21.68 | 170.50 | 21.60 | 170.58 | 21.45 | 170.73 |
| MW-7 | Monitoring Well | 188.47 | 17.82 | 170.65 | 18.01 | 170.46 | 17.88 | 170.59 |

**Table 3. Groundwater Elevations at LHAAP-18/24 Piezometers, Monitoring Wells, and Surface Water**

| Location Identification | Type | Reference Elevation (ft amsl) | Depth to Water (ft) 01/31/2022 | Groundwater Elevation (ft amsl) 01/31/2022 | Depth to Water (ft) 02/23/2022 | Groundwater Elevation (ft amsl) 02/23/2022 | Depth to Water (ft) 03/28/2022 | Groundwater Elevation (ft amsl) 03/28/2022 |
|---|---|---|---|---|---|---|---|---|
| MW-8 | Monitoring Well | 187.13 | 16.48 | 170.65 | 16.10 | 171.03 | 15.95 | 171.18 |
| MW-9 | Monitoring Well | 184.73 | 14.11 | 170.62 | 14.05 | 170.68 | 13.89 | 170.84 |
| MW-10 | Monitoring Well | 178.12 | 9.13 | 168.99 | 9.02 | 169.10 | 8.75 | 169.37 |
| MW-11 | Monitoring Well | 184.65 | 15.42 | 169.23 | 15.31 | 169.34 | 15.20 | 169.45 |
| MW-12 | Monitoring Well | 178.33 | 9.74 | 168.59 | 9.59 | 168.74 | 9.41 | 168.92 |
| MW-13 | Monitoring Well | 176.72 | 8.31 | 168.41 | 8.18 | 168.54 | 7.91 | 168.81 |
| MW-14 | Monitoring Well | 186.19 | 13.53 | 172.66 | 13.45 | 172.74 | 13.29 | 172.90 |
| MW-16 | Monitoring Well | 178.59 | 9.89 | 168.70 | 9.81 | 168.78 | 9.70 | 168.89 |
| MW-17 | Monitoring Well | 179.03 | 10.05 | 168.98 | 10.15 | 168.88 | 9.97 | 169.06 |
| MW-18 | Monitoring Well | 178.58 | 8.92 | 169.66 | 8.95 | 169.63 | 8.83 | 169.75 |
| MW-19 | Monitoring Well | 178.60 | 8.69 | 169.91 | 8.71 | 169.89 | 8.59 | 170.01 |
| MW-20 | Monitoring Well | 186.64 | 9.03 | 177.61 | 9.11 | 177.53 | 8.95 | 177.69 |
| MW-21 | Monitoring Well | 198.70 | 28.50 | 170.20 | 28.42 | 170.28 | 28.35 | 170.35 |
| MW-22 | Monitoring Well | 197.51 | 26.17 | 171.34 | 26.03 | 171.48 | 25.87 | 171.64 |
| MW-23 | Monitoring Well | 198.79 | 26.69 | 172.10 | 26.55 | 172.24 | 26.42 | 172.37 |
| 101 | Monitoring Well | 197.53 | 8.62 | 188.91 | 10.92 | 186.61 | 10.79 | 186.74 |
| 102 | Monitoring Well | 193.94 | 19.49 | 174.45 | 19.35 | 174.59 | 19.18 | 174.76 |
| 109 | Monitoring Well | 197.02 | 26.77 | 170.25 | 26.70 | 170.32 | 26.57 | 170.45 |
| 120 | Monitoring Well | 184.19 | 13.40 | 170.79 | 12.81 | 171.38 | 12.65 | 171.54 |
| 123 | Monitoring Well | 186.21 | 12.37 | 173.84 | 12.45 | 173.76 | 12.30 | 173.91 |
| 125 | Monitoring Well | 196.28 | 26.35 | 169.93 | 26.41 | 169.87 | 26.27 | 170.01 |
| 126 | Monitoring Well | 199.37 | 28.44 | 170.93 | 27.89 | 171.48 | 27.70 | 171.67 |
| 129 | Monitoring Well | 197.24 | 26.91 | 170.33 | 26.98 | 170.26 | 26.82 | 170.42 |

**Table 3. Groundwater Elevations at LHAAP-18/24 Piezometers, Monitoring Wells, and Surface Water**

| Location Identification | Type | Reference Elevation (ft amsl) | Depth to Water (ft) 01/31/2022 | Groundwater Elevation (ft amsl) 01/31/2022 | Depth to Water (ft) 02/23/2022 | Groundwater Elevation (ft amsl) 02/23/2022 | Depth to Water (ft) 03/28/2022 | Groundwater Elevation (ft amsl) 03/28/2022 |
|---|---|---|---|---|---|---|---|---|
| 130 | Monitoring Well | 177.73 | 8.27 | 169.46 | 8.17 | 169.56 | 8.02 | 169.71 |
| C-01 | Monitoring Well | 193.89 | 23.79 | 170.10 | 22.84 | 171.05 | 22.69 | 171.20 |
| C-02 | Monitoring Well | 175.95 | 8.61 | 167.34 | 8.50 | 167.45 | 8.37 | 167.58 |
| C-03 | Monitoring Well | 196.34 | 26.53 | 169.81 | 26.42 | 169.92 | 26.25 | 170.09 |
| C-04 | Monitoring Well | 194.64 | 24.97 | 169.67 | 24.81 | 169.83 | 24.69 | 169.95 |
| C-04A | Monitoring Well | 194.61 | 24.41 | 170.20 | 24.33 | 170.28 | 24.20 | 170.41 |
| C-05 | Monitoring Well | 180.74 | 13.24 | 167.50 | 13.15 | 167.59 | 12.89 | 167.85 |
| C-06 | Monitoring Well | 192.22 | 24.80 | 167.42 | 24.67 | 167.55 | 24.50 | 167.72 |
| C-07 | Monitoring Well | 196.80 | 27.46 | 169.34 | 27.51 | 169.29 | 27.36 | 169.44 |
| C-08 | Monitoring Well | 193.10 | 22.90 | 170.20 | 22.80 | 170.30 | 22.65 | 170.45 |
| C-09 | Monitoring Well | 202.35 | 32.12 | 170.23 | 32.05 | 170.30 | 31.81 | 170.54 |
| C-10 | Monitoring Well | 201.86 | 32.41 | 169.45 | 32.30 | 169.56 | 32.12 | 169.74 |
| 17WW08 | Monitoring Well | 179.72 | 10.39 | 169.33 | 10.17 | 169.55 | 9.93 | 169.79 |
| 18WW01 | Monitoring Well | 201.31 | NA | Plugged | NA | Plugged | NA | Plugged |
| 18WW02 | Monitoring Well | 179.30 | 9.89 | 169.41 | 9.27 | 170.03 | 9.12 | 170.18 |
| 18WW03 | Monitoring Well | 195.59 | 27.65 | 167.94 | 27.51 | 168.08 | 27.35 | 168.24 |
| 18WW04 | Monitoring Well | 183.74 | 16.99 | 166.75 | 16.90 | 166.84 | 16.72 | 167.02 |
| 18WW05 | Monitoring Well | 189.59 | 22.55 | 167.04 | 22.47 | 167.12 | 22.25 | 167.34 |
| 18WW06 | Monitoring Well | 179.70 | 10.71 | 168.99 | 9.84 | 169.86 | 9.67 | 170.03 |
| 18WW07 | Monitoring Well | 183.67 | NM | NM | NM | NM | NM | NM |
| 18WW08 | Monitoring Well | 177.77 | 10.83 | 166.94 | 10.69 | 167.08 | 10.51 | 167.26 |
| 18WW09 | Monitoring Well | 177.51 | 9.65 | 167.86 | 9.54 | 167.97 | 9.39 | 168.12 |
| 18WW10 | Monitoring Well | 182.26 | 14.15 | 168.11 | 14.03 | 168.23 | 13.79 | 168.47 |

**Table 3. Groundwater Elevations at LHAAP-18/24 Piezometers, Monitoring Wells, and Surface Water**

| Location Identification | Type | Reference Elevation (ft amsl) | Depth to Water (ft) 01/31/2022 | Groundwater Elevation (ft amsl) 01/31/2022 | Depth to Water (ft) 02/23/2022 | Groundwater Elevation (ft amsl) 02/23/2022 | Depth to Water (ft) 03/28/2022 | Groundwater Elevation (ft amsl) 03/28/2022 |
|---|---|---|---|---|---|---|---|---|
| 18WW11 | Monitoring Well | 182.29 | 14.51 | 167.78 | 14.40 | 167.89 | 14.20 | 168.09 |
| 18WW14 | Monitoring Well | 186.47 | 15.82 | 170.65 | 15.70 | 170.77 | 15.54 | 170.93 |
| 18WW15 | Monitoring Well | 186.24 | 15.33 | 170.91 | 15.22 | 171.02 | 15.01 | 171.23 |
| 18WW16 | Monitoring Well | 201.88 | NA | Plugged | NA | Plugged | NA | Plugged |
| 18WW18 | Monitoring Well | 196.82 | 27.59 | 169.23 | 27.51 | 169.31 | 27.33 | 169.49 |
| 18WW19 | Monitoring Well | 179.56 | 12.03 | 167.53 | 11.93 | 167.63 | 11.72 | 167.84 |
| 18WW20 | Monitoring Well | 180.42 | 12.55 | 167.87 | 12.41 | 168.01 | 12.22 | 168.20 |
| 18WW21 | Monitoring Well | 195.20 | 26.63 | 168.57 | 26.51 | 168.69 | 26.30 | 168.90 |
| 18WW22 | Monitoring Well | 195.37 | 26.20 | 169.17 | 26.24 | 169.13 | 26.02 | 169.35 |
| 18WW24 | Monitoring Well | 176.40 | 10.34 | 166.06 | 9.79 | 166.61 | 9.60 | 166.80 |
| 18WW25 | Monitoring Well | 175.15 | 9.88 | 165.27 | 9.41 | 165.74 | 9.27 | 165.88 |
| 18CPTMW01SW | Monitoring Well | 198.20 | 25.19 | 173.01 | 25.11 | 173.09 | 24.93 | 173.27 |
| 18CPTMW01DW | Monitoring Well | 197.92 | 27.32 | 170.60 | 27.19 | 170.73 | 26.97 | 170.95 |
| 18CPTMW03SW | Monitoring Well | 198.53 | 28.05 | 170.48 | 28.17 | 170.36 | 27.95 | 170.58 |
| 18CPTMW04 | Monitoring Well | 196.60 | 24.17 | 172.43 | 24.10 | 172.50 | 23.86 | 172.74 |
| 18CPTMW04SW | Monitoring Well | 196.42 | 26.98 | 169.44 | 26.85 | 169.57 | 26.68 | 169.74 |
| 18CPTMW06 | Monitoring Well | 198.12 | 27.57 | 170.55 | 27.97 | 170.15 | 27.80 | 170.32 |
| 18CPTMW07 | Monitoring Well | 197.32 | 27.75 | 169.57 | 27.20 | 170.12 | 26.98 | 170.34 |
| 18CPTMW08SW | Monitoring Well | 196.38 | 26.80 | 169.58 | 26.65 | 169.73 | 26.47 | 169.91 |
| 18CPTMW08DW | Monitoring Well | 196.59 | 27.49 | 169.10 | 27.37 | 169.22 | 27.15 | 169.44 |
| 18CPTMW10SW | Monitoring Well | 186.98 | 17.38 | 169.60 | 16.82 | 170.16 | 16.63 | 170.35 |
| 18CPTMW10DW | Monitoring Well | 187.38 | 18.20 | 169.18 | 18.09 | 169.29 | 17.88 | 169.50 |
| 18CPTMW12SW | Monitoring Well | 190.90 | 21.09 | 169.81 | 21.00 | 169.90 | 20.75 | 170.15 |

**Table 3. Groundwater Elevations at LHAAP-18/24 Piezometers, Monitoring Wells, and Surface Water**

| Location Identification | Type | Reference Elevation (ft amsl) | Depth to Water (ft) 01/31/2022 | Groundwater Elevation (ft amsl) 01/31/2022 | Depth to Water (ft) 02/23/2022 | Groundwater Elevation (ft amsl) 02/23/2022 | Depth to Water (ft) 03/28/2022 | Groundwater Elevation (ft amsl) 03/28/2022 |
|---|---|---|---|---|---|---|---|---|
| 18CPTMW12DW | Monitoring Well | 190.25 | 20.69 | 169.56 | 20.55 | 169.70 | 20.39 | 169.86 |
| 18CPTMW14 | Monitoring Well | 196.69 | 25.60 | 171.09 | 25.46 | 171.23 | 25.27 | 171.42 |
| 18CPTMW15 | Monitoring Well | 179.79 | 11.59 | 168.20 | 10.57 | 169.22 | 10.17 | 169.62 |
| 18CPTMW16 | Monitoring Well | 175.37 | 7.77 | 167.60 | 7.25 | 168.12 | 7.02 | 168.35 |
| 18CPTMW18 | Monitoring Well | 194.53 | 28.18 | 166.35 | 28.26 | 166.27 | 28.05 | 166.48 |
| 18CPTMW19 | Monitoring Well | 193.59 | 22.93 | 170.66 | 22.75 | 170.84 | 22.57 | 171.02 |
| 18CPTMW19SW | Monitoring Well | 193.29 | 23.65 | 169.64 | 23.49 | 169.80 | 23.31 | 169.98 |
| 18CPTMW22SW | Monitoring Well | 187.79 | 18.08 | 169.71 | 18.00 | 169.79 | 17.73 | 170.06 |
| 18CPTMW22R | Monitoring Well | 187.23 | 12.73 | 174.50 | 11.74 | 175.49 | 10.88 | 176.35 |
| 18CPTMW22DW | Monitoring Well | 188.00 | 18.90 | 169.10 | 18.78 | 169.22 | 18.55 | 169.45 |
| 18CPTMW23 | Monitoring Well | 177.47 | 9.11 | 168.36 | 8.95 | 168.52 | 8.51 | 168.96 |
| 18CPTMW23SW | Monitoring Well | 177.43 | 9.05 | 168.38 | 8.89 | 168.54 | 8.45 | 168.98 |
| 18CPTMW24 | Monitoring Well | 194.89 | 25.05 | 169.84 | 22.73 | 172.16 | 22.59 | 172.30 |
| 18CPTMW26 | Monitoring Well | 182.60 | 17.57 | 165.03 | 17.51 | 165.09 | 17.36 | 165.24 |
| 18CPTMW26SW | Monitoring Well | 182.00 | 13.09 | 168.91 | 12.97 | 169.03 | 12.70 | 169.30 |
| 1824HBSW7 | Surface Water Sample | 167.92 | 1.12 | 166.80 | 2.33 | 165.59 | 2.77 | 165.15 |

**Table 4. Treated Groundwater Discharged – January through March 2022**

| DATE | Harrison Bayou Flow (gpm) | Maximum Rate Allowed (gpm) | Released From GWTP To Harrison Bayou | Released From INF Pond to Harrison Bayou | Released From GWTP to INF Pond | Combined Total Released to Harrison Bayou | INF Pond Staff Reading (6.20 = 3 ft. Freeboard) |
|---|---|---|---|---|---|---|---|
| 01/01/2022 | NA | NA | 0 | 0 | 0 | 0 | 1.42 |
| 01/02/2022 | NA | NA | 0 | 0 | 0 | 0 | 1.44 |
| 01/03/2022 | NA | NA | 0 | 0 | 0 | 0 | 1.46 |
| 01/04/2022 | NA | NA | 0 | 0 | 32,218 | 0 | 1.48 |
| 01/05/2022 | NA | NA | 0 | 0 | 0 | 0 | 1.46 |
| 01/06/2022 | NA | NA | 0 | 0 | 0 | 0 | 1.46 |
| 01/07/2022 | NA | NA | 0 | 0 | 0 | 0 | 1.44 |
| 01/08/2022 | NA | NA | 0 | 0 | 0 | 0 | 1.46 |
| 01/09/2022 | NA | NA | 0 | 0 | 0 | 0 | 1.48 |
| 01/10/2022 | NA | NA | 0 | 0 | 29,992 | 0 | 1.50 |
| 01/11/2022 | NA | NA | 0 | 0 | 1,163 | 0 | 1.51 |
| 01/12/2022 | NA | NA | 0 | 0 | 11,670 | 0 | 1.52 |
| 01/13/2022 | NA | NA | 0 | 0 | 10,082 | 0 | 1.53 |
| 01/14/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.00 |
| 01/15/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.00 |
| 01/16/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.00 |
| 01/17/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.00 |
| 01/18/2022 | NA | NA | 0 | 0 | 33,788 | 0 | 0.00 |
| 01/19/2022 [1] | NA | NA | 0 | 161,500 | 10,663 | 161,500 | 0.00 |
| 01/20/2022 | NA | NA | 0 | 0 | 6,193 | 0 | 0.12 |
| 01/21/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.12 |
| 01/22/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.11 |
| 01/23/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.11 |
| 01/24/2022 | NA | NA | 0 | 0 | 24,861 | 0 | 0.25 |
| 01/25/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.33 |
| 01/26/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.33 |

**Table 4. Treated Groundwater Discharged – January through March 2022**

| DATE | Harrison Bayou Flow (gpm) | Maximum Rate Allowed (gpm) | Released From GWTP To Harrison Bayou | Released From INF Pond to Harrison Bayou | Released From GWTP to INF Pond | Combined Total Released to Harrison Bayou | INF Pond Staff Reading (6.20 = 3 ft. Freeboard) |
|---|---|---|---|---|---|---|---|
| 01/27/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.33 |
| 01/28/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.32 |
| 01/29/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.32 |
| 01/30/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.32 |
| 01/31/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.31 |
| 02/01/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.31 |
| 02/02/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.31 |
| 02/03/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.32 |
| 02/04/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.32 |
| 02/05/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.32 |
| 02/06/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.31 |
| 02/07/2022 | NA | NA | 0 | 0 | 19,641 | 0 | 0.79 |
| 02/08/2022 | NA | NA | 0 | 0 | 0 | 0 | 0.79 |
| 02/09/2022 | NA | NA | 0 | 0 | 2,815 | 0 | 0.95 |
| 02/10/2022 | NA | NA | 0 | 0 | 1,035 | 0 | 1.24 |
| 02/11/2022 | NA | NA | 0 | 0 | 0 | 0 | 1.49 |
| 02/12/2022 | NA | NA | 0 | 0 | 0 | 0 | 1.49 |
| 02/13/2022 | NA | NA | 0 | 0 | 0 | 0 | 1.49 |
| 02/14/2022 | NA | NA | 0 | 0 | 17,549 | 0 | 1.68 |
| 02/15/2022 | NA | NA | 0 | 0 | 6,397 | 0 | 1.77 |
| 02/16/2022 | NA | NA | 0 | 0 | 4,619 | 0 | 1.95 |
| 02/17/2022 | NA | NA | 0 | 0 | 2,557 | 0 | 2.02 |
| 02/18/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.02 |
| 02/19/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.02 |
| 02/20/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.02 |
| 02/21/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.01 |

**Table 4. Treated Groundwater Discharged – January through March 2022**

| DATE | Harrison Bayou Flow (gpm) | Maximum Rate Allowed (gpm) | Released From GWTP To Harrison Bayou | Released From INF Pond to Harrison Bayou | Released From GWTP to INF Pond | Combined Total Released to Harrison Bayou | INF Pond Staff Reading (6.20 = 3 ft. Freeboard) |
|---|---|---|---|---|---|---|---|
| 02/22/2022 | NA | NA | 0 | 0 | 21,270 | 0 | 2.05 |
| 02/23/2022 | NA | NA | 0 | 0 | 11,716 | 0 | 2.08 |
| 02/24/2022 | NA | NA | 0 | 0 | 7,439 | 0 | 2.10 |
| 02/25/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.10 |
| 02/26/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.10 |
| 02/27/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.09 |
| 02/28/2022 | NA | NA | 0 | 0 | 29,842 | 0 | 2.15 |
| 03/01/2022 | NA | NA | 0 | 0 | 5,055 | 0 | 2.15 |
| 03/02/2022 | NA | NA | 8,343 | 0 | 6,880 | 8,343 | 2.16 |
| 03/03/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.16 |
| 03/04/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.15 |
| 03/05/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.15 |
| 03/06/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.14 |
| 03/07/2022 | NA | NA | 27,624 | 0 | 0 | 27,624 | 2.14 |
| 03/08/2022 | NA | NA | 6,765 | 0 | 0 | 6,765 | 2.21 |
| 03/09/2022 | NA | NA | 7,552 | 0 | 0 | 7,552 | 2.21 |
| 03/10/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.21 |
| 03/11/2022 | NA | NA | 6,591 | 0 | 0 | 6,591 | 2.21 |
| 03/12/2022 | NA | NA | 35,282 | 0 | 0 | 35,282 | 2.20 |
| 03/13/2022 | NA | NA | 7,002 | 0 | 0 | 7,002 | 2.29 |
| 03/14/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.29 |
| 03/15/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.29 |
| 03/16/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.28 |
| 03/17/2022 | NA | NA | 7,593 | 0 | 0 | 7,593 | 2.28 |
| 03/18/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.27 |
| 03/19/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.35 |

**Table 4. Treated Groundwater Discharged – January through March 2022**

| DATE | Harrison Bayou Flow (gpm) | Maximum Rate Allowed (gpm) | Released From GWTP To Harrison Bayou | Released From INF Pond to Harrison Bayou | Released From GWTP to INF Pond | Combined Total Released to Harrison Bayou | INF Pond Staff Reading (6.20 = 3 ft. Freeboard) |
|---|---|---|---|---|---|---|---|
| 03/20/2022 | NA | NA | 0 | 0 | 0 | 0 | 2.35 |
| 03/21/2022 | NA | NA | 28,412 | 0 | 0 | 28,412 | 2.34 |
| 03/22/2022 | NA | NA | 5,594 | 0 | 0 | 5,594 | 3.43 |
| 03/23/2022 | NA | NA | 4,759 | 0 | 0 | 4,759 | 3.43 |
| 03/24/2022 | NA | NA | 2,531 | 0 | 0 | 2,531 | 3.42 |
| 03/25/2022 | NA | NA | 0 | 0 | 0 | 0 | 3.42 |
| 03/26/2022 | NA | NA | 0 | 0 | 0 | 0 | 3.41 |
| 03/27/2022 | NA | NA | 0 | 0 | 0 | 0 | 3.41 |
| 03/28/2022 | NA | NA | 25,136 | 0 | 0 | 25,136 | 3.40 |
| 03/29/2022 | NA | NA | 5,897 | 0 | 0 | 5,897 | 3.40 |
| 03/30/2022 | NA | NA | 6,974 | 0 | 0 | 6,974 | 3.40 |
| 03/31/2022 | NA | NA | 4,843 | 0 | 0 | 4,843 | 3.39 |
| Total | | | 190,898 | 161,500 | 297,445 | 352,398 | |

Notes: The maximum discharge rate from the INF Pond is 170 gpm and the maximum discharge rate from the GWTP is 30 gpm.
NA = Not applicable
Treated groundwater volume released over the weekend is included in the total for the next working day. These volumes are marked with an asterisk (*).

[1] Unintentional release of water from INF pond to Harrison Bayou due to unauthorized access and vandalism. The exact date of the release is undetermined. Discovered 19 January 2022.

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**Table 5. Monthly Groundwater Extraction Quantities – January through March 2022**

| ICT or Well Number | January 2022 (gallons) | February 2022 (gallons) | March 2022 (gallons) | Total |
|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 |
| 2 | 1,317 | 5,848 | 9,289 | 16,454 |
| 3 | 0 | 0 | 0 | 0 |
| 4 | 43,103 | 51,813 | 30,773 | 125,689 |
| 5 | 0 | 0 | 0 | 0 |
| EW-01 | 0 | 0 | 0 | 0 |
| 7 | 519 | 489 | 0 | 1,008 |
| 8 | 180 | 10,304 | 18,431 | 28,915 |
| 18WW17 | 7,195 | 9,554 | 4,981 | 21,730 |
| 10 | 0 | 0 | 0 | 0 |
| 11 | 4,333 | 17,627 | 23,513 | 45,473 |
| 12A | 2,350 | 3,026 | 1,559 | 6,935 |
| 12B | 18,508 | 20,106 | 4,685 | 43,299 |
| 12C | 532 | 844 | 4,086 | 5,462 |
| 12D | 2,129 | 387 | 5,205 | 7,721 |
| 12E | 13,145 | 11,328 | 15,616 | 40,089 |
| 13A | 5,414 | 0 | 2,689 | 8,103 |
| 13B | 21 | 0 | 0 | 21 |
| 13C | 0 | 124 | 871 | 995 |
| 13D | 9,640 | 8,281 | 11,145 | 29,066 |
| 13E | 7,271 | 301 | 6,804 | 14,376 |
| 13F | 751 | 1,733 | 5,806 | 8,290 |
| 13G | 0 | 0 | 0 | 0 |
| 14A | 902 | 1,065 | 689 | 2,656 |
| 14B | 9,813 | 12,681 | 6,580 | 29,074 |
| 14C | 0 | 0 | 2,225 | 2,225 |
| 14D | 0 | 0 | 3,690 | 3,690 |
| 14E | 18,259 | 22,371 | 11,832 | 52,462 |
| ***LHAAP-18/24 Total*** | ***145,382*** | ***177,882*** | ***170,469*** | ***493,733*** |

Notes:
Gpd – gallons per day
ICTs 6 and 9 were converted from extraction to infiltration trenches beginning 18 September 2007.
ICTs 1, 3, 5, and 10 were deactivated on 18 February 2008 as part of a pilot study for system optimization.
Low production in ICT 13F and EW-01 due to low water table. ICT 13G is dry and no longer active.
ICT 7 has an electrical issue. Repairs planned for 2nd Quarter 2022.
ICT 13B needs a new pump. Repair planned for 2nd Quarter 2022.
ICT 8 had a new pump and motor installed in March 2022.
ICTs 12B, ICT 12C, and ICT 13A had new flow meters installed in March 2022.
ICT 14C had a new motor installed in March 2022.
ICT 14D had a new pump and motor installed in March 2022.
ICT 12D had a new wiring harness, pump, and motor installed in March 2022.

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**Table 6. Weekly Perchlorate Sample Results**
**1st Quarter 2022 Groundwater Treatment Plant Report**
**Longhorn Army Ammunition Plant**

| Sample Identification | Lab Package | Date Sampled | Sample Location | Harrison Bayou Maximum Allowable Daily Discharge Perchlorate Concentration (µg/L) | INF Pond Discharge Criteria for Perchlorate (µg/L) | Reporting Limit | Influent Perchlorate (6850) | Effluent Perchlorate (6850) | | Does Concentration Meet Discharge Limit? (Yes/No) | No Daily Maximum Concentration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Result (µg/L) | Result (µg/L) | DVQ | | Ammonia as N (350.3) (mg/L) | Ortho-Phosphate (365.3) (mg/L) | Organic Carbon (415.1) (mg/L) |
| LH18/24-SP650_010522_AIX | HS22010166 | 1/5/2022 | TK-650 | 589 | 17 | 0.1 | NA | **0.117** | J | No | **60** | **9.27** | **7.91** |
| LH18/24-SP650_010522_AIX (monthly) | HS22010172 | 1/5/2022 | TK-650 | 589 | 17 | 0.1 | NA | **0.0890** | J | Yes | -- | -- | -- |
| LH18/24-SP140_010522 (monthly) | HS22010170 | 1/5/2022 | TK-140 | -- | -- | NA | **10,700** | NA | | NA | -- | -- | -- |
| LH18/24-SP650_011122_AIX | HS22010419 | 1/11/2022 | TK-650 | 589 | 17 | 0.1 | NA | **0.0882** | J | No | **57** | **4.45** | **3.84** |
| LH18/24-SP650_011922_AIX | HS22010825 | 1/19/2022 | TK-650 | 589 | 17 | 0.1 | NA | < 0.0500 | U | No | **49** | **11.2** | **14.7** |
| LH18/24-SP650_012522_AIX | HS22011130 | 1/25/2022 | TK-650 | 589 | 17 | 0.1 | NA | < 0.0500 | U | Yes | **32** | **12.6** | **23.6** |
| LH18/24-SP650_020222_AIX | HS22020282 | 2/2/2022 | TK-650 | 589 | 17 | 0.1 | NA | < 0.0500 | U | Yes | **25** | **0.967 J** | **22.6** |
| LH18/24-SP650_020222_AIX (monthly) | HS22020280 | 2/2/2022 | TK-650 | 589 | 17 | 0.1 | NA | < 0.0500 | U | Yes | -- | -- | -- |
| LH18/24-SP140_020222 (monthly) | HS22020283 | 2/2/2022 | TK-140 | -- | -- | NA | **18,900** | NA | | NA | -- | -- | -- |
| LH18/24-SP650_021022_AIX | HS22020588 | 2/10/2022 | TK-650 | 589 | 17 | 0.1 | NA | < 0.0500 | U | Yes | **28** | **8.38** | **0.5** |
| LH18/24-SP650_021522_AIX | HS22020807 | 2/15/2022 | TK-650 | 589 | 17 | 0.1 | NA | < 0.0500 | U | Yes | **11** | **9.20** | **22.9** |
| LH18/24-SP650_021522_AIX (quarterly) | HS22020822 | 2/15/2022 | TK-650 | 589 | 17 | 0.1 | NA | < 0.0500 | U | Yes | -- | -- | -- |
| LH18/24-SP140_021522 (quarterly) | HS22020823 | 2/15/2022 | TK-140 | -- | -- | NA | **15,300** | NA | | NA | -- | -- | -- |
| LH18/24-SP650_022222_AIX | HS22021124 | 2/22/2022 | TK-650 | 589 | 17 | 0.1 | NA | **0.626** | | Yes | **13** | **21.5 J** | **36.1** |
| LH18/24-SP650_030122_AIX (monthly) | HS22030083 | 3/1/2022 | TK-650 | 589 | 17 | 0.1 | NA | < 0.0500 | U | Yes | -- | -- | -- |
| LH18/24-SP140_030122 (monthly) | HS22030082 | 3/1/2022 | TK-140 | -- | -- | NA | **16,800** | NA | | NA | -- | -- | -- |
| LH18/24-SP650_030122_AIX | HS22030081 | 3/1/2022 | TK-650 | 589 | 17 | 0.1 | NA | < 0.0500 | U | Yes | **13** | **12.6** | **30.3** |
| LH18/24-SP650_030822_BIX/AIX | HS22030443 | 3/8/2022 | TK-650 | 589 | 17 | 0.1 | NA | **1,630/0.221** | | Yes | **22** | **9.45** | **10.7** |
| LH18/24-SP650_031522_BIX/AIX | HS22030820 | 3/15/2022 | TK-650 | 589 | 17 | 0.1 | NA | **903**/< 0.0500 U | | Yes | **31** | **5.6** | **2.32** |
| LH18/24-SP650_032222_BIX/AIX | HS22031203 | 3/22/2022 | TK-650 | 589 | 17 | 0.1 | NA | **577**/< 0.0500 U | | Yes | **38** | **5.94** | **4.18** |
| LH18/24-SP650_032922_BIX/AIX | HS22031664 | 3/29/2022 | TK-650 | 589 | 17 | 0.1 | NA | **605/0.102** | | Yes | **40** | **6.00** | **4.57** |

Notes:
Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level (PCL)
SP140 samples are influent samples.
µg/L - micrograms per liter
DVQ - data validation qualifier
J - Estimated concentration between the detection limit and limit of quantitation and/or due to quality control discrepancies
Detected analytes are in **bold**.
Blue highlighting indicates concentrations above the INF Pond Discharge Criteria for Perchlorate
NA - not applicable
U - non detect and reported to the limit of detection
BIX - before ion exchange/AIX - after ion exchange
mg/L - milligrams per liter

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**Table 7. Bi-Weekly GWTP Analytical Sampling Results for January 2022**
**1st Quarter 2022 Groundwater Treatment Plant Report**
**Longhorn Army Ammunition Plant**

| | | | Sample Location | EFFLUENT - Monthly | | INFLUENT - Monthly* | | EFFLUENT - Biweekly | | EFFLUENT - Biweekly | | Does Concentration Meet Effluent Discharge Limits? (Yes/No) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Sample Identification | LH18/24-SP650_010522 | | LH18/24-SP140_010522 | | LH18/24-SP650_011122 | | LH18/24-SP650_012522 | | |
| | | | Lab Package | HS22010172 | | HS22010170 | | HS22010420 | | HS22011131 | | |
| | | | Sample Date | 1/5/2022 | | 1/5/2022 | | 1/11/2022 | | 1/25/2022 | | |
| | | | Sample Type | GRAB | | GRAB | | GRAB | | GRAB | | |
| | Effluent Limitation for Discharge (µg/L) per Table 2 of ROD | | | | | | | | | | | |
| | Daily Average Concentration | Daily Maximum Concentration | INF Pond MCL | Result | DVQ | Result | DVQ | Result | DVQ | Result | DVQ | |
| **VOLATILES** | **µg/L** | **µg/L** | **µg/L** | **µg/L** | | | | | | | | |
| 1,1,1-Trichloroethane | 3,417 | 7,230 | 200 | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| 1,1,2-Trichloroethane | 102.5 | 216.9 | 5 | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| 1,1-Dichloroethane | 6,633 | 14,032 | NV | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| 1,1-Dichloroethene | 119 | 253 | 7 | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| 1,2-Dichloroethane | 85 | 181 | 5 | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| 1,2-Dichloropropane | NV | NV | 5 | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| Acetone | 1,132 | 2,395 | NV | < 2.0 | U | NA | | < 2.0 | U | < 2.0 | U | Yes |
| Benzene | 85 | 181 | 5 | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| Carbon Tetrachloride | 85 | 181 | 5 | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| Chlorobenzene | 22,300 | 47,180 | 100 | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| Chloroform | 1,708 | 3,615 | NV | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| cis-1,2-Dichloroethene | NV | NV | 70 | **1.6** | | NA | | **1.6** | | **1.3** | | Yes |
| Ethylbenzene | 26,954 | 57,025 | 700 | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| m,p-Xylenes | 39.5 | 83.6 | NV | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| Methylene Chloride | 803 | 1,699 | 5 | < 2.0 | U | NA | | <2.0 | U | < 2.0 | U | Yes |
| o-Xylene | 39.5 | 83.6 | NV | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| Styrene | 2,829 | 5,987 | 100 | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| Tetrachloroethene | 85.4 | 180.7 | 5 | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| Toluene | 1,980 | 4,189 | 10 | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| Trichloroethene | 85 | 181 | 5 | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| Vinyl Chloride | 34 | 72 | 2 | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| **ANIONS** | **mg/L** | **mg/L** | **mg/L** | **mg/L** | | **mg/L** | | **mg/L** | | **mg/L** | | |
| Chloride | NV | NV | NV | NA | | NA | | **799** | | **929** | | NA |
| Sulfate | NV | NV | NV | NA | | NA | | **33.7** | | **56.5** | | NA |
| **PERCHLORATE** | **µg/L** | **µg/L** | **µg/L** | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | | |
| Perchlorate | 278 | 589 | 17 | **0.0890** | J | **10,700** | | NA | | NA | | Yes |
| **METALS** | **mg/L** | **mg/L** | **mg/L** | **mg/L** | | **mg/L** | | **mg/L** | | **mg/L** | | |
| Hexavalent Chromium | 0.058 | 0.124 | NV | < 0.0100 | U | < 0.0100 | U | NA | | NA | | Yes |
| Barium | 1 | 2 | 2 | **0.375** | | NA | | NA | | NA | | Yes |
| Lead | 0.0022 | 0.0046 | 0.015 | < 0.00100 | U | NA | | NA | | NA | | Yes |
| Selenium | 0.0057 | 0.0120 | 0.05 | < 0.00250 | U | < 0.00250 | U | NA | | NA | | Yes |
| Silver | 0.0014 | 0.0030 | 0.1 | < 0.000500 | U | < 0.000500 | U | NA | | NA | | Yes |
| **SEMI-VOLATILES** | **µg/L** | **µg/L** | **µg/L** | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | | |
| 1,4-Dioxane** | NV | 134.2 | NV | **11** | | NA | | NA | | NA | | Yes |

Notes:
µg/L - micrograms per liter
DVQ - data validation qualifier
GWTP - Groundwater Treatment Plant
U - Non detect reported to the limit of detection
mg/L - milligrams per liter
J - estimated concentration between the detection limit and limit of quantitation and/or due to quality control discrepancy
*Influent sample not compared to discharge limits
** Calculated Effluent Limit

Grab samples are compared to the daily maximum and composite samples to the daily average.
ROD - Record of Decision
NA - not applicable or not analyzed
NV - No value
MCL - Maximum Contaminant Level

**Table 8. Bi-Weekly GWTP Analytical Sampling Results for February 2022**
**1st Quarter 2022 Groundwater Treatment Plant Report**
**Longhorn Army Ammunition Plant**

| | | | Sample Location | EFFLUENT - Monthly | | INFLUENT - Monthly* | | EFFLUENT - Biweekly | | EFFLUENT - Biweekly | | Does Concentration Meet Effluent Discharge Limits? (Yes/No) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Sample Identification | LH18/24-SP650_020222 | | LH18/24-SP140_020222 | | LH18/24-SP650_021022 | | LH18/24-SP650_022222 | | |
| | | | Lab Package | HS22020280 | | HS22020283 | | HS22020621 | | HS22021133 | | |
| | | | Sample Date | 2/2/2022 | | 2/2/2022 | | 2/10/2022 | | 2/22/2022 | | |
| | | | Sample Type | GRAB | | GRAB | | GRAB | | GRAB | | |
| | Effluent Limitation for Discharge (µg/L) per Table 2 of ROD | | | | | | | | | | | |
| | Daily Average Concentration | Daily Maximum Concentration | INF Pond MCL | Result | DVQ | Result | DVQ | Result | DVQ | Result | DVQ | |
| **VOLATILES** | **µg/L** | **µg/L** | **µg/L** | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | | |
| 1,1,1-Trichloroethane | 3,417 | 7,230 | 200 | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| 1,1,2-Trichloroethane | 102.5 | 216.9 | 5 | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| 1,1-Dichloroethane | 6,633 | 14,032 | NV | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| 1,1-Dichloroethene | 119 | 253 | 7 | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| 1,2-Dichloroethane | 85 | 181 | 5 | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| 1,2-Dichloropropane | NV | NV | 5 | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| Acetone | 1,132 | 2,395 | NV | < 2.0 | U | NA | | < 2.0 | U | < 2.0 | U | Yes |
| Benzene | 85 | 181 | 5 | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| Carbon Tetrachloride | 85 | 181 | 5 | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| Chlorobezene | 22,300 | 47,180 | 100 | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| Chloroform | 1,708 | 3,615 | NV | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| cis-1,2-Dichloroethene | NV | NV | 70 | **1.6** | | NA | | **1.4** | | **1.0** | J | Yes |
| Ethylbenzene | 26,954 | 57,025 | 700 | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| m,p-Xylenes | 39.5 | 83.6 | NV | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| Methylene Chloride | 803 | 1,699 | 5 | < 2.0 | U | NA | | < 2.0 | U | < 2.0 | U | Yes |
| o-Xylene | 39.5 | 83.6 | NV | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| Styrene | 2,829 | 5,987 | 100 | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| Tetrachloroethene | 85.4 | 180.7 | 5 | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| Toluene | 1,980 | 4,189 | 10 | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| Trichloroethene | 85 | 181 | 5 | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| Vinyl Chloride | 34 | 72 | 2 | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| **ANIONS** | **mg/L** | **mg/L** | **mg/L** | **mg/L** | | **mg/L** | | **mg/L** | | **mg/L** | | |
| Chloride | NV | NV | NV | NA | | NA | | **916** | | **863** | | NA |
| Sulfate | NV | NV | NV | NA | | NA | | **43.1** | | **28.9** | | NA |
| **PERCHLORATE** | **µg/L** | **µg/L** | **µg/L** | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | | |
| Perchlorate | 278 | 589 | 17 | < 0.0500 | U | **18,900** | | NA | | NA | | Yes |
| **METALS** | **mg/L** | **mg/L** | **mg/L** | **mg/L** | | **mg/L** | | **mg/L** | | **mg/L** | | |
| Hexavalent Chromium | 0.058 | 0.124 | NV | < 0.0100 | UJ | < 0.0100 | UJ | NA | | NA | | Yes |
| Barium | 1 | 2 | 2 | **0.838** | | NA | | NA | | NA | | Yes |
| Lead | 0.0022 | 0.0046 | 0.015 | < 0.00100 | U | NA | | NA | | NA | | Yes |
| Selenium | 0.0057 | 0.0120 | 0.05 | < 0.00250 | U | < 0.00250 | U | NA | | NA | | Yes |
| Silver | 0.0014 | 0.0030 | 0.1 | < 0.000500 | U | < 0.000500 | U | NA | | NA | | Yes |
| **SEMI-VOLATILES** | **µg/L** | **µg/L** | **µg/L** | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | | |
| 1,4-Dioxane** | NV | 134.2 | NV | **8** | | NA | | NA | | NA | | Yes |

Notes:

µg/L - micrograms per liter
mg/L - milligrams per liter
NV - No value
DVQ - data validation qualifier
ROD - Record of Decision
MCL - Maximum Contaminant Level
GWTP - Groundwater Treatment Plant
*Influent sample not compared to discharge limits
NA - not applicable or not analyzed
U - not detected and reported to the limit of detection
Grab samples are compared to the daily maximum and composite samples to the daily average.
** Calculated Effluent Limit
J - estimated concentration between the detection limit and limit of quantitation and/or due to quality control discrepancy
UJ - estimated non-detect due to quality control discrepancy

**Table 9. Bi-Weekly Analytical GWTP Sampling Results for March 2022**
**1st Quarter 2022 Groundwater Treatment Plant Report**
**Longhorn Army Ammunition Plant**

| | | | Sample Location | EFFLUENT - Monthly | | INFLUENT - Monthly* | | EFFLUENT - Biweekly | | EFFLUENT - Biweekly | | Does Concentration Meet Effluent Discharge Limits? (Yes/No) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Sample Identification | LH18/24-SP650_030122 | | LH18/24-SP140_030122 | | LH18/24-SP650_030822 | | LH18/24-SP650_032222 | | |
| | | | Lab Package | HS22030083 | | HS22030082 | | HS22030465 | | HS22031243 | | |
| | | | Sample Date | 3/1/2022 | | 3/1/2022 | | 3/8/2022 | | 3/22/2022 | | |
| | | | Sample Type | GRAB | | GRAB | | GRAB | | GRAB | | |
| | Effluent Limitation for Discharge (µg/L) per Table 2 of ROD | | | | | | | | | | | |
| | Daily Average Concentration | Daily Maximum Concentration | INF Pond MCL | Result | DVQ | Result | DVQ | Result | DVQ | Result | DVQ | |
| **VOLATILES** | **µg/L** | **µg/L** | **µg/L** | **µg/L** | | | | | | | | |
| 1,1,1-Trichloroethane | 3,417 | 7,230 | 200 | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| 1,1,2-Trichloroethane | 102.5 | 216.9 | 5 | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| 1,1-Dichloroethane | 6,633 | 14,032 | NV | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| 1,1-Dichloroethene | 119 | 253 | 7 | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| 1,2-Dichloroethane | 85 | 181 | 5 | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| 1,2-Dichloropropane | NV | NV | 5 | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| Acetone | 1,132 | 2,395 | NV | < 2.0 | U | NA | | < 2.0 | U | < 2.0 | U | Yes |
| Benzene | 85 | 181 | 5 | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| Carbon Tetrachloride | 85 | 181 | 5 | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| Chlorobenzene | 22,300 | 47,180 | 100 | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| Chloroform | 1,708 | 3,615 | NV | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| cis-1,2-Dichloroethene | NV | NV | 70 | **0.62** | J | NA | | **1.5** | | **1.2** | | Yes |
| Ethylbenzene | 26,954 | 57,025 | 700 | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| m,p-Xylenes | 39.5 | 83.6 | NV | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| Methylene Chloride | 803 | 1,699 | 5 | < 2.0 | U | NA | | <2.0 | U | < 2.0 | U | Yes |
| o-Xylene | 39.5 | 83.6 | NV | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| Styrene | 2,829 | 5,987 | 100 | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| Tetrachloroethene | 85.4 | 180.7 | 5 | < 1.0 | U | NA | | < 1.0 | U | < 1.0 | U | Yes |
| Toluene | 1,980 | 4,189 | 10 | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| Trichloroethene | 85 | 181 | 5 | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| Vinyl Chloride | 34 | 72 | 2 | < 0.50 | U | NA | | < 0.50 | U | < 0.50 | U | Yes |
| **ANIONS** | **mg/L** | **mg/L** | **mg/L** | **mg/L** | | **mg/L** | | **mg/L** | | **mg/L** | | |
| Chloride | NV | NV | NV | NA | | NA | | **853** | | **834** | | NA |
| Sulfate | NV | NV | NV | NA | | NA | | **32.6** | | **34.8** | | NA |
| **PERCHLORATE** | **µg/L** | **µg/L** | **µg/L** | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | | |
| Perchlorate | 278 | 589 | 17 | < 0.0500 | U | **16,800** | | **NA** | | **NA** | | Yes |
| **METALS** | **mg/L** | **mg/L** | **mg/L** | **mg/L** | | **mg/L** | | **mg/L** | | **mg/L** | | |
| Hexavalent Chromium | 0.058 | 0.124 | NV | < 0.0100 | U | < 0.0100 | U | NA | | NA | | Yes |
| Barium | 1 | 2 | 2 | **0.785** | | NA | | NA | | NA | | Yes |
| Lead | 0.0022 | 0.0046 | 0.015 | < 0.00100 | U | NA | | NA | | NA | | Yes |
| Selenium | 0.0057 | 0.0120 | 0.05 | < 0.00250 | U | < 0.00250 | U | NA | | NA | | Yes |
| Silver | 0.0014 | 0.0030 | 0.1 | < 0.000500 | U | < 0.000500 | U | NA | | NA | | Yes |
| **SEMI-VOLATILES** | **µg/L** | **µg/L** | **µg/L** | **µg/L** | | **µg/L** | | **µg/L** | | **µg/L** | | |
| 1,4-Dioxane** | NV | 134.2 | NV | **14** | | NA | | NA | | NA | | Yes |

Notes:
µg/L - micrograms per liter
DVQ - data validation qualifier
GWTP - Groundwater Treatment Plant
U - Non detect reported to the limit of detection
mg/L - milligrams per liter
J - estimated concentration between the detection limit and limit of quantitation and/or due to quality control discrepancy
*Influent sample not compared to discharge limits
** Calculated Effluent Limit
Grab samples are compared to the daily maximum and composite samples to the daily average.

ROD - Record of Decision
NA - not applicable or not analyzed
NV - No Value
MCL - Maximum Contaminant Level

**Table 10. Quarterly GWTP Analytical Sampling Results**
**1st Quarter 2022 Groundwater Treatment Plant Report**
**Longhorn Army Ammunition Plant**

| | | | Sample Location | EFFLUENT | | INFLUENT* | | Does Concentration Meet Discharge Limits? (Yes/No) |
|---|---|---|---|---|---|---|---|---|
| | | | Sample Identification | LH18/24-SP650_021522 | | LH18/24-SP140_021522 | | |
| | | | Lab Package | HS22020822 | | HS22020823 | | |
| | | | Sample Date | 2/15/2022 | | 2/15/2022 | | |
| | | | Sample Type | GRAB | | GRAB | | |
| | Effluent Limitation for Discharge (µg/L) per Protocol | | | | | | | |
| | Daily Average Concentration | Daily Maximum Concentration | INF Pond MCL | Result | DVQ | Result | DVQ | |
| **VOLATILES** | **µg/L** | **µg/L** | **µg/L** | **µg/L** | | **µg/L** | | |
| 1,1,1-Trichloroethane | 3,417 | 7,230 | 200 | < 0.50 | U | < 5.0 | U | Yes |
| 1,1,2-Trichloroethane | 102.5 | 216.9 | 5 | < 1.0 | U | < 10 | U | Yes |
| 1,1-Dichloroethane | 6,633 | 14,032 | NV | < 0.50 | U | < 5.0 | U | Yes |
| 1,1-Dichloroethene | 119 | 253 | 7 | < 0.50 | U | **24** | | Yes |
| 1,2-Dichloroethane | 85 | 181 | 5 | < 0.50 | U | **21** | | Yes |
| 1,2-Dichloropropane | NV | NV | 5 | < 1.0 | U | < 10 | U | Yes |
| Acetone | 1,132 | 2,395 | NV | < 2.0 | U | < 20 | U | Yes |
| Benzene | 85 | 181 | 5 | < 0.50 | U | < 5.0 | U | Yes |
| Carbon Tetrachloride | 85 | 181 | 5 | < 1.0 | U | **12** | | Yes |
| Chlorobenzene | 22,300 | 47,180 | 100 | < 1.0 | U | < 10 | U | Yes |
| Chloroform | 1,708 | 3,615 | NV | < 0.50 | U | < 5.0 | | Yes |
| cis-1,2-dichloroethene | NV | NV | 70 | **0.61** | J | **930** | | |
| Ethylbenzene | 26,954 | 57,025 | 700 | < 1.0 | U | < 10 | U | Yes |
| m,p-Xylenes | 39.5 | 83.6 | NV | < 1.0 | U | < 10 | U | Yes |
| Methylene Chloride | 803 | 1,699 | 5 | < 2.0 | U | **220** | | Yes |
| o-Xylene | 39.5 | 83.6 | NV | < 1.0 | U | < 10 | U | Yes |
| Styrene | 2,829 | 5,987 | 100 | < 1.0 | U | < 10 | U | Yes |
| Tetrachloroethene | 85.4 | 180.7 | 5 | < 1.0 | U | < 10 | U | Yes |
| Toluene | 1,980 | 4,189 | 10 | < 0.50 | U | < 5.0 | U | Yes |
| Trichloroethene | 85 | 181 | 5 | < 0.50 | U | **3,500** | | Yes |
| Vinyl Chloride | 34 | 72 | 2 | < 0.50 | U | **22** | | Yes |
| **ANIONS** | **mg/L** | **mg/L** | **mg/L** | **mg/L** | | **mg/L** | | |
| Chloride | NA | NA | NV | **878** | | **407** | | NA |
| Sulfate | NA | NA | NV | **41.7** | | **40.3** | | NA |
| **PERCHLORATE** | **µg/L** | **µg/L** | **µg/L** | **µg/L** | | **µg/L** | | |
| Perchlorate | 278 | 589 | 17 | < 0.0500 | U | **15,300** | | Yes |
| **METALS** | **mg/L** | **mg/L** | **mg/L** | **mg/L** | | **mg/L** | | |
| Aluminum | 0.777 | 1.644 | NV | **0.0254** | UB | **0.0720** | | Yes |
| Antimony | NV | NV | 0.006 | < 0.00100 | U | **0.00109** | J | NA |
| Arsenic | 0.365 | 0.772 | 0.01 | **0.000415** | J | **0.00131** | J | Yes |

**Table 10. Quarterly GWTP Analytical Sampling Results**
**1st Quarter 2022 Groundwater Treatment Plant Report**
**Longhorn Army Ammunition Plant**

| | | | Sample Location | EFFLUENT | | INFLUENT* | | Does Concentration Meet Discharge Limits? (Yes/No) |
|---|---|---|---|---|---|---|---|---|
| | | | Sample Identification | LH18/24-SP650_021522 | | LH18/24-SP140_021522 | | |
| | | | Lab Package | HS22020822 | | HS22020823 | | |
| | | | Sample Date | 2/15/2022 | | 2/15/2022 | | |
| | | | Sample Type | GRAB | | GRAB | | |
| | Effluent Limitation for Discharge (µg/L) per Protocol | | | | | | | |
| | Daily Average Concentration | Daily Maximum Concentration | INF Pond MCL | Result | DVQ | Result | DVQ | |
| Barium | 1 | 2 | 2 | **1.05** | | **0.491** | | Yes |
| Beryllium | NV | NV | 0.004 | < 0.000500 | U | < 0.000500 | U | NA |
| Cadmium | 0.0016 | 0.0034 | 0.005 | < 0.000500 | U | < 0.000500 | U | Yes |
| Calcium | NV | NV | NV | **66.5** | | **33.2** | | NA |
| Chromium | 0.355 | 0.752 | 0.1 | **0.00206** | J | **0.00354** | J | Yes |
| Cobalt | 5.433 | 11.495 | NV | **0.000898** | J | **0.00182** | J | Yes |
| Iron | 1.132 | 2.395 | NV | **0.159** | J | **0.260** | J | Yes |
| Lead | 0.0022 | 0.0046 | 0.015 | < 0.00100 | U | **0.00101** | J | Yes |
| Magnesium | NV | NV | NV | **17.7** | | **22.8** | | NA |
| Manganese | 7.323 | 15.494 | NV | **0.165** | | **0.110** | | Yes |
| Nickel | 0.087 | 0.184 | NV | 0.00254 | UB | **0.00950** | | Yes |
| Potassium | NV | NV | NV | **1.72** | | **1.35** | | NA |
| Selenium | 0.0057 | 0.012 | 0.05 | < 0.00250 | U | < 0.00250 | U | Yes |
| Silver | 0.0014 | 0.003 | NV | < 0.000500 | U | < 0.000500 | U | Yes |
| Sodium | NV | NV | NV | **579** | | **288** | | NA |
| Thallium | NV | NV | NV | < 0.000500 | U | < 0.000500 | U | NA |
| Vanadium | 1.698 | 3.592 | NV | **0.000900** | J | **0.00208** | J | Yes |
| Zinc | 0.146 | 0.31 | NV | **0.0257** | | **0.0344** | | Yes |
| Mercury | NV | NV | 0.002 | **0.0000580** | J | **0.0000540** | J | NA |
| **1,4-DIOXANE** | **µg/L** | **µg/L** | **µg/L** | **µg/L** | | **µg/L** | | |
| 1,4-Dioxane | NV | 134.2 | NV | **4.5** | | **12** | | Yes |
| **CHEMICAL OXYGEN DEMAND (COD)** | **mg/L** | **mg/L** | **mg/L** | **mg/L** | | **mg/L** | | |
| COD | NV | 200 | NV | **61.0** | | **14.0** | J | Yes |
| **OIL AND GREASE (O&G)** | **mg/L** | **mg/L** | **mg/L** | **mg/L** | | **mg/L** | | |
| O&G | NV | 15 | NV | < 1.00 | U | < 1.00 | U | Yes |

Notes:
µg/L - micrograms per liter
DVQ - data validation qualifier
Grab samples are compared to the daily maximum and composite samples to the daily average
* only Effluent sample is compared to discharge limits
J - Estimated concentration between the detection limit and limit of quantitation and/or due to quality control discrepancy
U - non detect and reported to the limit of detection
UB - considered an artifact of blank contamination
mg/L - milligrams per liter
GWTP - Groundwater Treatment Plant
NV - no value

# 3 QUALITY CONTROL

This report summarizes the data for samples collected during January, February, and March 2022. The samples were reviewed and validated in accordance with the guidelines in the *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (USEPA, January 2017); *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (USEPA, January 2017); and the quality control criteria specified in the *Basewide Uniform Federal Policy - Quality Assurance Project Plan Longhorn Army Ammunition Plant* which is in Appendix C of the *Final Installation-Wide Work Plan for Longhorn Army Ammunition Plant Karnack, Texas* (Bhate, May 2018).

The purpose of the sampling program is to evaluate the effectiveness of the groundwater pump and treat system, assess water quality within the ICT containment area, and assure compliance with the effluent discharge requirements of the Interim ROD. Quality control and quality assurance problems noted in the case narratives received from the laboratory are minor and do not affect the usability of the data for compliance at the GWTP. No sample results from the 1st Quarter of 2022 were rejected due to quality control problems.

ALS Environmental analyzed the compliance samples collected from the GWTP. Independent data verification and validation was performed by the Bhate Project Chemist as described in the Quality Control Summary Report in **Appendix D**. The laboratory reports for the GWTP are included in **Appendix C** (as a separate file on the CD). Air monitoring data is presented in **Appendix G**.

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# 4 TREATED GROUNDWATER DISCHARGED

Reinjection of groundwater in ICT 6 and ICT 9 was discontinued as of 15 July 2012. The last reinjection occurred on 24 May 2012, immediately prior to the scrubber system malfunction which caused GWTP operation to cease temporarily.

Treated groundwater that met the perchlorate PCL (17 µg/L) was discharged to the INF Pond in accordance with the Protocol for Discharging GWTP Effluent (**Appendix F**). Approximately, 297,445 gallons of treated groundwater was discharged from the GWTP to the INF Pond. Approximately, 190,898 gallons of treated groundwater was discharged from the GWTP directly to the Harrison Bayou. On 19 January 2022, an additional unintentional release from the INF pond to the Harrison Bayou, was observed during a site walk as part of the in-person January 2022 Monthly Manager's Meeting. The exact date of the release was undetermined. Based on staff gauging logs, an estimated 161,500 gallons of treated groundwater was released via the drain valve to the Harrison Bayou. The combined total volume discharged to Harrison Bayou in 1st Quarter 2022 was 352,398 gallons. **Table 4** summarizes daily volume from the INF Pond to the Harrison Bayou, the maximum flow rate allowed by chloride and sulfate concentrations, and the approximate volumes discharged for the 1st Quarter of 2022.

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# 5 AIR MONITORING

## 5.1 Summary of Air Monitoring Approach

Operation of the GWTP without air abatement was approved by the TCEQ and USEPA conditioned on collection of air monitoring data to determine the effect of GWTP operation on ambient air quality with respect to potential human health exposure risk. An Interim Air Monitoring Plan was developed by AECOM in August 2012 and used to implement the air monitoring program. The air monitoring program included sampling emission concentrations from the air stripper, ambient air at the GWTP, and ambient air downwind of the GWTP. Collection of air data occurred on a weekly basis from September 2012 through September 2013, on a monthly basis from September 2013 through September 2014, and on a quarterly basis since September 2014. The sampling program includes use of Summa canisters and a photoionization detector (PID) to measure vapor phase concentrations. The air stripper emission sample is collected as a grab sample while the ambient air samples are collected as composite samples. The GWTP sample is collected over 8 hours to represent a work day and the downwind sample is collected over 24 hours to represent potential exposure to an off-site receptor[1]. The downwind sample is collected at the closest downwind property boundary based on prevailing wind direction.

PID data (after system calibration) are collected each time the GWTP is operated and serve as a real-time indicator of ambient air conditions at and downwind of the GWTP. Correlations between definitive analytical air data and PID measurements were established and a means to calculate contaminant concentration from PID measurements was developed. A PID threshold of 0.4 parts per million by volume (ppmv) in ambient air was established, such that Summa canister measurements would occur when the PID threshold is exceeded.

The Summa canister samples are analyzed for VOCs using USEPA Method TO-15. The PID measurements are collected after instrument calibration. The air sampling results are summarized and reported to the USEPA and TCEQ in the GWTP quarterly reports; however, the air results are reviewed immediately upon receipt for the potential presence of any exceedances of ambient air concentrations. **Appendix G** (**Tables 1 through 3**) includes a comparison of ambient air concentrations with TCEQ Air Monitoring Comparison Values (AMCVs) or the short-term Effects Screening Levels (ESLs) for chemicals with no published AMCVs, calculations of emission rates from the emission point, and a compilation of PID results and calibration records. The air monitoring results to date indicate that all ambient air concentrations are lower than the

[1] Off-site receptor - Any recreational area, residence, commercial/industrial facility, or other normally occupied structures not used solely by the owner or operator of the facilities or the owner of the site upon which the facilities are located. Measurements of distances to determine compliance with this distance restriction must be taken toward structures that are in use as of the date that a notification is filed with the commission.

AMCVs or ESLs. The stripper stack sample concentrations are used to calculate emission rates in pounds per hour (lbs/hr) and tons per year (tpy). The calculated emission rates in lbs/hr are then compared to the allowable emission rates per 30 Texas Administrative Code (TAC) Section (§)106.533(f)(1). The emission rates have been lower than the allowable emission rates to the conservatively-selected off-site receptor. The calculated emission rate in tpy is compared to the allowable limit of 5 tpy per chemical. All emission rates have been lower than the allowable emission rates.

The air monitoring results from the first few months of operation between September and November 2012 were compiled and submitted in a separate report (December 2012) (along with validated data) to TCEQ to demonstrate compliance with Texas Permit by Rule emission standards. Approval of the analytical results and concurrence that the site will continue to meet Title 30 TAC §106.533 without the use of air abatement using a catalytic oxidation system was obtained from the TCEQ via email on 22 February 2013.

On 18 February 2013, AECOM presented analysis of the approach applicable to obtaining a variance for operating the GWTP without air abatement equipment to the TCEQ and USEPA. The analysis indicated that the use of an Explanation of Significant Difference (ESD) was the appropriate approach for the site. Approval of use of an ESD was obtained from the USEPA via email on 21 March 2013. The ESD was developed, reviewed, and accepted by USEPA and TCEQ. The ESD was signed by the designated parties on 3 April 2014, and concurrence from the TCEQ was obtained in a letter dated 16 April 2014.

## 5.2 Air Monitoring Results for the 1st Quarter of 2022

During the 1st Quarter of 2022, air sampling was completed on 7 - 8 March 2022. The laboratory data package is presented in **Appendix E.** A summary of the air sampling results is presented in **Appendix G (Tables 1 through 3)**. All results met the criteria described in Section 5.1.

### 5.2.1 Summa Canister Monitoring Results

Air sampling was conducted using Summa canisters on 7 – 8 March 2022. The samples were collected and analyzed as described in Section 5.1 and per the Interim Air Monitoring Plan (AECOM, August 2012). The analytical results were then compiled in spreadsheets where calculations were completed and comparisons to applicable criteria were made as described in Section 5.1.

#### 5.2.1.1 Ambient Air Results

In March 2022, acetone; benzene; methylene chloride (MC); trichloroethene; n-hexane; toluene; ethylbenzene; m,p-xylenes; o-xylene; propene (C3H6); dichlorodifluoromethane (CFC 12); ethanol; trichlorofluoromethane (CFC 11); trichlorotrifluoroethane (CFC 113); and d-limonene were detected in the ambient air at the GWTP.

In March 2022, n-hexane; propene (C3H6); dichlorodifluoromethane (CFC 12); and trichlorofluoromethane (CFC 11) were detected in the ambient air downwind of the GWTP.

Compounds originating at the GWTP would be expected to have lower concentrations in the downwind sampling location than at the GWTP sampling location. However, the fact that the compounds n-hexane; propene (C3H6); dichlorodifluoromethane (CFC 12); and trichlorofluoromethane (CFC 11) were detected in downwind ambient air, suggests that they are present in the ambient (background) air.

The ambient air results during the quarter met the ambient air criteria, as presented in **Table 1** within **Appendix G**.

#### 5.2.1.2 Air Stripper Effluent Results

The VOCs present in groundwater that are removed via the air stripper include 1,1-DCE; 1,2-DCA; cis-1,2-DCE; MC; trichloroethene (TCE); tetrachloroethene (PCE); vinyl chloride (VC); and trichlorotrifluoroethane. These compounds are frequently reported in groundwater at the site, with the exception of trichlorotrifluoroethane which is not typically a groundwater analyte at LHAAP. Trichlorotrifluoroethane, however, appears to be present in groundwater as indicated by limited analysis conducted in December 2013, where it was detected in several wells, and from historical accounts. Many of the chemicals that are reported in ambient air are not detected in the air stripper effluent. This is likely because the reporting limit for the air stripper effluent is higher than the reporting limit for the ambient air samples or the source for some of these chemicals are extraneous to groundwater.

In March 2022, 1,1-DCE; 1,2-DCA; chloroform; cis-1,2-DCE; MC; TCE; VC; and trichlorotrifluoroethane (CFC 113) were detected in air stripper effluent. The highest concentrations were for TCE. However, the air stripper effluent concentrations were below the emission criteria, as presented in **Table 2** within **Appendix G**.

### 5.2.2 PID Results

Along with collection of Summa canister air samples, PID measurements from the same sources/areas were collected and recorded. These simultaneous measurements allowed establishing a correlation between PID readings and VOC concentrations in the Summa canister air samples. Conversion from PID to compound concentrations was established by TCEQ in 30 TAC §106.533(h). The TCEQ equation allows use of a PID to determine individual compound concentrations if the distribution of chemicals in the ambient air is known or assumed. This allows the use of a PID as a tool to measure VOC concentrations and convert the PID results to estimates of compound concentrations. All ambient air PID measurements collected during this quarter were reported at 0.0 parts per million. No VOCs were detected at the GWTP ambient air or downwind PID locations. During 1st Quarter 2022, VOC detections at the air stripper PID location ranged between 20.3 and 24.4 parts per million at each sampling event. The results of the PID readings collected during GWTP operations are presented in **Table 3** within **Appendix G**.

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# 6 COMMENTS AND RESPONSES

The 4th Quarter (October - December) 2021 GWTP Evaluation Report was submitted to TCEQ and USEPA on 25 May 2022. No comments have been received to date.

# APPENDIX A
# ICT LAYOUT AND GWTP PROCESS FLOW DIAGRAM

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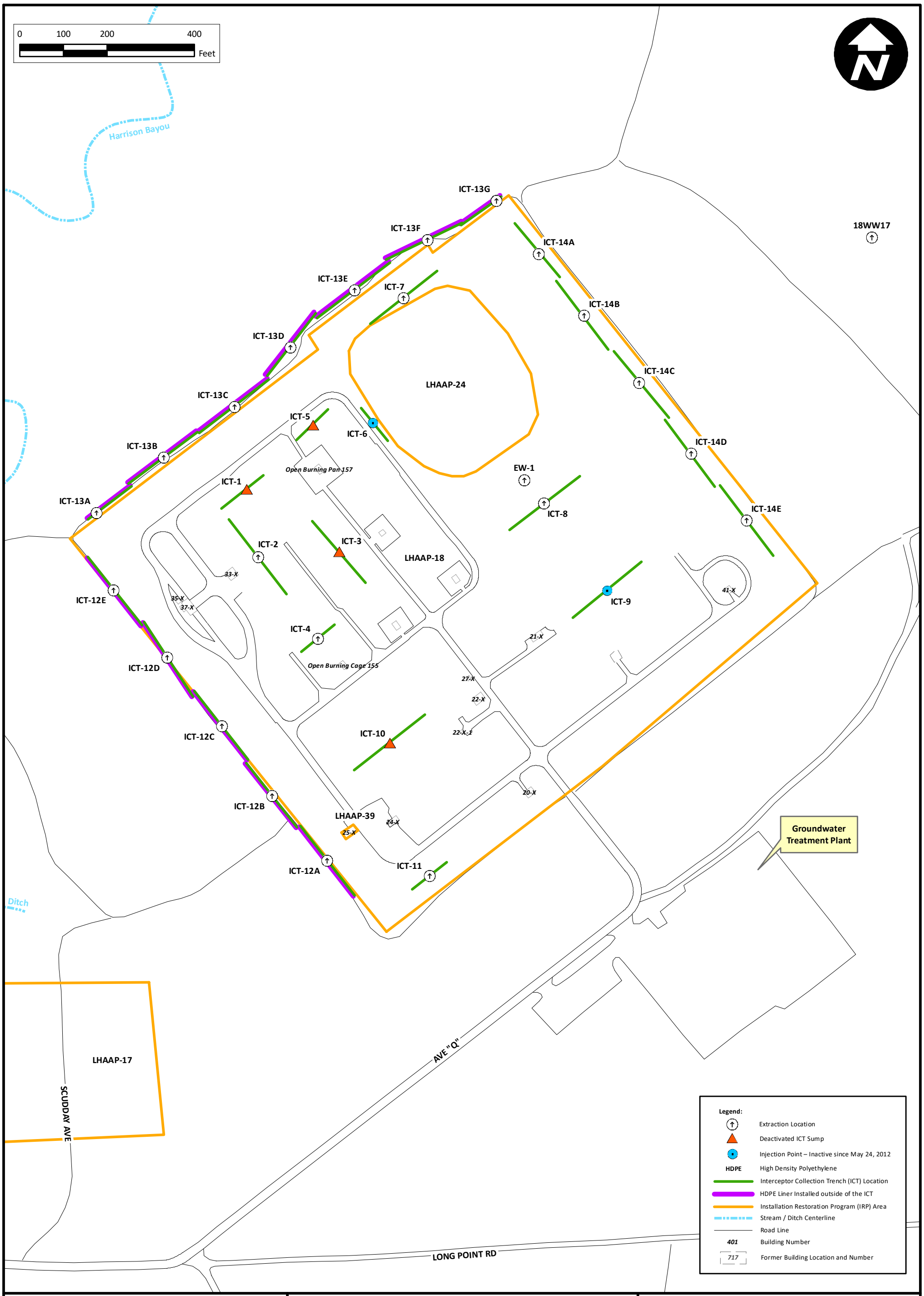


bhate

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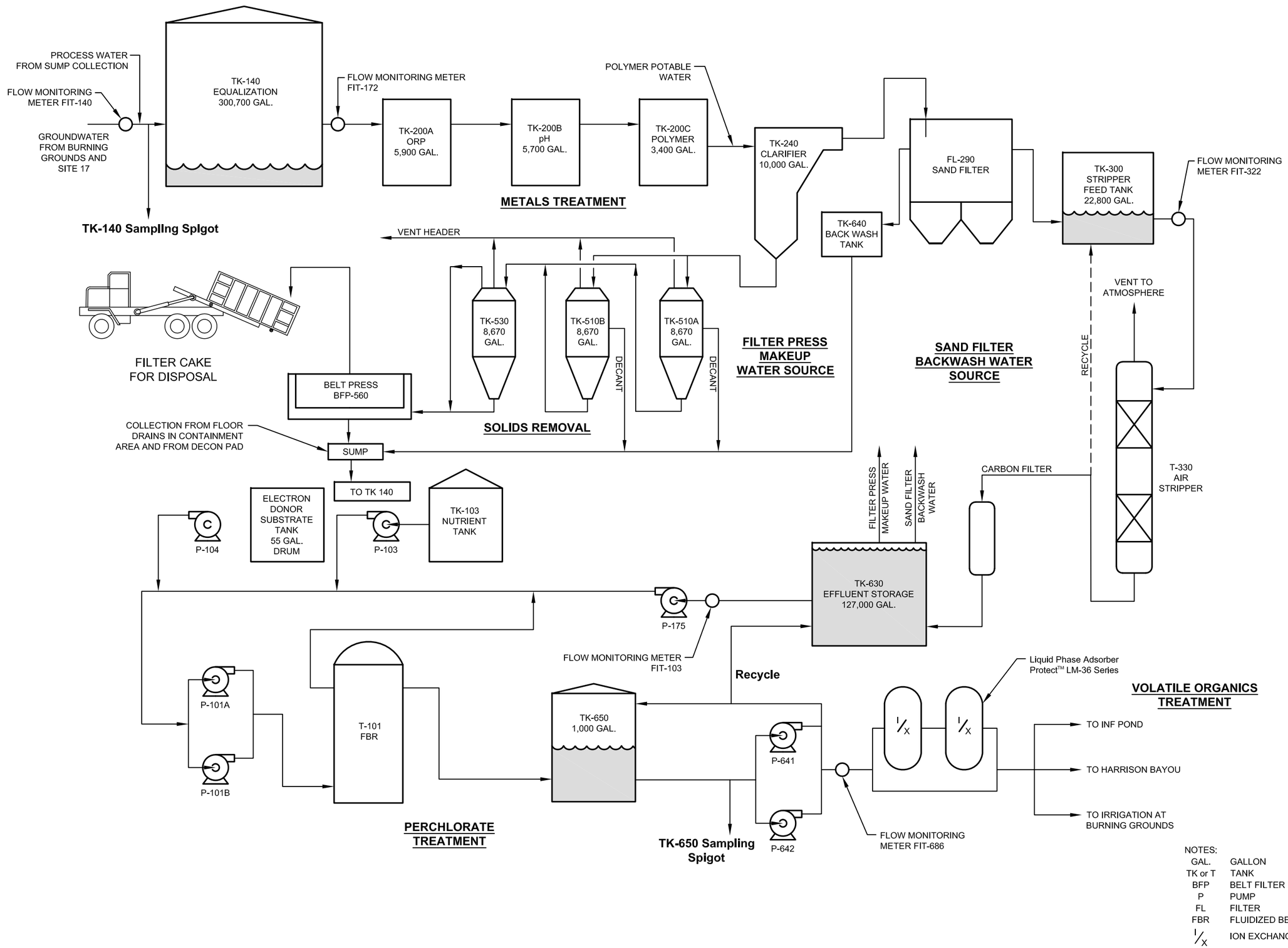
Quarterly Evaluation Report
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

| PROJECT NO: | SCALE: | DATE: | DRAWN BY: |
|---|---|---|---|
| NWO1312.0150 | As Shown | 5/26/2022 | MRM |

**ICT Layout Map**

**Figure A-1**

01116975




NOTES:

| | |
|---|---|
| GAL. | GALLON |
| TK or T | TANK |
| BFP | BELT FILTER PRESS |
| P | PUMP |
| FL | FILTER |
| FBR | FLUIDIZED BED REACTOR |
| I/X | ION EXCHANGE |

**Process Flow Diagram**

**Figure A-2**

Quarterly Evaluation Report
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

DRAWN BY: MRM

DATE: 5/26/2022

SCALE: Not to Scale

PROJECT NO: NW01312.0150

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## Table A-1: ICTs Completion Depths

| ICT | TOC Elevation | Total Depth | Sump Elevation | Comment |
|---|---|---|---|---|
| 1 | 186.07 | 22.5 | 163.57 | Taken out of service in 2007. |
| 2 | 185.02 | 29.5 | 155.52 | |
| 3 | 192.27 | 37.75 | 154.52 | Taken out of service in 2007. |
| 4 | 193.51 | 37.5 | 156.01 | |
| 5 | 192.67 | 35 | 157.67 | Taken out of service in 2007. |
| 6 | 197.30 | 40.75 | 156.55 | Converted to infiltration in 2007. Ceased reinjection in July 2012. |
| 7 | 198.03 | 32.33 | 165.7 | |
| 8 | 198.97 | 44.5 | 154.47 | |
| 9 | 197.64 | 45.5 | 152.14 | Converted to infiltration in 2007. Ceased reinjection in July 2012. |
| 10 | 198.07 | 45.42 | 152.65 | Taken out of service in 2007. |
| 11 | 198.01 | 43.33 | 154.68 | |
| 12A | 189.06 | 31.5 | 157.56 | Taken out of service in 2007. Reinstituted in December 2012. |
| 12B | 191.97 | 36.25 | 155.72 | |
| 12C | 193.90 | 34.33 | 159.57 | |
| 12D | 185.64 | 33.75 | 151.89 | |
| 12E | 183.38 | 32.25 | 151.13 | |
| 13A | 182.59 | 28.17 | 154.42 | |
| 13B | 184.72 | 29.58 | 155.14 | |
| 13C | 186.13 | 28.17 | 157.96 | |
| 13D | 186.72 | 26.17 | 160.55 | |
| 13E | 191.79 | 27.08 | 164.71 | |
| 13F | 197.81 | 32.33 | 165.48 | |
| 13G | 197.03 | 27.25 | 169.78 | Taken out of service in 2008. |
| 14A | 196.8 | 43.00 | 153.8 | |
| 14B | 197.61 | 43.42 | 154.19 | |
| 14C | 197.86 | 41.33 | 156.53 | |
| 14D | 198.47 | 44.25 | 154.22 | |
| 14E | 198.47 | 43.08 | 155.39 | |

Note(s):

ICT - interception-collection trench

TOC - top of casing, measuring point for groundwater elevations

Elevations are reported as feet above mean sea level.

Total depths are reported as feet below TOC.

Sump elevation calculated by subtracting total depth from TOC elevation.

ICTs were installed in 1998.

ICT 12A was replaced on December 5, 2012, and extraction has resumed.

TOC Elevations and total depth measured in October 2003, 4th Quarter 2003, Groundwater Treatment Plant Report.

# Table A-2: Extraction Equipment Maintenance Since 2011

**LHAAP-18/24**

| Well I.D. | Replaced Parts | Date | Contractor |
|---|---|---|---|
| ICT 14E | Pump | 3/15/2012 | Shaw |
| ICT 14D | Pump, motor, level probes | 3/16/2012 | Shaw |
| ICT 14B | Pump, level probes, level probe wire | 3/16/2012 | Shaw |
| ICT 14A | Pump, motor, level probes, level probe wire | 3/17/2012 | Shaw |
| ICT 2 | Pump, motor | 3/17/2012 | Shaw |
| ICT 13D | Pump | 3/19/2012 | Shaw |
| ICT 13B | Pump | 3/20/2012 | Shaw |
| ICT 14E | Pump, motor, broken piping | 11/19/2012 | AECOM |
| ICT 13C | Pump | 11/20/2012 | AECOM |
| ICT13E | Pump | 11/20/2012 | AECOM |
| ICT 12A | Pump, motor, wiring harness, level probes, level probe wire | 12/5/2012 | AECOM |
| ICT 7 | Pump, motor, wiring harness, level probes | 12/6/2012 | AECOM |
| | | | |
| ICT2 | Pump | 6/10/2013 | AECOM |
| ICT 13C | Pump | 6/11/2013 | AECOM |
| ICT 13D | Pump | 6/12/2013 | AECOM |
| ICT 14E | Pump rebuilt | 6/15/2013 | AECOM |
| ICT 14E | Replaced low level switch | 6/19/2013 | AECOM |
| | | | |
| ICT 13C | Pump, wiring harness, flow meter | 4/15/2014 | AECOM |
| ICT 14D | Repaired level probes | 6/24/2014 | AECOM |
| ICT 14E | Repaired level probes | 6/24/2014 | AECOM |
| ICT 14E | Pump and motor troubleshooting | 6/26/2014 | AECOM |
| | | | |
| ICT2, 13F, 14C, 14D, 14E | Repaired level probes | 7/7/2014 | AECOM |
| ICT 12E | Pump, motor | 10/2/2014 | AECOM |
| ICT 12E | Wiring harness, fixed leak | 10/8/2014 | AECOM |
| ICT 12E | Level probes | 10/9/2014 | AECOM |
| ICT13A | Pump, piping | 10/15/2014 | AECOM |
| ICT 12E | Repaired leaking fittings | 10/16/2014 | AECOM |
| | | | |
| ICT 11 | 1" tee and 1" elbow | 1/13/2015 | AECOM |
| ICT 12B | Flow meter | 1/13/2015 | AECOM |
| ICT 7 | 1" tee, repaired 1" pipe | 1/13/2015 | AECOM |
| ICT 13A | Flow meter | 1/15/2015 | AECOM |
| ICT 13B | Pump | 1/15/2015 | AECOM |
| ICT 13C | Pump | 1/16/2015 | AECOM |
| ICT 7 | Low level probe | 1/16/2015 | AECOM |
| ICT 13D | Pump, level probes | 1/17/2015 | AECOM |
| ICT 14C | Low level probe | 1/17/2015 | AECOM |
| ICT 14C | Low level probe | 1/29/2015 | AECOM |
| ICT 14D | Low level probe | 1/29/2015 | AECOM |
| ICT 13D | Level probes | 1/29/2015 | AECOM |
| ICT 2 | Pump | 1/30/2015 | AECOM |
| ICT 8 | Fuse | 3/2/2015 | AECOM |
| ICT 8 | Fuse | 3/9/2015 | AECOM |
| ICT 12E | Flow meter | 3/13/2015 | AECOM |
| ICT 13D | Union | 3/13/2015 | AECOM |
| ICT 14C | Cleaned level probes | 4/1/2015 | AECOM |
| ICT 14D | Cleaned level probes | 4/1/2015 | AECOM |
| ICT 13A | Cleaned level probes | 4/21/2015 | AECOM |
| ICT 14C | Cleaned level probes | 4/21/2015 | AECOM |
| ICT 8 | Low level probe | 7/24/2015 | AECOM |
| ICT 13C | Installed New Pump | 7/28/2015 | AECOM |

## Table A-2: Extraction Equipment Maintenance Since 2011

| Well I.D. | Replaced Parts | Date | Contractor |
|---|---|---|---|
| ICT 14C | Installed New Pump and Electric Motor | 7/29/2015 | AECOM |
| ICT 14E | Installed New Pump and Electric Motor | 7/31/2015 | AECOM |
| ICT 12E | Repaired wiring | 8/12/2015 | AECOM |
| ICT 13E | Replaced high and low level probes | 8/12/2015 | AECOM |
| ICT 2 | Installed Rebuilt Pump | 9/9/2015 | AECOM |
| ICT 12 E, ICT 14E | Replaced high level probe and wiring | 9/15/2015 | AECOM |
| ICT 13A | Installed new pump | 12/23/2015 | AECOM |
| ICT 13B | Installed new pump | 12/24/2015 | AECOM |
| | | | |
| ICT 13D | Replaced high level probe | 2/11/2016 | Aerotek |
| ICT 14C | Replace low level probe on ICT 14C | 2/15/2016 | Aerotek |
| ICT 8 | Installed new pump and electric motor | 2/19/2016 | Aerotek |
| ICT 14C | Repaired piping leak | 3/10/2016 | Aerotek |
| ICT 14E | Installed high and low level probes, level probe wire | 3/22/2016 | Aerotek |
| ICT 13D, ICT 14B | Installed high and low level probes, level probe wire | 3/24/2016 | Aerotek |
| ICT 14B | Installed new pump and electric motor | 3/31/2016 | Aerotek |
| ICT 14C | Installed new low level probe | 4/20/2016 | Aerotek |
| ICT 12B | Installed new mechanical flow meter | 6/16/2016 | Aerotek |
| ICT 13C | Installed rebuilt pump and new flow meter | 8/10/2016 | Aerotek |
| ICT 13A | Installed rebuilt pump, new flow meter, and new 1" unions | 8/24/2016 | Aerotek |
| ICT 14E | Installed new mechanical flow meter | 8/26/2016 | Aerotek |
| ICT 12C | Repair flow meter | 8/30/2016 | Aerotek |
| ICT 2 | Install rebuilt pump and new flow meter | 8/31/2016 | Aerotek |
| ICT 14C | Clean and adjust level probes | 9/7/2016 | Aerotek |
| ICT 14C | Replaced level probes | 9/12/2016 | Aerotek |
| ICT 14C | Installed new level probe wire and level probes | 9/21/2016 | Aerotek |
| ICT 12C | Installed rebuilt pump, new electric motor, new wiring harness, new level probe wire, and new level probes | 9/27/2016 | Aerotek |
| ICT 14C | Cleaned and adjusted level probes | 10/14/2016 | Aerotek |
| ICT 13C | Cleaned and adjusted level probes | 10/21/2016 | Aerotek |
| ICT 13B | Installed rebuilt pump | 10/25/2016 | Aerotek |
| ICT 14D | Installed rebuilt pump | 10/27/2016 | Aerotek |
| ICT 13C | Replace low level probe | 11/8/2016 | Aerotek |
| ICT 13B | Replace relay base plate | 11/8/2016 | Aerotek |
| ICT 13E | Clean and adjust low level probe | 11/15/2016 | Aerotek |
| ICT 13B | Replace broken relay base plate and bad level probe wire | 11/17/2016 | Aerotek |
| ICT 13C | Clean & repair leaking flow meter | 11/18/2016 | Aerotek |
| ICT 13B | Clean & adjust low level probe | 11/18/2016 | Aerotek |
| ICT 13A, 13B, & 13E | Clean and adjust low level probes | 12/2/2016 | Aerotek |
| | | | |
| ICT 13C & 14C | Pulled piping and pumps | 2/8/2017 | Aerotek |
| ICT 14C | Installed new electric motor | 2/8/2017 | Aerotek |
| ICT 13C & 14C | Installed rebuilt grundfos pumps | 2/8/2017 | Aerotek |
| ICT 7, 13A, & 14D | Repaired sample ports | 2/9/2017 | Aerotek |
| ICT 13B & 14E | Cleaned and adjusted low level probes | 3/30/2017 | Aerotek |
| ICT 13B & 13F | Installed new flow meters | 3/30/2017 | Aerotek |
| ICT 12B | Repair flow meter | 4/13/2017 | Aerotek |
| ICT 12C | Replace broken 1" tee | 5/1/2017 | Aerotek |
| ICT 11 | Installed new manual flow meter | 5/5/2017 | Aerotek |
| ICT 2 | Installed new flow meter | 5/9/2017 | Aerotek |
| ICT 14C & 14D | Cleaned and adjusted low level probes | 5/31/2017 | Aerotek |
| ICT 14C | Cleaned and adjusted low level probe | 6/27/2017 | Aerotek |
| ICT 8 | Clean low level probe | 7/11/2017 | Aerotek |
| ICT 2 & 14D | Cleaned and replaced level probes | 7/17/2017 | Aerotek |
| ICT 14C | Cleaned low level probe | 7/24/2017 | Aerotek |

## Table A-2: Extraction Equipment Maintenance Since 2011

| Well I.D. | Replaced Parts | Date | Contractor |
|---|---|---|---|
| ICT 13A | Installed new pump and flow meter | 8/8/2017 | Aerotek |
| ICT 13C & 13B | Installed new pump and flow meter | 8/9/2017 | Aerotek |
| ICT 13B | Installed new low level probe | 8/10/2017 | Aerotek |
| ICT 11 | Installed new pump and flow meter | 8/11/2017 | Aerotek |
| ICT 4 | Replaced low level probe | 8/11/2017 | Aerotek |
| ICT 2 | Installed rebuilt pump | 9/19/2017 | Aerotek |
| ICT 13D | Adjusted level probes | 9/22/2017 | Aerotek |
| ICT 14C | Cleaned level probes | 10/11/2017 | Bhate |
| ICT 13E | Clean and adjust level probes | 10/24/2017 | Bhate |
| ICT 12B | Adjust level probes | 11/15/2017 | Bhate |
| ICT 14D | Cleaned level probes | 11/15/2017 | Bhate |
| ICT 8 | Clean and adjust level probes | 11/28/2017 | Bhate |
| ICT 2 | Cleaned level probes | 12/20/2017 | Bhate |
| ICT 13C | Install new flow meter | 1/30/2018 | Bhate |
| ICT 14C | Cleaned level probes | 1/30/2018 | Bhate |
| ICT 13C | Cleaned & adjusted level probes | 2/1/2018 | Bhate |
| ICT 13B | Repair broken 1" union | 2/1/2018 | Bhate |
| ICT 14A | Repair 2 broken 1" elbows & lower high level probe | 2/1/2018 | Bhate |
| ICT 14B | Repair broken 1" tee & lower high level probe | 2/1/2018 | Bhate |
| ICT 14D | Install new flow meter | 2/8/2018 | Bhate |
| ICT 8 | Replace broken 1" tee & clened level probes | 2/8/2018 | Bhate |
| ICT 14D | Cleaned level probes | 2/28/2018 | Bhate |
| ICT 14C | Replace low level probe | 2/28/2018 | Bhate |
| ICT 13B | Cleaned level probes | 2/28/2018 | Bhate |
| ICT 13A | Install new motor & replace leaking 1" union | 3/14/2018 | Bhate |
| ICT 13C | Cleaned & adjusted level probes | 3/21/2018 | Bhate |
| ICT 12B | Replace broken 1" elbow & install new flow meter | 3/21/2018 | Bhate |
| ICT 2 | Install new pump | 3/22/2018 | Bhate |
| ICT 13B | Replaced level probes | 3/30/2018 | Bhate |
| ICT 14E | Lower high level probe | 3/30/2018 | Bhate |
| ICT 14C | Cleaned level probes | 4/27/2018 | Bhate |
| ICT 11 | Install new breaker | 4/27/2018 | Bhate |
| ICT 14E | Cleaned level probes | 6/7/2018 | Bhate |
| ICT 12C | Cleaned level probes | 6/7/2018 | Bhate |
| EW 01 | Cleaned level probes | 6/7/2018 | Bhate |
| ICT 14E | Replaced level probes | 6/8/2018 | Bhate |
| ICT 11 | Install new electrical wire from breaker to well | 6/14/2018 | Bhate |
| ICT 12B | Replaced pump | 6/25/2018 | Bhate |
| ICT 14E | Cleaned level probes | 6/26/2018 | Bhate |
| ICT 8 | Cleaned level probes | 6/26/2018 | Bhate |
| ICT 14C | Replaced pump | 6/27/2018 | Bhate |
| EW01 | Replaced level probes | 9/12/2018 | Bhate |
| ICT 7 | Cleaned level probes | 9/12/2018 | Bhate |
| ICT 12C | Replaced low level probe wire and probe | 9/12/2018 | Bhate |
| ICT 14D | Replaced high level probe wire & probe | 9/13/2018 | Bhate |
| ICT 12B | Replaced high and low level probe wires & probes | 9/13/2018 | Bhate |
| ICT 12B | Replaced electrical relay and relay base plate | 9/13/2018 | Bhate |
| ICT 14C | Cleaned level probes | 9/13/2018 | Bhate |
| ICT 13E | Replaced flow meter | 9/14/2018 | Bhate |
| ICT 14D | Replace low level probe | 10/31/2018 | Bhate |
| ICT 8 | Cleaned level probes | 10/31/2018 | Bhate |
| ICT 14C | Cleaned level probes | 10/31/2018 | Bhate |
| ICT 13A | Replace broken 1" Tee | 12/12/2018 | Bhate |
| ICT 14C | Cleaned level probes | 12/12/2018 | Bhate |
| ICT 13A | Install new flow meters | 2/14/2019 | Bhate |

## Table A-2: Extraction Equipment Maintenance Since 2011

| Well I.D. | Replaced Parts | Date | Contractor |
|---|---|---|---|
| ICT 12D | Replace pump & motor | 3/6/2019 | Bhate |
| ICT 13C | Replace pump | 3/8/2019 | Bhate |
| ICT 2 | Replace pump & flow meter | 3/11/2019 | Bhate |
| ICT 14C | Replace pump & motor | 3/12/2019 | Bhate |
| ICT 14D | Replace pump | 3/12/2019 | Bhate |
| ICT 14E | Replace pump, seal plate & level probes | 3/14/2019 | Bhate |
| ICT 14A | Replace pump and repair leaking 1" pipe | 3/15/2019 | Bhate |
| ICT 13C | Lower high level probe | 3/22/2019 | Bhate |
| ICT 14A | Lower high level probe | 3/22/2019 | Bhate |
| EW-01 | Replace pump | 3/29/2019 | Bhate |
| ICT 8 | Clean level probes | 4/1/2019 | Bhate |
| ICT 12C | Clean level probes | 4/1/2019 | Bhate |
| ICT 13D | Clean level probes | 4/1/2019 | Bhate |
| ICT 14E | Replaced bad relay | 4/2/2019 | Bhate |
| ICT 12A | Replace flow meter | 4/3/2019 | Bhate |
| ICT 13F | Replace flow meter | 4/3/2019 | Bhate |
| ICT 13D | Replace low level probe | 4/3/2019 | Bhate |
| ICT 13C | Clean level probes | 5/8/2019 | Bhate |
| ICT 14 C | Clean level probes | 5/8/2019 | Bhate |
| ICT 12D | Replace bad relay | 5/8/2019 | Bhate |
| ICT 13A | Replace pump | 7/10/2019 | Bhate |
| ICT 13D | Replace pump | 7/17/2019 | Bhate |
| ICT 14C | Clean level probes | 9/25/2019 | Bhate |
| ICT 14D | Clean level probes | 9/25/2019 | Bhate |
| ICT 12D | Clean level probes | 10/2/2019 | Bhate |
| ICT 13B | Clean level probes | 10/2/2019 | Bhate |
| ICT 13C | Clean level probes | 10/2/2019 | Bhate |
| ICT 14E | Clean level probes | 10/2/2019 | Bhate |
| 18WW17 | Install double wall pipe | 10/28/2019 | Bhate |
| ICT 14C | Clean level probes | 4/16/2020 | Bhate |
| ICT 12B | Replace coil in electrical panel | 5/5/2020 | Bhate |
| ICT 14D | Replace coil in electrical panel | 5/5/2020 | Bhate |
| ICT 11 | Replace broken 1" union | 5/12/2020 | Bhate |
| ICT 13E | Replace broken 1" union | 5/12/2020 | Bhate |
| ICT 14A | Replace broken 1" tee | 5/12/2020 | Bhate |
| ICT 14C | Clean level probes | 5/12/2020 | Bhate |
| ICT 14A | Clean level probes | 5/12/2020 | Bhate |
| ICT 7 | Clean level probes | 5/12/2020 | Bhate |
| ICT 13C | Replace pump | 5/13/2020 | Bhate |
| ICT 13C | Replace broken 1" union and 1" nipple | 5/13/2020 | Bhate |
| ICT 13B | Replace pump | 5/19/2020 | Bhate |
| ICT 13B | Replace flow meter | 5/19/2020 | Bhate |
| ICT 2 | Replace pump | 5/20/2020 | Bhate |
| ICT 4 | Replace flow meter | 9/29/2020 | Bhate |
| ICT 8 | Replace flow meter | 9/29/2020 | Bhate |
| ICT 12C | Repaired flow meter | 9/29/2020 | Bhate |
| ICT 13C | Replace flow meter | 9/30/2020 | Bhate |
| ICT 14B | Replace flow meter | 9/30/2020 | Bhate |
| ICT 7 | Replace flow meter | 9/30/2020 | Bhate |
| ICT 14E | Replace pump | 10/6/2020 | Bhate |
| ICT 14C | Replace pump and motor | 10/7/2020 | Bhate |
| 18WW17 | Replace bad coil | 12/9/2020 | Bhate |
| ICT 14A | Electrical problem repaired | 12/15/2020 | Bhate |
| ICT 13F | Electrical problem repaired | 12/15/2020 | Bhate |
| ICT 8 | Clean level probes | 12/16/2020 | Bhate |

## Table A-2: Extraction Equipment Maintenance Since 2011

| Well I.D. | Replaced Parts | Date | Contractor |
|---|---|---|---|
| ICT 14C | Clean level probes | 12/16/2020 | Bhate |
| ICT 14B | Replace blown fuse | 1/26/2021 | Bhate |
| ICT 13A | Replace pump | 1/27/2021 | Bhate |
| ICT 13D | Replace Pump & motor | 1/27/2021 | Bhate |
| ICT 2 | Replace pump & flowmeter | 2/9/2021 | Bhate |
| ICT 12E | Replace pump | 2/9/2021 | Bhate |
| ICT14A | Replace broken 1" tee | 3/3/2021 | Bhate |
| ICT 8 | Replaced pump and repaired wiring harness | 4/1/2021 | Bhate |
| ICT 14E | Replaced pump and motor | 5/1/2021 | Bhate |
| ICT 14D | Replaced pump | 5/1/2021 | Bhate |
| ICT 14C | Replaced pump | 5/1/2021 | Bhate |
| ICT 7 | Replaced blown fuse | 9/7/2021 | Bhate |
| ICT 13A | Replace breaker | 10/5/2021 | Bloc Design |
| ICT 12A | Clean level probes | 10/20/2021 | Bhate |
| ICT 8 | Replace low level probe | 10/20/2021 | Bhate |
| ICT 2 | Replace flow meter | 2/16/2022 | Bhate |
| ICT 7 | Replace flow meter | 2/16/2022 | Bhate |
| ICT 11 | Replace flow meter nipple | 2/16/2022 | Bhate |
| ICT 14E | Replace flow meter nipple | 2/16/2022 | Bhate |
| ICT 13C | Replace pump and flow meter | 3/10/2022 | Bhate |
| ICT 13A | Replacement flow meter | 3/10/2022 | Bhate |
| ICT 12B | Replace flow meter | 3/15/2022 | Bhate |
| ICT 12C | Replace flow meter | 3/15/2022 | Bhate |
| ICT 8 | Replace motor and pump | 3/23/2022 | Bhate |
| ICT 14D | Replace motor and pump | 3/23/2022 | Bhate |
| ICT 14C | Replace motor | 3/23/2022 | Bhate |
| ICT 12D | Replace pump, motor, and wiring harness | 3/30/2022 | Bhate |
| | **LHAAP-16** | | |
| **Well I.D.** | **Replaced Parts** | **Date** | **Contractor** |
| EW08 | New pump | 2/28/2011 | Shaw |
| EW01 | Rebuild pump | 8/25/2011 | Shaw |
| EW06 | Rebuild pump | 8/25/2011 | Shaw |
| EW02 | Rebuild pump | 2/12/2012 | Shaw |
| EW03 | Rebuild pump | 2/12/2012 | Shaw |
| EW08 | Rebuild pump | 11/8/2012 | AECOM |
| EW01 | Rebuild pump | 11/8/2012 | AECOM |
| EW04 | Repair pump | 11/13/2012 | AECOM |
| EW07 | Rebuild pump | 11/13/2012 | AECOM |
| EW04 | Installed New Pump | 11/28/2012 | AECOM |
| EW06 | Installed New Pump | 11/28/2012 | AECOM |
| EW02 | Installed New Pump | 12/4/2012 | AECOM |
| EW03 | Installed New Pump | 12/4/2012 | AECOM |
| EW01 | Installed New Pump | 12/17/2012 | AECOM |
| EW01 | Replaced Low level probe | 1/17/2015 | AECOM |
| EW01 | Cleaned and adjusted level probes | 10/21/2016 | Aerotek |

# APPENDIX B
# GROUNDWATER ELEVATION CONTOUR MAPS

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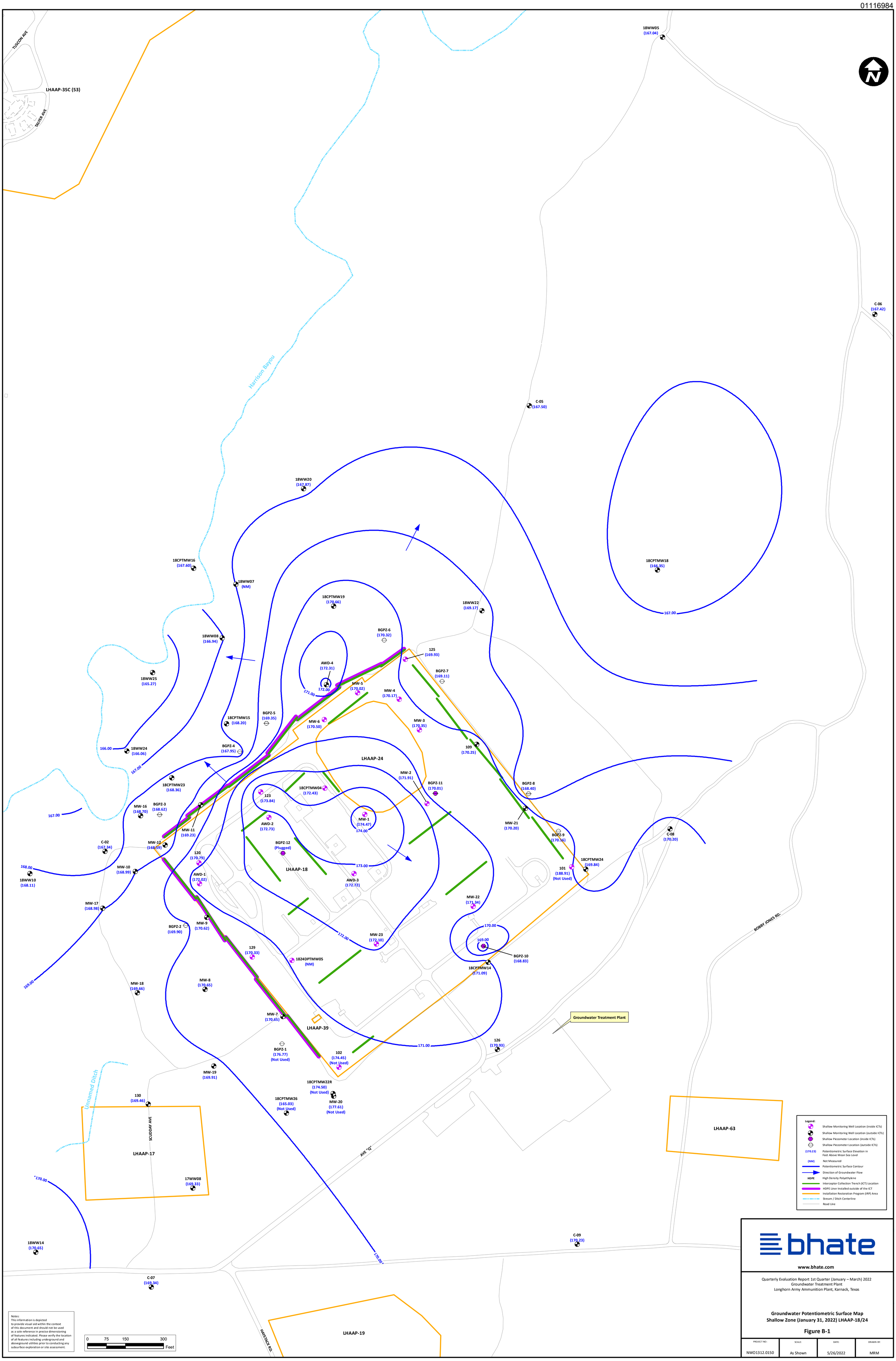
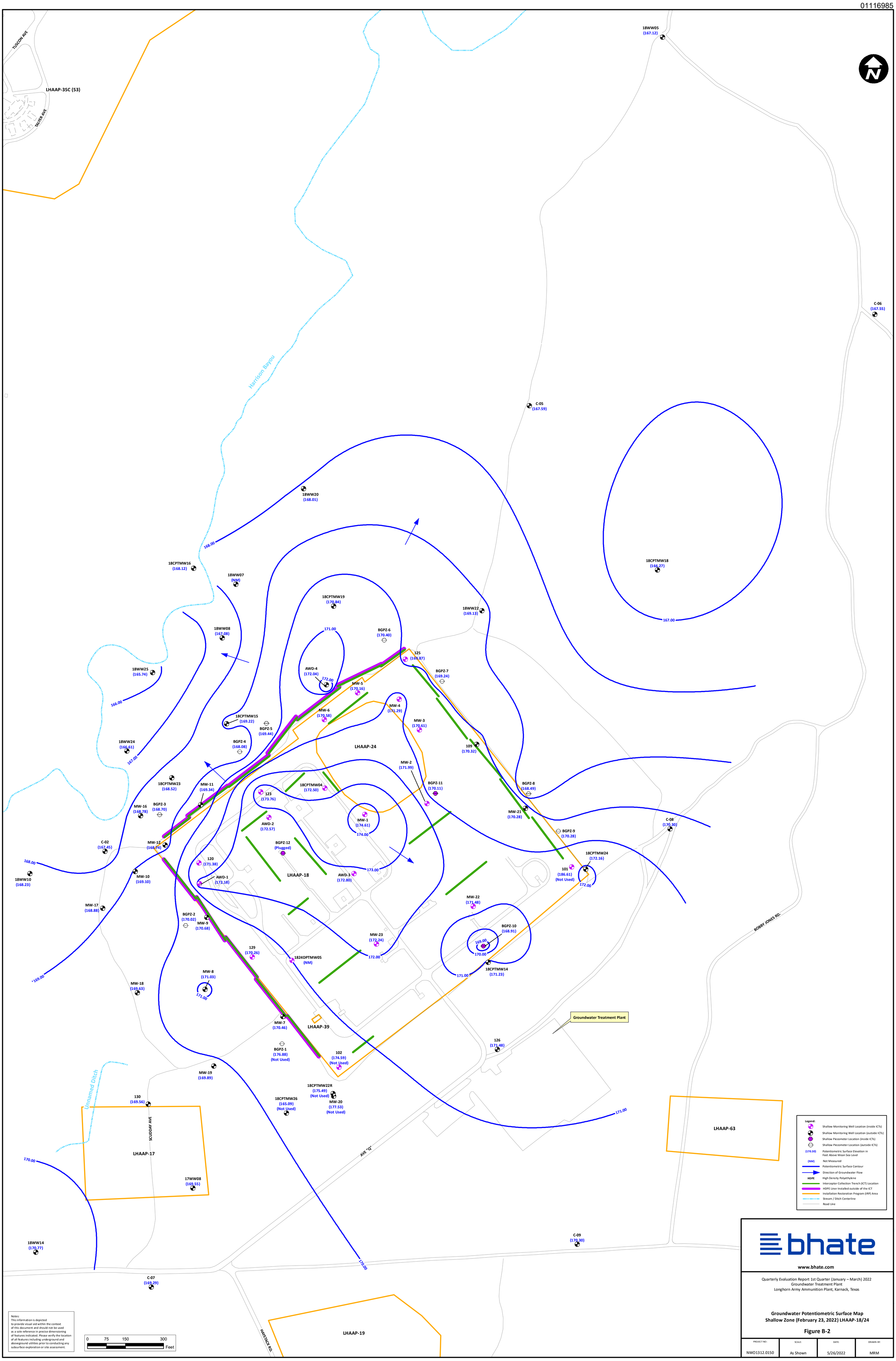
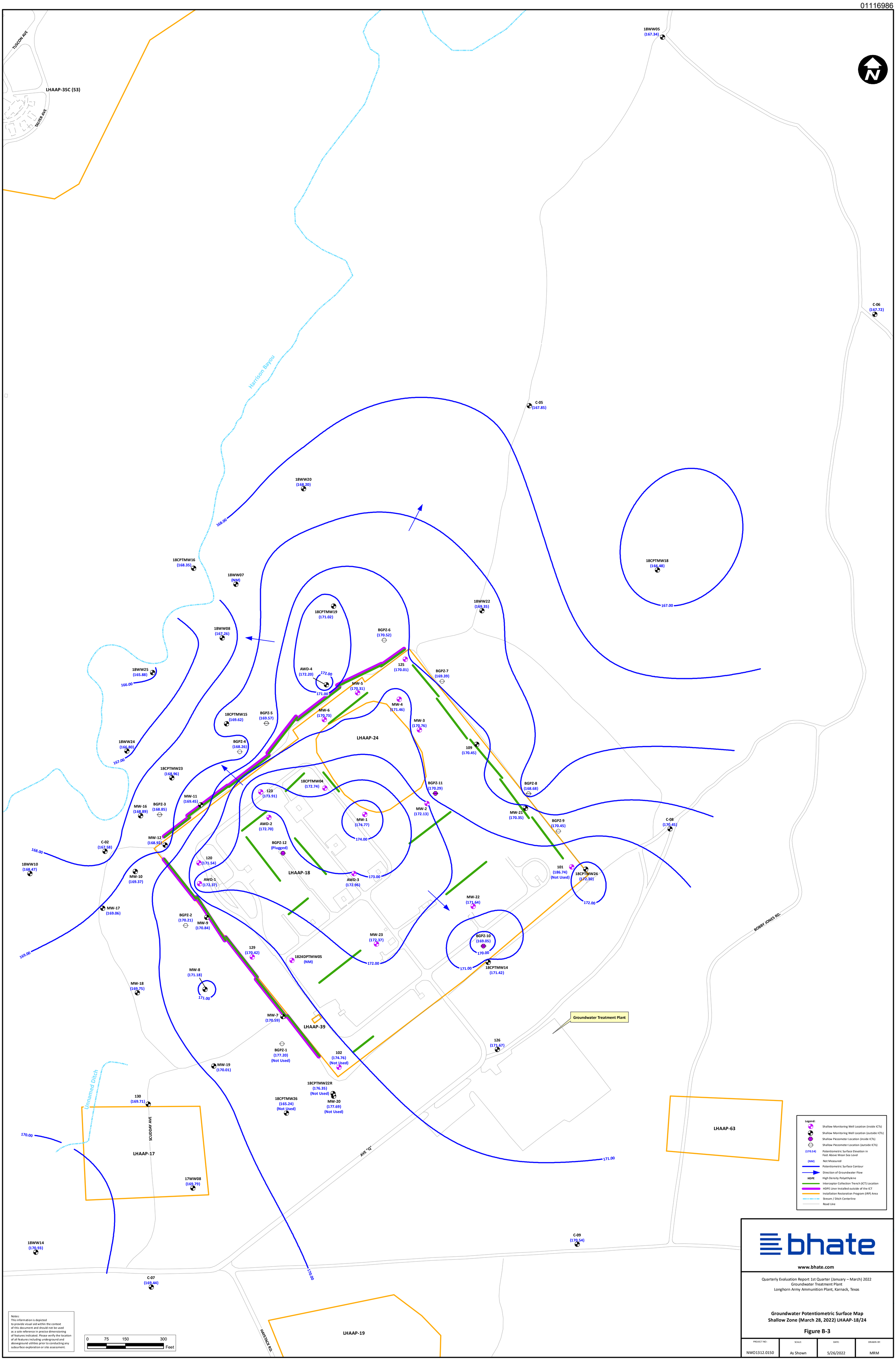
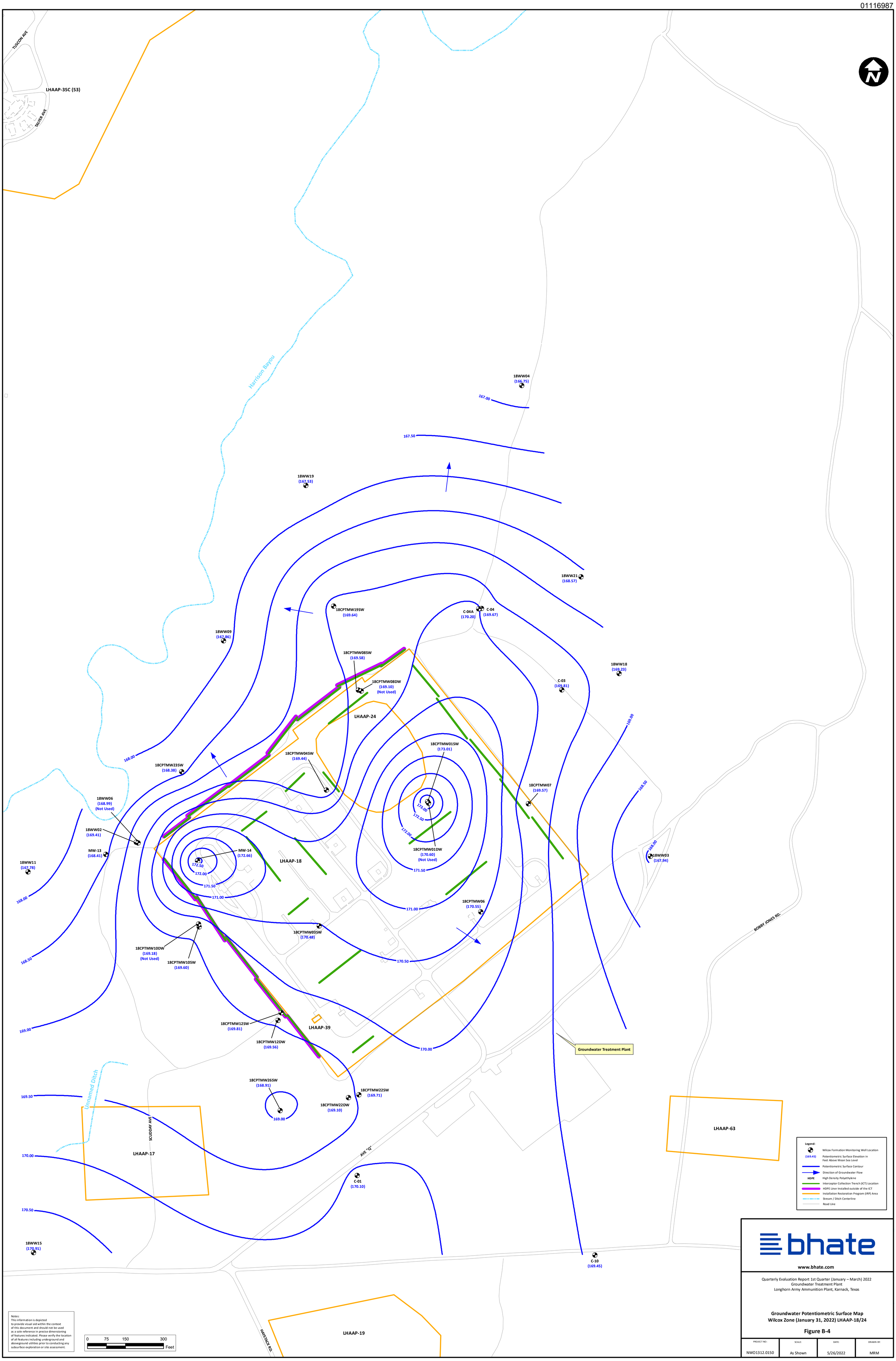
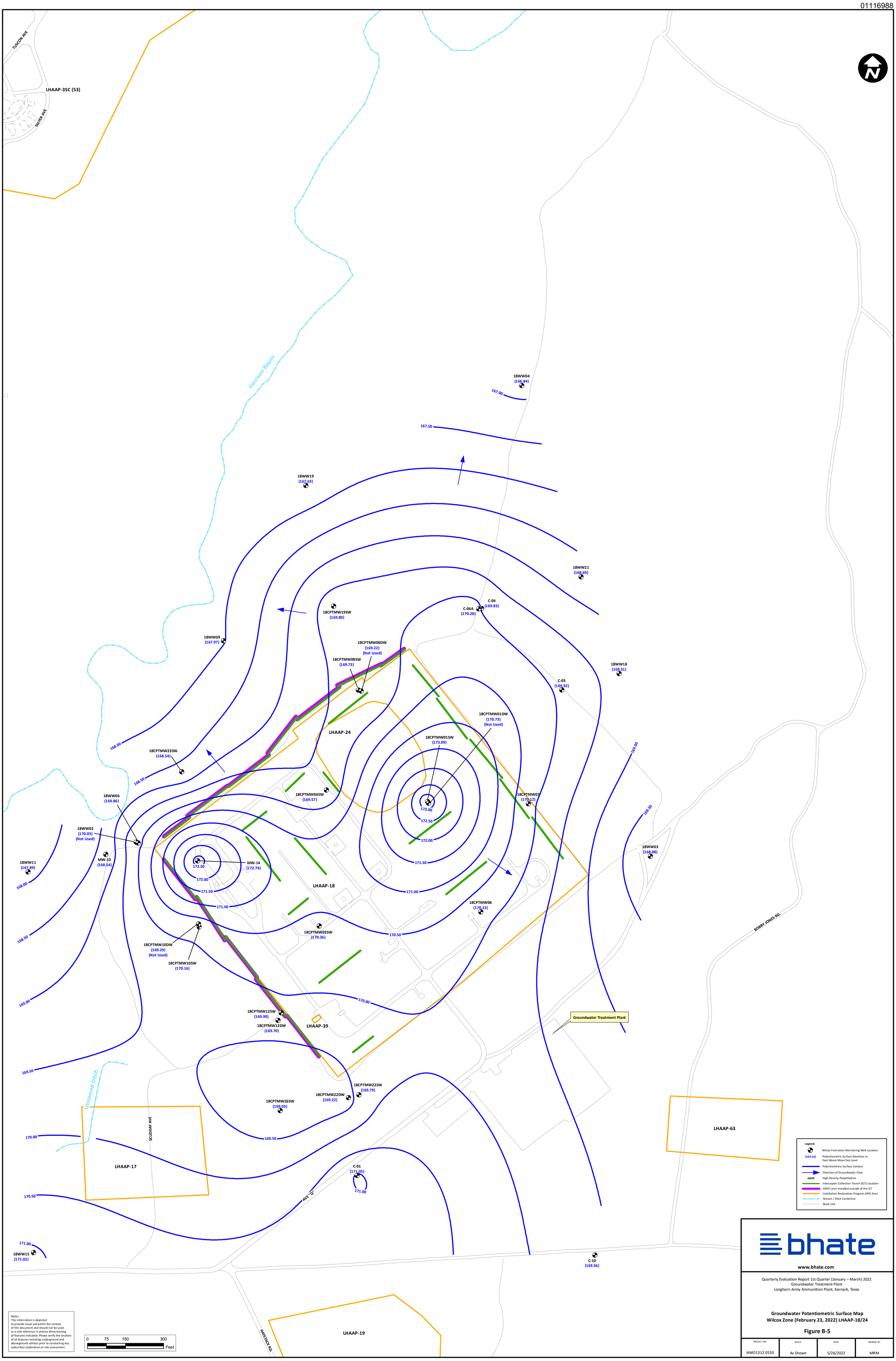

TUSCON AVE
TALVER AVE
LHAAP-35C (53)
Harrison Bayou
18WW05 (167.04)
C-06 (167.42)
C-05 (167.50)
18WW20 (167.87)
18CPTMW18 (166.35)
167.00
18CPTMW16 (167.60)
18WW07 (NM)
18CPTMW19 (170.66)
18WW22 (169.17)
18WW08 (166.94)
BGPZ-6 (170.32)
125 (169.93)
AWD-4 (172.31)
172.00
171.00
BGPZ-7 (169.11)
MW-5 (170.02)
MW-4 (170.17)
18WW25 (165.27)
18CPTMW15 (168.20)
BGPZ-5 (169.35)
MW-6 (170.50)
MW-3 (170.35)
166.00
18WW24 (166.06)
BGPZ-4 (167.95)
109 (170.25)
LHAAP-24
MW-2 (171.91)
BGPZ-11 (170.01)
BGPZ-8 (168.40)
18CPTMW23 (168.36)
18CPTMW04 (172.43)
123 (173.84)
MW-16 (168.70)
BGPZ-3 (168.62)
MW-11 (169.23)
AWD-2 (172.73)
MW-1 (174.47)
174.00
MW-21 (170.20)
BGPZ-9 (170.16)
C-08 (170.20)
C-02 (167.34)
MW-12 (168.59)
BGPZ-12 (Plugged)
120 (170.79)
173.00
18CPTMW24 (169.84)
168.00
MW-10 (168.99)
AWD-1 (172.02)
LHAAP-18
AWD-3 (172.72)
101 (188.91) (Not Used)
18WW10 (168.11)
MW-22 (171.34)
MW-17 (168.98)
BGPZ-2 (169.90)
MW-9 (170.62)
172.00
MW-23 (172.10)
170.00
169.00
BGPZ-10 (168.83)
129 (170.33)
1824DPTMW05 (NM)
18CPTMW14 (171.09)
169.00
MW-18 (169.66)
MW-8 (170.65)
MW-7 (170.65)
LHAAP-39
Groundwater Treatment Plant
171.00
126 (170.93)
BGPZ-1 (176.77) (Not Used)
102 (174.45) (Not Used)
MW-19 (169.91)
18CPTMW22R (174.50) (Not Used)
Unnamed Ditch
130 (169.46)
18CPTMW26 (165.03) (Not Used)
MW-20 (177.61) (Not Used)
SCUDDAY AVE
LHAAP-17
LHAAP-63
AVE "Q"
BOBBY JONES RD.
170.00
17WW08 (169.33)
18WW14 (170.65)
C-09 (170.23)
170.00
C-07 (169.34)
HAYSTACK RD.
LHAAP-19
Legend:
Shallow Monitoring Well Location (inside ICTs)
Shallow Monitoring Well Location (outside ICTs)
Shallow Piezometer Location (inside ICTs)
Shallow Piezometer Location (outside ICTs)
(170.23) Potentiometric Surface Elevation in Feet Above Mean Sea Level
(NM) Not Measured
Potentiometric Surface Contour
Direction of Groundwater Flow
HDPE High Density Polyethylene
Interceptor Collection Trench (ICT) Location
HDPE Liner Installed outside of the ICT
Installation Restoration Program (IRP) Area
Stream / Ditch Centerline
Road Line
Notes:
This information is depicted to provide visual aid within the context of this document and should not be used as a sole reference in precise dimensioning of features indicated. Please verify the location of all features including underground and aboveground utilities prior to conducting any subsurface exploration or site assessment.
0 75 150 300
Feet
bhate
www.bhate.com
Quarterly Evaluation Report 1st Quarter (January – March) 2022
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas
Groundwater Potentiometric Surface Map
Shallow Zone (January 31, 2022) LHAAP-18/24
Figure B-1
PROJECT NO: NWO1312.0150
SCALE: As Shown
DATE: 5/26/2022
DRAWN BY: MRM

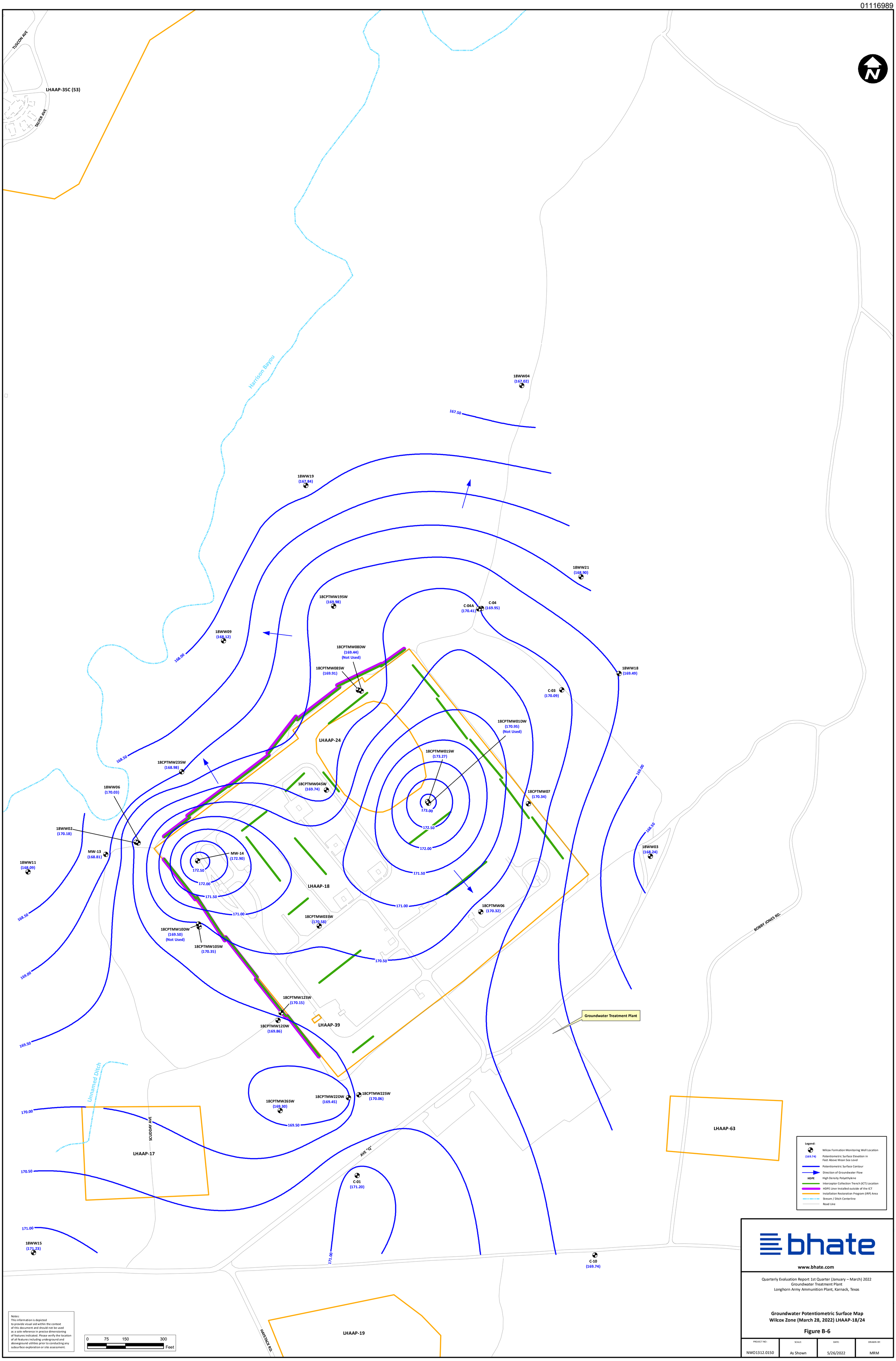

TUSCON AVE
TALVER AVE
LHAAP-35C (53)
18WW05 (167.12)
C-06 (167.55)
C-05 (167.59)
Harrison Bayou
18WW20 (168.01)
168.00
18CPTMW18 (166.27)
167.00
18CPTMW16 (168.12)
18WW07 (NM)
18CPTMW19 (170.84)
18WW22 (169.13)
18WW08 (167.08)
171.00
BGPZ-6 (170.40)
125 (169.87)
18WW25 (165.74)
AWD-4 (172.04)
172.00
BGPZ-7 (169.24)
MW-5 (170.16)
MW-4 (171.29)
MW-6 (170.58)
MW-3 (170.61)
166.00
18CPTMW15 (169.22)
BGPZ-5 (169.44)
18WW24 (166.61)
BGPZ-4 (168.08)
LHAAP-24
109 (170.32)
167.00
MW-2 (171.99)
18CPTMW23 (168.52)
MW-11 (169.34)
18CPTMW04 (172.50)
BGPZ-11 (170.11)
BGPZ-8 (168.49)
123 (173.76)
MW-16 (168.78)
BGPZ-3 (168.70)
MW-21 (170.28)
MW-1 (174.61)
174.00
AWD-2 (172.57)
C-08 (170.30)
BGPZ-9 (170.28)
C-02 (167.45)
MW-12 (168.74)
BGPZ-12 (Plugged)
18CPTMW24 (172.16)
168.00
120 (171.38)
173.00
101 (186.61) (Not Used)
18WW10 (168.23)
MW-10 (169.10)
AWD-1 (172.18)
LHAAP-18
AWD-3 (172.80)
172.00
MW-22 (171.48)
MW-17 (168.88)
BGPZ-2 (170.02)
MW-9 (170.68)
BGPZ-10 (168.91)
169.00
170.00
MW-23 (172.24)
129 (170.26)
1824DPTMW05 (NM)
172.00
169.00
18CPTMW14 (171.23)
171.00
MW-18 (169.63)
MW-8 (171.03)
171.00
BOBBY JONES RD.
Groundwater Treatment Plant
MW-7 (170.46)
LHAAP-39
126 (171.48)
BGPZ-1 (176.88) (Not Used)
102 (174.59) (Not Used)
MW-19 (169.89)
Unnamed Ditch
18CPTMW22R (175.49) (Not Used)
130 (169.56)
18CPTMW26 (165.09) (Not Used)
MW-20 (177.53) (Not Used)
171.00
LHAAP-63
SCUDDAY AVE
LHAAP-17
AVE "Q"
170.00
17WW08 (169.55)
18WW14 (170.77)
C-09 (170.30)
170.00
C-07 (169.29)
HAYSTACK RD.
LHAAP-19
Legend:
Shallow Monitoring Well Location (inside ICTs)
Shallow Monitoring Well Location (outside ICTs)
Shallow Piezometer Location (inside ICTs)
Shallow Piezometer Location (outside ICTs)
(170.30) Potentiometric Surface Elevation in Feet Above Mean Sea Level
(NM) Not Measured
Potentiometric Surface Contour
Direction of Groundwater Flow
HDPE High Density Polyethylene
Interceptor Collection Trench (ICT) Location
HDPE Liner Installed outside of the ICT
Installation Restoration Program (IRP) Area
Stream / Ditch Centerline
Road Line
Notes:
This information is depicted to provide visual aid within the context of this document and should not be used as a sole reference in precise dimensioning of features indicated. Please verify the location of all features including underground and aboveground utilities prior to conducting any subsurface exploration or site assessment.
0 75 150 300
Feet
bhate
www.bhate.com
Quarterly Evaluation Report 1st Quarter (January – March) 2022
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas
Groundwater Potentiometric Surface Map
Shallow Zone (February 23, 2022) LHAAP-18/24
Figure B-2
PROJECT NO: NWO1312.0150
SCALE: As Shown
DATE: 5/26/2022
DRAWN BY: MRM


TUSCON AVE
TALVER AVE
LHAAP-35C (53)
Harrison Bayou
18WW05 (167.34)
C-06 (167.72)
C-05 (167.85)
18WW20 (168.20)
168.00
18CPTMW16 (168.35)
18WW07 (NM)
18CPTMW18 (166.48)
167.00
18CPTMW19 (171.02)
18WW22 (169.35)
BGPZ-6 (170.52)
18WW08 (167.26)
18WW25 (165.88)
166.00
AWD-4 (172.20)
172.00
171.00
125 (170.01)
BGPZ-7 (169.39)
MW-5 (170.31)
MW-4 (171.46)
MW-6 (170.73)
MW-3 (170.76)
18CPTMW15 (169.62)
BGPZ-5 (169.57)
LHAAP-24
18WW24 (166.80)
BGPZ-4 (168.26)
109 (170.45)
18CPTMW23 (168.96)
18CPTMW04 (172.74)
123 (173.91)
BGPZ-11 (170.29)
BGPZ-8 (168.68)
MW-11 (169.45)
MW-16 (168.89)
BGPZ-3 (168.85)
MW-2 (172.13)
MW-21 (170.35)
BGPZ-9 (170.45)
C-08 (170.45)
AWD-2 (172.70)
MW-1 (174.77)
174.00
MW-12 (168.92)
C-02 (167.58)
BGPZ-12 (Plugged)
120 (171.54)
LHAAP-18
173.00
AWD-3 (172.96)
101 (186.74) (Not Used)
18CPTMW24 (172.30)
18WW10 (168.47)
MW-10 (169.37)
AWD-1 (172.37)
MW-22 (171.64)
MW-17 (169.06)
BGPZ-2 (170.21)
MW-9 (170.84)
MW-23 (172.37)
BGPZ-10 (169.05)
170.00
129 (170.42)
1824DPTMW05 (NM)
18CPTMW14 (171.42)
MW-8 (171.18)
MW-18 (169.75)
MW-7 (170.59)
LHAAP-39
Groundwater Treatment Plant
126 (171.67)
BGPZ-1 (177.20) (Not Used)
102 (174.76) (Not Used)
MW-19 (170.01)
18CPTMW22R (176.35) (Not Used)
18CPTMW26 (165.24) (Not Used)
MW-20 (177.69) (Not Used)
130 (169.71)
Unnamed Ditch
SCUDDAY AVE
LHAAP-17
LHAAP-63
AVE "Q"
BOBBY JONES RD.
17WW08 (169.79)
18WW14 (170.93)
C-09 (170.54)
C-07 (169.44)
HAYSTACK RD.
LHAAP-19
Legend:
Shallow Monitoring Well Location (inside ICTs)
Shallow Monitoring Well Location (outside ICTs)
Shallow Piezometer Location (inside ICTs)
Shallow Piezometer Location (outside ICTs)
(170.54) Potentiometric Surface Elevation in Feet Above Mean Sea Level
(NM) Not Measured
Potentiometric Surface Contour
Direction of Groundwater Flow
HDPE High Density Polyethylene
Interceptor Collection Trench (ICT) Location
HDPE Liner Installed outside of the ICT
Installation Restoration Program (IRP) Area
Stream / Ditch Centerline
Road Line
Notes:
This information is depicted to provide visual aid within the context of this document and should not be used as a sole reference in precise dimensioning of features indicated. Please verify the location of all features including underground and aboveground utilities prior to conducting any subsurface exploration or site assessment.
0 75 150 300
Feet
bhate
www.bhate.com
Quarterly Evaluation Report 1st Quarter (January – March) 2022
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas
Groundwater Potentiometric Surface Map
Shallow Zone (March 28, 2022) LHAAP-18/24
Figure B-3
PROJECT NO: NWO1312.0150
SCALE: As Shown
DATE: 5/26/2022
DRAWN BY: MRM


TUSCON AVE
LHAAP-35C (53)
TALVER AVE
Harrison Bayou
18WW04
(166.75)
167.00
167.50
18WW19
(167.53)
18WW21
(168.57)
18CPTMW19SW
(169.64)
C-04A
(170.20)
C-04
(169.67)
18WW09
(167.86)
18CPTMW08SW
(169.58)
18CPTMW08DW
(169.10)
(Not Used)
18WW18
(169.23)
C-03
(169.81)
LHAAP-24
169.00
18CPTMW01SW
(173.01)
18CPTMW04SW
(169.44)
168.00
18CPTMW23SW
(168.38)
18CPTMW07
(169.57)
168.50
18WW06
(168.99)
(Not Used)
173.00
172.50
172.00
18WW02
(169.41)
18CPTMW01DW
(170.60)
(Not Used)
MW-13
(168.41)
MW-14
(172.66)
18WW03
(167.94)
18WW11
(167.78)
LHAAP-18
171.50
171.00
18CPTMW06
(170.55)
18CPTMW03SW
(170.48)
BOBBY JONES RD.
18CPTMW10DW
(169.18)
(Not Used)
18CPTMW10SW
(169.60)
170.50
18CPTMW12SW
(169.81)
LHAAP-39
18CPTMW12DW
(169.56)
170.00
Groundwater Treatment Plant
18CPTMW26SW
(168.91)
18CPTMW22SW
(169.71)
18CPTMW22DW
(169.10)
Unnamed Ditch
SCUDDAY AVE
LHAAP-63
LHAAP-17
AVE "Q"
C-01
(170.10)
18WW15
(170.91)
C-10
(169.45)
HAYSTACK RD.
LHAAP-19
Legend:
Wilcox Formation Monitoring Well Location
(169.45) Potentiometric Surface Elevation in Feet Above Mean Sea Level
Potentiometric Surface Contour
Direction of Groundwater Flow
HDPE High Density Polyethylene
Interceptor Collection Trench (ICT) Location
HDPE Liner Installed outside of the ICT
Installation Restoration Program (IRP) Area
Stream / Ditch Centerline
Road Line
Notes:
This information is depicted to provide visual aid within the context of this document and should not be used as a sole reference in precise dimensioning of features indicated. Please verify the location of all features including underground and aboveground utilities prior to conducting any subsurface exploration or site assessment.
0 75 150 300
Feet
bhate
www.bhate.com
Quarterly Evaluation Report 1st Quarter (January – March) 2022
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas
Groundwater Potentiometric Surface Map
Wilcox Zone (January 31, 2022) LHAAP-18/24
Figure B-4
PROJECT NO: NWO1312.0150
SCALE: As Shown
DATE: 5/26/2022
DRAWN BY: MRM


TUSCON AVE
LHAAP-35C (53)
TALVER AVE
Harrison Bayou
18WW04
(166.84)
167.00
167.50
18WW19
(167.63)
18WW21
(168.69)
18CPTMW19SW
(169.80)
C-04A
(170.28)
C-04
(169.83)
18WW09
(167.97)
18CPTMW08DW
(169.22)
(Not Used)
18CPTMW08SW
(169.73)
18WW18
(169.31)
C-03
(169.92)
18CPTMW01DW
(170.73)
(Not Used)
LHAAP-24
18CPTMW01SW
(173.09)
168.00
18CPTMW23SW
(168.54)
169.00
168.50
18CPTMW04SW
(169.57)
18CPTMW07
(170.12)
18WW06
(169.86)
173.00
172.50
172.00
18WW02
(170.03)
(Not Used)
168.50
18WW03
(168.08)
18WW11
(167.89)
MW-13
(168.54)
MW-14
(172.74)
LHAAP-18
171.50
171.00
18CPTMW06
(170.15)
168.00
BOBBY JONES RD.
18CPTMW03SW
(170.36)
170.50
18CPTMW10DW
(169.29)
(Not Used)
18CPTMW10SW
(170.16)
168.50
169.00
170.00
18CPTMW12SW
(169.90)
18CPTMW12DW
(169.70)
LHAAP-39
Groundwater Treatment Plant
169.50
Unnamed Ditch
18CPTMW22SW
(169.79)
18CPTMW22DW
(169.22)
18CPTMW26SW
(169.03)
SCUDDAY AVE
LHAAP-63
170.00
LHAAP-17
C-01
(171.05)
AVE "Q"
170.50
171.00
18WW15
(171.02)
C-10
(169.56)
HAYSTACK RD.
LHAAP-19
Legend:
Wilcox Formation Monitoring Well Location
(169.56) Potentiometric Surface Elevation in Feet Above Mean Sea Level
Potentiometric Surface Contour
Direction of Groundwater Flow
HDPE High Density Polyethylene
Interceptor Collection Trench (ICT) Location
HDPE Liner Installed outside of the ICT
Installation Restoration Program (IRP) Area
Stream / Ditch Centerline
Road Line
Notes:
This information is depicted to provide visual aid within the context of this document and should not be used as a sole reference in precise dimensioning of features indicated. Please verify the location of all features including underground and aboveground utilities prior to conducting any subsurface exploration or site assessment.
0 75 150 300
Feet
bhate
www.bhate.com
Quarterly Evaluation Report 1st Quarter (January – March) 2022
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas
Groundwater Potentiometric Surface Map
Wilcox Zone (February 23, 2022) LHAAP-18/24
Figure B-5
PROJECT NO: NWO1312.0150
SCALE: As Shown
DATE: 5/26/2022
DRAWN BY: MRM

01116989


TUSCON AVE
LHAAP-35C (53)
TALVER AVE
Harrison Bayou
18WW04
(167.02)
167.50
18WW19
(167.84)
18WW21
(168.90)
18CPTMW19SW
(169.98)
C-04A
(170.41)
C-04
(169.95)
18WW09
(168.12)
168.00
18CPTMW08DW
(169.44)
(Not Used)
18CPTMW08SW
(169.91)
18WW18
(169.49)
C-03
(170.09)
18CPTMW01DW
(170.95)
(Not Used)
LHAAP-24
18CPTMW01SW
(173.27)
168.50
18CPTMW23SW
(168.98)
18CPTMW04SW
(169.74)
18CPTMW07
(170.34)
169.00
18WW06
(170.03)
173.00
172.50
172.00
171.50
171.00
18WW02
(170.18)
168.50
18WW03
(168.24)
MW-13
(168.81)
MW-14
(172.90)
18WW11
(168.09)
LHAAP-18
18CPTMW06
(170.32)
18CPTMW03SW
(170.58)
BOBBY JONES RD.
18CPTMW10DW
(169.50)
(Not Used)
18CPTMW10SW
(170.35)
170.50
169.00
18CPTMW12SW
(170.15)
Groundwater Treatment Plant
18CPTMW12DW
(169.86)
LHAAP-39
169.50
Unnamed Ditch
18CPTMW26SW
(169.30)
18CPTMW22DW
(169.45)
18CPTMW22SW
(170.06)
170.00
SCUDDAY AVE
LHAAP-63
LHAAP-17
AVE "Q"
170.50
C-01
(171.20)
171.00
18WW15
(171.23)
171.00
C-10
(169.74)
HAYSTACK RD.
LHAAP-19
Legend:
Wilcox Formation Monitoring Well Location
(169.74) Potentiometric Surface Elevation in Feet Above Mean Sea Level
Potentiometric Surface Contour
Direction of Groundwater Flow
HDPE High Density Polyethylene
Interceptor Collection Trench (ICT) Location
HDPE Liner Installed outside of the ICT
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Notes:
This information is depicted to provide visual aid within the context of this document and should not be used as a sole reference in precise dimensioning of features indicated. Please verify the location of all features including underground and aboveground utilities prior to conducting any subsurface exploration or site assessment.
0 75 150 300
Feet
bhate
www.bhate.com
Quarterly Evaluation Report 1st Quarter (January – March) 2022
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas
Groundwater Potentiometric Surface Map
Wilcox Zone (March 28, 2022) LHAAP-18/24
Figure B-6
PROJECT NO.: NWO1312.0150
SCALE: As Shown
DATE: 5/26/2022
DRAWN BY: MRM

# APPENDIX C
# GWTP WATER SAMPLING LABORATORY ANALYTICAL RESULTS
# (PROVIDED ELECTRONICALLY AS A SEPARATE FILE)

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

January 20, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22010166**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia Olive,

ALS Environmental received 2 sample(s) on Jan 06, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: DAYNA.FISHER**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22010166

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22010166-01 | LH18/24-SP650_010522 | Water | | 05-Jan-2022 14:00 | 06-Jan-2022 10:20 | ☐ |
| HS22010166-02 | LH18/24-SP650_010522_AIX | Water | | 05-Jan-2022 14:00 | 06-Jan-2022 10:20 | ☐ |

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22010166

**CASE NARRATIVE**

## Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached

## WetChemistry by Method E415.1

### Batch ID: R400667

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E350.3

### Batch ID: R399110

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E365.3

### Batch ID: R399056

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

**ALS Houston, US**

Date: 20-Jan-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS22010166 |
| Sample ID: | LH18/24-SP650_010522 | Lab ID:HS22010166-01 |
| Collection Date: | 05-Jan-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **AMMONIA AS N BY E350.3(ISE)** | | **Method:E350.3** | | | | | | Analyst: YP |
| **Nitrogen, Ammonia (As N)** | **60** | a | **1.0** | **2.0** | **2.0** | **mg/L** | 10 | 07-Jan-2022 12:24 |
| **ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978** | | **Method:E365.3** | | | | | | Analyst: AP |
| **Phosphorus, Total Orthophosphate (As P)** | **9.27** | a | **0.100** | **0.250** | **0.250** | **mg/L** | 10 | 06-Jan-2022 16:26 |
| **TOTAL ORGANIC CARBON BY E415.1** | | **Method:E415.1** | | | | | | Analyst: JAC |
| **Organic Carbon, Total** | **7.91** | a | **0.500** | **1.00** | **1.00** | **mg/L** | 1 | 19-Jan-2022 18:25 |

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

**ALS Houston, US**

Date: 20-Jan-22

| | | | |
|---|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder: | HS22010166 |
| Sample ID: | LH18/24-SP650_010522_AIX | Lab ID: | HS22010166-02 |
| Collection Date: | 05-Jan-2022 14:00 | Matrix: | Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 07-Jan-2022 15:03 |

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

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22010166

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** R399056 ( 0 ) | **Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978 | | | | **Matrix:** Water | |
| HS22010166-01 | LH18/24-SP650_010522 | 05 Jan 2022 14:00 | | | 06 Jan 2022 16:26 | 10 |
| **Batch ID:** R399058 ( 0 ) | **Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) | | | | **Matrix:** Water | |
| HS22010166-02 | LH18/24-SP650_010522_AIX | 05 Jan 2022 14:00 | | | 07 Jan 2022 15:03 | 1 |
| **Batch ID:** R399110 ( 0 ) | **Test Name :** AMMONIA AS N BY E350.3(ISE) | | | | **Matrix:** Water | |
| HS22010166-01 | LH18/24-SP650_010522 | 05 Jan 2022 14:00 | | | 07 Jan 2022 12:24 | 10 |
| **Batch ID:** R400667 ( 0 ) | **Test Name :** TOTAL ORGANIC CARBON BY E415.1 | | | | **Matrix:** Water | |
| HS22010166-01 | LH18/24-SP650_010522 | 05 Jan 2022 14:00 | | | 19 Jan 2022 18:25 | 1 |

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22010166

**QC BATCH REPORT**

**Batch ID:** R399056 ( 0 ) **Instrument:** UV-2450 **Method:** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978

**MBLK** Sample ID: **MBLK-R399056** Units: **mg/L** Analysis Date: **06-Jan-2022 16:26**
Client ID: Run ID: **UV-2450_399056** SeqNo: **6456240** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.0250 | 0.0250 | | | | | | | | U |

**LCS** Sample ID: **LCS-R399056** Units: **mg/L** Analysis Date: **06-Jan-2022 16:26**
Client ID: Run ID: **UV-2450_399056** SeqNo: **6456239** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.24 | 0.0250 | 0.25 | 0 | 96.0 | 85 - 115 | | | | |

**MS** Sample ID: **HS22010166-01MS** Units: **mg/L** Analysis Date: **06-Jan-2022 16:26**
Client ID: **LH18/24-SP650_010522** Run ID: **UV-2450_399056** SeqNo: **6456234** PrepDate: DF: **10**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 11.52 | 0.250 | 2.5 | 9.27 | 90.0 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22010166-01MSD** Units: **mg/L** Analysis Date: **06-Jan-2022 16:26**
Client ID: **LH18/24-SP650_010522** Run ID: **UV-2450_399056** SeqNo: **6456233** PrepDate: DF: **10**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 11.51 | 0.250 | 2.5 | 9.27 | 89.6 | 80 - 120 | 11.52 | 0.0868 | 20 | |

**The following samples were analyzed in this batch:** HS22010166-01

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22010166

**QC BATCH REPORT**

**Batch ID: R399110 ( 0 )** **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

**MBLK** Sample ID: **MBLK-R399110** Units: **mg/L** Analysis Date: **07-Jan-2022 12:24**
Client ID: Run ID: **WetChem_HS_399110** SeqNo: **6457223** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 0.20 | 0.20 | | | | | | | | U |

**LCS** Sample ID: **LCS-R399110** Units: **mg/L** Analysis Date: **07-Jan-2022 12:24**
Client ID: Run ID: **WetChem_HS_399110** SeqNo: **6457222** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 10.1 | 0.20 | 10 | 0 | 101 | 80 - 120 | | | | |

**MS** Sample ID: **HS22010031-01MS** Units: **mg/L** Analysis Date: **07-Jan-2022 12:24**
Client ID: Run ID: **WetChem_HS_399110** SeqNo: **6457225** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 10.6 | 0.20 | 10 | 0.14 | 105 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22010031-01MSD** Units: **mg/L** Analysis Date: **07-Jan-2022 12:24**
Client ID: Run ID: **WetChem_HS_399110** SeqNo: **6457224** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 10.52 | 0.20 | 10 | 0.14 | 104 | 80 - 120 | 10.6 | 0.814 | 20 | |

**The following samples were analyzed in this batch:** HS22010166-01

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22010166

**QC BATCH REPORT**

**Batch ID:** R400667 ( 0 ) **Instrument:** TOC_04 **Method:** TOTAL ORGANIC CARBON BY E415.1

**MBLK** Sample ID: **MBLK-01192022** Units: **mg/L** Analysis Date: **19-Jan-2022 17:45**
Client ID: Run ID: **TOC_04_400667** SeqNo: **6470172** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 1.00 | 1.00 | | | | | | | | U |

**LCS** Sample ID: **LCS-01192022** Units: **mg/L** Analysis Date: **19-Jan-2022 17:59**
Client ID: Run ID: **TOC_04_400667** SeqNo: **6470173** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 10.48 | 1.00 | 10 | 0 | 105 | 85 - 115 | | | | |

**LCSD** Sample ID: **LCSD-01192022** Units: **mg/L** Analysis Date: **19-Jan-2022 18:12**
Client ID: Run ID: **TOC_04_400667** SeqNo: **6470174** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 10.61 | 1.00 | 10 | 0 | 106 | 85 - 115 | 10.48 | 1.23 | 20 | |

**MS** Sample ID: **HS22010166-01MS** Units: **mg/L** Analysis Date: **19-Jan-2022 18:39**
Client ID: **LH18/24-SP650_010522** Run ID: **TOC_04_400667** SeqNo: **6470176** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 18.76 | 1.00 | 10 | 7.909 | 109 | 80 - 120 | | | | |

**The following samples were analyzed in this batch:** HS22010166-01

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** **HS22010166**

## 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: 20-Jan-22

## CERTIFICATIONS,ACCREDITATIONS & LICENSES

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas | 21-022-0 | 26-Mar-2022 |
| Florida | E87611-33 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22010166

## SAMPLE TRACKING

| Lab Samp ID | Client Sample ID | Action | Date | Person | New Location |
|---|---|---|---|---|---|
| HS22010166-01 | LH18/24-SP650_010522 | Login | 1/6/2022 11:51:48 AM | PMG | WET230 |
| HS22010166-01 | LH18/24-SP650_010522 | Login | 1/6/2022 11:51:48 AM | PMG | WET230 |
| HS22010166-01 | LH18/24-SP650_010522 | Login | 1/6/2022 11:51:48 AM | PMG | WET230 |
| HS22010166-02 | LH18/24-SP650_010522_AIX | Login | 1/6/2022 11:51:48 AM | PMG | Sub |

**ALS Houston, US** Date: 20-Jan-22

## Sample Receipt Checklist

**Work Order ID:** HS22010166 **Date/Time Received:** **06-Jan-2022 10:20**

**Client Name:** Bhate Environmental **Received by:** **Eric Widjaja**

**Completed By:** /S/ Paresh M. Giga (eSignature) 06-Jan-2022 11:53 (Date/Time) **Reviewed by:** /S/ Ragen Giga (eSignature) 06-Jan-2022 18:37 (Date/Time)

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

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

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 4.0C U/C | IR31 |
| Cooler(s)/Kit(s): | 46284 | |
| Date/Time sample(s) sent to storage: | 1/6/2022 12:05 | |

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

pH adjusted by:

Login Notes: 24Hr.TAT for Perchlorate only

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

01117005

**HS22010166**

Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Weekly Samples

# CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: Ragen Gigi

**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:** GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

**Prepared By:** Scott Beesinger

**P.O. Number**

Analys

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | AMMONIA-N | TOTAL ORGANIC CARBON | ORTHO-PHOSPHATE | PERCHLORATE | | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_010522 | Water | 01/05/22 / 14:00 | | 3 | X | X | | | | | | | | | H2SO4 | |
| LH18/24-SP650_010522 | Water | 01/05/22 / 14:00 | | 1 | | | X | | | | | | | | NONE | |
| LH18/24–SP650_010522_AIX | Water | 01/05/22 / 14:00 | | 1 | | | | X | | | | | | | NONE | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Additional Remarks: **24 Hour TAT on Perchlorate. Standard TAT on other parameters**

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 01/05/22 | 14:30 | | | | | | | | | |

**For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| EWhidgm | 01/06/22 | 10:20 | | | | | | | |

Remarks: 46284 4.0°C
UUL
CFO.0
IR+B1

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

01117006

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

46284

CUSTODY SEAL
Date: 1/5/22
Time: 1430
Name:
Company:

TRK# 4809 7833 1350

AB SGRA

PRIORITY OVERNIGHT

46284 77099
TX-US
IAH

4230674 05Jan2022 GGGA 56DG2/01EF/1823

January 07, 2022

Service Request No:E2200006

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS22010166**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory January 06, 2022
For your reference, these analyses have been assigned our service request number **E2200006.**

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.:** | E2200006 |
| **Project:** | HS22010166 | **Date Received:** | 01/06/22 |
| **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 01/06/22.

The sample was received in good condition and is 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:**

EQ2200008: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS-DLCS RPD exceed QC limit; the individual recoveries met acceptance criteria.

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:**E2200006
**Project:** HS22010166

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2200006-001 | LH18/24-SP650_010522_AIX | 1/5/2022 | 1400 |

# Service Request Summary

**Folder #:** **E2200006**
Client Name: ALS Environmental - US
Project Name: HS22010166
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 01/06/22
Internal Due Date: 1/10/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22010166
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**
**Rush**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON CIO4 DOD/6850 |
|---|---|---|---|---|
| E2200006-001 | LH18/24-SP650_010522_AIX | Ground Water | 01/05/22 1400 | **IV** |

## Folder Comments:

Send DWELR confirmation to Middletown PM for PADEP samples.

# Service Request Summary

**Folder #:** **E2200006**
Client Name: ALS Environmental - US
Project Name: HS22010166
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 01/06/22
Internal Due Date: 1/10/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22010166
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**
**Rush**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 1 | Level IV due 1/27 |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| + | Possible Tedlar bag artifact. |
| A | TIC is a suspected aldol-condensation product |
| B | Analyte found in the associated method blank as well as in the sample. |
| BC | Reported results are not blank corrected. |
| BH | The back section of the tube yielded higher results than the front. |
| BT | Results indicated possible breakthrough; back section >=10% front section. |
| C | Result identification confirmed. |
| D | Compound identified in an analysis at a secondary dilution factor |
| D | Spike was diluted out |
| DE | Reported results are corrected for desorption efficiency. |
| E | Estimated value. Concentration above calibration range |
| E | The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample. |
| F | The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard. |
| H | The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard. |
| H1 | Sample analysis performed past holding time. See case narrative. |
| H2 | Initial analysis within holding time. Reanalysis for the required dilution was past holding time. |
| H3 | Sample was received and analyzed past holding time. |
| H4 | Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative. |
| I | Internal standard not within the specified limits. See case narrative. |
| J | Estimated Value. Concentration found below MRL. |
| K | A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate. |
| K | Analyte was detected above the method reporting limit prior to normalization. |
| K | The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result. |
| L | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard. |
| L1 | Laboratory control sample recovery outside the specified limits; results may be biased high. |
| L2 | Laboratory control sample recovery outside the specified limits; results may be biased low. |
| L3 | Laboratory control sample recovery outside the specified limits. |
| M | Matrix interference; results may be biased high. |
| M | The duplicate injection precision not met. |
| M1 | Matrix interference due to coelution with a non-target compound; results may be biased high. |
| N | Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search. |
| N | The Matrix Spike sample recovery is not within control limits. See case narrative. |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| O | The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard. |
| P | Indicates chlorodiphenyl ether interference present at the retention time of the target compound. |
| P | Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns |
| Q | Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria. |
| R | Duplicate Precision not met. |
| R1 | Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated. |
| S | Surrogate recovery not within specified limits. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| T | Analyte is a tentatively identified compound, result is estimated. |
| U | Compound was analyzed for, but was not detected (ND). |
| V1 | The continuing calibration verification standard was outside (biased high) the specified limits for this compound. |
| V2 | The continuing calibration verification standard was outside (biased low) the specified limits for this compound. |
| W | Result quantified, but the corresponding peak was detected outside the generated retention time window. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| X | See case narrative. |
| Y | Recovery outside limits |
| Y | The chromatogram resembles a petroleum product but does not match the calibration standard. |
| Z | The chromatogram does not resemble a petroleum product. |
| i | The MRL/MDL has been elevated due to a matrix interference. |

# ALS Laboratory Group

## Acronyms

| | |
|---|---|
| Cal | Calibration |
| Conc | CONCentration |
| Dioxin(s) | Polychlorinated dibenzo-p-dioxin(s) |
| EDL | Estimated Detection Limit |
| EMPC | Estimated Maximum Possible Concentration |
| Flags | Data qualifiers |
| Furan(s) | Polychlorinated dibenzofuran(s) |
| g | Grams |
| ICAL | Initial CALibration |
| ID | IDentifier |
| Ions | Masses monitored for the analyte during data acquisition |
| L | Liter (s) |
| LCS | Laboratory Control Sample |
| DLCS | Duplicate Laboratory Control Sample |
| MB | Method Blank |
| MCL | Method Calibration Limit |
| MDL | Method Detection Limit |
| mL | Milliliters |
| MS | Matrix Spiked sample |
| DMS | Duplicate Matrix Spiked sample |
| NO | Number of peaks meeting all identification criteria |
| PCDD(s) | Polychlorinated dibenzo-p-dioxin(s) |
| PCDF(s) | Polychlorinated dibenzofuran(s) |
| ppb | Parts per billion |
| ppm | Parts per million |
| ppq | Parts per quadrillion |
| ppt | Parts per trillion |
| QA | Quality Assurance |
| QC | Quality Control |
| Ratio | Ratio of areas from monitored ions for an analyte |
| % Rec. | Percent recovery |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| RT | Retention Time |
| SDG | Sample Delivery Group |
| S/N | Signal-to-noise ratio |
| TEF | Toxicity Equivalence Factor |
| TEQ | Toxicity Equivalence Quotient |

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ALS Environmental

## State Certifications, Accreditations, and Licenses

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas Department of Environmental Quality | 19-028-0 | 6/30/2022 |
| Arkansas Department of Environmental Quality | 21-022-0 | 3/26/2022 |
| Florida Department of Health | E87611-33 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 5/1/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

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Houston, TX 77099
**T:** +1 281 530 5656
**F:** +1 281 530 5887
**www.alsglobal.com**

# Subcontract Chain of Custody

**SAMPLING STATE:** **Dept of Defense** **COC ID: 17833**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

| | |
|---|---|
| **Company:** | ALS Houston |
| **Contact:** | Ragen Giga |
| **Address:** | 10450 Stancliff Rd, Ste 210 |
| **Phone:** | +1 281 530 5656 |
| **Email:** | RagenP.Giga@ALSGlobal.com |
| **Alternate Contact:** | 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:** | HS22010166 |
| **TSR:** | Houston House Acct |

| | LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | | | DUE DATE |
| **1.** | **HS22010166-02** | **LH18/24-SP650_010522_AIX** | **Water** | **05 Jan 2022 14:00** |
| | 6850-Perch. DOD Level II & Level IV in separate pdf | | | 07 Jan 2022 |

**Comments:** Please analyze for the analysis listed above.
Send report to the emails shown above.
RUSH 24Hr.TAT

**QC Level:** DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 1/6/2022 1240.

Received By: Loret a Date/Time: 1/6/22 1246

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

# Cooler Receipt Form

Project Chemist: CH

Client/Project: ALS-H

Thermometer ID: 1231

Date/Time Received: 1-6-22 Initials: CH

Date/Time Logged in: 1-6-22 Initials: CH

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☒ Courier (ALS) ○ Client

2. Samples received in: ☒ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ☒ No
   Were they intact? ○ Yes ○ No ☒ N/A
   Were they signed and dated? ○ Yes ○ No ☒ N/A
   If yes, how many and where?

4. Packing Material: ○ Inserts ☒ Baggies ○ Bubble Wrap ○ Gel Packs ☒ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

| Cooler Tracking Number | COC ID | Date Opened | Time Opened | Opened By | Temp. °C | Temp Blank? |
|---|---|---|---|---|---|---|
| NA | | 1-6-22 | 1240 | PH | 3.0 | ☒ |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☒ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☒ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☒ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☒ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☒ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

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#:** 393624 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** **Prep Date/Time:** 1/7/22 09:16

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2200004-001 | 2112468-01 (MW-13) | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 2 | E2200004-002 | 2112468-02 (MW-17) | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 3 | E2200006-001 | LH18/24-SP650_010522_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 4 | E2200007-001 | LH18/24-SP650_010522_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 5 | E2200008-001 | LH18/24-SP140_010522 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 6 | EQ2200008-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 7 | EQ2200008-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 8 | EQ2200008-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |

## Spiking Solutions

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 214765 Logbook Ref: Sodium Perchlorate Expires On: 12/11/2022

E2200004-001 100.00µL E2200004-002 100.00µL E2200006-001 100.00µL E2200007-001 100.00µL E2200008-001 100.00µL EQ2200008-01 100.00µL
EQ2200008-02 100.00µL EQ2200008-03 100.00µL

Name: Perchlorate Intermediate Stock1 Inventory ID 219595 Logbook Ref: Perchlorate Expires On: 03/15/2022

EQ2200008-02 1.00µL EQ2200008-03 1.00µL

## Preparation Materials

Water HPLC Grade 08/03/2021 Water (218530) 537M Glass Culture Tubes 537M Glass Tubes (218064) 6850 0.45um syringe filters 6850 Syringe Filters (219639)

## Preparation Steps

Step: Preparation
Started: 1/7/22 09:16
Finished: 1/7/22 10:00
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 1/7/22

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:** | E2200006 |
| **Project:** | HS22010166 | **Date Collected:** | 1/ 5/22 1400 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 1/ 6/22 |
| **Sample Name:** | LH18/24-SP650_010522_AIX | **Units:** | µg/L |
| **Lab Code:** | E2200006-001 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.117** | J | 0.200 | 0.100 | 0.0500 | 2 | 1/ 7/22 | 1/7/22 13:05 | 393624 | 751127 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200006 |
| **Project:** | HS22010166 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2200008-01 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | ND | U | 0.100 | 0.0500 | 0.0250 | 1 | 1/ 7/22 | 1/7/22 11:30 | 393624 | 751127 | |

# 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:** HS22010166
**Sample Matrix:** Ground Water

**Service Request:** E2200006
**Date Analyzed:** 1/ 7/22

**Lab Control Sample Summary**
**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850
**Prep Method:**

**Units:** µg/L
**Basis:** NA

**Extraction Lot:** 393624

| | Lab Control Sample EQ2200008-02 | | | Duplicate Lab Control Sample EQ2200008-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.119 | 0.100 | 119 | 0.0973 | 0.100 | 97 | 84 - 119 | 20 * | 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:** | E2200006 |
| **Project:** | HS22010166 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200008-02 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.119** | | 0.100 | 0.0500 | 0.0250 | 1 | 1/ 7/22 | 1/7/22 11:38 | 393624 | 751127 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200006 |
| **Project:** | HS22010166 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200008-03 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.0973** | J | 0.100 | 0.0500 | 0.0250 | 1 | 1/ 7/22 | 1/7/22 11:46 | 393624 | 751127 | |

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

January 19, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22010170**

Laboratory Results for: **Longhorn GW Treatment Plant Monthly Influent**

Dear Marcia Olive,

ALS Environmental received 1 sample(s) on Jan 06, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: JUMOKE.LAWAL**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 19-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent
**Work Order:** HS22010170

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22010170-01 | LH18/24-SP140_010522 | Water | | 05-Jan-2022 14:00 | 06-Jan-2022 10:20 | ☐ |

**ALS Houston, US** Date: 19-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent
**Work Order:** HS22010170

**CASE NARRATIVE**

## Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached

## Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached

## Metals by Method SW6020A

### Batch ID: 174550

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method SW7196

### Batch ID: R398979

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

**ALS Houston, US** Date: 19-Jan-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Monthly Influent | WorkOrder:HS22010170 |
| Sample ID: | LH18/24-SP140_010522 | Lab ID:HS22010170-01 |
| Collection Date: | 05-Jan-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **METALS BY ICPMS BY SW6020A** | | **Method:SW6020A** | | | | Prep:SW3010A / 19-Jan-2022 | | Analyst: JHD |
| Selenium | 0.00250 | U | 0.00110 | 0.00250 | 0.00500 | mg/L | 1 | 19-Jan-2022 15:13 |
| Silver | 0.000500 | U | 0.000200 | 0.000500 | 0.00500 | mg/L | 1 | 19-Jan-2022 15:13 |
| **HEXAVALENT CHROMIUM BY SW7196A** | | **Method:SW7196** | | | | | | Analyst: AP |
| Chromium, Hexavalent | 0.0100 | U | 0.00600 | 0.0100 | 0.0100 | mg/L | 1 | 06-Jan-2022 13:57 |
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 07-Jan-2022 15:03 |

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

## Weight / Prep Log

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent
**WorkOrder:** HS22010170

**Batch ID:** 174550 **Start Date:** 19 Jan 2022 09:00 **End Date:** 19 Jan 2022 13:00
**Method:** WATER - SW3010A **Prep Code:** 3010A

| Sample ID | Container | Sample Wt/Vol | Final Volume | Prep Factor | |
|---|---|---|---|---|---|
| HS22010170-01 | | 10 (mL) | 10 (mL) | 1 | 120 plastic HNO3 |

**ALS Houston, US** Date: 19-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent
**WorkOrder:** HS22010170

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** 174550 ( 0 ) | **Test Name :** METALS BY ICPMS BY SW6020A | | | | **Matrix:** Water | |
| HS22010170-01 | LH18/24-SP140_010522 | 05 Jan 2022 14:00 | | 19 Jan 2022 13:00 | 19 Jan 2022 15:13 | 1 |
| **Batch ID:** R398979 ( 0 ) | **Test Name :** HEXAVALENT CHROMIUM BY SW7196A | | | | **Matrix:** Water | |
| HS22010170-01 | LH18/24-SP140_010522 | 05 Jan 2022 14:00 | | | 06 Jan 2022 13:57 | 1 |
| **Batch ID:** R399058 ( 0 ) | **Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) | | | | **Matrix:** Water | |
| HS22010170-01 | LH18/24-SP140_010522 | 05 Jan 2022 14:00 | | | 07 Jan 2022 15:03 | 1 |

**ALS Houston, US** Date: 19-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent
**WorkOrder:** HS22010170

**QC BATCH REPORT**

**Batch ID: 174550 ( 0 )** **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

**MBLK** Sample ID: **MBLK-174550** Units: **mg/L** Analysis Date: **19-Jan-2022 15:09**
Client ID: Run ID: **ICPMS06_400641** SeqNo: **6469524** PrepDate: **19-Jan-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Selenium | 0.00250 | 0.00500 | | | | | | | | U |
| Silver | 0.000500 | 0.00500 | | | | | | | | U |

**LCS** Sample ID: **LCS-174550** Units: **mg/L** Analysis Date: **19-Jan-2022 15:11**
Client ID: Run ID: **ICPMS06_400641** SeqNo: **6469525** PrepDate: **19-Jan-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Selenium | 0.0561 | 0.00500 | 0.05 | 0 | 112 | 80 - 120 | | | | |
| Silver | 0.05031 | 0.00500 | 0.05 | 0 | 101 | 85 - 116 | | | | |

**MS** Sample ID: **HS22010170-01MS** Units: **mg/L** Analysis Date: **19-Jan-2022 15:17**
Client ID: **LH18/24-SP140_010522** Run ID: **ICPMS06_400641** SeqNo: **6469528** PrepDate: **19-Jan-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Selenium | 0.05609 | 0.00500 | 0.05 | 0.000349 | 111 | 80 - 120 | | | | |
| Silver | 0.04897 | 0.00500 | 0.05 | 0.000009 | 97.9 | 85 - 116 | | | | |

**MSD** Sample ID: **HS22010170-01MSD** Units: **mg/L** Analysis Date: **19-Jan-2022 15:19**
Client ID: **LH18/24-SP140_010522** Run ID: **ICPMS06_400641** SeqNo: **6469529** PrepDate: **19-Jan-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Selenium | 0.05568 | 0.00500 | 0.05 | 0.000349 | 111 | 80 - 120 | 0.05609 | 0.732 | 20 | |
| Silver | 0.04831 | 0.00500 | 0.05 | 0.000009 | 96.6 | 85 - 116 | 0.04897 | 1.35 | 20 | |

**PDS** Sample ID: **HS22010170-01PDS** Units: **mg/L** Analysis Date: **19-Jan-2022 15:21**
Client ID: **LH18/24-SP140_010522** Run ID: **ICPMS06_400641** SeqNo: **6469530** PrepDate: **19-Jan-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Silver | 0.1171 | 0.00500 | 0.1 | 0.000009 | 117 | 80 - 120 | | | | |

**ALS Houston, US** Date: 19-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent
**WorkOrder:** HS22010170

**QC BATCH REPORT**

**Batch ID:** **174550 ( 0 )** **Instrument:** **ICPMS06** **Method:** **METALS BY ICPMS BY SW6020A**

**SD** Sample ID: **HS22010170-01SD** Units: **mg/L** Analysis Date: **19-Jan-2022 15:15**
Client ID: **LH18/24-SP140_010522** Run ID: **ICPMS06_400641** SeqNo: **6469527** PrepDate: **19-Jan-2022** DF: **5**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %D | %D Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Selenium | 0.0125 | 0.0250 | | | | | 0.000349 | 0 | 10 | U |
| Silver | 0.00250 | 0.0250 | | | | | 0.000009 | 0 | 10 | U |

**The following samples were analyzed in this batch:** HS22010170-01

**ALS Houston, US** Date: 19-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent
**WorkOrder:** HS22010170

**QC BATCH REPORT**

**Batch ID:** R398979 ( 0 ) **Instrument:** UV-2450 **Method:** HEXAVALENT CHROMIUM BY SW7196A

**MBLK** Sample ID: **MBLK-R398979** Units: **mg/L** Analysis Date: **06-Jan-2022 13:57**
Client ID: Run ID: **UV-2450_398979** SeqNo: **6454615** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 0.0100 | 0.0100 | | | | | | | | U |

**LCS** Sample ID: **LCS-R398979** Units: **mg/L** Analysis Date: **06-Jan-2022 13:57**
Client ID: Run ID: **UV-2450_398979** SeqNo: **6454614** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 0.259 | 0.0100 | 0.25 | 0 | 104 | 90 - 111 | | | | |

**MS** Sample ID: **HS22010170-01MS** Units: **mg/L** Analysis Date: **06-Jan-2022 13:57**
Client ID: **LH18/24-SP140_010522** Run ID: **UV-2450_398979** SeqNo: **6454609** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 0.257 | 0.0100 | 0.25 | 0 | 103 | 90 - 111 | | | | |

**MSD** Sample ID: **HS22010170-01MSD** Units: **mg/L** Analysis Date: **06-Jan-2022 13:57**
Client ID: **LH18/24-SP140_010522** Run ID: **UV-2450_398979** SeqNo: **6454608** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 0.258 | 0.0100 | 0.25 | 0 | 103 | 90 - 111 | 0.257 | 0.388 | 20 | |

**The following samples were analyzed in this batch:** HS22010170-01

**ALS Houston, US** Date: 19-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent
**WorkOrder:** **HS22010170**

## 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 |
| Florida | E87611-33 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 19-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent
**Work Order:** HS22010170

## SAMPLE TRACKING

| Lab Samp ID | Client Sample ID | Action | Date | Person | New Location |
|---|---|---|---|---|---|
| HS22010170-01 | LH18/24-SP140_010522 | Login | 1/6/2022 12:17:17 PM | PMG | MET044 |
| HS22010170-01 | LH18/24-SP140_010522 | Login | 1/6/2022 12:17:17 PM | PMG | Sub |
| HS22010170-01 | LH18/24-SP140_010522 | Login | 1/6/2022 12:17:17 PM | PMG | WET106 |

**ALS Houston, US** Date: 19-Jan-22

## Sample Receipt Checklist

**Work Order ID:** HS22010170 **Date/Time Received:** **06-Jan-2022 10:20**

**Client Name:** Bhate Environmental **Received by:** **Eric Widjaja**

**Completed By:** /S/ Paresh M. Giga (eSignature) 06-Jan-2022 12:23 (Date/Time) **Reviewed by:** /S/ Ragen Giga (eSignature) 06-Jan-2022 18:34 (Date/Time)

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

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

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 4.0C U/C | IR31 |
| Cooler(s)/Kit(s): | 46284 | |
| Date/Time sample(s) sent to storage: | 1/6/2022 12:35 | |

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

Page 1 of 1

**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:**
## GROUNDWATER TREATMENT PLANT MONTHLY INFLUENT SAMPLES

**Prepared By:** Scott Beesinger

**P.O. Number**

**HS22010170**

Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Monthly Influent

Analyses

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | SILVER & SELENIUM | HEXAVALENT CHROMIUM | PERCHLORATE | | | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP140_010522 | Water | 01/05/22 / 14:00 | | 1 | X | | | | | | | | | | HNO3 | |
| LH18/24-SP140_010522 | Water | 01/05/22 / 14:00 | | 2 | | X | X | | | | | | | | NONE | |

**Additional Remarks:** **STANDARD TURN AROUND TIME**

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 01/05/22 | 14:30 | | | | | | | | | |

**For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| Ellulyan | 01/06/22 | 10:20 | | | | | | | |

Remarks:
46254 4.0°C
VOC
CRO.0
IR#31

(Word) S:\1-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

46284

CUSTODY SEAL

Date: 1/5/22 Time: 1430
Name: Sam Beeson
Company: BHMT

Seal Broken By:
Date: HCl 2022.

TRK# 4809 7833 1350 PRIORITY OVERNIGHT

AB SGRA 46284 77099
TX-US
IAH

4230674 05Jan2022 GGGA 56DG2/01EF/1B23

January 07, 2022

Service Request No:E2200008

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS22010170**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory January 06, 2022
For your reference, these analyses have been assigned our service request number **E2200008.**

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

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PHONE +1 281 530 5656 | FAX +1 281 530 5887
ALS Group USA, Corp.
dba ALS Environmental

# Certificate of Analysis

**ALS Environmental - Houston HRMS**
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Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

**ALS Environmental**

| | | | |
|---|---|---|---|
| **Client:** | ALS Houston | **Service Request No.:** | E2200008 |
| **Project:** | HS22010170 | **Date Received:** | 01/06/22 |
| **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 01/06/22.

The sample was received in good condition and is 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:**

EQ2200008: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS-DLCS RPD exceed QC limit; the individual recoveries met acceptance criteria.

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:**E2200008
**Project:** HS22010170

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2200008-001 | LH18/24-SP140_010522 | 1/5/2022 | 1400 |

# Service Request Summary

**Folder #:** **E2200008**
Client Name: ALS Environmental - US
Project Name: HS22010170
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 01/06/22
Internal Due Date: 1/20/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22010170
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON ClO4 DOD/6850 |
|---|---|---|---|---|
| E2200008-001 | LH18/24-SP140_010522 | Ground Water | 01/05/22 1400 | **IV** |

## Folder Comments:

Send DWELR confirmation to Middletown PM for PADEP samples.

# Service Request Summary

| | |
|---|---|
| **Folder #:** | **E2200008** |
| Client Name: | ALS Environmental - US |
| Project Name: | HS22010170 |
| Project Number: | |
| **Report To:** | Ragen Giga<br>ALS Environmental - US<br>10450 Stancliff Rd Suite 210<br>Houston, TX 77099<br>USA |
| Phone Number: | |
| Cell Number: | |
| Fax Number: | |
| E-mail: | ragenp.giga@alsglobal.com |

| | |
|---|---|
| Project Chemist: | Corey Grandits |
| Originating Lab: | HOUSTON |
| Logged By: | CGRANDITS |
| Date Received: | 01/06/22 |
| Internal Due Date: | 1/20/2022 |
| QAP: | LAB QAP |
| Qualifier Set: | Lab Standard |
| Formset: | Lab Standard |
| Merged?: | Y |
| Report to MDL?: | Y |
| P.O. Number: | HS22010170 |
| EDD: | No EDD Specified |

1 120 mL-Plastic Bottle Natural WM Unpreserved

**Location:** EHRMS-AirArch 1

**Pressure Gas:**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 1 | Level IV due 1/27 |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| + | Possible Tedlar bag artifact. |
| A | TIC is a suspected aldol-condensation product |
| B | Analyte found in the associated method blank as well as in the sample. |
| BC | Reported results are not blank corrected. |
| BH | The back section of the tube yielded higher results than the front. |
| BT | Results indicated possible breakthrough; back section >=10% front section. |
| C | Result identification confirmed. |
| D | Compound identified in an analysis at a secondary dilution factor |
| D | Spike was diluted out |
| DE | Reported results are corrected for desorption efficiency. |
| E | Estimated value. Concentration above calibration range |
| E | The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample. |
| F | The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard. |
| H | The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard. |
| H1 | Sample analysis performed past holding time. See case narrative. |
| H2 | Initial analysis within holding time. Reanalysis for the required dilution was past holding time. |
| H3 | Sample was received and analyzed past holding time. |
| H4 | Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative. |
| I | Internal standard not within the specified limits. See case narrative. |
| J | Estimated Value. Concentration found below MRL. |
| K | A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate. |
| K | Analyte was detected above the method reporting limit prior to normalization. |
| K | The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result. |
| L | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard. |
| L1 | Laboratory control sample recovery outside the specified limits; results may be biased high. |
| L2 | Laboratory control sample recovery outside the specified limits; results may be biased low. |
| L3 | Laboratory control sample recovery outside the specified limits. |
| M | Matrix interference; results may be biased high. |
| M | The duplicate injection precision not met. |
| M1 | Matrix interference due to coelution with a non-target compound; results may be biased high. |
| N | Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search. |
| N | The Matrix Spike sample recovery is not within control limits. See case narrative. |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| O | The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard. |
| P | Indicates chlorodiphenyl ether interference present at the retention time of the target compound. |
| P | Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns |
| Q | Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria. |
| R | Duplicate Precision not met. |
| R1 | Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated. |
| S | Surrogate recovery not within specified limits. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| T | Analyte is a tentatively identified compound, result is estimated. |
| U | Compound was analyzed for, but was not detected (ND). |
| V1 | The continuing calibration verification standard was outside (biased high) the specified limits for this compound. |
| V2 | The continuing calibration verification standard was outside (biased low) the specified limits for this compound. |
| W | Result quantified, but the corresponding peak was detected outside the generated retention time window. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| X | See case narrative. |
| Y | Recovery outside limits |
| Y | The chromatogram resembles a petroleum product but does not match the calibration standard. |
| Z | The chromatogram does not resemble a petroleum product. |
| i | The MRL/MDL has been elevated due to a matrix interference. |

# ALS Laboratory Group

## Acronyms

| | |
|---|---|
| Cal | Calibration |
| Conc | CONCentration |
| Dioxin(s) | Polychlorinated dibenzo-p-dioxin(s) |
| EDL | Estimated Detection Limit |
| EMPC | Estimated Maximum Possible Concentration |
| Flags | Data qualifiers |
| Furan(s) | Polychlorinated dibenzofuran(s) |
| g | Grams |
| ICAL | Initial CALibration |
| ID | IDentifier |
| Ions | Masses monitored for the analyte during data acquisition |
| L | Liter (s) |
| LCS | Laboratory Control Sample |
| DLCS | Duplicate Laboratory Control Sample |
| MB | Method Blank |
| MCL | Method Calibration Limit |
| MDL | Method Detection Limit |
| mL | Milliliters |
| MS | Matrix Spiked sample |
| DMS | Duplicate Matrix Spiked sample |
| NO | Number of peaks meeting all identification criteria |
| PCDD(s) | Polychlorinated dibenzo-p-dioxin(s) |
| PCDF(s) | Polychlorinated dibenzofuran(s) |
| ppb | Parts per billion |
| ppm | Parts per million |
| ppq | Parts per quadrillion |
| ppt | Parts per trillion |
| QA | Quality Assurance |
| QC | Quality Control |
| Ratio | Ratio of areas from monitored ions for an analyte |
| % Rec. | Percent recovery |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| RT | Retention Time |
| SDG | Sample Delivery Group |
| S/N | Signal-to-noise ratio |
| TEF | Toxicity Equivalence Factor |
| TEQ | Toxicity Equivalence Quotient |

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ALS Environmental

## State Certifications, Accreditations, and Licenses

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas Department of Environmental Quality | 19-028-0 | 6/30/2022 |
| Arkansas Department of Environmental Quality | 21-022-0 | 3/26/2022 |
| Florida Department of Health | E87611-33 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 5/1/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd, Suite 210, Houston TX 77099
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# Subcontract Chain of Custody

**SAMPLING STATE:** **Dept of Defense** **COC ID: 17834**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

| | |
|---|---|
| **Company:** | ALS Houston |
| **Contact:** | Ragen Giga |
| **Address:** | 10450 Stancliff Rd, Ste 210 |
| **Phone:** | +1 281 530 5656 |
| **Email:** | RagenP.Giga@ALSGlobal.com |
| **Alternate Contact:** | 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:** | HS22010170 |
| **TSR:** | Sonia West |

| | LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | | | DUE DATE |
| **1.** | **HS22010170-01** | **LH18/24-SP140_010522** | **Water** | **05 Jan 2022 14:00** |
| | 6850-Perch. DOD Level II & Level IV in separate pdf | | | 20 Jan 2022 |

**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: 1/6/2022 12:30

Received By: CG Date/Time: 1/6/22 1240

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

# Cooler Receipt Form

Project Chemist: CH

Client/Project: ALS-H

Thermometer ID: 1231

Date/Time Received: 1-6-22 Initials: CH

Date/Time Logged in: 1-6-22 Initials: CH

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☒ Courier (ALS) ○ Client

2. Samples received in: ☒ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ☒ No

Were they intact? ○ Yes ○ No ☒ N/A

Were they signed and dated? ○ Yes ○ No ☒ N/A

If yes, how many and where?

4. Packing Material: ○ Inserts ☒ Baggies ○ Bubble Wrap ○ Gel Packs ☒ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

| Cooler Tracking Number | COC ID | Date Opened | Time Opened | Opened By | Temp. °C | Temp Blank? |
|---|---|---|---|---|---|---|
| NA | | 1-6-22 | 1240 | PH | 3.0 | ☒ |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☒ Yes ○ No

7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☒ Yes ○ No

8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☒ Yes ○ No

9. Were appropriate bottles/containers and volumes received for the requested tests? ☒ Yes ○ No

10. Did sample labels and tags agree with custody documents? ☒ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

ALS Environmental - Houston HRMS

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**www.alsglobal.com**

# SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

**Cooler Custody Seals (desirable, mandatory if specified in SAP):**

- ✓ Intact on outside of cooler, signed and dated

**Chain-of-Custody (COC) documentation (mandatory):**

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

**Sample Integrity (mandatory):**

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

**Temperature Requirement (varies by sample matrix):**

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

# Preparation Information Benchsheets

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Phone (713)266-1599 Fax (713)266-0130
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# *Preparation Information Benchsheet*

**Prep Run#:** 393624 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** **Prep Date/Time:** 1/7/22 09:16

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2200004-001 | 2112468-01 (MW-13) | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 2 | E2200004-002 | 2112468-02 (MW-17) | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 3 | E2200006-001 | LH18/24-SP650_010522_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 4 | E2200007-001 | LH18/24-SP650_010522_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 5 | E2200008-001 | LH18/24-SP140_010522 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 6 | EQ2200008-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 7 | EQ2200008-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 8 | EQ2200008-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |

## Spiking Solutions

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 214765 Logbook Ref: Sodium Perchlorate Expires On: 12/11/2022

E2200004-001 100.00µL E2200004-002 100.00µL E2200006-001 100.00µL E2200007-001 100.00µL E2200008-001 100.00µL EQ2200008-01 100.00µL
EQ2200008-02 100.00µL EQ2200008-03 100.00µL

Name: Perchlorate Intermediate Stock1 Inventory ID 219595 Logbook Ref: Perchlorate Expires On: 03/15/2022

EQ2200008-02 1.00µL EQ2200008-03 1.00µL

## Preparation Materials

Water HPLC Grade 08/03/2021 Water (218530) 537M Glass Culture Tubes 537M Glass Tubes (218064) 6850 0.45um syringe filters 6850 Syringe Filters (219639)

## Preparation Steps

Step: Preparation
Started: 1/7/22 09:16
Finished: 1/7/22 10:00
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 1/7/22

Chain of Custody

Relinquished By: _____ Date: _____ Extracts Examined
Received By: _____ Date: _____ Yes No

# Analytical Results

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**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200008 |
| **Project:** | HS22010170 | **Date Collected:** | 1/ 5/22 1400 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 1/ 6/22 |
| **Sample Name:** | LH18/24-SP140_010522 | **Units:** | µg/L |
| **Lab Code:** | E2200008-001 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **10700** | | 50.0 | 25.0 | 12.5 | 500 | 1/ 7/22 | 1/7/22 12:57 | 393624 | 751127 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200008 |
| **Project:** | HS22010170 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2200008-01 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | ND | U | 0.100 | 0.0500 | 0.0250 | 1 | 1/ 7/22 | 1/7/22 11:30 | 393624 | 751127 | |

# Accuracy & Precision

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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:** | E2200008 |
| **Project:** | HS22010170 | **Date Analyzed:** | 1/ 7/22 |
| **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:** | | **Basis:** | NA |
| | | **Extraction Lot:** | 393624 |

| | Lab Control Sample EQ2200008-02 | | | Duplicate Lab Control Sample EQ2200008-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.119 | 0.100 | 119 | 0.0973 | 0.100 | 97 | 84 - 119 | 20 * | 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:** | E2200008 |
| **Project:** | HS22010170 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200008-02 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.119** | | 0.100 | 0.0500 | 0.0250 | 1 | 1/ 7/22 | 1/7/22 11:38 | 393624 | 751127 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200008 |
| **Project:** | HS22010170 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200008-03 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.0973** | J | 0.100 | 0.0500 | 0.0250 | 1 | 1/ 7/22 | 1/7/22 11:46 | 393624 | 751127 | |

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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January 20, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22010172**

Laboratory Results for: **Longhorn GW Treatment Plant Monthly Effluent Samples**

Dear Marcia Olive,

ALS Environmental received 3 sample(s) on Jan 06, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: DAYNA.FISHER**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**Work Order:** HS22010172

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22010172-01 | LH18/24-SP650_010522 | Water | | 05-Jan-2022 14:00 | 06-Jan-2022 10:20 | ☐ |
| HS22010172-02 | LH18/24-SP650_010522_AIX | Water | | 05-Jan-2022 14:00 | 06-Jan-2022 10:20 | ☐ |
| HS22010172-03 | Trip Blank | Water | CG-121321-05 | 05-Jan-2022 14:00 | 06-Jan-2022 10:20 | ☐ |

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**Work Order:** HS22010172

**CASE NARRATIVE**

## Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached

## GCMS Semivolatiles by Method SW8270SIM

### Batch ID: 174302

**Sample ID: LH18/24-SP650_010522 (HS22010172-01)**

- The GCMS semi-volatile extract of this sample was run at a dilution due to a high level of matrix interference.
- The surrogate recoveries could not be determined due to dilution below the calibration range.

## GCMS Volatiles by Method SW8260

### Batch ID: R399088

**Sample ID: LH18/24-SP650_010522 (HS22010172-01MS)**

- MS/MSD failed QC limits for some compounds.

## Metals by Method SW6020A

### Batch ID: 174550

**Sample ID: HS22010170-01MS**

- MS/MSD and DUPs are for an unrelated sample (Barium)

## WetChemistry by Method SW7196

### Batch ID: R398979

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

**ALS Houston, US** Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
Sample ID: LH18/24-SP650_010522
Collection Date: 05-Jan-2022 14:00

**ANALYTICAL REPORT**
WorkOrder:HS22010172
Lab ID:HS22010172-01
Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| 1,1,1,2-Tetrachloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 1,1,1-Trichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 1,1-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 1,1-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 1,1-Dichloropropene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 1,2,3-Trichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 1,2,3-Trichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 1,2,4-Trichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 1,2,4-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 1,2-Dibromo-3-chloropropane | 1.0 | U | 0.20 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 1,2-Dibromoethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 1,2-Dichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 1,2-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 1,2-Dichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 1,3,5-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 1,3-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 1,3-Dichloropropane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 1,4-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 2,2-Dichloropropane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 2-Butanone | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 2-Chlorotoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 2-Hexanone | 2.0 | U | 1.0 | 2.0 | 2.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 4-Chlorotoluene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 4-Isopropyltoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| 4-Methyl-2-pentanone | 2.0 | U | 0.70 | 2.0 | 2.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Acetone | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Benzene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Bromobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Bromochloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Bromodichloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Bromoform | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Bromomethane | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Carbon disulfide | 2.0 | U | 0.60 | 2.0 | 2.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Carbon tetrachloride | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Chlorobenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Chloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Chloroform | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |

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

**ALS Houston, US** Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.

**ANALYTICAL REPORT**

Project: Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS22010172

Sample ID: LH18/24-SP650_010522 Lab ID:HS22010172-01

Collection Date: 05-Jan-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| Chloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| **cis-1,2-Dichloroethene** | **1.6** | | **0.20** | **0.50** | **1.0** | **ug/L** | 1 | 07-Jan-2022 13:20 |
| cis-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Dibromochloromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Dibromomethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Dichlorodifluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Ethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Hexachlorobutadiene | 1.0 | U | 1.0 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Isopropylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| m,p-Xylene | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Methylene chloride | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| n-Butylbenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| n-Propylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Naphthalene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| o-Xylene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| sec-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Styrene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| tert-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Tetrachloroethene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Toluene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| trans-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| trans-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Trichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Trichlorofluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| Vinyl chloride | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 13:20 |
| *Surr: 1,2-Dichloroethane-d4* | *81.1* | | | **0** | *81-118* | *%REC* | *1* | *07-Jan-2022 13:20* |
| *Surr: 4-Bromofluorobenzene* | *97.8* | | | **0** | *85-114* | *%REC* | *1* | *07-Jan-2022 13:20* |
| *Surr: Dibromofluoromethane* | *90.3* | | | **0** | *80-119* | *%REC* | *1* | *07-Jan-2022 13:20* |
| *Surr: Toluene-d8* | *107* | | | **0** | *89-112* | *%REC* | *1* | *07-Jan-2022 13:20* |
| **SEMIVOLATILES SIM** | | **Method:SW8270SIM** | | | | Prep:SW3510 / 11-Jan-2022 | | Analyst: JLJ |
| **1,4-Dioxane** | **11** | a | **1.0** | **1.0** | **1.0** | **ug/L** | 100 | 20-Jan-2022 13:56 |
| *Surr: 2-Fluorobiphenyl* | *0* | *S* | | 0 | *40-140* | *%REC* | *100* | *20-Jan-2022 13:56* |
| *Surr: 4-Terphenyl-d14* | *0* | *S* | | 0 | *40-140* | *%REC* | *100* | *20-Jan-2022 13:56* |
| *Surr: Nitrobenzene-d5* | *0* | *S* | | 0 | *40-140* | *%REC* | *100* | *20-Jan-2022 13:56* |
| **METALS BY ICPMS BY SW6020A** | | **Method:SW6020A** | | | | Prep:SW3010A / 19-Jan-2022 | | Analyst: JHD |
| **Barium** | **0.375** | | **0.00190** | **0.00250** | **0.00500** | **mg/L** | 1 | 19-Jan-2022 15:23 |
| Lead | 0.00100 | U | 0.000600 | 0.00100 | 0.00500 | mg/L | 1 | 19-Jan-2022 15:23 |
| Selenium | 0.00250 | U | 0.00110 | 0.00250 | 0.00500 | mg/L | 1 | 19-Jan-2022 15:23 |
| Silver | 0.000500 | U | 0.000200 | 0.000500 | 0.00500 | mg/L | 1 | 19-Jan-2022 15:23 |

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

**ALS Houston, US**

Date: 20-Jan-22

**ANALYTICAL REPORT**

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
Sample ID: LH18/24-SP650_010522
Collection Date: 05-Jan-2022 14:00

WorkOrder:HS22010172
Lab ID:HS22010172-01
Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **HEXAVALENT CHROMIUM BY SW7196A** | | **Method:SW7196** | | | | | | Analyst: AP |
| Chromium, Hexavalent | 0.0100 | U | 0.00600 | 0.0100 | 0.0100 | mg/L | 1 | 06-Jan-2022 13:57 |

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

**ALS Houston, US**

Date: 20-Jan-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Monthly Effluent Samples | WorkOrder:HS22010172 |
| Sample ID: | LH18/24-SP650_010522_AIX | Lab ID:HS22010172-02 |
| Collection Date: | 05-Jan-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 07-Jan-2022 15:03 |

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

**ALS Houston, US** Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS22010172
Sample ID: Trip Blank Lab ID:HS22010172-03
Collection Date: 05-Jan-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| 1,1,1,2-Tetrachloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 1,1,1-Trichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 1,1-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 1,1-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 1,1-Dichloropropene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 1,2,3-Trichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 1,2,3-Trichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 1,2,4-Trichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 1,2,4-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 1,2-Dibromo-3-chloropropane | 1.0 | U | 0.20 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 1,2-Dibromoethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 1,2-Dichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 1,2-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 1,2-Dichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 1,3,5-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 1,3-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 1,3-Dichloropropane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 1,4-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 2,2-Dichloropropane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 2-Butanone | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 2-Chlorotoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 2-Hexanone | 2.0 | U | 1.0 | 2.0 | 2.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 4-Chlorotoluene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 4-Isopropyltoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| 4-Methyl-2-pentanone | 2.0 | U | 0.70 | 2.0 | 2.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Acetone | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Benzene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Bromobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Bromochloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Bromodichloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Bromoform | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Bromomethane | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Carbon disulfide | 2.0 | U | 0.60 | 2.0 | 2.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Carbon tetrachloride | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Chlorobenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Chloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Chloroform | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |

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

**ALS Houston, US** Date: 20-Jan-22

Client: Bhate Environmental Associates, Inc.

**ANALYTICAL REPORT**

Project: Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS22010172

Sample ID: Trip Blank Lab ID:HS22010172-03

Collection Date: 05-Jan-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| Chloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| cis-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| cis-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Dibromochloromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Dibromomethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Dichlorodifluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Ethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Hexachlorobutadiene | 1.0 | U | 1.0 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Isopropylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| m,p-Xylene | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Methylene chloride | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| n-Butylbenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| n-Propylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Naphthalene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| o-Xylene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| sec-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Styrene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| tert-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Tetrachloroethene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Toluene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| trans-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| trans-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Trichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Trichlorofluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| Vinyl chloride | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 07-Jan-2022 12:58 |
| *Surr: 1,2-Dichloroethane-d4* | *81.3* | | | **0** | *81-118* | *%REC* | *1* | *07-Jan-2022 12:58* |
| *Surr: 4-Bromofluorobenzene* | *97.4* | | | **0** | *85-114* | *%REC* | *1* | *07-Jan-2022 12:58* |
| *Surr: Dibromofluoromethane* | *89.9* | | | **0** | *80-119* | *%REC* | *1* | *07-Jan-2022 12:58* |
| *Surr: Toluene-d8* | *107* | | | **0** | *89-112* | *%REC* | *1* | *07-Jan-2022 12:58* |

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

**ALS Houston, US** Date: 20-Jan-22

## Weight / Prep Log

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22010172

**Batch ID:** 174302 **Start Date:** 11 Jan 2022 09:30 **End Date:** 11 Jan 2022 13:00
**Method:** SV AQ SEP FUN EXTRACT-LOWLEV - 3510C **Prep Code:** 3510_B_SIM

| Sample ID | Container | Sample Wt/Vol | Final Volume | Prep Factor | |
|---|---|---|---|---|---|
| HS22010172-01 | 1 | 1000 (mL) | 1 (mL) | 0.001 | 1-liter amber glass, Neat |

**Batch ID:** 174550 **Start Date:** 19 Jan 2022 09:00 **End Date:** 19 Jan 2022 13:00
**Method:** WATER - SW3010A **Prep Code:** 3010A

| Sample ID | Container | Sample Wt/Vol | Final Volume | Prep Factor | |
|---|---|---|---|---|---|
| HS22010172-01 | | 10 (mL) | 10 (mL) | 1 | 120 plastic HNO3 |

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22010172

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** 174302 ( 0 ) | **Test Name :** SEMIVOLATILES SIM | | | | **Matrix:** Water | |
| HS22010172-01 | LH18/24-SP650_010522 | 05 Jan 2022 14:00 | | 11 Jan 2022 11:46 | 20 Jan 2022 13:56 | 100 |
| **Batch ID:** 174550 ( 0 ) | **Test Name :** METALS BY ICPMS BY SW6020A | | | | **Matrix:** Water | |
| HS22010172-01 | LH18/24-SP650_010522 | 05 Jan 2022 14:00 | | 19 Jan 2022 13:00 | 19 Jan 2022 15:23 | 1 |
| **Batch ID:** R398979 ( 0 ) | **Test Name :** HEXAVALENT CHROMIUM BY SW7196A | | | | **Matrix:** Water | |
| HS22010172-01 | LH18/24-SP650_010522 | 05 Jan 2022 14:00 | | | 06 Jan 2022 13:57 | 1 |
| **Batch ID:** R399058 ( 0 ) | **Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) | | | | **Matrix:** Water | |
| HS22010172-02 | LH18/24-SP650_010522_AIX | 05 Jan 2022 14:00 | | | 07 Jan 2022 15:03 | 1 |
| **Batch ID:** R399088 ( 0 ) | **Test Name :** VOLATILES ORGANICS BY METHOD 8260C | | | | **Matrix:** Water | |
| HS22010172-01 | LH18/24-SP650_010522 | 05 Jan 2022 14:00 | | | 07 Jan 2022 13:20 | 1 |
| HS22010172-03 | Trip Blank | 05 Jan 2022 14:00 | | | 07 Jan 2022 12:58 | 1 |

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22010172

**QC BATCH REPORT**

**Batch ID: 174550 ( 0 )** **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

**MBLK** Sample ID: **MBLK-174550** Units: **mg/L** Analysis Date: **19-Jan-2022 15:09**
Client ID: Run ID: **ICPMS06_400641** SeqNo: **6469524** PrepDate: **19-Jan-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 0.00250 | 0.00500 | | | | | | | | U |
| Lead | 0.00100 | 0.00500 | | | | | | | | U |
| Selenium | 0.00250 | 0.00500 | | | | | | | | U |
| Silver | 0.000500 | 0.00500 | | | | | | | | U |

**LCS** Sample ID: **LCS-174550** Units: **mg/L** Analysis Date: **19-Jan-2022 15:11**
Client ID: Run ID: **ICPMS06_400641** SeqNo: **6469525** PrepDate: **19-Jan-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 0.05445 | 0.00500 | 0.05 | 0 | 109 | 86 - 114 | | | | |
| Lead | 0.05203 | 0.00500 | 0.05 | 0 | 104 | 88 - 115 | | | | |
| Selenium | 0.0561 | 0.00500 | 0.05 | 0 | 112 | 80 - 120 | | | | |
| Silver | 0.05031 | 0.00500 | 0.05 | 0 | 101 | 85 - 116 | | | | |

**MS** Sample ID: **HS22010170-01MS** Units: **mg/L** Analysis Date: **19-Jan-2022 15:17**
Client ID: Run ID: **ICPMS06_400641** SeqNo: **6469528** PrepDate: **19-Jan-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 0.5064 | 0.00500 | 0.05 | 0.4314 | 150 | 86 - 114 | | | | SO |
| Lead | 0.05476 | 0.00500 | 0.05 | 0.001565 | 106 | 88 - 115 | | | | |
| Selenium | 0.05609 | 0.00500 | 0.05 | 0.000349 | 111 | 80 - 120 | | | | |
| Silver | 0.04897 | 0.00500 | 0.05 | 0.000009 | 97.9 | 85 - 116 | | | | |

**MSD** Sample ID: **HS22010170-01MSD** Units: **mg/L** Analysis Date: **19-Jan-2022 15:19**
Client ID: Run ID: **ICPMS06_400641** SeqNo: **6469529** PrepDate: **19-Jan-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 0.4891 | 0.00500 | 0.05 | 0.4314 | 115 | 86 - 114 | 0.5064 | 3.48 | 20 | SO |
| Lead | 0.05392 | 0.00500 | 0.05 | 0.001565 | 105 | 88 - 115 | 0.05476 | 1.53 | 20 | |
| Selenium | 0.05568 | 0.00500 | 0.05 | 0.000349 | 111 | 80 - 120 | 0.05609 | 0.732 | 20 | |
| Silver | 0.04831 | 0.00500 | 0.05 | 0.000009 | 96.6 | 85 - 116 | 0.04897 | 1.35 | 20 | |

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22010172

**QC BATCH REPORT**

**Batch ID: 174550 ( 0 )** **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

**PDS** Sample ID: **HS22010170-01PDS** Units: **mg/L** Analysis Date: **19-Jan-2022 15:21**
Client ID: Run ID: **ICPMS06_400641** SeqNo: **6469530** PrepDate: **19-Jan-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 0.5765 | 0.00500 | 0.1 | 0.4314 | 145 | 80 - 120 | | | | SO |
| Silver | 0.1171 | 0.00500 | 0.1 | 0.000009 | 117 | 80 - 120 | | | | |

**SD** Sample ID: **HS22010170-01SD** Units: **mg/L** Analysis Date: **19-Jan-2022 15:15**
Client ID: Run ID: **ICPMS06_400641** SeqNo: **6469527** PrepDate: **19-Jan-2022** DF: **5**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %D | %D Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 0.4281 | 0.0250 | | | | | 0.4314 | 0.768 | 10 | |
| Lead | 0.00500 | 0.0250 | | | | | 0.001565 | 0 | 10 | U |
| Selenium | 0.0125 | 0.0250 | | | | | 0.000349 | 0 | 10 | U |
| Silver | 0.00250 | 0.0250 | | | | | 0.000009 | 0 | 10 | U |

**The following samples were analyzed in this batch:** HS22010172-01

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22010172

**QC BATCH REPORT**

**Batch ID: 174302 ( 0 )** **Instrument: SV-6** **Method: SEMIVOLATILES SIM**

**MBLK** Sample ID: **MBLK-174302** Units: **ug/L** Analysis Date: **20-Jan-2022 12:41**
Client ID: Run ID: **SV-6_400703** SeqNo: **6470736** PrepDate: **11-Jan-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,4-Dioxane | 0.010 | 0.010 | | | | | | | | U |
| *Surr: 2-Fluorobiphenyl* | *0.07684* | *0* | *0.08* | *0* | *96.1* | *40 - 140* | | | | |
| *Surr: 4-Terphenyl-d14* | *0.08625* | *0* | *0.08* | *0* | *108* | *40 - 140* | | | | |
| *Surr: Nitrobenzene-d5* | *0.07911* | *0* | *0.08* | *0* | *98.9* | *40 - 140* | | | | |

**LCS** Sample ID: **LCS-174302** Units: **ug/L** Analysis Date: **20-Jan-2022 12:59**
Client ID: Run ID: **SV-6_400703** SeqNo: **6470737** PrepDate: **11-Jan-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,4-Dioxane | 0.1001 | 0.010 | 0.08 | 0 | 125 | 40 - 140 | | | | |
| *Surr: 2-Fluorobiphenyl* | *0.08064* | *0* | *0.08* | *0* | *101* | *40 - 140* | | | | |
| *Surr: 4-Terphenyl-d14* | *0.07499* | *0* | *0.08* | *0* | *93.7* | *40 - 140* | | | | |
| *Surr: Nitrobenzene-d5* | *0.067* | *0* | *0.08* | *0* | *83.8* | *40 - 140* | | | | |

**LCSD** Sample ID: **LCSD-174302** Units: **ug/L** Analysis Date: **20-Jan-2022 13:17**
Client ID: Run ID: **SV-6_400703** SeqNo: **6470738** PrepDate: **11-Jan-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,4-Dioxane | 0.1098 | 0.010 | 0.08 | 0 | 137 | 40 - 140 | 0.1001 | 9.23 | 20 | |
| *Surr: 2-Fluorobiphenyl* | *0.08631* | *0* | *0.08* | *0* | *108* | *40 - 140* | *0.08064* | *6.79* | *20* | |
| *Surr: 4-Terphenyl-d14* | *0.0764* | *0* | *0.08* | *0* | *95.5* | *40 - 140* | *0.07499* | *1.87* | *20* | |
| *Surr: Nitrobenzene-d5* | *0.07328* | *0* | *0.08* | *0* | *91.6* | *40 - 140* | *0.067* | *8.95* | *20* | |

**The following samples were analyzed in this batch:** HS22010172-01

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22010172

**QC BATCH REPORT**

**Batch ID:** R399088 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220107** Units: **ug/L** Analysis Date: **07-Jan-2022 12:36**
Client ID: Run ID: **VOA9_399088** SeqNo: **6456794** PrepDate: DF: **1**

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

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22010172

**QC BATCH REPORT**

**Batch ID:** R399088 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220107** Units: **ug/L** Analysis Date: **07-Jan-2022 12:36**
Client ID: Run ID: **VOA9_399088** SeqNo: **6456794** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 2.0 | 2.0 | | | | | | | | U |
| Carbon tetrachloride | 1.0 | 1.0 | | | | | | | | U |
| Chlorobenzene | 1.0 | 1.0 | | | | | | | | U |
| Chloroethane | 1.0 | 1.0 | | | | | | | | U |
| Chloroform | 0.50 | 1.0 | | | | | | | | U |
| Chloromethane | 0.50 | 1.0 | | | | | | | | U |
| cis-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| cis-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Dibromochloromethane | 1.0 | 1.0 | | | | | | | | U |
| Dibromomethane | 0.50 | 1.0 | | | | | | | | U |
| Dichlorodifluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Ethylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Hexachlorobutadiene | 1.0 | 1.0 | | | | | | | | U |
| Isopropylbenzene | 1.0 | 1.0 | | | | | | | | U |
| m,p-Xylene | 1.0 | 2.0 | | | | | | | | U |
| Methylene chloride | 2.0 | 2.0 | | | | | | | | U |
| Naphthalene | 1.0 | 1.0 | | | | | | | | U |
| n-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| n-Propylbenzene | 1.0 | 1.0 | | | | | | | | U |
| o-Xylene | 1.0 | 1.0 | | | | | | | | U |
| sec-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Styrene | 1.0 | 1.0 | | | | | | | | U |
| tert-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Tetrachloroethene | 1.0 | 1.0 | | | | | | | | U |
| Toluene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Trichloroethene | 0.50 | 1.0 | | | | | | | | U |
| Trichlorofluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Vinyl chloride | 0.50 | 1.0 | | | | | | | | U |
| *Surr: 1,2-Dichloroethane-d4* | *40.61* | *1.0* | *50* | *0* | *81.2* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *47.87* | *1.0* | *50* | *0* | *95.7* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *43.95* | *1.0* | *50* | *0* | *87.9* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *52.9* | *1.0* | *50* | *0* | *106* | *89 - 112* | | | | |

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22010172

**QC BATCH REPORT**

**Batch ID:** R399088 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220107** Units: **ug/L** Analysis Date: **07-Jan-2022 11:51**
Client ID: Run ID: **VOA9_399088** SeqNo: **6456793** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 21.66 | 1.0 | 20 | 0 | 108 | 78 - 124 | | | | |
| 1,1,1-Trichloroethane | 18.07 | 1.0 | 20 | 0 | 90.4 | 74 - 131 | | | | |
| 1,1,2,2-Tetrachloroethane | 19.98 | 1.0 | 20 | 0 | 99.9 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 20.42 | 1.0 | 20 | 0 | 102 | 80 - 119 | | | | |
| 1,1-Dichloroethane | 17.46 | 1.0 | 20 | 0 | 87.3 | 77 - 125 | | | | |
| 1,1-Dichloroethene | 17.9 | 1.0 | 20 | 0 | 89.5 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 19.16 | 1.0 | 20 | 0 | 95.8 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 20.81 | 1.0 | 20 | 0 | 104 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 19.28 | 1.0 | 20 | 0 | 96.4 | 73 - 122 | | | | |
| 1,2,4-Trichlorobenzene | 21.35 | 1.0 | 20 | 0 | 107 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 20.77 | 1.0 | 20 | 0 | 104 | 76 - 124 | | | | |
| 1,2-Dibromo-3-chloropropane | 17.98 | 1.0 | 20 | 0 | 89.9 | 62 - 128 | | | | |
| 1,2-Dibromoethane | 20.97 | 1.0 | 20 | 0 | 105 | 77 - 121 | | | | |
| 1,2-Dichlorobenzene | 20.93 | 1.0 | 20 | 0 | 105 | 80 - 119 | | | | |
| 1,2-Dichloroethane | 18.74 | 1.0 | 20 | 0 | 93.7 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 21.27 | 1.0 | 20 | 0 | 106 | 78 - 122 | | | | |
| 1,3,5-Trimethylbenzene | 20.71 | 1.0 | 20 | 0 | 104 | 75 - 124 | | | | |
| 1,3-Dichlorobenzene | 20.83 | 1.0 | 20 | 0 | 104 | 80 - 119 | | | | |
| 1,3-Dichloropropane | 20.57 | 1.0 | 20 | 0 | 103 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 20.18 | 1.0 | 20 | 0 | 101 | 79 - 118 | | | | |
| 2,2-Dichloropropane | 18.4 | 1.0 | 20 | 0 | 92.0 | 60 - 139 | | | | |
| 2-Butanone | 34.04 | 2.0 | 40 | 0 | 85.1 | 56 - 143 | | | | |
| 2-Chlorotoluene | 20.48 | 1.0 | 20 | 0 | 102 | 79 - 122 | | | | |
| 2-Hexanone | 37.38 | 2.0 | 40 | 0 | 93.4 | 57 - 139 | | | | |
| 4-Chlorotoluene | 20.14 | 1.0 | 20 | 0 | 101 | 78 - 122 | | | | |
| 4-Isopropyltoluene | 20.65 | 1.0 | 20 | 0 | 103 | 77 - 127 | | | | |
| 4-Methyl-2-pentanone | 38.44 | 2.0 | 40 | 0 | 96.1 | 67 - 130 | | | | |
| Acetone | 33.51 | 2.0 | 40 | 0 | 83.8 | 39 - 160 | | | | |
| Benzene | 20.6 | 1.0 | 20 | 0 | 103 | 79 - 120 | | | | |
| Bromobenzene | 20.69 | 1.0 | 20 | 0 | 103 | 80 - 120 | | | | |
| Bromochloromethane | 20.8 | 1.0 | 20 | 0 | 104 | 78 - 123 | | | | |
| Bromodichloromethane | 19.78 | 1.0 | 20 | 0 | 98.9 | 79 - 125 | | | | |
| Bromoform | 18.71 | 1.0 | 20 | 0 | 93.5 | 66 - 130 | | | | |
| Bromomethane | 20.08 | 1.0 | 20 | 0 | 100 | 53 - 141 | | | | |

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22010172

**QC BATCH REPORT**

**Batch ID:** R399088 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220107** Units: **ug/L** Analysis Date: **07-Jan-2022 11:51**
Client ID: Run ID: **VOA9_399088** SeqNo: **6456793** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 37.32 | 2.0 | 40 | 0 | 93.3 | 64 - 133 | | | | |
| Carbon tetrachloride | 18.18 | 1.0 | 20 | 0 | 90.9 | 72 - 136 | | | | |
| Chlorobenzene | 20.98 | 1.0 | 20 | 0 | 105 | 82 - 118 | | | | |
| Chloroethane | 18.46 | 1.0 | 20 | 0 | 92.3 | 60 - 138 | | | | |
| Chloroform | 18.08 | 1.0 | 20 | 0 | 90.4 | 79 - 124 | | | | |
| Chloromethane | 18.28 | 1.0 | 20 | 0 | 91.4 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 20.35 | 1.0 | 20 | 0 | 102 | 78 - 123 | | | | |
| cis-1,3-Dichloropropene | 19.67 | 1.0 | 20 | 0 | 98.3 | 75 - 124 | | | | |
| Dibromochloromethane | 20 | 1.0 | 20 | 0 | 100.0 | 74 - 126 | | | | |
| Dibromomethane | 20.22 | 1.0 | 20 | 0 | 101 | 79 - 123 | | | | |
| Dichlorodifluoromethane | 16.44 | 1.0 | 20 | 0 | 82.2 | 32 - 152 | | | | |
| Ethylbenzene | 20.73 | 1.0 | 20 | 0 | 104 | 79 - 121 | | | | |
| Hexachlorobutadiene | 22.6 | 1.0 | 20 | 0 | 113 | 66 - 134 | | | | |
| Isopropylbenzene | 20.42 | 1.0 | 20 | 0 | 102 | 72 - 131 | | | | |
| m,p-Xylene | 42.26 | 2.0 | 40 | 0 | 106 | 80 - 121 | | | | |
| Methylene chloride | 18.89 | 2.0 | 20 | 0 | 94.5 | 74 - 124 | | | | |
| Naphthalene | 18.77 | 1.0 | 20 | 0 | 93.8 | 61 - 128 | | | | |
| n-Butylbenzene | 20.27 | 1.0 | 20 | 0 | 101 | 75 - 128 | | | | |
| n-Propylbenzene | 19.89 | 1.0 | 20 | 0 | 99.5 | 76 - 126 | | | | |
| o-Xylene | 21.91 | 1.0 | 20 | 0 | 110 | 78 - 122 | | | | |
| sec-Butylbenzene | 20.12 | 1.0 | 20 | 0 | 101 | 77 - 126 | | | | |
| Styrene | 22.36 | 1.0 | 20 | 0 | 112 | 78 - 123 | | | | |
| tert-Butylbenzene | 20.23 | 1.0 | 20 | 0 | 101 | 78 - 124 | | | | |
| Tetrachloroethene | 20.86 | 1.0 | 20 | 0 | 104 | 74 - 129 | | | | |
| Toluene | 21.3 | 1.0 | 20 | 0 | 106 | 80 - 121 | | | | |
| trans-1,2-Dichloroethene | 18.22 | 1.0 | 20 | 0 | 91.1 | 75 - 124 | | | | |
| trans-1,3-Dichloropropene | 18.38 | 1.0 | 20 | 0 | 91.9 | 73 - 127 | | | | |
| Trichloroethene | 21.78 | 1.0 | 20 | 0 | 109 | 79 - 123 | | | | |
| Trichlorofluoromethane | 16.1 | 1.0 | 20 | 0 | 80.5 | 65 - 141 | | | | |
| Vinyl chloride | 17.01 | 1.0 | 20 | 0 | 85.1 | 58 - 137 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *43.04* | *1.0* | *50* | *0* | *86.1* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *50.13* | *1.0* | *50* | *0* | *100* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *47.68* | *1.0* | *50* | *0* | *95.4* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *50.73* | *1.0* | *50* | *0* | *101* | *89 - 112* | | | | |

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22010172

**QC BATCH REPORT**

**Batch ID:** R399088 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS22010172-01MS** Units: **ug/L** Analysis Date: **07-Jan-2022 13:43**
Client ID: **LH18/24-SP650_010522** Run ID: **VOA9_399088** SeqNo: **6456797** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 24.06 | 1.0 | 20 | 0 | 120 | 78 - 124 | | | | |
| 1,1,1-Trichloroethane | 21.13 | 1.0 | 20 | 0 | 106 | 74 - 131 | | | | |
| 1,1,2,2-Tetrachloroethane | 20.83 | 1.0 | 20 | 0 | 104 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 22.02 | 1.0 | 20 | 0 | 110 | 80 - 119 | | | | |
| 1,1-Dichloroethane | 18.45 | 1.0 | 20 | 0 | 92.3 | 77 - 125 | | | | |
| 1,1-Dichloroethene | 20.92 | 1.0 | 20 | 0 | 105 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 23.11 | 1.0 | 20 | 0 | 116 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 22.69 | 1.0 | 20 | 0 | 113 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 18.6 | 1.0 | 20 | 0 | 93.0 | 73 - 122 | | | | |
| 1,2,4-Trichlorobenzene | 22.56 | 1.0 | 20 | 0 | 113 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 23.94 | 1.0 | 20 | 0 | 120 | 76 - 124 | | | | |
| 1,2-Dibromo-3-chloropropane | 19.01 | 1.0 | 20 | 0 | 95.1 | 62 - 128 | | | | |
| 1,2-Dibromoethane | 22.79 | 1.0 | 20 | 0 | 114 | 77 - 121 | | | | |
| 1,2-Dichlorobenzene | 22.56 | 1.0 | 20 | 0 | 113 | 80 - 119 | | | | |
| 1,2-Dichloroethane | 19.38 | 1.0 | 20 | 0 | 96.9 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 22.21 | 1.0 | 20 | 0 | 111 | 78 - 122 | | | | |
| 1,3,5-Trimethylbenzene | 23.79 | 1.0 | 20 | 0 | 119 | 75 - 124 | | | | |
| 1,3-Dichlorobenzene | 22.85 | 1.0 | 20 | 0 | 114 | 80 - 119 | | | | |
| 1,3-Dichloropropane | 21.98 | 1.0 | 20 | 0 | 110 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 22.22 | 1.0 | 20 | 0 | 111 | 79 - 118 | | | | |
| 2,2-Dichloropropane | 21 | 1.0 | 20 | 0 | 105 | 60 - 139 | | | | |
| 2-Butanone | 34.7 | 2.0 | 40 | 0 | 86.7 | 56 - 143 | | | | |
| 2-Chlorotoluene | 22.92 | 1.0 | 20 | 0 | 115 | 79 - 122 | | | | |
| 2-Hexanone | 42.17 | 2.0 | 40 | 0 | 105 | 57 - 139 | | | | |
| 4-Chlorotoluene | 23.24 | 1.0 | 20 | 0 | 116 | 78 - 122 | | | | |
| 4-Isopropyltoluene | 24.3 | 1.0 | 20 | 0 | 121 | 77 - 127 | | | | |
| 4-Methyl-2-pentanone | 42.93 | 2.0 | 40 | 0 | 107 | 67 - 130 | | | | |
| Acetone | 30.33 | 2.0 | 40 | 0 | 75.8 | 39 - 160 | | | | |
| Benzene | 22.94 | 1.0 | 20 | 0 | 115 | 79 - 120 | | | | |
| Bromobenzene | 23.44 | 1.0 | 20 | 0 | 117 | 80 - 120 | | | | |
| Bromochloromethane | 21.03 | 1.0 | 20 | 0 | 105 | 78 - 123 | | | | |
| Bromodichloromethane | 21.42 | 1.0 | 20 | 0 | 107 | 79 - 125 | | | | |
| Bromoform | 19.99 | 1.0 | 20 | 0 | 100.0 | 66 - 130 | | | | |
| Bromomethane | 12.2 | 1.0 | 20 | 0 | 61.0 | 53 - 141 | | | | |

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22010172

**QC BATCH REPORT**

**Batch ID:** R399088 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS22010172-01MS** Units: **ug/L** Analysis Date: **07-Jan-2022 13:43**
Client ID: **LH18/24-SP650_010522** Run ID: **VOA9_399088** SeqNo: **6456797** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 40.69 | 2.0 | 40 | 0 | 102 | 64 - 133 | | | | |
| Carbon tetrachloride | 23.76 | 1.0 | 20 | 0 | 119 | 72 - 136 | | | | |
| Chlorobenzene | 23.53 | 1.0 | 20 | 0 | 118 | 82 - 118 | | | | |
| Chloroethane | 18.25 | 1.0 | 20 | 0 | 91.2 | 60 - 138 | | | | |
| Chloroform | 18.9 | 1.0 | 20 | 0 | 94.5 | 79 - 124 | | | | |
| Chloromethane | 19.01 | 1.0 | 20 | 0 | 95.1 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 22.9 | 1.0 | 20 | 1.619 | 106 | 78 - 123 | | | | |
| cis-1,3-Dichloropropene | 20 | 1.0 | 20 | 0 | 100 | 75 - 124 | | | | |
| Dibromochloromethane | 21.29 | 1.0 | 20 | 0 | 106 | 74 - 126 | | | | |
| Dibromomethane | 21.57 | 1.0 | 20 | 0 | 108 | 79 - 123 | | | | |
| Dichlorodifluoromethane | 16.66 | 1.0 | 20 | 0 | 83.3 | 32 - 152 | | | | |
| Ethylbenzene | 24.4 | 1.0 | 20 | 0 | 122 | 79 - 121 | | | | S |
| Hexachlorobutadiene | 25.83 | 1.0 | 20 | 0 | 129 | 66 - 134 | | | | |
| Isopropylbenzene | 25.48 | 1.0 | 20 | 0 | 127 | 72 - 131 | | | | |
| m,p-Xylene | 50.49 | 2.0 | 40 | 0 | 126 | 80 - 121 | | | | S |
| Methylene chloride | 19.09 | 2.0 | 20 | 0 | 95.4 | 74 - 124 | | | | |
| Naphthalene | 20.43 | 1.0 | 20 | 0 | 102 | 61 - 128 | | | | |
| n-Butylbenzene | 24.35 | 1.0 | 20 | 0 | 122 | 75 - 128 | | | | |
| n-Propylbenzene | 23.94 | 1.0 | 20 | 0 | 120 | 76 - 126 | | | | |
| o-Xylene | 24.9 | 1.0 | 20 | 0 | 125 | 78 - 122 | | | | S |
| sec-Butylbenzene | 25.09 | 1.0 | 20 | 0 | 125 | 77 - 126 | | | | |
| Styrene | 25.13 | 1.0 | 20 | 0 | 126 | 78 - 123 | | | | S |
| tert-Butylbenzene | 24.59 | 1.0 | 20 | 0 | 123 | 78 - 124 | | | | |
| Tetrachloroethene | 26.66 | 1.0 | 20 | 0 | 133 | 74 - 129 | | | | S |
| Toluene | 24.63 | 1.0 | 20 | 0 | 123 | 80 - 121 | | | | S |
| trans-1,2-Dichloroethene | 20.47 | 1.0 | 20 | 0 | 102 | 75 - 124 | | | | |
| trans-1,3-Dichloropropene | 19.49 | 1.0 | 20 | 0 | 97.4 | 73 - 127 | | | | |
| Trichloroethene | 25.13 | 1.0 | 20 | 0 | 126 | 79 - 123 | | | | S |
| Trichlorofluoromethane | 20.22 | 1.0 | 20 | 0 | 101 | 65 - 141 | | | | |
| Vinyl chloride | 19.16 | 1.0 | 20 | 0 | 95.8 | 58 - 137 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *38.9* | *1.0* | *50* | *0* | *77.8* | *81 - 118* | | | | S |
| *Surr: 4-Bromofluorobenzene* | *50.72* | *1.0* | *50* | *0* | *101* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *45.24* | *1.0* | *50* | *0* | *90.5* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *53.63* | *1.0* | *50* | *0* | *107* | *89 - 112* | | | | |

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22010172

**QC BATCH REPORT**

**Batch ID:** R399088 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS22010172-01MSD** Units: **ug/L** Analysis Date: **07-Jan-2022 14:05**
Client ID: **LH18/24-SP650_010522** Run ID: **VOA9_399088** SeqNo: **6456798** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 23.8 | 1.0 | 20 | 0 | 119 | 78 - 124 | 24.06 | 1.08 | 20 | |
| 1,1,1-Trichloroethane | 20.28 | 1.0 | 20 | 0 | 101 | 74 - 131 | 21.13 | 4.1 | 20 | |
| 1,1,2,2-Tetrachloroethane | 20.63 | 1.0 | 20 | 0 | 103 | 71 - 121 | 20.83 | 0.997 | 20 | |
| 1,1,2-Trichloroethane | 22.53 | 1.0 | 20 | 0 | 113 | 80 - 119 | 22.02 | 2.28 | 20 | |
| 1,1-Dichloroethane | 17.71 | 1.0 | 20 | 0 | 88.6 | 77 - 125 | 18.45 | 4.08 | 20 | |
| 1,1-Dichloroethene | 19.87 | 1.0 | 20 | 0 | 99.4 | 71 - 131 | 20.92 | 5.13 | 20 | |
| 1,1-Dichloropropene | 22.64 | 1.0 | 20 | 0 | 113 | 78 - 125 | 23.11 | 2.05 | 20 | |
| 1,2,3-Trichlorobenzene | 22.77 | 1.0 | 20 | 0 | 114 | 69 - 129 | 22.69 | 0.371 | 20 | |
| 1,2,3-Trichloropropane | 19.79 | 1.0 | 20 | 0 | 99.0 | 73 - 122 | 18.6 | 6.22 | 20 | |
| 1,2,4-Trichlorobenzene | 22.78 | 1.0 | 20 | 0 | 114 | 69 - 130 | 22.56 | 0.959 | 20 | |
| 1,2,4-Trimethylbenzene | 23.45 | 1.0 | 20 | 0 | 117 | 76 - 124 | 23.94 | 2.04 | 20 | |
| 1,2-Dibromo-3-chloropropane | 19.64 | 1.0 | 20 | 0 | 98.2 | 62 - 128 | 19.01 | 3.24 | 20 | |
| 1,2-Dibromoethane | 22.57 | 1.0 | 20 | 0 | 113 | 77 - 121 | 22.79 | 0.988 | 20 | |
| 1,2-Dichlorobenzene | 22.26 | 1.0 | 20 | 0 | 111 | 80 - 119 | 22.56 | 1.35 | 20 | |
| 1,2-Dichloroethane | 18.88 | 1.0 | 20 | 0 | 94.4 | 73 - 128 | 19.38 | 2.61 | 20 | |
| 1,2-Dichloropropane | 22.17 | 1.0 | 20 | 0 | 111 | 78 - 122 | 22.21 | 0.166 | 20 | |
| 1,3,5-Trimethylbenzene | 23.44 | 1.0 | 20 | 0 | 117 | 75 - 124 | 23.79 | 1.48 | 20 | |
| 1,3-Dichlorobenzene | 22.72 | 1.0 | 20 | 0 | 114 | 80 - 119 | 22.85 | 0.572 | 20 | |
| 1,3-Dichloropropane | 22.17 | 1.0 | 20 | 0 | 111 | 80 - 119 | 21.98 | 0.835 | 20 | |
| 1,4-Dichlorobenzene | 21.43 | 1.0 | 20 | 0 | 107 | 79 - 118 | 22.22 | 3.65 | 20 | |
| 2,2-Dichloropropane | 19.87 | 1.0 | 20 | 0 | 99.4 | 60 - 139 | 21 | 5.53 | 20 | |
| 2-Butanone | 33.41 | 2.0 | 40 | 0 | 83.5 | 56 - 143 | 34.7 | 3.79 | 20 | |
| 2-Chlorotoluene | 22.51 | 1.0 | 20 | 0 | 113 | 79 - 122 | 22.92 | 1.83 | 20 | |
| 2-Hexanone | 41.68 | 2.0 | 40 | 0 | 104 | 57 - 139 | 42.17 | 1.18 | 20 | |
| 4-Chlorotoluene | 22.21 | 1.0 | 20 | 0 | 111 | 78 - 122 | 23.24 | 4.55 | 20 | |
| 4-Isopropyltoluene | 23.77 | 1.0 | 20 | 0 | 119 | 77 - 127 | 24.3 | 2.21 | 20 | |
| 4-Methyl-2-pentanone | 41.78 | 2.0 | 40 | 0 | 104 | 67 - 130 | 42.93 | 2.72 | 20 | |
| Acetone | 31.18 | 2.0 | 40 | 0 | 78.0 | 39 - 160 | 30.33 | 2.77 | 20 | |
| Benzene | 22.4 | 1.0 | 20 | 0 | 112 | 79 - 120 | 22.94 | 2.41 | 20 | |
| Bromobenzene | 22.37 | 1.0 | 20 | 0 | 112 | 80 - 120 | 23.44 | 4.67 | 20 | |
| Bromochloromethane | 19.73 | 1.0 | 20 | 0 | 98.6 | 78 - 123 | 21.03 | 6.41 | 20 | |
| Bromodichloromethane | 21.18 | 1.0 | 20 | 0 | 106 | 79 - 125 | 21.42 | 1.12 | 20 | |
| Bromoform | 20.47 | 1.0 | 20 | 0 | 102 | 66 - 130 | 19.99 | 2.39 | 20 | |
| Bromomethane | 10.84 | 1.0 | 20 | 0 | 54.2 | 53 - 141 | 12.2 | 11.8 | 20 | |

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22010172

**QC BATCH REPORT**

**Batch ID:** R399088 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS22010172-01MSD** Units: **ug/L** Analysis Date: **07-Jan-2022 14:05**
Client ID: **LH18/24-SP650_010522** Run ID: **VOA9_399088** SeqNo: **6456798** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 39 | 2.0 | 40 | 0 | 97.5 | 64 - 133 | 40.69 | 4.23 | 20 | |
| Carbon tetrachloride | 22.69 | 1.0 | 20 | 0 | 113 | 72 - 136 | 23.76 | 4.62 | 20 | |
| Chlorobenzene | 23.54 | 1.0 | 20 | 0 | 118 | 82 - 118 | 23.53 | 0.0693 | 20 | |
| Chloroethane | 21.19 | 1.0 | 20 | 0 | 106 | 60 - 138 | 18.25 | 14.9 | 20 | |
| Chloroform | 18.44 | 1.0 | 20 | 0 | 92.2 | 79 - 124 | 18.9 | 2.51 | 20 | |
| Chloromethane | 17.46 | 1.0 | 20 | 0 | 87.3 | 50 - 139 | 19.01 | 8.53 | 20 | |
| cis-1,2-Dichloroethene | 21.95 | 1.0 | 20 | 1.619 | 102 | 78 - 123 | 22.9 | 4.23 | 20 | |
| cis-1,3-Dichloropropene | 19.74 | 1.0 | 20 | 0 | 98.7 | 75 - 124 | 20 | 1.31 | 20 | |
| Dibromochloromethane | 21.31 | 1.0 | 20 | 0 | 107 | 74 - 126 | 21.29 | 0.103 | 20 | |
| Dibromomethane | 20.69 | 1.0 | 20 | 0 | 103 | 79 - 123 | 21.57 | 4.14 | 20 | |
| Dichlorodifluoromethane | 16.05 | 1.0 | 20 | 0 | 80.3 | 32 - 152 | 16.66 | 3.75 | 20 | |
| Ethylbenzene | 23.88 | 1.0 | 20 | 0 | 119 | 79 - 121 | 24.4 | 2.17 | 20 | |
| Hexachlorobutadiene | 23.65 | 1.0 | 20 | 0 | 118 | 66 - 134 | 25.83 | 8.79 | 20 | |
| Isopropylbenzene | 25.14 | 1.0 | 20 | 0 | 126 | 72 - 131 | 25.48 | 1.35 | 20 | |
| m,p-Xylene | 50.08 | 2.0 | 40 | 0 | 125 | 80 - 121 | 50.49 | 0.828 | 20 | S |
| Methylene chloride | 18.36 | 2.0 | 20 | 0 | 91.8 | 74 - 124 | 19.09 | 3.88 | 20 | |
| Naphthalene | 21.26 | 1.0 | 20 | 0 | 106 | 61 - 128 | 20.43 | 3.95 | 20 | |
| n-Butylbenzene | 23.98 | 1.0 | 20 | 0 | 120 | 75 - 128 | 24.35 | 1.53 | 20 | |
| n-Propylbenzene | 23.45 | 1.0 | 20 | 0 | 117 | 76 - 126 | 23.94 | 2.06 | 20 | |
| o-Xylene | 25.33 | 1.0 | 20 | 0 | 127 | 78 - 122 | 24.9 | 1.71 | 20 | S |
| sec-Butylbenzene | 24.26 | 1.0 | 20 | 0 | 121 | 77 - 126 | 25.09 | 3.34 | 20 | |
| Styrene | 24.44 | 1.0 | 20 | 0 | 122 | 78 - 123 | 25.13 | 2.76 | 20 | |
| tert-Butylbenzene | 23.89 | 1.0 | 20 | 0 | 119 | 78 - 124 | 24.59 | 2.88 | 20 | |
| Tetrachloroethene | 25.9 | 1.0 | 20 | 0 | 130 | 74 - 129 | 26.66 | 2.86 | 20 | S |
| Toluene | 24.26 | 1.0 | 20 | 0 | 121 | 80 - 121 | 24.63 | 1.52 | 20 | S |
| trans-1,2-Dichloroethene | 18.89 | 1.0 | 20 | 0 | 94.5 | 75 - 124 | 20.47 | 8.01 | 20 | |
| trans-1,3-Dichloropropene | 19 | 1.0 | 20 | 0 | 95.0 | 73 - 127 | 19.49 | 2.56 | 20 | |
| Trichloroethene | 24.17 | 1.0 | 20 | 0 | 121 | 79 - 123 | 25.13 | 3.92 | 20 | |
| Trichlorofluoromethane | 18.99 | 1.0 | 20 | 0 | 94.9 | 65 - 141 | 20.22 | 6.29 | 20 | |
| Vinyl chloride | 18.58 | 1.0 | 20 | 0 | 92.9 | 58 - 137 | 19.16 | 3.03 | 20 | |
| *Surr: 1,2-Dichloroethane-d4* | *38.31* | *1.0* | *50* | *0* | *76.6* | *81 - 118* | *38.9* | *1.52* | *20* | S |
| *Surr: 4-Bromofluorobenzene* | *51.31* | *1.0* | *50* | *0* | *103* | *85 - 114* | *50.72* | *1.15* | *20* | |
| *Surr: Dibromofluoromethane* | *43.63* | *1.0* | *50* | *0* | *87.3* | *80 - 119* | *45.24* | *3.64* | *20* | |
| *Surr: Toluene-d8* | *53.48* | *1.0* | *50* | *0* | *107* | *89 - 112* | *53.63* | *0.279* | *20* | |

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22010172

**QC BATCH REPORT**

| Batch ID: | R399088 ( 0 ) | Instrument: | VOA9 | Method: | VOLATILES ORGANICS BY METHOD 8260C |
|---|---|---|---|---|---|

**The following samples were analyzed in this batch:** HS22010172-01 HS22010172-03

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22010172

**QC BATCH REPORT**

**Batch ID:** R398979 ( 0 ) **Instrument:** UV-2450 **Method:** HEXAVALENT CHROMIUM BY SW7196A

**MBLK** Sample ID: **MBLK-R398979** Units: **mg/L** Analysis Date: **06-Jan-2022 13:57**
Client ID: Run ID: **UV-2450_398979** SeqNo: **6454615** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 0.0100 | 0.0100 | | | | | | | | U |

**LCS** Sample ID: **LCS-R398979** Units: **mg/L** Analysis Date: **06-Jan-2022 13:57**
Client ID: Run ID: **UV-2450_398979** SeqNo: **6454614** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 0.259 | 0.0100 | 0.25 | 0 | 104 | 90 - 111 | | | | |

**MS** Sample ID: **HS22010170-01MS** Units: **mg/L** Analysis Date: **06-Jan-2022 13:57**
Client ID: Run ID: **UV-2450_398979** SeqNo: **6454609** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 0.257 | 0.0100 | 0.25 | 0 | 103 | 90 - 111 | | | | |

**MSD** Sample ID: **HS22010170-01MSD** Units: **mg/L** Analysis Date: **06-Jan-2022 13:57**
Client ID: Run ID: **UV-2450_398979** SeqNo: **6454608** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 0.258 | 0.0100 | 0.25 | 0 | 103 | 90 - 111 | 0.257 | 0.388 | 20 | |

**The following samples were analyzed in this batch:** HS22010172-01

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** **HS22010172**

## 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: 20-Jan-22

## CERTIFICATIONS,ACCREDITATIONS & LICENSES

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas | 21-022-0 | 26-Mar-2022 |
| Florida | E87611-33 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 20-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**Work Order:** HS22010172

## SAMPLE TRACKING

| Lab Samp ID | Client Sample ID | Action | Date | Person | New Location |
|---|---|---|---|---|---|
| HS22010172-01 | LH18/24-SP650_010522 | Login | 1/6/2022 12:30:09 PM | PMG | MET044 |
| HS22010172-01 | LH18/24-SP650_010522 | Login | 1/6/2022 12:30:09 PM | PMG | EXT064 |
| HS22010172-01 | LH18/24-SP650_010522 | Login | 1/6/2022 12:30:09 PM | PMG | WET106 |
| HS22010172-01 | LH18/24-SP650_010522 | Login | 1/6/2022 12:30:09 PM | PMG | VOA026 |
| HS22010172-02 | LH18/24-SP650_010522_AIX | Login | 1/6/2022 12:30:09 PM | PMG | Sub |
| HS22010172-03 | Trip Blank | Login | 1/6/2022 12:30:09 PM | PMG | VOA026 |

**ALS Houston, US** Date: 20-Jan-22

## Sample Receipt Checklist

**Work Order ID:** HS22010172 **Date/Time Received:** **06-Jan-2022 10:20**

**Client Name:** Bhate Environmental **Received by:** **Eric Widjaja**

**Completed By:** /S/ Paresh M. Giga (eSignature) 06-Jan-2022 12:32 (Date/Time) **Reviewed by:** /S/ Ragen Giga (eSignature) 07-Jan-2022 13:24 (Date/Time)

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

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

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 4.0C U/C | IR31 |
| Cooler(s)/Kit(s): | 46284 | |
| Date/Time sample(s) sent to storage: | 1/6/2022 12:40 | |

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

Page 1 of 1

**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:**
**GROUNDWATER TREATMENT PLANT MONTHLY EFFLUENT SAMPLES**

**Prepared By:** Scott Beesinger

**P.O. Number**

**HS22010172**
Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Monthly Effluent Sam

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | VOLATILES | SILVER, SELENIUM, LEAD, BARIUM | HEXAVALENT CHROMIUM | 1, 4 - DIOXANE | PERCHLORATE | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_010522 | Water | 01/05/22 / 14:00 | | 3 | X | | | | | | | | | | HCL | |
| LH18/24-SP650_010522 | Water | 01/05/22 / 14:00 | | 2 | | | X | X | | | | | | | NONE | |
| LH18/24-SP650_010522_AIX | Water | 01/05/22 / 14:00 | | 1 | | | | | X | | | | | | NONE | |
| LH18/24-SP650_010522 | Water | 01/05/22 / 14:00 | | 1 | | X | | | | | | | | | HNO3 | |
| Trip Blank | Water | 01/05/22 | | 2 | X | | | | | | | | | | HCL | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Analyses

**Additional Remarks:** **Standard TAT on all parameters**

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 01/05/22 | 14:30 | | | | | | | | | |

**For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| Elhidaya | 01/06/22 | 10:20 | | | | | | | |

Remarks:
46284
4.0°C
UCC
CF-0.0
IR#31

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

01117097

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

46284

CUSTODY SEAL

Date: 1/5/22 Time: 1430
Name: Sean Beesley
Company: BHMC

Seal Broken By:
Date: HCl 2022.

TRK# 0221 4809 7833 1350

PRIORITY OVERNIGHT

AB SGRA

46284 77099
TX-US
IAH

4230674 05Jan2022 GGGA 56DG2/01EF/1B23

January 07, 2022

Service Request No:E2200007

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS22010172**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory January 06, 2022
For your reference, these analyses have been assigned our service request number **E2200007.**

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.:** | E2200007 |
| **Project:** | HS22010172 | **Date Received:** | 01/06/22 |
| **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 01/06/22.

The sample was received in good condition and is 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:**

EQ2200008: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS-DLCS RPD exceed QC limit; the individual recoveries met acceptance criteria.

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:**E2200007
**Project:** HS22010172

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2200007-001 | LH18/24-SP650_010522_AIX | 1/5/2022 | 1400 |

# Service Request Summary

**Folder #:** **E2200007**
Client Name: ALS Environmental - US
Project Name: HS22010172
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 01/06/22
Internal Due Date: 1/20/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22010172
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON CIO4 DOD/6850 |
|---|---|---|---|---|
| E2200007-001 | LH18/24-SP650_010522_AIX | Ground Water | 01/05/22 1400 | **IV** |

## Folder Comments:

Send DWELR confirmation to Middletown PM for PADEP samples.

# Service Request Summary

| | | | |
|---|---|---|---|
| **Folder #:** | **E2200007** | Project Chemist: | Corey Grandits |
| Client Name: | ALS Environmental - US | Originating Lab: | HOUSTON |
| Project Name: | HS22010172 | Logged By: | CGRANDITS |
| Project Number: | | Date Received: | 01/06/22 |
| **Report To:** | Ragen Giga<br>ALS Environmental - US<br>10450 Stancliff Rd Suite 210<br>Houston, TX 77099<br>USA | Internal Due Date: | 1/20/2022 |
| | | QAP: | LAB QAP |
| | | Qualifier Set: | Lab Standard |
| | | Formset: | Lab Standard |
| | | Merged?: | Y |
| Phone Number: | | Report to MDL?: | Y |
| Cell Number: | | P.O. Number: | HS22010172 |
| Fax Number: | | EDD: | No EDD Specified |
| E-mail: | ragenp.giga@alsglobal.com | | |

1 120 mL-Plastic Bottle Natural WM Unpreserved

**Location:** EHRMS-AirArch 1

**Pressure Gas:**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 1 | Level IV due 1/27 |

# 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 |
|---|---|---|
| Arkansas Department of Environmental Quality | 19-028-0 | 6/30/2022 |
| Arkansas Department of Environmental Quality | 21-022-0 | 3/26/2022 |
| Florida Department of Health | E87611-33 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 5/1/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
**T:** +1 281 530 5656
**F:** +1 281 530 5887
**www.alsglobal.com**

# Subcontract Chain of Custody

**SAMPLING STATE:** **Dept of Defense** **COC ID: 17835**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

| | |
|---|---|
| **Company:** | ALS Houston |
| **Contact:** | Ragen Giga |
| **Address:** | 10450 Stancliff Rd, Ste 210 |
| **Phone:** | +1 281 530 5656 |
| **Email:** | RagenP.Giga@ALSGlobal.com |
| **Alternate Contact:** | 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:** | HS22010172 |
| **TSR:** | Sonia West |

| | LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | | | DUE DATE |
| **1.** | **HS22010172-02** | **LH18/24-SP650_010522_AIX** | **Water** | **05 Jan 2022 14:00** |
| | Provide Level II and Level IV reports in separate pdf | | | 20 Jan 2022 |

**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: 1/6/2022 12:40.

Received By: _____ Date/Time: 1/6/22 1240

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

# Cooler Receipt Form

Project Chemist: CH

Client/Project: ALS-H

Thermometer ID: 1291

Date/Time Received: 1-6-22 Initials: CH Date/Time Logged in: 1-6-22 Initials: CH

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☒ Courier (ALS) ○ Client
2. Samples received in: ☒ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ☒ No
   Were they intact? ○ Yes ○ No ☒ N/A
   Were they signed and dated? ○ Yes ○ No ☒ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ☒ Baggies ○ Bubble Wrap ○ Gel Packs ☒ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

| Cooler Tracking Number | COC ID | Date Opened | Time Opened | Opened By | Temp. °C | Temp Blank? |
|---|---|---|---|---|---|---|
| NA | | 1-6-22 | 1240 | PH | 3.0 | ☒ |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☒ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☒ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☒ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☒ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☒ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

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#:** 393624 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** **Prep Date/Time:** 1/7/22 09:16

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2200004-001 | 2112468-01 (MW-13) | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 2 | E2200004-002 | 2112468-02 (MW-17) | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 3 | E2200006-001 | LH18/24-SP650_010522_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 4 | E2200007-001 | LH18/24-SP650_010522_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 5 | E2200008-001 | LH18/24-SP140_010522 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 6 | EQ2200008-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 7 | EQ2200008-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 8 | EQ2200008-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |

## Spiking Solutions

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 214765 Logbook Ref: Sodium Perchlorate Expires On: 12/11/2022

E2200004-001 100.00µL E2200004-002 100.00µL E2200006-001 100.00µL E2200007-001 100.00µL E2200008-001 100.00µL EQ2200008-01 100.00µL
EQ2200008-02 100.00µL EQ2200008-03 100.00µL

Name: Perchlorate Intermediate Stock1 Inventory ID 219595 Logbook Ref: Perchlorate Expires On: 03/15/2022

EQ2200008-02 1.00µL EQ2200008-03 1.00µL

## Preparation Materials

Water HPLC Grade 08/03/2021 Water (218530) 537M Glass Culture Tubes 537M Glass Tubes (218064) 6850 0.45um syringe filters 6850 Syringe Filters (219639)

## Preparation Steps

Step: Preparation
Started: 1/7/22 09:16
Finished: 1/7/22 10:00
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 1/7/22

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:** | E2200007 |
| **Project:** | HS22010172 | **Date Collected:** | 1/ 5/22 1400 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 1/ 6/22 |
| **Sample Name:** | LH18/24-SP650_010522_AIX | **Units:** | µg/L |
| **Lab Code:** | E2200007-001 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.0890** | J | 0.200 | 0.100 | 0.0500 | 2 | 1/ 7/22 | 1/7/22 13:13 | 393624 | 751127 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200007 |
| **Project:** | HS22010172 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2200008-01 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | ND | U | 0.100 | 0.0500 | 0.0250 | 1 | 1/ 7/22 | 1/7/22 11:30 | 393624 | 751127 | |

# 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:** | E2200007 |
| **Project:** | HS22010172 | **Date Analyzed:** | 1/ 7/22 |
| **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:** | | **Basis:** | NA |
| | | **Extraction Lot:** | 393624 |

| | Lab Control Sample EQ2200008-02 | | | Duplicate Lab Control Sample EQ2200008-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.119 | 0.100 | 119 | 0.0973 | 0.100 | 97 | 84 - 119 | 20 * | 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:** | E2200007 |
| **Project:** | HS22010172 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200008-02 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.119** | | 0.100 | 0.0500 | 0.0250 | 1 | 1/ 7/22 | 1/7/22 11:38 | 393624 | 751127 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200007 |
| **Project:** | HS22010172 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200008-03 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.0973** | J | 0.100 | 0.0500 | 0.0250 | 1 | 1/ 7/22 | 1/7/22 11:46 | 393624 | 751127 | |

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January 24, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22010419**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Effluent**

Dear Marcia Olive,

ALS Environmental received 2 sample(s) on Jan 12, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: JUMOKE.LAWAL**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 24-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Effluent
**Work Order:** HS22010419

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22010419-01 | LH18/24-SP650_011122 | Water | | 11-Jan-2022 14:00 | 12-Jan-2022 10:05 | ☐ |
| HS22010419-02 | LH18/24-SP650_011122_AIX | Water | | 11-Jan-2022 14:00 | 12-Jan-2022 10:05 | ☐ |

**ALS Houston, US** Date: 24-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Effluent
**Work Order:** HS22010419

**CASE NARRATIVE**

## Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached

## WetChemistry by Method E350.3

### Batch ID: R400858

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E415.1

### Batch ID: R400667

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E365.3

### Batch ID: R400272

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

**ALS Houston, US** Date: 24-Jan-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Effluent | WorkOrder:HS22010419 |
| Sample ID: | LH18/24-SP650_011122 | Lab ID:HS22010419-01 |
| Collection Date: | 11-Jan-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **AMMONIA AS N BY E350.3(ISE)** | | **Method:E350.3** | | | | | | Analyst: YP |
| **Nitrogen, Ammonia (As N)** | **57** | a | **1.0** | **2.0** | **2.0** | **mg/L** | 10 | 20-Jan-2022 13:14 |
| **ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978** | | **Method:E365.3** | | | | | | Analyst: AP |
| **Phosphorus, Total Orthophosphate (As P)** | **4.45** | a | **0.100** | **0.250** | **0.250** | **mg/L** | 10 | 12-Jan-2022 16:35 |
| **TOTAL ORGANIC CARBON BY E415.1** | | **Method:E415.1** | | | | | | Analyst: JAC |
| **Organic Carbon, Total** | **3.84** | a | **0.500** | **1.00** | **1.00** | **mg/L** | 1 | 19-Jan-2022 19:21 |

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

**ALS Houston, US** Date: 24-Jan-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Effluent | WorkOrder:HS22010419 |
| Sample ID: | LH18/24-SP650_011122_AIX | Lab ID:HS22010419-02 |
| Collection Date: | 11-Jan-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 13-Jan-2022 15:03 |

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

**ALS Houston, US** Date: 24-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Effluent
**WorkOrder:** HS22010419

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** R400272 ( 0 ) | **Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978 | | | | **Matrix:** Water | |
| HS22010419-01 | LH18/24-SP650_011122 | 11 Jan 2022 14:00 | | | 12 Jan 2022 16:35 | 10 |
| **Batch ID:** R400331 ( 0 ) | **Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) | | | | **Matrix:** Water | |
| HS22010419-02 | LH18/24-SP650_011122_AIX | 11 Jan 2022 14:00 | | | 13 Jan 2022 15:03 | 1 |
| **Batch ID:** R400667 ( 0 ) | **Test Name :** TOTAL ORGANIC CARBON BY E415.1 | | | | **Matrix:** Water | |
| HS22010419-01 | LH18/24-SP650_011122 | 11 Jan 2022 14:00 | | | 19 Jan 2022 19:21 | 1 |
| **Batch ID:** R400858 ( 0 ) | **Test Name :** AMMONIA AS N BY E350.3(ISE) | | | | **Matrix:** Water | |
| HS22010419-01 | LH18/24-SP650_011122 | 11 Jan 2022 14:00 | | | 20 Jan 2022 13:14 | 10 |

**ALS Houston, US** Date: 24-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Effluent
**WorkOrder:** HS22010419

**QC BATCH REPORT**

**Batch ID:** R400272 ( 0 ) **Instrument:** UV-2450 **Method:** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978

**MBLK** Sample ID: **MBLK-R400272** Units: **mg/L** Analysis Date: **12-Jan-2022 16:35**
Client ID: Run ID: **UV-2450_400272** SeqNo: **6461471** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.0250 | 0.0250 | | | | | | | | U |

**LCS** Sample ID: **LCS-R400272** Units: **mg/L** Analysis Date: **12-Jan-2022 16:35**
Client ID: Run ID: **UV-2450_400272** SeqNo: **6461470** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.254 | 0.0250 | 0.25 | 0 | 102 | 85 - 115 | | | | |

**MS** Sample ID: **HS22010419-01MS** Units: **mg/L** Analysis Date: **12-Jan-2022 16:35**
Client ID: **LH18/24-SP650_011122** Run ID: **UV-2450_400272** SeqNo: **6461465** PrepDate: DF: **10**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 6.76 | 0.250 | 2.5 | 4.45 | 92.4 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22010419-01MSD** Units: **mg/L** Analysis Date: **12-Jan-2022 16:35**
Client ID: **LH18/24-SP650_011122** Run ID: **UV-2450_400272** SeqNo: **6461464** PrepDate: DF: **10**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 6.94 | 0.250 | 2.5 | 4.45 | 99.6 | 80 - 120 | 6.76 | 2.63 | 20 | |

**The following samples were analyzed in this batch:** HS22010419-01

**ALS Houston, US** Date: 24-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Effluent
**WorkOrder:** HS22010419

**QC BATCH REPORT**

**Batch ID:** R400667 ( 0 ) **Instrument:** TOC_04 **Method:** TOTAL ORGANIC CARBON BY E415.1

**MBLK** Sample ID: **MBLK-01192022** Units: **mg/L** Analysis Date: **19-Jan-2022 17:45**
Client ID: Run ID: **TOC_04_400667** SeqNo: **6470172** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 1.00 | 1.00 | | | | | | | | U |

**LCS** Sample ID: **LCS-01192022** Units: **mg/L** Analysis Date: **19-Jan-2022 17:59**
Client ID: Run ID: **TOC_04_400667** SeqNo: **6470173** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 10.48 | 1.00 | 10 | 0 | 105 | 85 - 115 | | | | |

**LCSD** Sample ID: **LCSD-01192022** Units: **mg/L** Analysis Date: **19-Jan-2022 18:12**
Client ID: Run ID: **TOC_04_400667** SeqNo: **6470174** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 10.61 | 1.00 | 10 | 0 | 106 | 85 - 115 | 10.48 | 1.23 | 20 | |

**MS** Sample ID: **HS22010166-01MS** Units: **mg/L** Analysis Date: **19-Jan-2022 18:39**
Client ID: Run ID: **TOC_04_400667** SeqNo: **6470176** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 18.76 | 1.00 | 10 | 7.909 | 109 | 80 - 120 | | | | |

**The following samples were analyzed in this batch:** HS22010419-01

**ALS Houston, US** Date: 24-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Effluent
**WorkOrder:** HS22010419

**QC BATCH REPORT**

**Batch ID: R400858 ( 0 )** **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

**MBLK** Sample ID: **MBLK-R400858** Units: **mg/L** Analysis Date: **20-Jan-2022 13:14**
Client ID: Run ID: **WetChem_HS_400858** SeqNo: **6473806** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 0.20 | 0.20 | | | | | | | | U |

**LCS** Sample ID: **LCS-R400858** Units: **mg/L** Analysis Date: **20-Jan-2022 13:14**
Client ID: Run ID: **WetChem_HS_400858** SeqNo: **6473805** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 10.14 | 0.20 | 10 | 0 | 101 | 80 - 120 | | | | |

**MS** Sample ID: **HS22010319-01MS** Units: **mg/L** Analysis Date: **20-Jan-2022 13:14**
Client ID: Run ID: **WetChem_HS_400858** SeqNo: **6473808** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 10.13 | 0.20 | 10 | 0.098 | 100 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22010319-01MSD** Units: **mg/L** Analysis Date: **20-Jan-2022 13:14**
Client ID: Run ID: **WetChem_HS_400858** SeqNo: **6473807** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 9.738 | 0.20 | 10 | 0.098 | 96.4 | 80 - 120 | 10.13 | 3.96 | 20 | |

**The following samples were analyzed in this batch:** HS22010419-01

**ALS Houston, US** Date: 24-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Effluent
**WorkOrder:** **HS22010419**

## 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 |
| Florida | E87611-33 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 24-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Effluent
**Work Order:** HS22010419

## SAMPLE TRACKING

| Lab Samp ID | Client Sample ID | Action | Date | Person | New Location |
|---|---|---|---|---|---|
| HS22010419-01 | LH18/24-SP650_011122 | Login | 1/12/2022 11:06:29 AM | PJM | WET374 |
| HS22010419-01 | LH18/24-SP650_011122 | Login | 1/12/2022 11:06:29 AM | PJM | WET374 |
| HS22010419-01 | LH18/24-SP650_011122 | Login | 1/12/2022 11:06:29 AM | PJM | WET335 |
| HS22010419-02 | LH18/24-SP650_011122_AIX | Login | 1/12/2022 11:06:29 AM | PJM | Sub |

**ALS Houston, US** Date: 24-Jan-22

## Sample Receipt Checklist

**Work Order ID:** HS22010419 **Date/Time Received:** **12-Jan-2022 10:05**

**Client Name:** Bhate Environmental **Received by:** **Pablo Marinez**

**Completed By:** /S/ Pablo Marinez (eSignature) 12-Jan-2022 11:08 (Date/Time) **Reviewed by:** /S/ Ragen Giga (eSignature) 13-Jan-2022 19:45 (Date/Time)

Matrices: **WATER** Carrier name: **FedEx Priority Overnight**

| | Yes | No | |
|---|---|---|---|
| Shipping container/cooler in good condition? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on shipping container/cooler? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on sample bottles? | ☐ | ☐ | Not Present ☑ |
| VOA/TX1005/TX1006 Solids in hermetically sealed vials? | ☐ | ☐ | Not Present ☑ |
| Chain of custody present? | ☑ | ☐ | 1 Page(s) |
| Chain of custody signed when relinquished and received? | ☑ | ☐ | COC IDs:CLIENT |
| Samplers name present on COC? | ☑ | ☐ | |
| Chain of custody agrees with sample labels? | ☑ | ☐ | |
| Samples in proper container/bottle? | ☑ | ☐ | |
| Sample containers intact? | ☑ | ☐ | |
| Sufficient sample volume for indicated test? | ☑ | ☐ | |
| All samples received within holding time? | ☑ | ☐ | |
| Container/Temp Blank temperature in compliance? | ☑ | ☐ | |

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 1.4°C UC/C | IR 31 |
| Cooler(s)/Kit(s): | 48333 | |
| Date/Time sample(s) sent to storage: | 1/12/22 11:15 | |

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

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

bhate ENVIRONMENTAL CONSTRUCTION ENERGY

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

# Chain of Custody and Analytical Request

Page: _____ of _____

Project/Phase No: NWO1312.0150

COC Number(1): _____

LIMS Number: _____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / GWTP weekly Effluent

Client Name:

Collected by: Scott Beesinger

| Field Sample ID (30 Characters Max) | Date Collected (dd-mmm-yyyy) | Time Collected (Military) (hhmm) | Sample Depth (beginning - ending) | SA Code (2) | Sample Number (1) | Sample Matrix (4) | Number of containers | TOC | Ammonia-N | Orthophosphate | Perchlorate | | | | | | | Ambient Blank Lot Control Number | Equipment Blank Lot Control Number | Trip Blank Lot Control Number | Cooler ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_011122 | 11 Jan 2022 | 1400 | - | N | | WG | ~~5~~ 4 | X | X | X | ~~X~~ SB | | | | | | | | | | |
| LH18/24-SP650_011122_AIX | 11 Jan 2022 | 1400 | - | N | | WG | 1 | | | | X | | | | | | | | | | |
| | | | - | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
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| | | | - | | | | | | | | | | | | | | | | | | |
| | | | - | | | | | | | | | | | | | | | | | | |

HS22010419
Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Weekly Effluent

COMMENTS: STANDARD TAT

**Custody Transfers Prior to Receipt by Laboratory**

| Relinquished By (Signed) | Date | Time | Received by (signed) | Date | Time |
|---|---|---|---|---|---|
| 1. Scott Beesinger | 1/11/22 | 1430 | 1. Paul Nunn | 1-12-22 | 10:05 |
| 2. | | | 2. | | |
| 3. | | | 3. | | |

48333
1.4C 1R31 CFC

**Sample Delivery Details / Laboratory Receipt**

Delivered Directly to Lab: _____ Shipped _____ No.:

Method of Shipment: _____

Fed Ex _____ Airbill Number:

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

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

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)
2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)
3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)
4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks
5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.
6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

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

48333

CUSTODY SEAL

Date: 1/11/22
Time: 1430
Name: Steve Baumgar
Company: ZHH ETX

Seal Broken By: PM
Date: 1-12-22

TRK# 1251 0291 2375
FedEx
PRIORITY OVERNIGHT SAT

AB SGRA 48333

77099
TX-US
IAH

3923207 11Jan2022 GGGA 56DG2/01EF/1B23

January 13, 2022

Service Request No:E2200031

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS22010419**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory January 12, 2022
For your reference, these analyses have been assigned our service request number **E2200031.**

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.:** | E2200031 |
| **Project:** | HS22010419 | **Date Received:** | 01/12/22 |
| **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 01/12/22.

The sample was received in good condition and is 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:**

EQ2200013: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS-DLCS RPD exceed QC limit; the individual recoveries met acceptance criteria.

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:**E2200031
**Project:** HS22010419

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2200031-001 | LH18/24-SP650_011122_AIX | 1/11/2022 | 1400 |

# Service Request Summary

**Folder #:** **E2200031**
Client Name: ALS Environmental - US
Project Name: HS22010419
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: TWOODS
Date Received: 01/12/22
Internal Due Date: 1/26/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22010419
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON ClO4 DOD/6850 |
|---|---|---|---|---|
| E2200031-001 | LH18/24-SP650_011122_AIX | Ground Water | 01/11/22 1400 | **IV** |

# Service Request Summary

**Folder #:** **E2200031**
Client Name: ALS Environmental - US
Project Name: HS22010419
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: TWOODS
Date Received: 01/12/22
Internal Due Date: 1/26/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22010419
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 1 | Level IV due 2/2 |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| + | Possible Tedlar bag artifact. |
| A | TIC is a suspected aldol-condensation product |
| B | Analyte found in the associated method blank as well as in the sample. |
| BC | Reported results are not blank corrected. |
| BH | The back section of the tube yielded higher results than the front. |
| BT | Results indicated possible breakthrough; back section >=10% front section. |
| C | Result identification confirmed. |
| D | Compound identified in an analysis at a secondary dilution factor |
| D | Spike was diluted out |
| DE | Reported results are corrected for desorption efficiency. |
| E | Estimated value. Concentration above calibration range |
| E | The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample. |
| F | The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard. |
| H | The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard. |
| H1 | Sample analysis performed past holding time. See case narrative. |
| H2 | Initial analysis within holding time. Reanalysis for the required dilution was past holding time. |
| H3 | Sample was received and analyzed past holding time. |
| H4 | Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative. |
| I | Internal standard not within the specified limits. See case narrative. |
| J | Estimated Value. Concentration found below MRL. |
| K | A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate. |
| K | Analyte was detected above the method reporting limit prior to normalization. |
| K | The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result. |
| L | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard. |
| L1 | Laboratory control sample recovery outside the specified limits; results may be biased high. |
| L2 | Laboratory control sample recovery outside the specified limits; results may be biased low. |
| L3 | Laboratory control sample recovery outside the specified limits. |
| M | Matrix interference; results may be biased high. |
| M | The duplicate injection precision not met. |
| M1 | Matrix interference due to coelution with a non-target compound; results may be biased high. |
| N | Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search. |
| N | The Matrix Spike sample recovery is not within control limits. See case narrative. |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| O | The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard. |
| P | Indicates chlorodiphenyl ether interference present at the retention time of the target compound. |
| P | Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns |
| Q | Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria. |
| R | Duplicate Precision not met. |
| R1 | Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated. |
| S | Surrogate recovery not within specified limits. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| T | Analyte is a tentatively identified compound, result is estimated. |
| U | Compound was analyzed for, but was not detected (ND). |
| V1 | The continuing calibration verification standard was outside (biased high) the specified limits for this compound. |
| V2 | The continuing calibration verification standard was outside (biased low) the specified limits for this compound. |
| W | Result quantified, but the corresponding peak was detected outside the generated retention time window. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| X | See case narrative. |
| Y | Recovery outside limits |
| Y | The chromatogram resembles a petroleum product but does not match the calibration standard. |
| Z | The chromatogram does not resemble a petroleum product. |
| i | The MRL/MDL has been elevated due to a matrix interference. |

# ALS Laboratory Group

## Acronyms

| | |
|---|---|
| Cal | Calibration |
| Conc | CONCentration |
| Dioxin(s) | Polychlorinated dibenzo-p-dioxin(s) |
| EDL | Estimated Detection Limit |
| EMPC | Estimated Maximum Possible Concentration |
| Flags | Data qualifiers |
| Furan(s) | Polychlorinated dibenzofuran(s) |
| g | Grams |
| ICAL | Initial CALibration |
| ID | IDentifier |
| Ions | Masses monitored for the analyte during data acquisition |
| L | Liter (s) |
| LCS | Laboratory Control Sample |
| DLCS | Duplicate Laboratory Control Sample |
| MB | Method Blank |
| MCL | Method Calibration Limit |
| MDL | Method Detection Limit |
| mL | Milliliters |
| MS | Matrix Spiked sample |
| DMS | Duplicate Matrix Spiked sample |
| NO | Number of peaks meeting all identification criteria |
| PCDD(s) | Polychlorinated dibenzo-p-dioxin(s) |
| PCDF(s) | Polychlorinated dibenzofuran(s) |
| ppb | Parts per billion |
| ppm | Parts per million |
| ppq | Parts per quadrillion |
| ppt | Parts per trillion |
| QA | Quality Assurance |
| QC | Quality Control |
| Ratio | Ratio of areas from monitored ions for an analyte |
| % Rec. | Percent recovery |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| RT | Retention Time |
| SDG | Sample Delivery Group |
| S/N | Signal-to-noise ratio |
| TEF | Toxicity Equivalence Factor |
| TEQ | Toxicity Equivalence Quotient |

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ALS Environmental

## State Certifications, Accreditations, and Licenses

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas Department of Environmental Quality | 19-028-0 | 6/30/2022 |
| Arkansas Department of Environmental Quality | 21-022-0 | 3/26/2022 |
| Florida Department of Health | E87611-33 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 5/1/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
**T:** +1 281 530 5656
**F:** +1 281 530 5887
**www.alsglobal.com**

# Subcontract Chain of Custody

**SAMPLING STATE:** **Dept of Defense** **COC ID: 17894**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

**Company:** ALS Houston
**Contact:** Ragen Giga
**Address:** 10450 Stancliff Rd, Ste 210
**Phone:** +1 281 530 5656
**Email:** RagenP.Giga@ALSGlobal.com
**Alternate Contact:**
**Email:**

**INVOICE INFORMATION:**

**Company:** ALS Houston
**Contact:** Accounts Payable
**Address:** 10450 Stancliff Rd, Ste 210
**Phone:** +1 281 530 5656
**Reference:** HS22010419
**TSR:** Houston House Acct

| | LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | | | DUE DATE |
| 1. | **HS22010419-02** | **LH18/24-SP650_011122_AIX** | **Water** | **11 Jan 2022 14:00** |
| | 6850-Perch. DOD Level II & Level IV in separate pdf | | | 26 Jan 2022 |

**Comments:** Please analyze for the analysis listed above.
Send report to the emails shown above.

**QC Level:** DOD IV (DoD Data Package)

Relinquished By: Paul Mann Date/Time: 1-12-22 11:15
Received By: Corey G Date/Time: 1-12-22 11:15
Cooler ID(s): Temperature(s): 3.4 IR#1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental

# Cooler Receipt Form

Project Chemist: CG

Client/Project: ALS-H

Thermometer ID: IR31

Date/Time Received: 1-12-22 Initials: CG

Date/Time Logged in: 1-12-22 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 | | 1-12-22 | 1115 | CG | 3.4 | ☒ |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☒ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☒ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☒ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☒ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☒ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

ALS Environmental - Houston HRMS

10450 Stancliff Rd., Suite 210
Houston, TX 77099
**T:** +1 713 266 1599
**F:** +1 713 266 1599
**www.alsglobal.com**

# SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

**Cooler Custody Seals (desirable, mandatory if specified in SAP):**

- ✓ Intact on outside of cooler, signed and dated

**Chain-of-Custody (COC) documentation (mandatory):**

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

**Sample Integrity (mandatory):**

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

**Temperature Requirement (varies by sample matrix):**

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

# Preparation Information Benchsheets

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

# *Preparation Information Benchsheet*

**Prep Run#:** 393804 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 1/12/22 08:53

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2200020-001 | LHAAP17_ARaAH_011022 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 2 | E2200031-001 | LH18/24-SP650_011122_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 3 | EQ2200013-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 4 | EQ2200013-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 5 | EQ2200013-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |

## Spiking Solutions

Name: Sodium Perchlorate 1 ug/mL (IS) (18-O) as CLO4 Inventory ID 214765 Logbook Ref: Sodium Perchlorate Expires On: 12/11/2022

E2200020-001 100.00µL EQ2200013-01 100.00µL EQ2200013-02 100.00µL EQ2200013-03 100.00µL

Name: Perchlorate Intermediate Stock1 Inventory ID 219595 Logbook Ref: Perchlorate Expires On: 03/15/2022

EQ2200013-02 1.00µL EQ2200013-03 1.00µL

## Preparation Materials

Water HPLC Grade 08/03/2021 Water (218530) 537M Glass Culture Tubes 537M Glass Tubes (218064) 6850 0.45um syringe filters 6850 Syringe Filters (219639)

## Preparation Steps

Step: Preparation
Started: 1/12/22 08:53
Finished: 1/12/22 09:30
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 1/12/22

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:** | E2200031 |
| **Project:** | HS22010419 | **Date Collected:** | 1/11/22 1400 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 1/12/22 |
| **Sample Name:** | LH18/24-SP650_011122_AIX | **Units:** | µg/L |
| **Lab Code:** | E2200031-001 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.0882** | J | 0.200 | 0.100 | 0.0500 | 2 | 1/12/22 | 1/13/22 13:02 | 393804 | 751604 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200031 |
| **Project:** | HS22010419 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2200013-01 | **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 | 1/12/22 | 1/13/22 12:04 | 393804 | 751604 | |

# 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:** | E2200031 |
| **Project:** | HS22010419 | **Date Analyzed:** | 1/13/22 |
| **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:** | 393804 |

| | Lab Control Sample EQ2200013-02 | | | Duplicate Lab Control Sample EQ2200013-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.119 | 0.100 | 119 | 0.110 | 0.100 | 110 | 84 - 119 | 7 | 15 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200031 |
| **Project:** | HS22010419 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200013-02 | **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 | **0.119** | | 0.100 | 0.0500 | 0.0250 | 1 | 1/12/22 | 1/13/22 12:11 | 393804 | 751604 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200031 |
| **Project:** | HS22010419 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200013-03 | **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 | **0.110** | | 0.100 | 0.0500 | 0.0250 | 1 | 1/12/22 | 1/13/22 12:39 | 393804 | 751604 | |

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

January 25, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22010420**

Laboratory Results for: **Longhorn GW Treatment Plant Bi-Weekly Effluent**

Dear Marcia Olive,

ALS Environmental received 2 sample(s) on Jan 12, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: DAYNA.FISHER**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 25-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Effluent
**Work Order:** HS22010420

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22010420-01 | LH18/24-SP650_011122 | Water | | 11-Jan-2022 14:00 | 12-Jan-2022 10:05 | ☐ |
| HS22010420-02 | Trip Blank | Water | CG-111221-65 | 11-Jan-2022 00:00 | 12-Jan-2022 10:05 | ☐ |

**ALS Houston, US** Date: 25-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Effluent
**Work Order:** HS22010420

**CASE NARRATIVE**

## GCMS Volatiles by Method SW8260

### Batch ID: R400883

**Sample ID: LH18/24-SP650_011122 (HS22010420-01MSD)**

- MS/MSD RPD recovered outside control limits for Bromomethane

## WetChemistry by Method SW9056

### Batch ID: R400949

**Sample ID: HS22010703-01MS**

- MS and MSD are for an unrelated sample (Sulfate)

**ALS Houston, US** Date: 25-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Effluent
Sample ID: LH18/24-SP650_011122
Collection Date: 11-Jan-2022 14:00

**ANALYTICAL REPORT**
WorkOrder:HS22010420
Lab ID:HS22010420-01
Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| 1,1,1,2-Tetrachloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 1,1,1-Trichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 1,1-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 1,1-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 1,1-Dichloropropene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 1,2,3-Trichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 1,2,3-Trichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 1,2,4-Trichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 1,2,4-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 1,2-Dibromo-3-chloropropane | 1.0 | U | 0.20 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 1,2-Dibromoethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 1,2-Dichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 1,2-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 1,2-Dichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 1,3,5-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 1,3-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 1,3-Dichloropropane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 1,4-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 2,2-Dichloropropane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 2-Butanone | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 2-Chlorotoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 2-Hexanone | 2.0 | U | 1.0 | 2.0 | 2.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 4-Chlorotoluene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 4-Isopropyltoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| 4-Methyl-2-pentanone | 2.0 | U | 0.70 | 2.0 | 2.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Acetone | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Benzene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Bromobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Bromochloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Bromodichloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Bromoform | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Bromomethane | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Carbon disulfide | 2.0 | U | 0.60 | 2.0 | 2.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Carbon tetrachloride | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Chlorobenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Chloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Chloroform | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |

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

**ALS Houston, US** Date: 25-Jan-22

Client: Bhate Environmental Associates, Inc.

**ANALYTICAL REPORT**

Project: Longhorn GW Treatment Plant Bi-Weekly Effluent WorkOrder:HS22010420

Sample ID: LH18/24-SP650_011122 Lab ID:HS22010420-01

Collection Date: 11-Jan-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| Chloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| **cis-1,2-Dichloroethene** | **1.6** | | **0.20** | **0.50** | **1.0** | **ug/L** | 1 | 24-Jan-2022 13:20 |
| cis-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Dibromochloromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Dibromomethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Dichlorodifluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Ethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Hexachlorobutadiene | 1.0 | U | 1.0 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Isopropylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| m,p-Xylene | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Methylene chloride | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| n-Butylbenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| n-Propylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Naphthalene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| o-Xylene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| sec-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Styrene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| tert-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Tetrachloroethene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Toluene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| trans-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| trans-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Trichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Trichlorofluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| Vinyl chloride | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 13:20 |
| *Surr: 1,2-Dichloroethane-d4* | *100* | | | **0** | *81-118* | *%REC* | *1* | *24-Jan-2022 13:20* |
| *Surr: 4-Bromofluorobenzene* | *100* | | | **0** | *85-114* | *%REC* | *1* | *24-Jan-2022 13:20* |
| *Surr: Dibromofluoromethane* | *97.2* | | | **0** | *80-119* | *%REC* | *1* | *24-Jan-2022 13:20* |
| *Surr: Toluene-d8* | *106* | | | **0** | *89-112* | *%REC* | *1* | *24-Jan-2022 13:20* |
| **ANIONS BY SW9056A** | | **Method:SW9056** | | | | | | Analyst: YP |
| **Chloride** | **799** | | **4.00** | **10.0** | **10.0** | **mg/L** | 20 | 25-Jan-2022 05:58 |
| **Sulfate** | **33.7** | | **0.200** | **0.500** | **0.500** | **mg/L** | 1 | 25-Jan-2022 05:51 |

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

**ALS Houston, US** Date: 25-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Effluent
Sample ID: Trip Blank
Collection Date: 11-Jan-2022 00:00

**ANALYTICAL REPORT**
WorkOrder:HS22010420
Lab ID:HS22010420-02
Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| 1,1,1,2-Tetrachloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 1,1,1-Trichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 1,1-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 1,1-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 1,1-Dichloropropene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 1,2,3-Trichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 1,2,3-Trichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 1,2,4-Trichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 1,2,4-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 1,2-Dibromo-3-chloropropane | 1.0 | U | 0.20 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 1,2-Dibromoethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 1,2-Dichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 1,2-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 1,2-Dichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 1,3,5-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 1,3-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 1,3-Dichloropropane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 1,4-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 2,2-Dichloropropane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 2-Butanone | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 2-Chlorotoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 2-Hexanone | 2.0 | U | 1.0 | 2.0 | 2.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 4-Chlorotoluene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 4-Isopropyltoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| 4-Methyl-2-pentanone | 2.0 | U | 0.70 | 2.0 | 2.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Acetone | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Benzene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Bromobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Bromochloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Bromodichloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Bromoform | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Bromomethane | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Carbon disulfide | 2.0 | U | 0.60 | 2.0 | 2.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Carbon tetrachloride | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Chlorobenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Chloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Chloroform | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |

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

**ALS Houston, US** Date: 25-Jan-22

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Effluent
Sample ID: Trip Blank
Collection Date: 11-Jan-2022 00:00

**ANALYTICAL REPORT**
WorkOrder:HS22010420
Lab ID:HS22010420-02
Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| Chloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| cis-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| cis-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Dibromochloromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Dibromomethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Dichlorodifluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Ethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Hexachlorobutadiene | 1.0 | U | 1.0 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Isopropylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| m,p-Xylene | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Methylene chloride | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| n-Butylbenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| n-Propylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Naphthalene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| o-Xylene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| sec-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Styrene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| tert-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Tetrachloroethene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Toluene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| trans-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| trans-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Trichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Trichlorofluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| Vinyl chloride | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 24-Jan-2022 12:57 |
| *Surr: 1,2-Dichloroethane-d4* | *99.0* | | | **0** | *81-118* | *%REC* | *1* | *24-Jan-2022 12:57* |
| *Surr: 4-Bromofluorobenzene* | *101* | | | **0** | *85-114* | *%REC* | *1* | *24-Jan-2022 12:57* |
| *Surr: Dibromofluoromethane* | *96.0* | | | **0** | *80-119* | *%REC* | *1* | *24-Jan-2022 12:57* |
| *Surr: Toluene-d8* | *107* | | | **0** | *89-112* | *%REC* | *1* | *24-Jan-2022 12:57* |

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

**ALS Houston, US** Date: 25-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Effluent
**WorkOrder:** HS22010420

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** R400883 ( 0 ) | **Test Name :** VOLATILES ORGANICS BY METHOD 8260C | | | | **Matrix:** Water | |
| HS22010420-01 | LH18/24-SP650_011122 | 11 Jan 2022 14:00 | | | 24 Jan 2022 13:20 | 1 |
| HS22010420-02 | Trip Blank | 11 Jan 2022 00:00 | | | 24 Jan 2022 12:57 | 1 |
| **Batch ID:** R400949 ( 0 ) | **Test Name :** ANIONS BY SW9056A | | | | **Matrix:** Water | |
| HS22010420-01 | LH18/24-SP650_011122 | 11 Jan 2022 14:00 | | | 25 Jan 2022 05:58 | 20 |
| HS22010420-01 | LH18/24-SP650_011122 | 11 Jan 2022 14:00 | | | 25 Jan 2022 05:51 | 1 |

**ALS Houston, US** Date: 25-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Effluent
**WorkOrder:** HS22010420

**QC BATCH REPORT**

**Batch ID:** R400883 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220124** Units: **ug/L** Analysis Date: **24-Jan-2022 12:35**
Client ID: Run ID: **VOA9_400883** SeqNo: **6474374** PrepDate: DF: **1**

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

**ALS Houston, US** Date: 25-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Effluent
**WorkOrder:** HS22010420

**QC BATCH REPORT**

**Batch ID:** R400883 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220124** Units: **ug/L** Analysis Date: **24-Jan-2022 12:35**
Client ID: Run ID: **VOA9_400883** SeqNo: **6474374** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 2.0 | 2.0 | | | | | | | | U |
| Carbon tetrachloride | 1.0 | 1.0 | | | | | | | | U |
| Chlorobenzene | 1.0 | 1.0 | | | | | | | | U |
| Chloroethane | 1.0 | 1.0 | | | | | | | | U |
| Chloroform | 0.50 | 1.0 | | | | | | | | U |
| Chloromethane | 0.50 | 1.0 | | | | | | | | U |
| cis-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| cis-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Dibromochloromethane | 1.0 | 1.0 | | | | | | | | U |
| Dibromomethane | 0.50 | 1.0 | | | | | | | | U |
| Dichlorodifluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Ethylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Hexachlorobutadiene | 1.0 | 1.0 | | | | | | | | U |
| Isopropylbenzene | 1.0 | 1.0 | | | | | | | | U |
| m,p-Xylene | 1.0 | 2.0 | | | | | | | | U |
| Methylene chloride | 2.0 | 2.0 | | | | | | | | U |
| Naphthalene | 1.0 | 1.0 | | | | | | | | U |
| n-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| n-Propylbenzene | 1.0 | 1.0 | | | | | | | | U |
| o-Xylene | 1.0 | 1.0 | | | | | | | | U |
| sec-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Styrene | 1.0 | 1.0 | | | | | | | | U |
| tert-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Tetrachloroethene | 1.0 | 1.0 | | | | | | | | U |
| Toluene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Trichloroethene | 0.50 | 1.0 | | | | | | | | U |
| Trichlorofluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Vinyl chloride | 0.50 | 1.0 | | | | | | | | U |
| *Surr: 1,2-Dichloroethane-d4* | *49.19* | *1.0* | *50* | *0* | *98.4* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *49.15* | *1.0* | *50* | *0* | *98.3* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *48.06* | *1.0* | *50* | *0* | *96.1* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *52.68* | *1.0* | *50* | *0* | *105* | *89 - 112* | | | | |

**ALS Houston, US** Date: 25-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Effluent
**WorkOrder:** HS22010420

**QC BATCH REPORT**

**Batch ID:** R400883 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220124** Units: **ug/L** Analysis Date: **24-Jan-2022 11:51**
Client ID: Run ID: **VOA9_400883** SeqNo: **6474373** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 21.26 | 1.0 | 20 | 0 | 106 | 78 - 124 | | | | |
| 1,1,1-Trichloroethane | 19.5 | 1.0 | 20 | 0 | 97.5 | 74 - 131 | | | | |
| 1,1,2,2-Tetrachloroethane | 21.3 | 1.0 | 20 | 0 | 107 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 21.17 | 1.0 | 20 | 0 | 106 | 80 - 119 | | | | |
| 1,1-Dichloroethane | 20.25 | 1.0 | 20 | 0 | 101 | 77 - 125 | | | | |
| 1,1-Dichloroethene | 18.98 | 1.0 | 20 | 0 | 94.9 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 19.65 | 1.0 | 20 | 0 | 98.2 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 19.58 | 1.0 | 20 | 0 | 97.9 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 21.89 | 1.0 | 20 | 0 | 109 | 73 - 122 | | | | |
| 1,2,4-Trichlorobenzene | 19.54 | 1.0 | 20 | 0 | 97.7 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 22.48 | 1.0 | 20 | 0 | 112 | 76 - 124 | | | | |
| 1,2-Dibromo-3-chloropropane | 20.12 | 1.0 | 20 | 0 | 101 | 62 - 128 | | | | |
| 1,2-Dibromoethane | 21.6 | 1.0 | 20 | 0 | 108 | 77 - 121 | | | | |
| 1,2-Dichlorobenzene | 19.73 | 1.0 | 20 | 0 | 98.6 | 80 - 119 | | | | |
| 1,2-Dichloroethane | 21.17 | 1.0 | 20 | 0 | 106 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 19.47 | 1.0 | 20 | 0 | 97.4 | 78 - 122 | | | | |
| 1,3,5-Trimethylbenzene | 19.88 | 1.0 | 20 | 0 | 99.4 | 75 - 124 | | | | |
| 1,3-Dichlorobenzene | 20.09 | 1.0 | 20 | 0 | 100 | 80 - 119 | | | | |
| 1,3-Dichloropropane | 20.68 | 1.0 | 20 | 0 | 103 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 18.86 | 1.0 | 20 | 0 | 94.3 | 79 - 118 | | | | |
| 2,2-Dichloropropane | 20.22 | 1.0 | 20 | 0 | 101 | 60 - 139 | | | | |
| 2-Butanone | 47.44 | 2.0 | 40 | 0 | 119 | 56 - 143 | | | | |
| 2-Chlorotoluene | 20.88 | 1.0 | 20 | 0 | 104 | 79 - 122 | | | | |
| 2-Hexanone | 48.84 | 2.0 | 40 | 0 | 122 | 57 - 139 | | | | |
| 4-Chlorotoluene | 20.97 | 1.0 | 20 | 0 | 105 | 78 - 122 | | | | |
| 4-Isopropyltoluene | 19.37 | 1.0 | 20 | 0 | 96.9 | 77 - 127 | | | | |
| 4-Methyl-2-pentanone | 47.25 | 2.0 | 40 | 0 | 118 | 67 - 130 | | | | |
| Acetone | 48.51 | 2.0 | 40 | 0 | 121 | 39 - 160 | | | | |
| Benzene | 20.23 | 1.0 | 20 | 0 | 101 | 79 - 120 | | | | |
| Bromobenzene | 20.77 | 1.0 | 20 | 0 | 104 | 80 - 120 | | | | |
| Bromochloromethane | 19.72 | 1.0 | 20 | 0 | 98.6 | 78 - 123 | | | | |
| Bromodichloromethane | 20.34 | 1.0 | 20 | 0 | 102 | 79 - 125 | | | | |
| Bromoform | 19.24 | 1.0 | 20 | 0 | 96.2 | 66 - 130 | | | | |
| Bromomethane | 21.09 | 1.0 | 20 | 0 | 105 | 53 - 141 | | | | |

**ALS Houston, US** Date: 25-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Effluent
**WorkOrder:** HS22010420

**QC BATCH REPORT**

**Batch ID:** R400883 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220124** Units: **ug/L** Analysis Date: **24-Jan-2022 11:51**
Client ID: Run ID: **VOA9_400883** SeqNo: **6474373** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 40.38 | 2.0 | 40 | 0 | 101 | 64 - 133 | | | | |
| Carbon tetrachloride | 19.44 | 1.0 | 20 | 0 | 97.2 | 72 - 136 | | | | |
| Chlorobenzene | 19.87 | 1.0 | 20 | 0 | 99.4 | 82 - 118 | | | | |
| Chloroethane | 19.51 | 1.0 | 20 | 0 | 97.6 | 60 - 138 | | | | |
| Chloroform | 19.86 | 1.0 | 20 | 0 | 99.3 | 79 - 124 | | | | |
| Chloromethane | 18.79 | 1.0 | 20 | 0 | 93.9 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 19.64 | 1.0 | 20 | 0 | 98.2 | 78 - 123 | | | | |
| cis-1,3-Dichloropropene | 19.5 | 1.0 | 20 | 0 | 97.5 | 75 - 124 | | | | |
| Dibromochloromethane | 19.57 | 1.0 | 20 | 0 | 97.8 | 74 - 126 | | | | |
| Dibromomethane | 20.35 | 1.0 | 20 | 0 | 102 | 79 - 123 | | | | |
| Dichlorodifluoromethane | 17.38 | 1.0 | 20 | 0 | 86.9 | 32 - 152 | | | | |
| Ethylbenzene | 20 | 1.0 | 20 | 0 | 100 | 79 - 121 | | | | |
| Hexachlorobutadiene | 19.49 | 1.0 | 20 | 0 | 97.4 | 66 - 134 | | | | |
| Isopropylbenzene | 20.96 | 1.0 | 20 | 0 | 105 | 72 - 131 | | | | |
| m,p-Xylene | 43.21 | 2.0 | 40 | 0 | 108 | 80 - 121 | | | | |
| Methylene chloride | 20.14 | 2.0 | 20 | 0 | 101 | 74 - 124 | | | | |
| Naphthalene | 20.24 | 1.0 | 20 | 0 | 101 | 61 - 128 | | | | |
| n-Butylbenzene | 20.43 | 1.0 | 20 | 0 | 102 | 75 - 128 | | | | |
| n-Propylbenzene | 20.72 | 1.0 | 20 | 0 | 104 | 76 - 126 | | | | |
| o-Xylene | 21.32 | 1.0 | 20 | 0 | 107 | 78 - 122 | | | | |
| sec-Butylbenzene | 20.1 | 1.0 | 20 | 0 | 101 | 77 - 126 | | | | |
| Styrene | 22.41 | 1.0 | 20 | 0 | 112 | 78 - 123 | | | | |
| tert-Butylbenzene | 19.99 | 1.0 | 20 | 0 | 100.0 | 78 - 124 | | | | |
| Tetrachloroethene | 20.24 | 1.0 | 20 | 0 | 101 | 74 - 129 | | | | |
| Toluene | 21.06 | 1.0 | 20 | 0 | 105 | 80 - 121 | | | | |
| trans-1,2-Dichloroethene | 19.47 | 1.0 | 20 | 0 | 97.4 | 75 - 124 | | | | |
| trans-1,3-Dichloropropene | 19.29 | 1.0 | 20 | 0 | 96.4 | 73 - 127 | | | | |
| Trichloroethene | 19.22 | 1.0 | 20 | 0 | 96.1 | 79 - 123 | | | | |
| Trichlorofluoromethane | 18.9 | 1.0 | 20 | 0 | 94.5 | 65 - 141 | | | | |
| Vinyl chloride | 18.51 | 1.0 | 20 | 0 | 92.6 | 58 - 137 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *54.79* | *1.0* | *50* | *0* | *110* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *53.64* | *1.0* | *50* | *0* | *107* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *53.17* | *1.0* | *50* | *0* | *106* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *52.46* | *1.0* | *50* | *0* | *105* | *89 - 112* | | | | |

**ALS Houston, US** Date: 25-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Effluent
**WorkOrder:** HS22010420

**QC BATCH REPORT**

**Batch ID:** R400883 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS22010420-01MS** Units: **ug/L** Analysis Date: **24-Jan-2022 14:49**
Client ID: **LH18/24-SP650_011122** Run ID: **VOA9_400883** SeqNo: **6474379** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 21.22 | 1.0 | 20 | 0 | 106 | 78 - 124 | | | | |
| 1,1,1-Trichloroethane | 20.02 | 1.0 | 20 | 0 | 100 | 74 - 131 | | | | |
| 1,1,2,2-Tetrachloroethane | 20.27 | 1.0 | 20 | 0 | 101 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 19.97 | 1.0 | 20 | 0 | 99.8 | 80 - 119 | | | | |
| 1,1-Dichloroethane | 19.49 | 1.0 | 20 | 0 | 97.5 | 77 - 125 | | | | |
| 1,1-Dichloroethene | 20.12 | 1.0 | 20 | 0 | 101 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 21.72 | 1.0 | 20 | 0 | 109 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 19.19 | 1.0 | 20 | 0 | 96.0 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 20.45 | 1.0 | 20 | 0 | 102 | 73 - 122 | | | | |
| 1,2,4-Trichlorobenzene | 19.31 | 1.0 | 20 | 0 | 96.6 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 23.78 | 1.0 | 20 | 0 | 119 | 76 - 124 | | | | |
| 1,2-Dibromo-3-chloropropane | 19.99 | 1.0 | 20 | 0 | 99.9 | 62 - 128 | | | | |
| 1,2-Dibromoethane | 20.34 | 1.0 | 20 | 0 | 102 | 77 - 121 | | | | |
| 1,2-Dichlorobenzene | 19.38 | 1.0 | 20 | 0 | 96.9 | 80 - 119 | | | | |
| 1,2-Dichloroethane | 20.68 | 1.0 | 20 | 0 | 103 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 19.22 | 1.0 | 20 | 0 | 96.1 | 78 - 122 | | | | |
| 1,3,5-Trimethylbenzene | 21.17 | 1.0 | 20 | 0 | 106 | 75 - 124 | | | | |
| 1,3-Dichlorobenzene | 20.05 | 1.0 | 20 | 0 | 100 | 80 - 119 | | | | |
| 1,3-Dichloropropane | 20.13 | 1.0 | 20 | 0 | 101 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 19.49 | 1.0 | 20 | 0 | 97.4 | 79 - 118 | | | | |
| 2,2-Dichloropropane | 20.04 | 1.0 | 20 | 0 | 100 | 60 - 139 | | | | |
| 2-Butanone | 41.53 | 2.0 | 40 | 0 | 104 | 56 - 143 | | | | |
| 2-Chlorotoluene | 21.15 | 1.0 | 20 | 0 | 106 | 79 - 122 | | | | |
| 2-Hexanone | 44.14 | 2.0 | 40 | 0 | 110 | 57 - 139 | | | | |
| 4-Chlorotoluene | 21.45 | 1.0 | 20 | 0 | 107 | 78 - 122 | | | | |
| 4-Isopropyltoluene | 21.52 | 1.0 | 20 | 0 | 108 | 77 - 127 | | | | |
| 4-Methyl-2-pentanone | 44.77 | 2.0 | 40 | 0 | 112 | 67 - 130 | | | | |
| Acetone | 38.41 | 2.0 | 40 | 0 | 96.0 | 39 - 160 | | | | |
| Benzene | 20.58 | 1.0 | 20 | 0 | 103 | 79 - 120 | | | | |
| Bromobenzene | 20.07 | 1.0 | 20 | 0 | 100 | 80 - 120 | | | | |
| Bromochloromethane | 17.98 | 1.0 | 20 | 0 | 89.9 | 78 - 123 | | | | |
| Bromodichloromethane | 20.19 | 1.0 | 20 | 0 | 101 | 79 - 125 | | | | |
| Bromoform | 18.11 | 1.0 | 20 | 0 | 90.6 | 66 - 130 | | | | |
| Bromomethane | 16.19 | 1.0 | 20 | 0 | 80.9 | 53 - 141 | | | | |

**ALS Houston, US** Date: 25-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Effluent
**WorkOrder:** HS22010420

**QC BATCH REPORT**

**Batch ID:** R400883 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS22010420-01MS** Units: **ug/L** Analysis Date: **24-Jan-2022 14:49**
Client ID: **LH18/24-SP650_011122** Run ID: **VOA9_400883** SeqNo: **6474379** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 43.5 | 2.0 | 40 | 0 | 109 | 64 - 133 | | | | |
| Carbon tetrachloride | 22.84 | 1.0 | 20 | 0 | 114 | 72 - 136 | | | | |
| Chlorobenzene | 20.41 | 1.0 | 20 | 0 | 102 | 82 - 118 | | | | |
| Chloroethane | 16.22 | 1.0 | 20 | 0 | 81.1 | 60 - 138 | | | | |
| Chloroform | 18.76 | 1.0 | 20 | 0 | 93.8 | 79 - 124 | | | | |
| Chloromethane | 17.58 | 1.0 | 20 | 0 | 87.9 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 20.02 | 1.0 | 20 | 1.61 | 92.1 | 78 - 123 | | | | |
| cis-1,3-Dichloropropene | 18.82 | 1.0 | 20 | 0 | 94.1 | 75 - 124 | | | | |
| Dibromochloromethane | 19.11 | 1.0 | 20 | 0 | 95.5 | 74 - 126 | | | | |
| Dibromomethane | 19.1 | 1.0 | 20 | 0 | 95.5 | 79 - 123 | | | | |
| Dichlorodifluoromethane | 18.42 | 1.0 | 20 | 0 | 92.1 | 32 - 152 | | | | |
| Ethylbenzene | 21.54 | 1.0 | 20 | 0 | 108 | 79 - 121 | | | | |
| Hexachlorobutadiene | 20.21 | 1.0 | 20 | 0 | 101 | 66 - 134 | | | | |
| Isopropylbenzene | 23.13 | 1.0 | 20 | 0 | 116 | 72 - 131 | | | | |
| m,p-Xylene | 45.18 | 2.0 | 40 | 0 | 113 | 80 - 121 | | | | |
| Methylene chloride | 18.46 | 2.0 | 20 | 0 | 92.3 | 74 - 124 | | | | |
| Naphthalene | 19.35 | 1.0 | 20 | 0 | 96.7 | 61 - 128 | | | | |
| n-Butylbenzene | 23.16 | 1.0 | 20 | 0 | 116 | 75 - 128 | | | | |
| n-Propylbenzene | 22.71 | 1.0 | 20 | 0 | 114 | 76 - 126 | | | | |
| o-Xylene | 21.91 | 1.0 | 20 | 0 | 110 | 78 - 122 | | | | |
| sec-Butylbenzene | 23.32 | 1.0 | 20 | 0 | 117 | 77 - 126 | | | | |
| Styrene | 22.21 | 1.0 | 20 | 0 | 111 | 78 - 123 | | | | |
| tert-Butylbenzene | 22.2 | 1.0 | 20 | 0 | 111 | 78 - 124 | | | | |
| Tetrachloroethene | 22.27 | 1.0 | 20 | 0 | 111 | 74 - 129 | | | | |
| Toluene | 21.63 | 1.0 | 20 | 0 | 108 | 80 - 121 | | | | |
| trans-1,2-Dichloroethene | 19.15 | 1.0 | 20 | 0 | 95.8 | 75 - 124 | | | | |
| trans-1,3-Dichloropropene | 18.64 | 1.0 | 20 | 0 | 93.2 | 73 - 127 | | | | |
| Trichloroethene | 20.57 | 1.0 | 20 | 0 | 103 | 79 - 123 | | | | |
| Trichlorofluoromethane | 20.93 | 1.0 | 20 | 0 | 105 | 65 - 141 | | | | |
| Vinyl chloride | 19.31 | 1.0 | 20 | 0 | 96.5 | 58 - 137 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *49.21* | *1.0* | *50* | *0* | *98.4* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *52.94* | *1.0* | *50* | *0* | *106* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *48.73* | *1.0* | *50* | *0* | *97.5* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *53.21* | *1.0* | *50* | *0* | *106* | *89 - 112* | | | | |

**ALS Houston, US** Date: 25-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Effluent
**WorkOrder:** HS22010420

**QC BATCH REPORT**

**Batch ID:** R400883 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS22010420-01MSD** Units: **ug/L** Analysis Date: **24-Jan-2022 15:11**
Client ID: **LH18/24-SP650_011122** Run ID: **VOA9_400883** SeqNo: **6474380** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 20.61 | 1.0 | 20 | 0 | 103 | 78 - 124 | 21.22 | 2.89 | 20 | |
| 1,1,1-Trichloroethane | 19.69 | 1.0 | 20 | 0 | 98.4 | 74 - 131 | 20.02 | 1.67 | 20 | |
| 1,1,2,2-Tetrachloroethane | 20.58 | 1.0 | 20 | 0 | 103 | 71 - 121 | 20.27 | 1.51 | 20 | |
| 1,1,2-Trichloroethane | 19.66 | 1.0 | 20 | 0 | 98.3 | 80 - 119 | 19.97 | 1.55 | 20 | |
| 1,1-Dichloroethane | 19.21 | 1.0 | 20 | 0 | 96.0 | 77 - 125 | 19.49 | 1.47 | 20 | |
| 1,1-Dichloroethene | 19.26 | 1.0 | 20 | 0 | 96.3 | 71 - 131 | 20.12 | 4.35 | 20 | |
| 1,1-Dichloropropene | 20.78 | 1.0 | 20 | 0 | 104 | 78 - 125 | 21.72 | 4.44 | 20 | |
| 1,2,3-Trichlorobenzene | 19.92 | 1.0 | 20 | 0 | 99.6 | 69 - 129 | 19.19 | 3.72 | 20 | |
| 1,2,3-Trichloropropane | 20.76 | 1.0 | 20 | 0 | 104 | 73 - 122 | 20.45 | 1.54 | 20 | |
| 1,2,4-Trichlorobenzene | 19.77 | 1.0 | 20 | 0 | 98.9 | 69 - 130 | 19.31 | 2.36 | 20 | |
| 1,2,4-Trimethylbenzene | 23.91 | 1.0 | 20 | 0 | 120 | 76 - 124 | 23.78 | 0.522 | 20 | |
| 1,2-Dibromo-3-chloropropane | 20.15 | 1.0 | 20 | 0 | 101 | 62 - 128 | 19.99 | 0.839 | 20 | |
| 1,2-Dibromoethane | 20.4 | 1.0 | 20 | 0 | 102 | 77 - 121 | 20.34 | 0.309 | 20 | |
| 1,2-Dichlorobenzene | 19.19 | 1.0 | 20 | 0 | 96.0 | 80 - 119 | 19.38 | 0.957 | 20 | |
| 1,2-Dichloroethane | 19.9 | 1.0 | 20 | 0 | 99.5 | 73 - 128 | 20.68 | 3.83 | 20 | |
| 1,2-Dichloropropane | 18.77 | 1.0 | 20 | 0 | 93.8 | 78 - 122 | 19.22 | 2.37 | 20 | |
| 1,3,5-Trimethylbenzene | 21.15 | 1.0 | 20 | 0 | 106 | 75 - 124 | 21.17 | 0.0954 | 20 | |
| 1,3-Dichlorobenzene | 19.92 | 1.0 | 20 | 0 | 99.6 | 80 - 119 | 20.05 | 0.667 | 20 | |
| 1,3-Dichloropropane | 19.72 | 1.0 | 20 | 0 | 98.6 | 80 - 119 | 20.13 | 2.06 | 20 | |
| 1,4-Dichlorobenzene | 19.07 | 1.0 | 20 | 0 | 95.3 | 79 - 118 | 19.49 | 2.18 | 20 | |
| 2,2-Dichloropropane | 19.36 | 1.0 | 20 | 0 | 96.8 | 60 - 139 | 20.04 | 3.42 | 20 | |
| 2-Butanone | 42.54 | 2.0 | 40 | 0 | 106 | 56 - 143 | 41.53 | 2.39 | 20 | |
| 2-Chlorotoluene | 20.77 | 1.0 | 20 | 0 | 104 | 79 - 122 | 21.15 | 1.8 | 20 | |
| 2-Hexanone | 46 | 2.0 | 40 | 0 | 115 | 57 - 139 | 44.14 | 4.13 | 20 | |
| 4-Chlorotoluene | 21.48 | 1.0 | 20 | 0 | 107 | 78 - 122 | 21.45 | 0.154 | 20 | |
| 4-Isopropyltoluene | 21.59 | 1.0 | 20 | 0 | 108 | 77 - 127 | 21.52 | 0.304 | 20 | |
| 4-Methyl-2-pentanone | 45.34 | 2.0 | 40 | 0 | 113 | 67 - 130 | 44.77 | 1.27 | 20 | |
| Acetone | 38.96 | 2.0 | 40 | 0 | 97.4 | 39 - 160 | 38.41 | 1.41 | 20 | |
| Benzene | 19.84 | 1.0 | 20 | 0 | 99.2 | 79 - 120 | 20.58 | 3.69 | 20 | |
| Bromobenzene | 20.19 | 1.0 | 20 | 0 | 101 | 80 - 120 | 20.07 | 0.59 | 20 | |
| Bromochloromethane | 17.55 | 1.0 | 20 | 0 | 87.8 | 78 - 123 | 17.98 | 2.39 | 20 | |
| Bromodichloromethane | 19.81 | 1.0 | 20 | 0 | 99.1 | 79 - 125 | 20.19 | 1.86 | 20 | |
| Bromoform | 18.38 | 1.0 | 20 | 0 | 91.9 | 66 - 130 | 18.11 | 1.49 | 20 | |
| Bromomethane | 12.95 | 1.0 | 20 | 0 | 64.8 | 53 - 141 | 16.19 | 22.2 | 20 | R |

**ALS Houston, US** Date: 25-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Effluent
**WorkOrder:** HS22010420

**QC BATCH REPORT**

**Batch ID:** R400883 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS22010420-01MSD** Units: **ug/L** Analysis Date: **24-Jan-2022 15:11**
Client ID: **LH18/24-SP650_011122** Run ID: **VOA9_400883** SeqNo: **6474380** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 42.52 | 2.0 | 40 | 0 | 106 | 64 - 133 | 43.5 | 2.28 | 20 | |
| Carbon tetrachloride | 21.47 | 1.0 | 20 | 0 | 107 | 72 - 136 | 22.84 | 6.19 | 20 | |
| Chlorobenzene | 19.64 | 1.0 | 20 | 0 | 98.2 | 82 - 118 | 20.41 | 3.82 | 20 | |
| Chloroethane | 15.6 | 1.0 | 20 | 0 | 78.0 | 60 - 138 | 16.22 | 3.87 | 20 | |
| Chloroform | 18.37 | 1.0 | 20 | 0 | 91.8 | 79 - 124 | 18.76 | 2.08 | 20 | |
| Chloromethane | 16.8 | 1.0 | 20 | 0 | 84.0 | 50 - 139 | 17.58 | 4.51 | 20 | |
| cis-1,2-Dichloroethene | 19.67 | 1.0 | 20 | 1.61 | 90.3 | 78 - 123 | 20.02 | 1.76 | 20 | |
| cis-1,3-Dichloropropene | 18.45 | 1.0 | 20 | 0 | 92.2 | 75 - 124 | 18.82 | 2.01 | 20 | |
| Dibromochloromethane | 18.66 | 1.0 | 20 | 0 | 93.3 | 74 - 126 | 19.11 | 2.39 | 20 | |
| Dibromomethane | 18.75 | 1.0 | 20 | 0 | 93.7 | 79 - 123 | 19.1 | 1.88 | 20 | |
| Dichlorodifluoromethane | 17.25 | 1.0 | 20 | 0 | 86.2 | 32 - 152 | 18.42 | 6.58 | 20 | |
| Ethylbenzene | 20.7 | 1.0 | 20 | 0 | 104 | 79 - 121 | 21.54 | 3.98 | 20 | |
| Hexachlorobutadiene | 20.36 | 1.0 | 20 | 0 | 102 | 66 - 134 | 20.21 | 0.752 | 20 | |
| Isopropylbenzene | 22.39 | 1.0 | 20 | 0 | 112 | 72 - 131 | 23.13 | 3.27 | 20 | |
| m,p-Xylene | 43.95 | 2.0 | 40 | 0 | 110 | 80 - 121 | 45.18 | 2.76 | 20 | |
| Methylene chloride | 18.09 | 2.0 | 20 | 0 | 90.4 | 74 - 124 | 18.46 | 2.05 | 20 | |
| Naphthalene | 20.48 | 1.0 | 20 | 0 | 102 | 61 - 128 | 19.35 | 5.69 | 20 | |
| n-Butylbenzene | 22.92 | 1.0 | 20 | 0 | 115 | 75 - 128 | 23.16 | 1.05 | 20 | |
| n-Propylbenzene | 22.4 | 1.0 | 20 | 0 | 112 | 76 - 126 | 22.71 | 1.4 | 20 | |
| o-Xylene | 21.4 | 1.0 | 20 | 0 | 107 | 78 - 122 | 21.91 | 2.36 | 20 | |
| sec-Butylbenzene | 22.85 | 1.0 | 20 | 0 | 114 | 77 - 126 | 23.32 | 2.04 | 20 | |
| Styrene | 21.51 | 1.0 | 20 | 0 | 108 | 78 - 123 | 22.21 | 3.18 | 20 | |
| tert-Butylbenzene | 21.98 | 1.0 | 20 | 0 | 110 | 78 - 124 | 22.2 | 1.01 | 20 | |
| Tetrachloroethene | 21.48 | 1.0 | 20 | 0 | 107 | 74 - 129 | 22.27 | 3.62 | 20 | |
| Toluene | 21.12 | 1.0 | 20 | 0 | 106 | 80 - 121 | 21.63 | 2.4 | 20 | |
| trans-1,2-Dichloroethene | 18.23 | 1.0 | 20 | 0 | 91.2 | 75 - 124 | 19.15 | 4.94 | 20 | |
| trans-1,3-Dichloropropene | 18.17 | 1.0 | 20 | 0 | 90.9 | 73 - 127 | 18.64 | 2.52 | 20 | |
| Trichloroethene | 20.07 | 1.0 | 20 | 0 | 100 | 79 - 123 | 20.57 | 2.49 | 20 | |
| Trichlorofluoromethane | 20.16 | 1.0 | 20 | 0 | 101 | 65 - 141 | 20.93 | 3.76 | 20 | |
| Vinyl chloride | 18.28 | 1.0 | 20 | 0 | 91.4 | 58 - 137 | 19.31 | 5.47 | 20 | |
| *Surr: 1,2-Dichloroethane-d4* | *49.14* | *1.0* | *50* | *0* | *98.3* | *81 - 118* | *49.21* | *0.125* | *20* | |
| *Surr: 4-Bromofluorobenzene* | *52.34* | *1.0* | *50* | *0* | *105* | *85 - 114* | *52.94* | *1.15* | *20* | |
| *Surr: Dibromofluoromethane* | *49.63* | *1.0* | *50* | *0* | *99.3* | *80 - 119* | *48.73* | *1.83* | *20* | |
| *Surr: Toluene-d8* | *53.26* | *1.0* | *50* | *0* | *107* | *89 - 112* | *53.21* | *0.11* | *20* | |

**ALS Houston, US**

Date: 25-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Effluent
**WorkOrder:** HS22010420

**QC BATCH REPORT**

| Batch ID: | R400883 ( 0 ) | Instrument: | VOA9 | Method: | VOLATILES ORGANICS BY METHOD 8260C |
|---|---|---|---|---|---|

**The following samples were analyzed in this batch:** HS22010420-01 HS22010420-02

**ALS Houston, US** Date: 25-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Effluent
**WorkOrder:** HS22010420

**QC BATCH REPORT**

**Batch ID: R400949 ( 0 )** **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

**MBLK** Sample ID: **MBLK** Units: **mg/L** Analysis Date: **25-Jan-2022 06:51**
Client ID: Run ID: **ICS-Integrion_400949** SeqNo: **6475839** 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: **25-Jan-2022 06:59**
Client ID: Run ID: **ICS-Integrion_400949** SeqNo: **6475840** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 19.37 | 0.500 | 20 | 0 | 96.8 | 80 - 120 | | | | |
| Sulfate | 19.52 | 0.500 | 20 | 0 | 97.6 | 80 - 120 | | | | |

**MS** Sample ID: **HS22010703-01MS** Units: **mg/L** Analysis Date: **25-Jan-2022 05:36**
Client ID: Run ID: **ICS-Integrion_400949** SeqNo: **6475831** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 26.07 | 0.500 | 10 | 17.66 | 84.1 | 80 - 120 | | | | |
| Sulfate | 247.8 | 0.500 | 10 | 246.7 | 10.6 | 80 - 120 | | | | SEO |

**MSD** Sample ID: **HS22010703-01MSD** Units: **mg/L** Analysis Date: **25-Jan-2022 05:43**
Client ID: Run ID: **ICS-Integrion_400949** SeqNo: **6475832** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 26.32 | 0.500 | 10 | 17.66 | 86.6 | 80 - 120 | 26.07 | 0.977 | 20 | |
| Sulfate | 250 | 0.500 | 10 | 246.7 | 33.1 | 80 - 120 | 247.8 | 0.904 | 20 | SEO |

**The following samples were analyzed in this batch:** HS22010420-01

**ALS Houston, US** Date: 25-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Effluent
**WorkOrder:** **HS22010420**

## QUALIFIERS, ACRONYMS, UNITS

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

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

| Unit Reported | Description |
|---|---|
| mg/L | Milligrams per Liter |

**ALS Houston, US** Date: 25-Jan-22

## CERTIFICATIONS,ACCREDITATIONS & LICENSES

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas | 21-022-0 | 26-Mar-2022 |
| Florida | E87611-33 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 25-Jan-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Effluent
**Work Order:** HS22010420

## SAMPLE TRACKING

| Lab Samp ID | Client Sample ID | Action | Date | Person | New Location |
|---|---|---|---|---|---|
| HS22010420-01 | LH18/24-SP650_011122 | Login | 1/12/2022 11:15:45 AM | PJM | WET230 |
| HS22010420-01 | LH18/24-SP650_011122 | Login | 1/12/2022 11:15:45 AM | PJM | VOA191 |
| HS22010420-02 | Trip Blank | Login | 1/12/2022 11:15:45 AM | PJM | VOA191 |

**ALS Houston, US** Date: 25-Jan-22

## Sample Receipt Checklist

**Work Order ID:** HS22010420 **Date/Time Received:** **12-Jan-2022 10:05**

**Client Name:** Bhate Environmental **Received by:** **Pablo Marinez**

**Completed By:** /S/ Pablo Marinez (eSignature) 12-Jan-2022 11:18 (Date/Time) **Reviewed by:** /S/ Ragen Giga (eSignature) 13-Jan-2022 19:53 (Date/Time)

Matrices: **WATER** Carrier name: **FedEx Priority Overnight**

| | Yes | No | Not Present |
|---|---|---|---|
| Shipping container/cooler in good condition? | ☑ | ☐ | ☐ |
| Custody seals intact on shipping container/cooler? | ☑ | ☐ | ☐ |
| Custody seals intact on sample bottles? | ☐ | ☐ | ☑ |
| VOA/TX1005/TX1006 Solids in hermetically sealed vials? | ☐ | ☐ | ☑ |
| Chain of custody present? | ☑ | ☐ | 1 Page(s) |
| Chain of custody signed when relinquished and received? | ☑ | ☐ | COC IDs:CLIENT |
| Samplers name present on COC? | ☑ | ☐ | |
| Chain of custody agrees with sample labels? | ☑ | ☐ | |
| Samples in proper container/bottle? | ☑ | ☐ | |
| Sample containers intact? | ☑ | ☐ | |
| Sufficient sample volume for indicated test? | ☑ | ☐ | |
| All samples received within holding time? | ☑ | ☐ | |
| Container/Temp Blank temperature in compliance? | ☑ | ☐ | |

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 1.4°C UC/C | IR 31 |
| Cooler(s)/Kit(s): | 48333 | |
| Date/Time sample(s) sent to storage: | 1/12/22 11:20 | |

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

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

01117181

bhate ENVIRONMENTAL CONSTRUCTION ENERGY

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

# Chain of Custody and Analytical Request

Page: ____ of ____

Project/Phase No: NWO1312.0150

COC Number(1): ____

LIMS Number: ____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / GWTP Bi-Weekly Effluent

Client Name:

Collected by: Scott Beesinger

| Field Sample ID (30 Characters Max) | Date Collected (dd-mmm-yyyy) | Time Collected (Military) (hhmm) | Sample Depth (beginning - ending) | SA Code (2) | Sample Number (3) | Sample Matrix (4) | Number of containers | VOC | CHLORIDE SULFATE | | | | | | | | | Ambient Blank Lot Control Number | Equipment Blank Lot Control Number | Trip Blank Lot Control Number | Cooler ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_011122 | 11 JAN 2022 | 1400 | - | N | | WG | 4 | X | X | | | | | | | | | | | | |
| TRIP BLANK | 11 JAN 2022 | | - | TB | | W | 2 | X | | | | | | | | | | | | | |
| | | | - | | | | | | | | | | | | | | | | | | |
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| | | | - | | | | | | | | | | | | | | | | | | |
| | | | - | | | | | | | | | | | | | | | | | | |

Sample Analysis Requested (5)

Quality Assurance Samples (6)

**HS22010420**

Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Bi-Weekly Effluent

COMMENTS: STANDARD TAT

**Custody Transfers Prior to Receipt by Laboratory**

| Relinquished By (Signed) | Date | Time | Received by (signed) | Date | Time |
|---|---|---|---|---|---|
| 1. Scott Beesinger | 1/11/22 | 1430 | 1. Paul [illegible] | 1-12-22 | 10:05 |
| 2. | | | 2. | | 4E333 |
| 3. | | | 3. | | 1.4C 1831 CFO |

**Sample Delivery Details / Laboratory Receipt**

Delivered Directly to Lab: ____ Shipped ____ No.:

Method of Shipment: ____

Fed Ex ____ Airbill Number:

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

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

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)
2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)
3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)
4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks
5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.
6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

01117182

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887 48333

CUSTODY SEAL
Date: 1/11/22 Time: 1430
Name: Steve
Company: BHA

Seal Broken By: PM
Date: 1-12-22

TRK# 1251 0291 2375 FedEx PRIORITY OVERNIGHT SAT

AB SGRA 48333 77099
TX-US
IAH

3923207 11Jan2022 GGGA 56DG2/01EF/1B23

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

February 03, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22010825**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia Olive,

ALS Environmental received 2 sample(s) on Jan 20, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: JUMOKE.LAWAL**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 03-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22010825

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22010825-01 | LH18/24-SP650_011922 | Water | | 19-Jan-2022 14:00 | 20-Jan-2022 10:20 | ☐ |
| HS22010825-02 | LH18/24-SP650_011922_AIX | Water | | 19-Jan-2022 14:00 | 20-Jan-2022 10:20 | ☐ |

**ALS Houston, US** Date: 03-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22010825

**CASE NARRATIVE**

## Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached

## WetChemistry by Method E350.3

### Batch ID: R401514

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E415.1

### Batch ID: R400903

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E365.3

### Batch ID: R400767

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

**ALS Houston, US** Date: 03-Feb-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS22010825 |
| Sample ID: | LH18/24-SP650_011922 | Lab ID:HS22010825-01 |
| Collection Date: | 19-Jan-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **AMMONIA AS N BY E350.3(ISE)** | | **Method:E350.3** | | | | | | Analyst: MZD |
| **Nitrogen, Ammonia (As N)** | **49** | a | **0.10** | **0.20** | **0.20** | **mg/L** | 1 | 03-Feb-2022 11:50 |
| **ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978** | | **Method:E365.3** | | | | | | Analyst: AP |
| **Phosphorus, Total Orthophosphate (As P)** | **11.2** | a | **0.250** | **0.625** | **0.625** | **mg/L** | 25 | 21-Jan-2022 11:28 |
| **TOTAL ORGANIC CARBON BY E415.1** | | **Method:E415.1** | | | | | | Analyst: JAC |
| **Organic Carbon, Total** | **14.7** | a | **0.500** | **1.00** | **1.00** | **mg/L** | 1 | 24-Jan-2022 16:08 |

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

**ALS Houston, US** Date: 03-Feb-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS22010825 |
| Sample ID: | LH18/24-SP650_011922_AIX | Lab ID:HS22010825-02 |
| Collection Date: | 19-Jan-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 28-Jan-2022 17:03 |

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

**ALS Houston, US** Date: 03-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22010825

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** R400767 ( 0 ) | **Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978 | | | | **Matrix:** Water | |
| HS22010825-01 | LH18/24-SP650_011922 | 19 Jan 2022 14:00 | | | 21 Jan 2022 11:28 | 25 |
| **Batch ID:** R400903 ( 0 ) | **Test Name :** TOTAL ORGANIC CARBON BY E415.1 | | | | **Matrix:** Water | |
| HS22010825-01 | LH18/24-SP650_011922 | 19 Jan 2022 14:00 | | | 24 Jan 2022 16:08 | 1 |
| **Batch ID:** R401214 ( 0 ) | **Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) | | | | **Matrix:** Water | |
| HS22010825-02 | LH18/24-SP650_011922_AIX | 19 Jan 2022 14:00 | | | 28 Jan 2022 17:03 | 1 |
| **Batch ID:** R401514 ( 0 ) | **Test Name :** AMMONIA AS N BY E350.3(ISE) | | | | **Matrix:** Water | |
| HS22010825-01 | LH18/24-SP650_011922 | 19 Jan 2022 14:00 | | | 03 Feb 2022 11:50 | 1 |

**ALS Houston, US** Date: 03-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22010825

**QC BATCH REPORT**

**Batch ID:** R400767 ( 0 ) **Instrument:** UV-2450 **Method:** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978

**MBLK** Sample ID: **MBLK-R400767** Units: **mg/L** Analysis Date: **21-Jan-2022 11:28**
Client ID: Run ID: **UV-2450_400767** SeqNo: **6471927** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.0250 | 0.0250 | | | | | | | | U |

**LCS** Sample ID: **LCS-R400767** Units: **mg/L** Analysis Date: **21-Jan-2022 11:28**
Client ID: Run ID: **UV-2450_400767** SeqNo: **6471926** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.253 | 0.0250 | 0.25 | 0 | 101 | 85 - 115 | | | | |

**MS** Sample ID: **HS22010825-01MS** Units: **mg/L** Analysis Date: **21-Jan-2022 11:28**
Client ID: **LH18/24-SP650_011922** Run ID: **UV-2450_400767** SeqNo: **6471921** PrepDate: DF: **25**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 17.5 | 0.625 | 6.25 | 11.18 | 101 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22010825-01MSD** Units: **mg/L** Analysis Date: **21-Jan-2022 11:28**
Client ID: **LH18/24-SP650_011922** Run ID: **UV-2450_400767** SeqNo: **6471920** PrepDate: DF: **25**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 17.72 | 0.625 | 6.25 | 11.18 | 105 | 80 - 120 | 17.5 | 1.28 | 20 | |

**The following samples were analyzed in this batch:** HS22010825-01

**ALS Houston, US** Date: 03-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22010825

**QC BATCH REPORT**

**Batch ID: R400903 ( 0 )** **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON BY E415.1**

**MBLK** Sample ID: **MBLK-01242022** Units: **mg/L** Analysis Date: **24-Jan-2022 14:44**
Client ID: Run ID: **TOC_04_400903** SeqNo: **6474902** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 1.00 | 1.00 | | | | | | | | U |

**LCS** Sample ID: **LCS-01242022** Units: **mg/L** Analysis Date: **24-Jan-2022 14:58**
Client ID: Run ID: **TOC_04_400903** SeqNo: **6474903** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 9.973 | 1.00 | 10 | 0 | 99.7 | 85 - 115 | | | | |

**LCSD** Sample ID: **LCSD-01242022** Units: **mg/L** Analysis Date: **24-Jan-2022 15:11**
Client ID: Run ID: **TOC_04_400903** SeqNo: **6474904** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 10.16 | 1.00 | 10 | 0 | 102 | 85 - 115 | 9.973 | 1.86 | 20 | |

**MS** Sample ID: **HS22010679-01MS** Units: **mg/L** Analysis Date: **24-Jan-2022 15:42**
Client ID: Run ID: **TOC_04_400903** SeqNo: **6474906** PrepDate: DF: **10**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 109.8 | 10.0 | 100 | 7.705 | 102 | 80 - 120 | | | | |

**The following samples were analyzed in this batch:** HS22010825-01

**ALS Houston, US** Date: 03-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22010825

**QC BATCH REPORT**

**Batch ID: R401514 ( 0 )** **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

**MBLK** Sample ID: **MBLK-R401514** Units: **mg/L** Analysis Date: **03-Feb-2022 11:50**
Client ID: Run ID: **WetChem_HS_401514** SeqNo: **6487929** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 0.20 | 0.20 | | | | | | | | U |

**LCS** Sample ID: **LCS-R401514** Units: **mg/L** Analysis Date: **03-Feb-2022 11:50**
Client ID: Run ID: **WetChem_HS_401514** SeqNo: **6487928** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 9.978 | 0.20 | 10 | 0 | 99.8 | 80 - 120 | | | | |

**MS** Sample ID: **HS22020025-01MS** Units: **mg/L** Analysis Date: **03-Feb-2022 11:50**
Client ID: Run ID: **WetChem_HS_401514** SeqNo: **6487931** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 28.06 | 0.20 | 10 | 16.32 | 117 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22020025-01MSD** Units: **mg/L** Analysis Date: **03-Feb-2022 11:50**
Client ID: Run ID: **WetChem_HS_401514** SeqNo: **6487930** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 28.08 | 0.20 | 10 | 16.32 | 118 | 80 - 120 | 28.06 | 0.0356 | 20 | |

**The following samples were analyzed in this batch:** HS22010825-01

**ALS Houston, US** Date: 03-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** **HS22010825**

## 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 |
| Florida | E87611-33 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 03-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22010825

## SAMPLE TRACKING

| Lab Samp ID | Client Sample ID | Action | Date | Person | New Location |
|---|---|---|---|---|---|
| HS22010825-01 | LH18/24-SP650_011922 | Login | 1/20/2022 12:09:26 PM | PMG | WET374 |
| HS22010825-01 | LH18/24-SP650_011922 | Login | 1/20/2022 12:09:26 PM | PMG | WET374 |
| HS22010825-01 | LH18/24-SP650_011922 | Login | 1/20/2022 12:09:26 PM | PMG | WET335 |
| HS22010825-02 | LH18/24-SP650_011922_AIX | Login | 1/20/2022 12:09:26 PM | PMG | Sub |

**ALS Houston, US** Date: 03-Feb-22

## Sample Receipt Checklist

**Work Order ID:** HS22010825 **Date/Time Received:** **20-Jan-2022 10:20**

**Client Name:** Bhate Environmental **Received by:** **Eric Widjaja**

**Completed By:** /S/ Paresh M. Giga (eSignature) 20-Jan-2022 12:11 (Date/Time) **Reviewed by:** /S/ Corey Grandits (eSignature) 21-Jan-2022 14:34 (Date/Time)

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

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

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 1.6C/2.1C U/c | IR31 |
| Cooler(s)/Kit(s): | blue | |
| Date/Time sample(s) sent to storage: | 1/20/2022 12:20 | |

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

Page 1 of 1

**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:** GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

**Prepared By:** Scott Beesinger

**P.O. Number**

**HS22010825**

Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Weekly Samples

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | AMMONIA-N | TOTAL ORGANIC CARBON | ORTHO-PHOSPHATE | PERCHLORATE | | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_011922 | Water | 01/19/22 / 14:00 | | 3 | X | X | | | | | | | | | H2SO4 | |
| LH18/24-SP650_011922 | Water | 01/19/22 / 14:00 | | 1 | | | X | | | | | | | | NONE | |
| LH18/24–SP650_011922_AIX | Water | 01/19/22 / 14:00 | | 1 | | | | X | | | | | | | NONE | |

Analyses

Additional Remarks: **Standard TAT on all parameters**

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 01/19/22 | 14:30 | [illegible] | | | | | | | | |

**For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| [illegible] | 01/20/22 | 10:20 | | | | | | | |

Remarks: 1.6°C
Blue UVC CF0.5

IR#31

(Word) S:\1-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

CU
Date: 1/19/22
Name: [illegible]
Company: BH

STODY SEAL
Time: 1130
Relinquished by

Seal Broken By:
Date: 1/20/22

FedEx
TRK# 0221 1251 0291 2721

THU - 20 JAN 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

#475872.01/19 5GDJ4/F289/FE4A

January 28, 2022

Service Request No:E2200059

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS22010825**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory January 20, 2022
For your reference, these analyses have been assigned our service request number **E2200059.**

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**
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Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

**ALS Environmental**

| | | | |
|---|---|---|---|
| **Client:** | ALS Houston | **Service Request No.:** | E2200059 |
| **Project:** | HS22010825 | **Date Received:** | 012006/22 |
| **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 01/20/22.

The sample was received in good condition and is 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:**

EQ2200008: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS-DLCS recoveries are within QC limits.

DoD Certification is held for the method/matrix/analytes provided in this report.

*The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*

**Client:** ALS Environmental - US **Service Request:**E2200059
**Project:** HS22010825

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2200059-001 | LH18/24-SP650_011922_AIX | 1/19/2022 | 1400 |

# Service Request Summary

**Folder #:** **E2200059**
Client Name: ALS Environmental - US
Project Name: HS22010825
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: TWOODS
Date Received: 01/20/22
Internal Due Date: 2/3/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22010825
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON ClO4 DOD/6850 |
|---|---|---|---|---|
| E2200059-001 | LH18/24-SP650_011922_AIX | Ground Water | 01/19/22 1400 | **IV** |

# Service Request Summary

**Folder #:** **E2200059**
Client Name: ALS Environmental - US
Project Name: HS22010825
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: TWOODS
Date Received: 01/20/22
Internal Due Date: 2/3/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22010825
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 1 | Level IV due 2/10 |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| + | Possible Tedlar bag artifact. |
| A | TIC is a suspected aldol-condensation product |
| B | Analyte found in the associated method blank as well as in the sample. |
| BC | Reported results are not blank corrected. |
| BH | The back section of the tube yielded higher results than the front. |
| BT | Results indicated possible breakthrough; back section >=10% front section. |
| C | Result identification confirmed. |
| D | Compound identified in an analysis at a secondary dilution factor |
| D | Spike was diluted out |
| DE | Reported results are corrected for desorption efficiency. |
| E | Estimated value. Concentration above calibration range |
| E | The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample. |
| F | The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard. |
| H | The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard. |
| H1 | Sample analysis performed past holding time. See case narrative. |
| H2 | Initial analysis within holding time. Reanalysis for the required dilution was past holding time. |
| H3 | Sample was received and analyzed past holding time. |
| H4 | Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative. |
| I | Internal standard not within the specified limits. See case narrative. |
| J | Estimated Value. Concentration found below MRL. |
| K | A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate. |
| K | Analyte was detected above the method reporting limit prior to normalization. |
| K | The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result. |
| L | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard. |
| L1 | Laboratory control sample recovery outside the specified limits; results may be biased high. |
| L2 | Laboratory control sample recovery outside the specified limits; results may be biased low. |
| L3 | Laboratory control sample recovery outside the specified limits. |
| M | Matrix interference; results may be biased high. |
| M | The duplicate injection precision not met. |
| M1 | Matrix interference due to coelution with a non-target compound; results may be biased high. |
| N | Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search. |
| N | The Matrix Spike sample recovery is not within control limits. See case narrative. |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| O | The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard. |
| P | Indicates chlorodiphenyl ether interference present at the retention time of the target compound. |
| P | Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns |
| Q | Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria. |
| R | Duplicate Precision not met. |
| R1 | Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated. |
| S | Surrogate recovery not within specified limits. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| T | Analyte is a tentatively identified compound, result is estimated. |
| U | Compound was analyzed for, but was not detected (ND). |
| V1 | The continuing calibration verification standard was outside (biased high) the specified limits for this compound. |
| V2 | The continuing calibration verification standard was outside (biased low) the specified limits for this compound. |
| W | Result quantified, but the corresponding peak was detected outside the generated retention time window. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| X | See case narrative. |
| Y | Recovery outside limits |
| Y | The chromatogram resembles a petroleum product but does not match the calibration standard. |
| Z | The chromatogram does not resemble a petroleum product. |
| i | The MRL/MDL has been elevated due to a matrix interference. |

# ALS Laboratory Group

## Acronyms

| | |
|---|---|
| Cal | Calibration |
| Conc | CONCentration |
| Dioxin(s) | Polychlorinated dibenzo-p-dioxin(s) |
| EDL | Estimated Detection Limit |
| EMPC | Estimated Maximum Possible Concentration |
| Flags | Data qualifiers |
| Furan(s) | Polychlorinated dibenzofuran(s) |
| g | Grams |
| ICAL | Initial CALibration |
| ID | IDentifier |
| Ions | Masses monitored for the analyte during data acquisition |
| L | Liter (s) |
| LCS | Laboratory Control Sample |
| DLCS | Duplicate Laboratory Control Sample |
| MB | Method Blank |
| MCL | Method Calibration Limit |
| MDL | Method Detection Limit |
| mL | Milliliters |
| MS | Matrix Spiked sample |
| DMS | Duplicate Matrix Spiked sample |
| NO | Number of peaks meeting all identification criteria |
| PCDD(s) | Polychlorinated dibenzo-p-dioxin(s) |
| PCDF(s) | Polychlorinated dibenzofuran(s) |
| ppb | Parts per billion |
| ppm | Parts per million |
| ppq | Parts per quadrillion |
| ppt | Parts per trillion |
| QA | Quality Assurance |
| QC | Quality Control |
| Ratio | Ratio of areas from monitored ions for an analyte |
| % Rec. | Percent recovery |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| RT | Retention Time |
| SDG | Sample Delivery Group |
| S/N | Signal-to-noise ratio |
| TEF | Toxicity Equivalence Factor |
| TEQ | Toxicity Equivalence Quotient |

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ALS Environmental

## State Certifications, Accreditations, and Licenses

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas Department of Environmental Quality | 19-028-0 | 6/30/2022 |
| Arkansas Department of Environmental Quality | 21-022-0 | 3/26/2022 |
| Florida Department of Health | E87611-33 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 5/1/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
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Houston, TX 77099
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**F:** +1 281 530 5887
**www.alsglobal.com**

# Subcontract Chain of Custody

**SAMPLING STATE:** **Dept of Defense** **COC ID: 17975**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

| | |
|---|---|
| **Company:** | ALS Houston |
| **Contact:** | Ragen Giga |
| **Address:** | 10450 Stancliff Rd, Ste 210 |
| **Phone:** | +1 281 530 5656 |
| **Email:** | RagenP.Giga@ALSGlobal.com |
| **Alternate Contact:** | 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:** | HS22010825 |
| **TSR:** | Houston House Acct |

| | LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | | | DUE DATE |
| **1.** | **HS22010825-02** | **LH18/24-SP650_011922_AIX** | **Water** | **19 Jan 2022 14:00** |
| | 6850-Perch. DOD Level II & Level IV in separate pdf | | | 03 Feb 2022 |

**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: Coakley Date/Time: 1-20-22 1407

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

# Cooler Receipt Form

Project Chemist: CG

Client/Project: ALS-H

Thermometer ID: 1231

Date/Time Received: 1-20-22 Initials: CG

Date/Time Logged in: 1-20-22 Initials: CG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL (X) Courier (ALS) ○ Client

2. Samples received in: (X) Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes (X) No

Were they intact? ○ Yes ○ No (X) N/A

Were they signed and dated? ○ Yes ○ No (X) N/A

If yes, how many and where?

4. Packing Material: ○ Inserts (X) Baggies ○ Bubble Wrap ○ Gel Packs (X) 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 | | 1-20-22 | 1407 | CG | 0.7 | ☑ |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? (X) Yes ○ No

7. Did all bottles arrive in good condition (not broken, no signs of leakage)? (X) Yes ○ No

8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? (X) Yes ○ No

9. Were appropriate bottles/containers and volumes received for the requested tests? (X) Yes ○ No

10. Did sample labels and tags agree with custody documents? (X) Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

Effective 10/04/2013

ALS Environmental - Houston HRMS

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**www.alsglobal.com**

# SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

**Cooler Custody Seals (desirable, mandatory if specified in SAP):**

- ✓ Intact on outside of cooler, signed and dated

**Chain-of-Custody (COC) documentation (mandatory):**

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

**Sample Integrity (mandatory):**

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

**Temperature Requirement (varies by sample matrix):**

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

# Preparation Information Benchsheets

**ALS Environmental - Houston HRMS**
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Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

# Preparation Information Benchsheet

**Prep Run#:** 394364 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 1/25/22 09:26

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2200053-001 | EA-12_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 2 | E2200053-002 | CTC-47_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 3 | E2200053-003 | CTC-24_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 4 | E2200053-004 | CTC-25_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 5 | E2200053-005 | EA-34_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 6 | E2200053-006 | CTC-48_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 7 | E2200053-007 | CTC-51_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 8 | E2200053-008 | CTC-44_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 9 | E2200053-009 | CTC-32_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 10 | E2200053-010 | EA-36_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 11 | E2200054-001 | EA-10_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 12 | E2200054-002 | CTC-46_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 13 | E2200054-003 | CTC-45_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 14 | E2200054-004 | EA-30_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 15 | E2200054-005 | CTC-25_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 16 | E2200054-006 | EA-32_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 17 | E2200054-007 | CTC-53_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 18 | E2200059-001 | LH18/24-SP650_011922_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 19 | EQ2200026-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 20 | EQ2200026-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 21 | EQ2200026-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |

## Spiking Solutions

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 221408 Logbook Ref: Perchlorate Internal Standard Expires On: 04/30/2022

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E2200053-001 | 100.00µL | E2200053-002 | 100.00µL | E2200053-003 | 100.00µL | E2200053-004 | 100.00µL | E2200053-005 | 100.00µL | E2200053-006 | 100.00µL |
| E2200053-007 | 100.00µL | E2200053-008 | 100.00µL | E2200053-009 | 100.00µL | E2200053-010 | 100.00µL | E2200054-001 | 100.00µL | E2200054-002 | 100.00µL |
| E2200054-003 | 100.00µL | E2200054-004 | 100.00µL | E2200054-005 | 100.00µL | E2200054-006 | 100.00µL | E2200054-007 | 100.00µL | E2200059-001 | 100.00µL |
| EQ2200026-01 | 100.00µL | EQ2200026-02 | 100.00µL | EQ2200026-03 | 100.00µL | | | | | | |

Name: Perchlorate Intermediate Stock1 Inventory ID 221456 Logbook Ref: Perchlorate Expires On: 04/30/2022

| | | | |
|---|---|---|---|
| EQ2200026-02 | 1.00µL | EQ2200026-03 | 1.00µL |

# *Preparation Information Benchsheet*

**Prep Run#:** 394364 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 1/25/22 09:26

## Preparation Materials

| | | | | | |
|---|---|---|---|---|---|
| Water HPLC Grade | 08/03/2021 Water (218530) | 6850 Amber Glass screw vial | 2mL Screw Top Vial (221308) | 537M Glass Culture Tubes | 537M Glass Tubes (218064) |
| 6850 0.45um syringe filters | 6850 Syringe Filters (219639) | 6850 Luer-Lok Syringes | Luer-Lok Syringes (221305) | 6850 Pipette Tips 50-1000 uL | 6850 Pipette Tips (221307) |

## Preparation Steps

Step: Preparation
Started: 1/25/22 09:26
Finished: 1/25/22 10:36
By: GRIVERA
Comments

Comments:

Reviewed By: GR Date: 1/25/22

Chain of Custody

Relinquished By: Date:

Received By: Date:

Extracts Examined
Yes No

# Analytical Results

**ALS Environmental - Houston HRMS**
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**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200059 |
| **Project:** | HS22010825 | **Date Collected:** | 1/19/22 1400 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 1/20/22 |
| **Sample Name:** | LH18/24-SP650_011922_AIX | **Units:** | µg/L |
| **Lab Code:** | E2200059-001 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850
**Prep Method:** Method

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | ND | U | 0.100 | 0.0500 | 0.0250 | 1 | 1/25/22 | 1/27/22 18:02 | 394364 | 753020 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200059 |
| **Project:** | HS22010825 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2200026-01 | **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 | 1/25/22 | 1/27/22 14:44 | 394364 | 753020 | |

# Accuracy & Precision

**ALS Environmental - Houston HRMS**
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**ALS Group USA, Corp. dba ALS Environmental**

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200059 |
| **Project:** | HS22010825 | **Date Analyzed:** | 1/27/22 |
| **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:** | 394364 |

| | Lab Control Sample EQ2200026-02 | | | Duplicate Lab Control Sample EQ2200026-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.116 | 0.100 | 116 | 0.107 | 0.100 | 107 | 84 - 119 | 8 | 15 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200059 |
| **Project:** | HS22010825 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200026-02 | **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 | **0.116** | | 0.100 | 0.0500 | 0.0250 | 1 | 1/25/22 | 1/27/22 14:52 | 394364 | 753020 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200059 |
| **Project:** | HS22010825 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200026-03 | **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 | **0.107** | | 0.100 | 0.0500 | 0.0250 | 1 | 1/25/22 | 1/27/22 15:24 | 394364 | 753020 | |

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

February 10, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22011130**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia Olive,

ALS Environmental received 2 sample(s) on Jan 26, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: JUMOKE.LAWAL**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 10-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22011130

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22011130-01 | LH18/24-SP650_012522 | Water | | 25-Jan-2022 14:00 | 26-Jan-2022 10:45 | ☐ |
| HS22011130-02 | LH18/24-SP650_012522_AIX | Water | | 25-Jan-2022 14:00 | 26-Jan-2022 10:45 | ☐ |

**ALS Houston, US** Date: 10-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22011130

**CASE NARRATIVE**

## Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached

## WetChemistry by Method E350.3

### Batch ID: R401514

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E365.3

### Batch ID: R401505

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E415.1

### Batch ID: R401269

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

**ALS Houston, US** Date: 10-Feb-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS22011130 |
| Sample ID: | LH18/24-SP650_012522 | Lab ID:HS22011130-01 |
| Collection Date: | 25-Jan-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **AMMONIA AS N BY E350.3(ISE)** | | **Method:E350.3** | | | | | | Analyst: MZD |
| **Nitrogen, Ammonia (As N)** | **32** | a | **0.10** | **0.20** | **0.20** | **mg/L** | 1 | 03-Feb-2022 11:50 |
| **ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978** | | **Method:E365.3** | | | | | | Analyst: MZD |
| **Phosphorus, Total Orthophosphate (As P)** | **12.6** | a | **0.500** | **1.25** | **1.25** | **mg/L** | 50 | 27-Jan-2022 11:23 |
| **TOTAL ORGANIC CARBON BY E415.1** | | **Method:E415.1** | | | | | | Analyst: JAC |
| **Organic Carbon, Total** | **23.6** | a | **0.500** | **1.00** | **1.00** | **mg/L** | 1 | 28-Jan-2022 15:50 |

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

**ALS Houston, US** Date: 10-Feb-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS22011130 |
| Sample ID: | LH18/24-SP650_012522_AIX | Lab ID:HS22011130-02 |
| Collection Date: | 25-Jan-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 10-Feb-2022 11:15 |

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

**ALS Houston, US** Date: 10-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22011130

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** R401269 ( 0 ) | **Test Name :** TOTAL ORGANIC CARBON BY E415.1 | | | | **Matrix:** Water | |
| HS22011130-01 | LH18/24-SP650_012522 | 25 Jan 2022 14:00 | | | 28 Jan 2022 15:50 | 1 |
| **Batch ID:** R401505 ( 0 ) | **Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978 | | | | **Matrix:** Water | |
| HS22011130-01 | LH18/24-SP650_012522 | 25 Jan 2022 14:00 | | | 27 Jan 2022 11:23 | 50 |
| **Batch ID:** R401514 ( 0 ) | **Test Name :** AMMONIA AS N BY E350.3(ISE) | | | | **Matrix:** Water | |
| HS22011130-01 | LH18/24-SP650_012522 | 25 Jan 2022 14:00 | | | 03 Feb 2022 11:50 | 1 |
| **Batch ID:** R401962 ( 0 ) | **Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) | | | | **Matrix:** Water | |
| HS22011130-02 | LH18/24-SP650_012522_AIX | 25 Jan 2022 14:00 | | | 10 Feb 2022 11:15 | 1 |

**ALS Houston, US** Date: 10-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22011130

**QC BATCH REPORT**

**Batch ID: R401269 ( 0 )** **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON BY E415.1**

**MBLK** Sample ID: **MBLK-01282022** Units: **mg/L** Analysis Date: **28-Jan-2022 14:15**
Client ID: Run ID: **TOC_04_401269** SeqNo: **6482432** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 1.00 | 1.00 | | | | | | | | U |

**LCS** Sample ID: **LCS-01282022** Units: **mg/L** Analysis Date: **28-Jan-2022 14:28**
Client ID: Run ID: **TOC_04_401269** SeqNo: **6482433** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 10.17 | 1.00 | 10 | 0 | 102 | 85 - 115 | | | | |

**LCSD** Sample ID: **LCSD-01282022** Units: **mg/L** Analysis Date: **28-Jan-2022 14:42**
Client ID: Run ID: **TOC_04_401269** SeqNo: **6482434** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 10.31 | 1.00 | 10 | 0 | 103 | 85 - 115 | 10.17 | 1.37 | 20 | |

**MS** Sample ID: **HS22011022-01MS** Units: **mg/L** Analysis Date: **28-Jan-2022 15:10**
Client ID: Run ID: **TOC_04_401269** SeqNo: **6482436** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 25.58 | 1.00 | 10 | 14.85 | 107 | 80 - 120 | | | | |

**The following samples were analyzed in this batch:** HS22011130-01

**ALS Houston, US** Date: 10-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22011130

**QC BATCH REPORT**

**Batch ID:** R401505 ( 0 ) **Instrument:** UV-2450 **Method:** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978

**MBLK** Sample ID: **MBLK-R401505** Units: **mg/L** Analysis Date: **27-Jan-2022 11:23**
Client ID: Run ID: **UV-2450_401505** SeqNo: **6490268** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.0250 | 0.0250 | | | | | | | | U |

**LCS** Sample ID: **LCS-R401505** Units: **mg/L** Analysis Date: **27-Jan-2022 11:23**
Client ID: Run ID: **UV-2450_401505** SeqNo: **6490267** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.226 | 0.0250 | 0.25 | 0 | 90.4 | 85 - 115 | | | | |

**MS** Sample ID: **HS22011215-01MS** Units: **mg/L** Analysis Date: **27-Jan-2022 11:23**
Client ID: Run ID: **UV-2450_401505** SeqNo: **6490270** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.218 | 0.0250 | 0.25 | 0 | 87.2 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22011215-01MSD** Units: **mg/L** Analysis Date: **27-Jan-2022 11:23**
Client ID: Run ID: **UV-2450_401505** SeqNo: **6490269** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.217 | 0.0250 | 0.25 | 0 | 86.8 | 80 - 120 | 0.218 | 0.46 | 20 | |

**The following samples were analyzed in this batch:** HS22011130-01

**ALS Houston, US** Date: 10-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22011130

**QC BATCH REPORT**

**Batch ID: R401514 ( 0 )** **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

**MBLK** Sample ID: **MBLK-R401514** Units: **mg/L** Analysis Date: **03-Feb-2022 11:50**
Client ID: Run ID: **WetChem_HS_401514** SeqNo: **6487929** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 0.20 | 0.20 | | | | | | | | U |

**LCS** Sample ID: **LCS-R401514** Units: **mg/L** Analysis Date: **03-Feb-2022 11:50**
Client ID: Run ID: **WetChem_HS_401514** SeqNo: **6487928** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 9.978 | 0.20 | 10 | 0 | 99.8 | 80 - 120 | | | | |

**MS** Sample ID: **HS22020025-01MS** Units: **mg/L** Analysis Date: **03-Feb-2022 11:50**
Client ID: Run ID: **WetChem_HS_401514** SeqNo: **6487931** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 28.06 | 0.20 | 10 | 16.32 | 117 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22020025-01MSD** Units: **mg/L** Analysis Date: **03-Feb-2022 11:50**
Client ID: Run ID: **WetChem_HS_401514** SeqNo: **6487930** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 28.08 | 0.20 | 10 | 16.32 | 118 | 80 - 120 | 28.06 | 0.0356 | 20 | |

**The following samples were analyzed in this batch:** HS22011130-01

**ALS Houston, US** Date: 10-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** **HS22011130**

## 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 |
| Florida | E87611-33 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 10-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22011130

## SAMPLE TRACKING

| Lab Samp ID | Client Sample ID | Action | Date | Person | New Location |
|---|---|---|---|---|---|
| HS22011130-01 | LH18/24-SP650_012522 | Login | 1/26/2022 11:37:11 AM | PMG | WET374 |
| HS22011130-01 | LH18/24-SP650_012522 | Login | 1/26/2022 11:37:11 AM | PMG | WET374 |
| HS22011130-01 | LH18/24-SP650_012522 | Login | 1/26/2022 11:37:11 AM | PMG | WET335 |
| HS22011130-02 | LH18/24-SP650_012522_AIX | Login | 1/26/2022 11:37:11 AM | PMG | Sub |

**ALS Houston, US** Date: 10-Feb-22

## Sample Receipt Checklist

**Work Order ID:** HS22011130 **Date/Time Received:** **26-Jan-2022 10:45**

**Client Name:** Bhate Environmental **Received by:** **Paresh M. Giga**

**Completed By:** /S/ Paresh M. Giga (eSignature) 26-Jan-2022 11:41 (Date/Time) **Reviewed by:** /S/ Ragen Giga (eSignature) 27-Jan-2022 20:09 (Date/Time)

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

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

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 0.2C/0.7C U/c | IR31 |
| Cooler(s)/Kit(s): | 6120 | |
| Date/Time sample(s) sent to storage: | 1/26/22 11:50 | |

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

Page 1 of 1

**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:** GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

**Prepared By:** Scott Beesinger

**P.O. Number**

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | AMMONIA-N | TOTAL ORGANIC CARBON | ORTHO-PHOSPHATE | PERCHLORATE | | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_012522 | Water | 01/25/22 / 14:00 | | 3 | X | X | | | | | | | | | H2SO4 | |
| LH18/24-SP650_012522 | Water | 01/25/22 / 14:00 | | 1 | | | X | | | | | | | | NONE | |
| LH18/24–SP650_012522_AIX | Water | 01/25/22 / 14:00 | | 1 | | | | X | | | | | | | NONE | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Analyses

Additional Remarks: **Standard TAT on all parameters**

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 01/25/22 | 14:30 | 1/26/2022 | 10 | 45 | | | | | | |

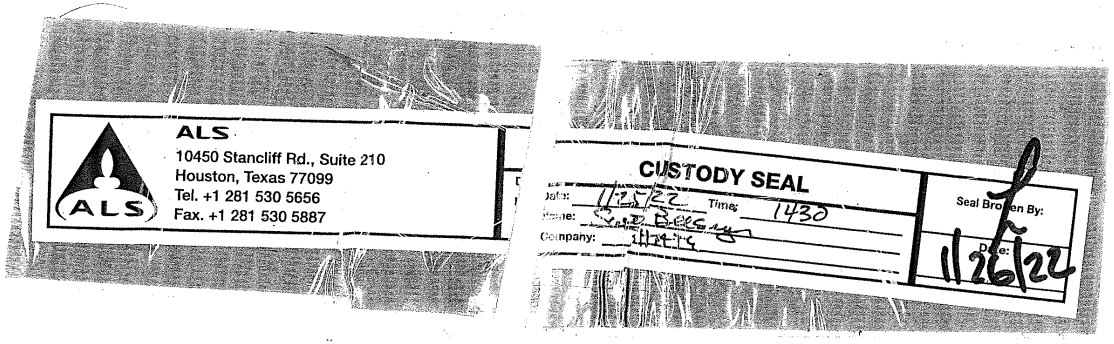
**For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Containers | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Remarks:
6120 0.20 -tt 31
Cl(F 0.5

HS22011130
Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Weekly Samples

(Word) S:\1-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
ALS
CUSTODY SEAL
Date: 11-25-22
Time: 1430
Company:
Seal Broken By:
Date: 11/26/22

RMA:
FedEx
Express
E
FedEx
TRK# 0221 1251 0293 9831
WED – 26 JAN 10:30A
PRIORITY OVERNIGHT
AB SGRA
77099
TX-US IAH

February 10, 2022

Service Request No:E2200078

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS22011130**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory January 26, 2022
For your reference, these analyses have been assigned our service request number **E2200078.**

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.:** | E2200078 |
| **Project:** | HS22011130 | **Date Received:** | 01/26/22 |
| **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 01/26/22.

The sample was received in good condition and is 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:**

EQ2200030: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS-DLCS recoveries met acceptance criteria.

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:**E2200078
**Project:** HS22011130

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2200078-001 | LH18/24-SP650_012522_AIX | 1/25/2022 | 1400 |

# Service Request Summary

**Folder #:** **E2200078**
Client Name: ALS Environmental - US
Project Name: HS22011130
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 01/26/22
Internal Due Date: 2/9/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22011130
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON CIO4 DOD/6850 |
|---|---|---|---|---|
| E2200078-001 | LH18/24-SP650_012522_AIX | Ground Water | 01/25/22 1400 | **IV** |

# Service Request Summary

**Folder #:** **E2200078**
Client Name: ALS Environmental - US
Project Name: HS22011130
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 01/26/22
Internal Due Date: 2/9/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22011130
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 1 | Level IV due 2/16 |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| + | Possible Tedlar bag artifact. |
| A | TIC is a suspected aldol-condensation product |
| B | Analyte found in the associated method blank as well as in the sample. |
| BC | Reported results are not blank corrected. |
| BH | The back section of the tube yielded higher results than the front. |
| BT | Results indicated possible breakthrough; back section >=10% front section. |
| C | Result identification confirmed. |
| D | Compound identified in an analysis at a secondary dilution factor |
| D | Spike was diluted out |
| DE | Reported results are corrected for desorption efficiency. |
| E | Estimated value. Concentration above calibration range |
| E | The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample. |
| F | The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard. |
| H | The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard. |
| H1 | Sample analysis performed past holding time. See case narrative. |
| H2 | Initial analysis within holding time. Reanalysis for the required dilution was past holding time. |
| H3 | Sample was received and analyzed past holding time. |
| H4 | Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative. |
| I | Internal standard not within the specified limits. See case narrative. |
| J | Estimated Value. Concentration found below MRL. |
| K | A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate. |
| K | Analyte was detected above the method reporting limit prior to normalization. |
| K | The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result. |
| L | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard. |
| L1 | Laboratory control sample recovery outside the specified limits; results may be biased high. |
| L2 | Laboratory control sample recovery outside the specified limits; results may be biased low. |
| L3 | Laboratory control sample recovery outside the specified limits. |
| M | Matrix interference; results may be biased high. |
| M | The duplicate injection precision not met. |
| M1 | Matrix interference due to coelution with a non-target compound; results may be biased high. |
| N | Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search. |
| N | The Matrix Spike sample recovery is not within control limits. See case narrative. |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| O | The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard. |
| P | Indicates chlorodiphenyl ether interference present at the retention time of the target compound. |
| P | Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns |
| Q | Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria. |
| R | Duplicate Precision not met. |
| R1 | Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated. |
| S | Surrogate recovery not within specified limits. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| T | Analyte is a tentatively identified compound, result is estimated. |
| U | Compound was analyzed for, but was not detected (ND). |
| V1 | The continuing calibration verification standard was outside (biased high) the specified limits for this compound. |
| V2 | The continuing calibration verification standard was outside (biased low) the specified limits for this compound. |
| W | Result quantified, but the corresponding peak was detected outside the generated retention time window. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| X | See case narrative. |
| Y | Recovery outside limits |
| Y | The chromatogram resembles a petroleum product but does not match the calibration standard. |
| Z | The chromatogram does not resemble a petroleum product. |
| i | The MRL/MDL has been elevated due to a matrix interference. |

# ALS Laboratory Group

## Acronyms

| | |
|---|---|
| Cal | Calibration |
| Conc | CONCentration |
| Dioxin(s) | Polychlorinated dibenzo-p-dioxin(s) |
| EDL | Estimated Detection Limit |
| EMPC | Estimated Maximum Possible Concentration |
| Flags | Data qualifiers |
| Furan(s) | Polychlorinated dibenzofuran(s) |
| g | Grams |
| ICAL | Initial CALibration |
| ID | IDentifier |
| Ions | Masses monitored for the analyte during data acquisition |
| L | Liter (s) |
| LCS | Laboratory Control Sample |
| DLCS | Duplicate Laboratory Control Sample |
| MB | Method Blank |
| MCL | Method Calibration Limit |
| MDL | Method Detection Limit |
| mL | Milliliters |
| MS | Matrix Spiked sample |
| DMS | Duplicate Matrix Spiked sample |
| NO | Number of peaks meeting all identification criteria |
| PCDD(s) | Polychlorinated dibenzo-p-dioxin(s) |
| PCDF(s) | Polychlorinated dibenzofuran(s) |
| ppb | Parts per billion |
| ppm | Parts per million |
| ppq | Parts per quadrillion |
| ppt | Parts per trillion |
| QA | Quality Assurance |
| QC | Quality Control |
| Ratio | Ratio of areas from monitored ions for an analyte |
| % Rec. | Percent recovery |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| RT | Retention Time |
| SDG | Sample Delivery Group |
| S/N | Signal-to-noise ratio |
| TEF | Toxicity Equivalence Factor |
| TEQ | Toxicity Equivalence Quotient |

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ALS Environmental

## State Certifications, Accreditations, and Licenses

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas Department of Environmental Quality | 19-028-0 | 6/30/2022 |
| Arkansas Department of Environmental Quality | 21-022-0 | 3/26/2022 |
| Florida Department of Health | E87611-33 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 5/1/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
**T:** +1 281 530 5656
**F:** +1 281 530 5887
**www.alsglobal.com**

# Subcontract Chain of Custody

**SAMPLING STATE:** **Dept of Defense**

**COC ID:** **18025**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084

**Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

| | |
|---|---|
| **Company:** | ALS Houston |
| **Contact:** | Ragen Giga |
| **Address:** | 10450 Stancliff Rd, Ste 210 |
| **Phone:** | +1 281 530 5656 |
| **Email:** | RagenP.Giga@ALSGlobal.com |
| **Alternate Contact:** | 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:** | HS22011130 |
| **TSR:** | Houston House Acct |

| | LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | | | DUE DATE |
| **1.** | **HS22011130-02** | **LH18/24-SP650_012522_AIX** | **Water** | **25 Jan 2022 14:00** |
| | 6850-Perch. DOD Level II & Level IV in separate pdf | | | 09 Feb 2022 |

**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: Corey G Date/Time: 1-26-22 1243

Cooler ID(s): _____ Temperature(s): 1.2+0.5=1.7

ALS Environmental

# Cooler Receipt Form

Project Chemist: IG

Client/Project: ALY-H

Thermometer ID: 1231

Date/Time Received: 1-26-22 Initials: IG

Date/Time Logged in: 1-26-22 Initials: IG

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 | | 1-26-22 | 1243 | IG | 1.7 | ☒ |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☒ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☒ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☒ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☒ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☒ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

ALS Environmental - Houston HRMS

10450 Stancliff Rd., Suite 210
Houston, TX 77099
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**www.alsglobal.com**

# SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

**Cooler Custody Seals (desirable, mandatory if specified in SAP):**

- ✓ Intact on outside of cooler, signed and dated

**Chain-of-Custody (COC) documentation (mandatory):**

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

**Sample Integrity (mandatory):**

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

**Temperature Requirement (varies by sample matrix):**

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

# Preparation Information Benchsheets

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

# Preparation Information Benchsheet

**Prep Run#:** 394625 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 1/31/22 09:19

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2200066-001 | EastsideShaft_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 2 | E2200066-002 | CTC-50_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 3 | E2200066-003 | MS-1_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 4 | E2200066-004 | MS-3_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 5 | E2200066-005 | MS-4_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 6 | E2200066-006 | MS-2_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 7 | E2200066-007 | EA-20_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 8 | E2200066-008 | CTC-4_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 9 | E2200066-009 | CTC-2_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 10 | E2200066-010 | CTC-3_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 11 | E2200066-011 | CTC-31_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 12 | E2200066-012 | EA-48_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 13 | E2200066-013 | CTC-6_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 14 | E2200066-014 | CTC-15_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 15 | E2200066-015 | CTC-14_0122 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 16 | E2200078-001 | LH18/24-SP650_012522_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 17 | EQ2200030-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 18 | EQ2200030-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 19 | EQ2200030-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |

## Spiking Solutions

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 221408 Logbook Ref: Perchlorate Internal Standard Expires On: 04/30/2022

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E2200066-001 | 100.00µL | E2200066-002 | 100.00µL | E2200066-003 | 100.00µL | E2200066-004 | 100.00µL | E2200066-005 | 100.00µL | E2200066-006 | 100.00µL |
| E2200066-007 | 100.00µL | E2200066-008 | 100.00µL | E2200066-009 | 100.00µL | E2200066-010 | 100.00µL | E2200066-011 | 100.00µL | E2200066-012 | 100.00µL |
| E2200066-013 | 100.00µL | E2200066-014 | 100.00µL | E2200066-015 | 100.00µL | E2200078-001 | 100.00µL | EQ2200030-01 | 100.00µL | EQ2200030-02 | 100.00µL |
| EQ2200030-03 | 100.00µL | | | | | | | | | | |

Name: Perchlorate Intermediate Stock1 Inventory ID 221456 Logbook Ref: Perchlorate Expires On: 04/30/2022

| | | | |
|---|---|---|---|
| EQ2200030-02 | 1.00µL | EQ2200030-03 | 1.00µL |

## Preparation Materials

| | | | | | |
|---|---|---|---|---|---|
| Water HPLC Grade | 08/03/2021 Water (218530) | 6850 Amber Glass screw vial | 2mL Screw Top Vial (221308) | 537M Glass Culture Tubes | 537M Glass Tubes (218064) |
| 6850 0.45um syringe filters | 6850 Syringe Filters (219639) | 6850 Luer-Lok Syringes | Luer-Lok Syringes (221305) | 6850 Pipette Tips 50-1000 uL | 6850 Pipette Tips (221307) |

# *Preparation Information Benchsheet*

**Prep Run#:** 394625 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 1/31/22 09:19

## Preparation Steps

Step: Preparation
Started: 1/31/22 09:19
Finished: 1/31/22 10:30
By: GRIVERA
Comments

Comments:

Reviewed By: GR Date: 1/31/22

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:** | E2200078 |
| **Project:** | HS22011130 | **Date Collected:** | 1/25/22 1400 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 1/26/22 |
| **Sample Name:** | LH18/24-SP650_012522_AIX | **Units:** | µg/L |
| **Lab Code:** | E2200078-001 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850
**Prep Method:** Method

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | ND | U | 0.100 | 0.0500 | 0.0250 | 1 | 1/31/22 | 1/31/22 20:59 | 394625 | 753348 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200078 |
| **Project:** | HS22011130 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2200030-01 | **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 | 1/31/22 | 1/31/22 18:29 | 394625 | 753348 | |

# 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:** | E2200078 |
| **Project:** | HS22011130 | **Date Analyzed:** | 2/ 4/22 - 2/ 4/22 |
| **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:** | 394625 |

| | Lab Control Sample EQ2200030-02 | | | Duplicate Lab Control Sample EQ2200030-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.105 | 0.100 | 105 | 0.103 | 0.100 | 103 | 84 - 119 | 2 | 15 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200078 |
| **Project:** | HS22011130 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200030-02 | **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 | **0.105** | | 0.100 | 0.0500 | 0.0250 | 1 | 1/31/22 | 2/4/22 17:04 | 394625 | 753805 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200078 |
| **Project:** | HS22011130 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200030-03 | **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 | **0.103** | | 0.100 | 0.0500 | 0.0250 | 1 | 1/31/22 | 1/31/22 18:45 | 394625 | 753348 | |

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

February 09, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22011131**

Laboratory Results for: **Longhorn GW Treatment Plant Bi-Weekly Samples**

Dear Marcia Olive,

ALS Environmental received 2 sample(s) on Jan 26, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: JUMOKE.LAWAL**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 09-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**Work Order:** HS22011131

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22011131-01 | LH18/24-SP650_012522 | Water | | 25-Jan-2022 14:00 | 26-Jan-2022 10:45 | ☐ |
| HS22011131-02 | Trip Blank | Water | CG-112321-347 | 25-Jan-2022 00:00 | 26-Jan-2022 10:45 | ☐ |

**ALS Houston, US** Date: 09-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**Work Order:** HS22011131

**CASE NARRATIVE**

## GCMS Volatiles by Method SW8260

### Batch ID: R401143

**Sample ID: HS22011089-06MS**

- MS and MSD are for an unrelated sample

## WetChemistry by Method SW9056

### Batch ID: R401856

**Sample ID: HS22020344-02MS**

- MS and MSD are for an unrelated sample (Sulfate)

**ALS Houston, US** Date: 09-Feb-22

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS22011131
Sample ID: LH18/24-SP650_012522 Lab ID:HS22011131-01
Collection Date: 25-Jan-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| 1,1,1,2-Tetrachloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 1,1,1-Trichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 1,1-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 1,1-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 1,1-Dichloropropene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 1,2,3-Trichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 1,2,3-Trichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 1,2,4-Trichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 1,2,4-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 1,2-Dibromo-3-chloropropane | 1.0 | U | 0.20 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 1,2-Dibromoethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 1,2-Dichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 1,2-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 1,2-Dichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 1,3,5-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 1,3-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 1,3-Dichloropropane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 1,4-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 2,2-Dichloropropane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 2-Butanone | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 2-Chlorotoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 2-Hexanone | 2.0 | U | 1.0 | 2.0 | 2.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 4-Chlorotoluene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 4-Isopropyltoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| 4-Methyl-2-pentanone | 2.0 | U | 0.70 | 2.0 | 2.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Acetone | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Benzene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Bromobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Bromochloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Bromodichloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Bromoform | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Bromomethane | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Carbon disulfide | 2.0 | U | 0.60 | 2.0 | 2.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Carbon tetrachloride | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Chlorobenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Chloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Chloroform | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |

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

**ALS Houston, US** Date: 09-Feb-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Bi-Weekly Samples | WorkOrder:HS22011131 |
| Sample ID: | LH18/24-SP650_012522 | Lab ID:HS22011131-01 |
| Collection Date: | 25-Jan-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| Chloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| **cis-1,2-Dichloroethene** | **1.3** | | **0.20** | **0.50** | **1.0** | **ug/L** | 1 | 27-Jan-2022 13:37 |
| cis-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Dibromochloromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Dibromomethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Dichlorodifluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Ethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Hexachlorobutadiene | 1.0 | U | 1.0 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Isopropylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| m,p-Xylene | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Methylene chloride | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| n-Butylbenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| n-Propylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Naphthalene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| o-Xylene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| sec-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Styrene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| tert-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Tetrachloroethene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Toluene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| trans-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| trans-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Trichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Trichlorofluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| Vinyl chloride | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:37 |
| *Surr: 1,2-Dichloroethane-d4* | *103* | | | **0** | *81-118* | *%REC* | *1* | *27-Jan-2022 13:37* |
| *Surr: 4-Bromofluorobenzene* | *102* | | | **0** | *85-114* | *%REC* | *1* | *27-Jan-2022 13:37* |
| *Surr: Dibromofluoromethane* | *97.8* | | | **0** | *80-119* | *%REC* | *1* | *27-Jan-2022 13:37* |
| *Surr: Toluene-d8* | *106* | | | **0** | *89-112* | *%REC* | *1* | *27-Jan-2022 13:37* |
| **ANIONS BY SW9056A** | | **Method:SW9056** | | | | | | Analyst: YP |
| **Chloride** | **929** | | **4.00** | **10.0** | **10.0** | **mg/L** | 20 | 08-Feb-2022 19:53 |
| **Sulfate** | **56.5** | | **0.200** | **0.500** | **0.500** | **mg/L** | 1 | 08-Feb-2022 19:48 |

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

**ALS Houston, US** Date: 09-Feb-22

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Sample ID: Trip Blank
Collection Date: 25-Jan-2022 00:00

**ANALYTICAL REPORT**
WorkOrder:HS22011131
Lab ID:HS22011131-02
Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| 1,1,1,2-Tetrachloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 1,1,1-Trichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 1,1-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 1,1-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 1,1-Dichloropropene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 1,2,3-Trichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 1,2,3-Trichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 1,2,4-Trichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 1,2,4-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 1,2-Dibromo-3-chloropropane | 1.0 | U | 0.20 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 1,2-Dibromoethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 1,2-Dichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 1,2-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 1,2-Dichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 1,3,5-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 1,3-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 1,3-Dichloropropane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 1,4-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 2,2-Dichloropropane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 2-Butanone | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 2-Chlorotoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 2-Hexanone | 2.0 | U | 1.0 | 2.0 | 2.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 4-Chlorotoluene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 4-Isopropyltoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| 4-Methyl-2-pentanone | 2.0 | U | 0.70 | 2.0 | 2.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Acetone | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Benzene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Bromobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Bromochloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Bromodichloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Bromoform | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Bromomethane | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Carbon disulfide | 2.0 | U | 0.60 | 2.0 | 2.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Carbon tetrachloride | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Chlorobenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Chloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Chloroform | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |

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

**ALS Houston, US** Date: 09-Feb-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Bi-Weekly Samples | WorkOrder:HS22011131 |
| Sample ID: | Trip Blank | Lab ID:HS22011131-02 |
| Collection Date: | 25-Jan-2022 00:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| Chloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| cis-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| cis-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Dibromochloromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Dibromomethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Dichlorodifluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Ethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Hexachlorobutadiene | 1.0 | U | 1.0 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Isopropylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| m,p-Xylene | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Methylene chloride | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| n-Butylbenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| n-Propylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Naphthalene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| o-Xylene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| sec-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Styrene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| tert-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Tetrachloroethene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Toluene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| trans-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| trans-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Trichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Trichlorofluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| Vinyl chloride | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 27-Jan-2022 13:14 |
| *Surr: 1,2-Dichloroethane-d4* | *104* | | | **0** | *81-118* | *%REC* | *1* | *27-Jan-2022 13:14* |
| *Surr: 4-Bromofluorobenzene* | *102* | | | **0** | *85-114* | *%REC* | *1* | *27-Jan-2022 13:14* |
| *Surr: Dibromofluoromethane* | *97.8* | | | **0** | *80-119* | *%REC* | *1* | *27-Jan-2022 13:14* |
| *Surr: Toluene-d8* | *106* | | | **0** | *89-112* | *%REC* | *1* | *27-Jan-2022 13:14* |

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

**ALS Houston, US** Date: 09-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22011131

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** R401143 ( 0 ) | **Test Name :** VOLATILES ORGANICS BY METHOD 8260C | | | | **Matrix:** Water | |
| HS22011131-01 | LH18/24-SP650_012522 | 25 Jan 2022 14:00 | | | 27 Jan 2022 13:37 | 1 |
| HS22011131-02 | Trip Blank | 25 Jan 2022 00:00 | | | 27 Jan 2022 13:14 | 1 |
| **Batch ID:** R401856 ( 0 ) | **Test Name :** ANIONS BY SW9056A | | | | **Matrix:** Water | |
| HS22011131-01 | LH18/24-SP650_012522 | 25 Jan 2022 14:00 | | | 08 Feb 2022 19:53 | 20 |
| HS22011131-01 | LH18/24-SP650_012522 | 25 Jan 2022 14:00 | | | 08 Feb 2022 19:48 | 1 |

**ALS Houston, US** Date: 09-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22011131

**QC BATCH REPORT**

**Batch ID:** R401143 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220127** Units: **ug/L** Analysis Date: **27-Jan-2022 12:52**
Client ID: Run ID: **VOA9_401143** SeqNo: **6480175** PrepDate: DF: **1**

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

**ALS Houston, US** Date: 09-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22011131

**QC BATCH REPORT**

**Batch ID:** R401143 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220127** Units: **ug/L** Analysis Date: **27-Jan-2022 12:52**
Client ID: Run ID: **VOA9_401143** SeqNo: **6480175** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 2.0 | 2.0 | | | | | | | | U |
| Carbon tetrachloride | 1.0 | 1.0 | | | | | | | | U |
| Chlorobenzene | 1.0 | 1.0 | | | | | | | | U |
| Chloroethane | 1.0 | 1.0 | | | | | | | | U |
| Chloroform | 0.50 | 1.0 | | | | | | | | U |
| Chloromethane | 0.50 | 1.0 | | | | | | | | U |
| cis-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| cis-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Dibromochloromethane | 1.0 | 1.0 | | | | | | | | U |
| Dibromomethane | 0.50 | 1.0 | | | | | | | | U |
| Dichlorodifluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Ethylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Hexachlorobutadiene | 1.0 | 1.0 | | | | | | | | U |
| Isopropylbenzene | 1.0 | 1.0 | | | | | | | | U |
| m,p-Xylene | 1.0 | 2.0 | | | | | | | | U |
| Methylene chloride | 2.0 | 2.0 | | | | | | | | U |
| Naphthalene | 1.0 | 1.0 | | | | | | | | U |
| n-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| n-Propylbenzene | 1.0 | 1.0 | | | | | | | | U |
| o-Xylene | 1.0 | 1.0 | | | | | | | | U |
| sec-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Styrene | 1.0 | 1.0 | | | | | | | | U |
| tert-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Tetrachloroethene | 1.0 | 1.0 | | | | | | | | U |
| Toluene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Trichloroethene | 0.50 | 1.0 | | | | | | | | U |
| Trichlorofluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Vinyl chloride | 0.50 | 1.0 | | | | | | | | U |
| *Surr: 1,2-Dichloroethane-d4* | *51.51* | *1.0* | *50* | *0* | *103* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *50.65* | *1.0* | *50* | *0* | *101* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *48.8* | *1.0* | *50* | *0* | *97.6* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *53.08* | *1.0* | *50* | *0* | *106* | *89 - 112* | | | | |

**ALS Houston, US** Date: 09-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22011131

**QC BATCH REPORT**

**Batch ID:** R401143 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220127** Units: **ug/L** Analysis Date: **27-Jan-2022 12:08**
Client ID: Run ID: **VOA9_401143** SeqNo: **6480174** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 20.97 | 1.0 | 20 | 0 | 105 | 78 - 124 | | | | |
| 1,1,1-Trichloroethane | 20.39 | 1.0 | 20 | 0 | 102 | 74 - 131 | | | | |
| 1,1,2,2-Tetrachloroethane | 20.77 | 1.0 | 20 | 0 | 104 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 20.08 | 1.0 | 20 | 0 | 100 | 80 - 119 | | | | |
| 1,1-Dichloroethane | 21.73 | 1.0 | 20 | 0 | 109 | 77 - 125 | | | | |
| 1,1-Dichloroethene | 20.75 | 1.0 | 20 | 0 | 104 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 19.81 | 1.0 | 20 | 0 | 99.1 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 19.69 | 1.0 | 20 | 0 | 98.5 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 20.62 | 1.0 | 20 | 0 | 103 | 73 - 122 | | | | |
| 1,2,4-Trichlorobenzene | 19.58 | 1.0 | 20 | 0 | 97.9 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 23.57 | 1.0 | 20 | 0 | 118 | 76 - 124 | | | | |
| 1,2-Dibromo-3-chloropropane | 18.85 | 1.0 | 20 | 0 | 94.3 | 62 - 128 | | | | |
| 1,2-Dibromoethane | 20.76 | 1.0 | 20 | 0 | 104 | 77 - 121 | | | | |
| 1,2-Dichlorobenzene | 19.79 | 1.0 | 20 | 0 | 99.0 | 80 - 119 | | | | |
| 1,2-Dichloroethane | 21.52 | 1.0 | 20 | 0 | 108 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 19.23 | 1.0 | 20 | 0 | 96.1 | 78 - 122 | | | | |
| 1,3,5-Trimethylbenzene | 20.71 | 1.0 | 20 | 0 | 104 | 75 - 124 | | | | |
| 1,3-Dichlorobenzene | 20.31 | 1.0 | 20 | 0 | 102 | 80 - 119 | | | | |
| 1,3-Dichloropropane | 20.19 | 1.0 | 20 | 0 | 101 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 19.55 | 1.0 | 20 | 0 | 97.8 | 79 - 118 | | | | |
| 2,2-Dichloropropane | 20.06 | 1.0 | 20 | 0 | 100 | 60 - 139 | | | | |
| 2-Butanone | 43.8 | 2.0 | 40 | 0 | 109 | 56 - 143 | | | | |
| 2-Chlorotoluene | 21.01 | 1.0 | 20 | 0 | 105 | 79 - 122 | | | | |
| 2-Hexanone | 45.99 | 2.0 | 40 | 0 | 115 | 57 - 139 | | | | |
| 4-Chlorotoluene | 21.54 | 1.0 | 20 | 0 | 108 | 78 - 122 | | | | |
| 4-Isopropyltoluene | 19.94 | 1.0 | 20 | 0 | 99.7 | 77 - 127 | | | | |
| 4-Methyl-2-pentanone | 45.18 | 2.0 | 40 | 0 | 113 | 67 - 130 | | | | |
| Acetone | 49.78 | 2.0 | 40 | 0 | 124 | 39 - 160 | | | | |
| Benzene | 20.16 | 1.0 | 20 | 0 | 101 | 79 - 120 | | | | |
| Bromobenzene | 20.91 | 1.0 | 20 | 0 | 105 | 80 - 120 | | | | |
| Bromochloromethane | 19.37 | 1.0 | 20 | 0 | 96.9 | 78 - 123 | | | | |
| Bromodichloromethane | 20.95 | 1.0 | 20 | 0 | 105 | 79 - 125 | | | | |
| Bromoform | 18.56 | 1.0 | 20 | 0 | 92.8 | 66 - 130 | | | | |
| Bromomethane | 22.36 | 1.0 | 20 | 0 | 112 | 53 - 141 | | | | |

**ALS Houston, US** Date: 09-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22011131

**QC BATCH REPORT**

**Batch ID:** R401143 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220127** Units: **ug/L** Analysis Date: **27-Jan-2022 12:08**
Client ID: Run ID: **VOA9_401143** SeqNo: **6480174** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 45.27 | 2.0 | 40 | 0 | 113 | 64 - 133 | | | | |
| Carbon tetrachloride | 20.01 | 1.0 | 20 | 0 | 100 | 72 - 136 | | | | |
| Chlorobenzene | 20.04 | 1.0 | 20 | 0 | 100 | 82 - 118 | | | | |
| Chloroethane | 21.6 | 1.0 | 20 | 0 | 108 | 60 - 138 | | | | |
| Chloroform | 20.28 | 1.0 | 20 | 0 | 101 | 79 - 124 | | | | |
| Chloromethane | 18.51 | 1.0 | 20 | 0 | 92.5 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 19.61 | 1.0 | 20 | 0 | 98.1 | 78 - 123 | | | | |
| cis-1,3-Dichloropropene | 18.68 | 1.0 | 20 | 0 | 93.4 | 75 - 124 | | | | |
| Dibromochloromethane | 19.57 | 1.0 | 20 | 0 | 97.8 | 74 - 126 | | | | |
| Dibromomethane | 19.58 | 1.0 | 20 | 0 | 97.9 | 79 - 123 | | | | |
| Dichlorodifluoromethane | 17.68 | 1.0 | 20 | 0 | 88.4 | 32 - 152 | | | | |
| Ethylbenzene | 20.31 | 1.0 | 20 | 0 | 102 | 79 - 121 | | | | |
| Hexachlorobutadiene | 18.74 | 1.0 | 20 | 0 | 93.7 | 66 - 134 | | | | |
| Isopropylbenzene | 21.59 | 1.0 | 20 | 0 | 108 | 72 - 131 | | | | |
| m,p-Xylene | 44.35 | 2.0 | 40 | 0 | 111 | 80 - 121 | | | | |
| Methylene chloride | 22.03 | 2.0 | 20 | 0 | 110 | 74 - 124 | | | | |
| Naphthalene | 19.88 | 1.0 | 20 | 0 | 99.4 | 61 - 128 | | | | |
| n-Butylbenzene | 21.58 | 1.0 | 20 | 0 | 108 | 75 - 128 | | | | |
| n-Propylbenzene | 21.54 | 1.0 | 20 | 0 | 108 | 76 - 126 | | | | |
| o-Xylene | 21.95 | 1.0 | 20 | 0 | 110 | 78 - 122 | | | | |
| sec-Butylbenzene | 21.03 | 1.0 | 20 | 0 | 105 | 77 - 126 | | | | |
| Styrene | 22.7 | 1.0 | 20 | 0 | 113 | 78 - 123 | | | | |
| tert-Butylbenzene | 20.4 | 1.0 | 20 | 0 | 102 | 78 - 124 | | | | |
| Tetrachloroethene | 20.19 | 1.0 | 20 | 0 | 101 | 74 - 129 | | | | |
| Toluene | 21.18 | 1.0 | 20 | 0 | 106 | 80 - 121 | | | | |
| trans-1,2-Dichloroethene | 20.55 | 1.0 | 20 | 0 | 103 | 75 - 124 | | | | |
| trans-1,3-Dichloropropene | 18.36 | 1.0 | 20 | 0 | 91.8 | 73 - 127 | | | | |
| Trichloroethene | 19.01 | 1.0 | 20 | 0 | 95.1 | 79 - 123 | | | | |
| Trichlorofluoromethane | 20.98 | 1.0 | 20 | 0 | 105 | 65 - 141 | | | | |
| Vinyl chloride | 20.2 | 1.0 | 20 | 0 | 101 | 58 - 137 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *57.05* | *1.0* | *50* | *0* | *114* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *53.47* | *1.0* | *50* | *0* | *107* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *53.98* | *1.0* | *50* | *0* | *108* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *52.48* | *1.0* | *50* | *0* | *105* | *89 - 112* | | | | |

**ALS Houston, US** Date: 09-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22011131

**QC BATCH REPORT**

**Batch ID:** R401143 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS22011089-06MS** Units: **ug/L** Analysis Date: **27-Jan-2022 15:50**
Client ID: Run ID: **VOA9_401143** SeqNo: **6480181** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 21 | 1.0 | 20 | 0 | 105 | 78 - 124 | | | | |
| 1,1,1-Trichloroethane | 19.33 | 1.0 | 20 | 0 | 96.6 | 74 - 131 | | | | |
| 1,1,2,2-Tetrachloroethane | 19.9 | 1.0 | 20 | 0 | 99.5 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 19.61 | 1.0 | 20 | 0 | 98.0 | 80 - 119 | | | | |
| 1,1-Dichloroethane | 19.88 | 1.0 | 20 | 0 | 99.4 | 77 - 125 | | | | |
| 1,1-Dichloroethene | 20.23 | 1.0 | 20 | 0 | 101 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 21.83 | 1.0 | 20 | 0 | 109 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 20.17 | 1.0 | 20 | 0 | 101 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 19.6 | 1.0 | 20 | 0 | 98.0 | 73 - 122 | | | | |
| 1,2,4-Trichlorobenzene | 20.4 | 1.0 | 20 | 0 | 102 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 34.87 | 1.0 | 20 | 0 | 174 | 76 - 124 | | | | S |
| 1,2-Dibromo-3-chloropropane | 23.02 | 1.0 | 20 | 0 | 115 | 62 - 128 | | | | |
| 1,2-Dibromoethane | 20.51 | 1.0 | 20 | 0 | 103 | 77 - 121 | | | | |
| 1,2-Dichlorobenzene | 19.98 | 1.0 | 20 | 0 | 99.9 | 80 - 119 | | | | |
| 1,2-Dichloroethane | 20.21 | 1.0 | 20 | 0 | 101 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 19.3 | 1.0 | 20 | 0 | 96.5 | 78 - 122 | | | | |
| 1,3,5-Trimethylbenzene | 24.79 | 1.0 | 20 | 0 | 124 | 75 - 124 | | | | |
| 1,3-Dichlorobenzene | 20.68 | 1.0 | 20 | 0 | 103 | 80 - 119 | | | | |
| 1,3-Dichloropropane | 19.99 | 1.0 | 20 | 0 | 100.0 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 19.68 | 1.0 | 20 | 0 | 98.4 | 79 - 118 | | | | |
| 2,2-Dichloropropane | 18.1 | 1.0 | 20 | 0 | 90.5 | 60 - 139 | | | | |
| 2-Butanone | 70.41 | 2.0 | 40 | 0 | 176 | 56 - 143 | | | | S |
| 2-Chlorotoluene | 22.77 | 1.0 | 20 | 0 | 114 | 79 - 122 | | | | |
| 2-Hexanone | 43.4 | 2.0 | 40 | 0 | 108 | 57 - 139 | | | | |
| 4-Chlorotoluene | 22.44 | 1.0 | 20 | 0 | 112 | 78 - 122 | | | | |
| 4-Isopropyltoluene | 23.91 | 1.0 | 20 | 0 | 120 | 77 - 127 | | | | |
| 4-Methyl-2-pentanone | 44.43 | 2.0 | 40 | 0 | 111 | 67 - 130 | | | | |
| Acetone | 40.81 | 2.0 | 40 | 0 | 102 | 39 - 160 | | | | |
| Benzene | 20.33 | 1.0 | 20 | 0 | 102 | 79 - 120 | | | | |
| Bromobenzene | 21.14 | 1.0 | 20 | 0 | 106 | 80 - 120 | | | | |
| Bromochloromethane | 17.93 | 1.0 | 20 | 0 | 89.6 | 78 - 123 | | | | |
| Bromodichloromethane | 18.85 | 1.0 | 20 | 0 | 94.3 | 79 - 125 | | | | |
| Bromoform | 16.69 | 1.0 | 20 | 0 | 83.4 | 66 - 130 | | | | |
| Bromomethane | 19.45 | 1.0 | 20 | 0 | 97.3 | 53 - 141 | | | | |

**ALS Houston, US** Date: 09-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22011131

**QC BATCH REPORT**

**Batch ID:** R401143 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS22011089-06MS** Units: **ug/L** Analysis Date: **27-Jan-2022 15:50**
Client ID: Run ID: **VOA9_401143** SeqNo: **6480181** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 38.51 | 2.0 | 40 | 0 | 96.3 | 64 - 133 | | | | |
| Carbon tetrachloride | 20.83 | 1.0 | 20 | 0 | 104 | 72 - 136 | | | | |
| Chlorobenzene | 20.46 | 1.0 | 20 | 0 | 102 | 82 - 118 | | | | |
| Chloroethane | 18.71 | 1.0 | 20 | 0 | 93.5 | 60 - 138 | | | | |
| Chloroform | 18.61 | 1.0 | 20 | 0 | 93.1 | 79 - 124 | | | | |
| Chloromethane | 16.42 | 1.0 | 20 | 0 | 82.1 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 18.31 | 1.0 | 20 | 0 | 91.6 | 78 - 123 | | | | |
| cis-1,3-Dichloropropene | 18.03 | 1.0 | 20 | 0 | 90.2 | 75 - 124 | | | | |
| Dibromochloromethane | 18.12 | 1.0 | 20 | 0 | 90.6 | 74 - 126 | | | | |
| Dibromomethane | 18.65 | 1.0 | 20 | 0 | 93.3 | 79 - 123 | | | | |
| Dichlorodifluoromethane | 16.52 | 1.0 | 20 | 0 | 82.6 | 32 - 152 | | | | |
| Ethylbenzene | 22.85 | 1.0 | 20 | 0 | 114 | 79 - 121 | | | | |
| Hexachlorobutadiene | 20.75 | 1.0 | 20 | 0 | 104 | 66 - 134 | | | | |
| Isopropylbenzene | 24.29 | 1.0 | 20 | 0 | 121 | 72 - 131 | | | | |
| m,p-Xylene | 49.88 | 2.0 | 40 | 0 | 125 | 80 - 121 | | | | S |
| Methylene chloride | 18.73 | 2.0 | 20 | 0 | 93.6 | 74 - 124 | | | | |
| Naphthalene | 27.88 | 1.0 | 20 | 0 | 139 | 61 - 128 | | | | S |
| n-Butylbenzene | 29.75 | 1.0 | 20 | 0 | 149 | 75 - 128 | | | | S |
| n-Propylbenzene | 25.97 | 1.0 | 20 | 0 | 130 | 76 - 126 | | | | S |
| o-Xylene | 23.81 | 1.0 | 20 | 0 | 119 | 78 - 122 | | | | |
| sec-Butylbenzene | 26.59 | 1.0 | 20 | 0 | 133 | 77 - 126 | | | | S |
| Styrene | 21.91 | 1.0 | 20 | 0 | 110 | 78 - 123 | | | | |
| tert-Butylbenzene | 23.05 | 1.0 | 20 | 0 | 115 | 78 - 124 | | | | |
| Tetrachloroethene | 22.67 | 1.0 | 20 | 0 | 113 | 74 - 129 | | | | |
| Toluene | 25.55 | 1.0 | 20 | 0 | 128 | 80 - 121 | | | | S |
| trans-1,2-Dichloroethene | 19.16 | 1.0 | 20 | 0 | 95.8 | 75 - 124 | | | | |
| trans-1,3-Dichloropropene | 17.27 | 1.0 | 20 | 0 | 86.3 | 73 - 127 | | | | |
| Trichloroethene | 23.97 | 1.0 | 20 | 4.576 | 97.0 | 79 - 123 | | | | |
| Trichlorofluoromethane | 20.82 | 1.0 | 20 | 0 | 104 | 65 - 141 | | | | |
| Vinyl chloride | 19.07 | 1.0 | 20 | 0 | 95.3 | 58 - 137 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *47.2* | *1.0* | *50* | *0* | *94.4* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *52.9* | *1.0* | *50* | *0* | *106* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *46.54* | *1.0* | *50* | *0* | *93.1* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *52.59* | *1.0* | *50* | *0* | *105* | *89 - 112* | | | | |

**ALS Houston, US** Date: 09-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22011131

**QC BATCH REPORT**

**Batch ID:** R401143 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS22011089-06MSD** Units: **ug/L** Analysis Date: **27-Jan-2022 16:12**
Client ID: Run ID: **VOA9_401143** SeqNo: **6480182** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 20.29 | 1.0 | 20 | 0 | 101 | 78 - 124 | 21 | 3.43 | 20 | |
| 1,1,1-Trichloroethane | 18.7 | 1.0 | 20 | 0 | 93.5 | 74 - 131 | 19.33 | 3.3 | 20 | |
| 1,1,2,2-Tetrachloroethane | 19.4 | 1.0 | 20 | 0 | 97.0 | 71 - 121 | 19.9 | 2.52 | 20 | |
| 1,1,2-Trichloroethane | 19.2 | 1.0 | 20 | 0 | 96.0 | 80 - 119 | 19.61 | 2.12 | 20 | |
| 1,1-Dichloroethane | 19.38 | 1.0 | 20 | 0 | 96.9 | 77 - 125 | 19.88 | 2.53 | 20 | |
| 1,1-Dichloroethene | 19.24 | 1.0 | 20 | 0 | 96.2 | 71 - 131 | 20.23 | 5 | 20 | |
| 1,1-Dichloropropene | 20.93 | 1.0 | 20 | 0 | 105 | 78 - 125 | 21.83 | 4.22 | 20 | |
| 1,2,3-Trichlorobenzene | 19.68 | 1.0 | 20 | 0 | 98.4 | 69 - 129 | 20.17 | 2.44 | 20 | |
| 1,2,3-Trichloropropane | 18.83 | 1.0 | 20 | 0 | 94.2 | 73 - 122 | 19.6 | 3.98 | 20 | |
| 1,2,4-Trichlorobenzene | 19.98 | 1.0 | 20 | 0 | 99.9 | 69 - 130 | 20.4 | 2.06 | 20 | |
| 1,2,4-Trimethylbenzene | 25.68 | 1.0 | 20 | 0 | 128 | 76 - 124 | 34.87 | 30.3 | 20 | SR |
| 1,2-Dibromo-3-chloropropane | 20.44 | 1.0 | 20 | 0 | 102 | 62 - 128 | 23.02 | 11.9 | 20 | |
| 1,2-Dibromoethane | 20.03 | 1.0 | 20 | 0 | 100 | 77 - 121 | 20.51 | 2.37 | 20 | |
| 1,2-Dichlorobenzene | 18.83 | 1.0 | 20 | 0 | 94.1 | 80 - 119 | 19.98 | 5.93 | 20 | |
| 1,2-Dichloroethane | 20.74 | 1.0 | 20 | 0 | 104 | 73 - 128 | 20.21 | 2.56 | 20 | |
| 1,2-Dichloropropane | 18.77 | 1.0 | 20 | 0 | 93.8 | 78 - 122 | 19.3 | 2.8 | 20 | |
| 1,3,5-Trimethylbenzene | 21.32 | 1.0 | 20 | 0 | 107 | 75 - 124 | 24.79 | 15.1 | 20 | |
| 1,3-Dichlorobenzene | 19.65 | 1.0 | 20 | 0 | 98.3 | 80 - 119 | 20.68 | 5.09 | 20 | |
| 1,3-Dichloropropane | 19.31 | 1.0 | 20 | 0 | 96.6 | 80 - 119 | 19.99 | 3.46 | 20 | |
| 1,4-Dichlorobenzene | 18.85 | 1.0 | 20 | 0 | 94.2 | 79 - 118 | 19.68 | 4.32 | 20 | |
| 2,2-Dichloropropane | 17.69 | 1.0 | 20 | 0 | 88.5 | 60 - 139 | 18.1 | 2.27 | 20 | |
| 2-Butanone | 43.52 | 2.0 | 40 | 0 | 109 | 56 - 143 | 70.41 | 47.2 | 20 | R |
| 2-Chlorotoluene | 20.57 | 1.0 | 20 | 0 | 103 | 79 - 122 | 22.77 | 10.1 | 20 | |
| 2-Hexanone | 44.23 | 2.0 | 40 | 0 | 111 | 57 - 139 | 43.4 | 1.9 | 20 | |
| 4-Chlorotoluene | 20.92 | 1.0 | 20 | 0 | 105 | 78 - 122 | 22.44 | 7.01 | 20 | |
| 4-Isopropyltoluene | 21.53 | 1.0 | 20 | 0 | 108 | 77 - 127 | 23.91 | 10.5 | 20 | |
| 4-Methyl-2-pentanone | 44.16 | 2.0 | 40 | 0 | 110 | 67 - 130 | 44.43 | 0.612 | 20 | |
| Acetone | 38.71 | 2.0 | 40 | 0 | 96.8 | 39 - 160 | 40.81 | 5.3 | 20 | |
| Benzene | 19.53 | 1.0 | 20 | 0 | 97.6 | 79 - 120 | 20.33 | 4.01 | 20 | |
| Bromobenzene | 20.04 | 1.0 | 20 | 0 | 100 | 80 - 120 | 21.14 | 5.35 | 20 | |
| Bromochloromethane | 16.97 | 1.0 | 20 | 0 | 84.8 | 78 - 123 | 17.93 | 5.5 | 20 | |
| Bromodichloromethane | 19.26 | 1.0 | 20 | 0 | 96.3 | 79 - 125 | 18.85 | 2.14 | 20 | |
| Bromoform | 17.32 | 1.0 | 20 | 0 | 86.6 | 66 - 130 | 16.69 | 3.7 | 20 | |
| Bromomethane | 18.6 | 1.0 | 20 | 0 | 93.0 | 53 - 141 | 19.45 | 4.49 | 20 | |

**ALS Houston, US** Date: 09-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22011131

**QC BATCH REPORT**

**Batch ID:** R401143 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS22011089-06MSD** Units: **ug/L** Analysis Date: **27-Jan-2022 16:12**
Client ID: Run ID: **VOA9_401143** SeqNo: **6480182** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 39.59 | 2.0 | 40 | 0 | 99.0 | 64 - 133 | 38.51 | 2.77 | 20 | |
| Carbon tetrachloride | 20.84 | 1.0 | 20 | 0 | 104 | 72 - 136 | 20.83 | 0.0478 | 20 | |
| Chlorobenzene | 19.42 | 1.0 | 20 | 0 | 97.1 | 82 - 118 | 20.46 | 5.2 | 20 | |
| Chloroethane | 17.34 | 1.0 | 20 | 0 | 86.7 | 60 - 138 | 18.71 | 7.58 | 20 | |
| Chloroform | 18.39 | 1.0 | 20 | 0 | 92.0 | 79 - 124 | 18.61 | 1.21 | 20 | |
| Chloromethane | 15.83 | 1.0 | 20 | 0 | 79.1 | 50 - 139 | 16.42 | 3.66 | 20 | |
| cis-1,2-Dichloroethene | 17.49 | 1.0 | 20 | 0 | 87.4 | 78 - 123 | 18.31 | 4.61 | 20 | |
| cis-1,3-Dichloropropene | 18.38 | 1.0 | 20 | 0 | 91.9 | 75 - 124 | 18.03 | 1.93 | 20 | |
| Dibromochloromethane | 18.1 | 1.0 | 20 | 0 | 90.5 | 74 - 126 | 18.12 | 0.0872 | 20 | |
| Dibromomethane | 18 | 1.0 | 20 | 0 | 90.0 | 79 - 123 | 18.65 | 3.55 | 20 | |
| Dichlorodifluoromethane | 15.44 | 1.0 | 20 | 0 | 77.2 | 32 - 152 | 16.52 | 6.74 | 20 | |
| Ethylbenzene | 20.69 | 1.0 | 20 | 0 | 103 | 79 - 121 | 22.85 | 9.95 | 20 | |
| Hexachlorobutadiene | 19.66 | 1.0 | 20 | 0 | 98.3 | 66 - 134 | 20.75 | 5.37 | 20 | |
| Isopropylbenzene | 22.73 | 1.0 | 20 | 0 | 114 | 72 - 131 | 24.29 | 6.64 | 20 | |
| m,p-Xylene | 44.85 | 2.0 | 40 | 0 | 112 | 80 - 121 | 49.88 | 10.6 | 20 | |
| Methylene chloride | 18.23 | 2.0 | 20 | 0 | 91.2 | 74 - 124 | 18.73 | 2.68 | 20 | |
| Naphthalene | 21.44 | 1.0 | 20 | 0 | 107 | 61 - 128 | 27.88 | 26.1 | 20 | R |
| n-Butylbenzene | 24.3 | 1.0 | 20 | 0 | 122 | 75 - 128 | 29.75 | 20.2 | 20 | R |
| n-Propylbenzene | 22.79 | 1.0 | 20 | 0 | 114 | 76 - 126 | 25.97 | 13.1 | 20 | |
| o-Xylene | 21.87 | 1.0 | 20 | 0 | 109 | 78 - 122 | 23.81 | 8.48 | 20 | |
| sec-Butylbenzene | 23.18 | 1.0 | 20 | 0 | 116 | 77 - 126 | 26.59 | 13.7 | 20 | |
| Styrene | 20.94 | 1.0 | 20 | 0 | 105 | 78 - 123 | 21.91 | 4.5 | 20 | |
| tert-Butylbenzene | 21.5 | 1.0 | 20 | 0 | 108 | 78 - 124 | 23.05 | 6.97 | 20 | |
| Tetrachloroethene | 21.33 | 1.0 | 20 | 0 | 107 | 74 - 129 | 22.67 | 6.1 | 20 | |
| Toluene | 22.07 | 1.0 | 20 | 0 | 110 | 80 - 121 | 25.55 | 14.6 | 20 | |
| trans-1,2-Dichloroethene | 18.13 | 1.0 | 20 | 0 | 90.6 | 75 - 124 | 19.16 | 5.55 | 20 | |
| trans-1,3-Dichloropropene | 17.81 | 1.0 | 20 | 0 | 89.0 | 73 - 127 | 17.27 | 3.07 | 20 | |
| Trichloroethene | 23.29 | 1.0 | 20 | 4.576 | 93.6 | 79 - 123 | 23.97 | 2.88 | 20 | |
| Trichlorofluoromethane | 20.12 | 1.0 | 20 | 0 | 101 | 65 - 141 | 20.82 | 3.42 | 20 | |
| Vinyl chloride | 17.88 | 1.0 | 20 | 0 | 89.4 | 58 - 137 | 19.07 | 6.45 | 20 | |
| *Surr: 1,2-Dichloroethane-d4* | *47.45* | *1.0* | *50* | *0* | *94.9* | *81 - 118* | *47.2* | *0.512* | *20* | |
| *Surr: 4-Bromofluorobenzene* | *53.15* | *1.0* | *50* | *0* | *106* | *85 - 114* | *52.9* | *0.478* | *20* | |
| *Surr: Dibromofluoromethane* | *46.73* | *1.0* | *50* | *0* | *93.5* | *80 - 119* | *46.54* | *0.411* | *20* | |
| *Surr: Toluene-d8* | *52.84* | *1.0* | *50* | *0* | *106* | *89 - 112* | *52.59* | *0.477* | *20* | |

**ALS Houston, US** Date: 09-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22011131

**QC BATCH REPORT**

| Batch ID: | R401143 ( 0 ) | Instrument: | VOA9 | Method: | VOLATILES ORGANICS BY METHOD 8260C |
|---|---|---|---|---|---|

**The following samples were analyzed in this batch:** HS22011131-01 HS22011131-02

**ALS Houston, US** Date: 09-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22011131

**QC BATCH REPORT**

**Batch ID:** R401856 ( 0 ) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

**MBLK** Sample ID: **MBLK** Units: **mg/L** Analysis Date: **08-Feb-2022 10:36**
Client ID: Run ID: **ICS-Integrion_401856** SeqNo: **6494822** 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: **08-Feb-2022 10:41**
Client ID: Run ID: **ICS-Integrion_401856** SeqNo: **6494823** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 19.94 | 0.500 | 20 | 0 | 99.7 | 80 - 120 | | | | |
| Sulfate | 20.05 | 0.500 | 20 | 0 | 100 | 80 - 120 | | | | |

**MS** Sample ID: **HS22020344-02MS** Units: **mg/L** Analysis Date: **08-Feb-2022 14:34**
Client ID: Run ID: **ICS-Integrion_401856** SeqNo: **6494827** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 23.31 | 0.500 | 10 | 12.76 | 106 | 80 - 120 | | | | |
| Sulfate | 844.9 | 0.500 | 10 | 810.8 | 341 | 80 - 120 | | | | SEO |

**MSD** Sample ID: **HS22020344-02MSD** Units: **mg/L** Analysis Date: **08-Feb-2022 14:39**
Client ID: Run ID: **ICS-Integrion_401856** SeqNo: **6494851** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 23.34 | 0.500 | 10 | 12.76 | 106 | 80 - 120 | 23.31 | 0.116 | 20 | |
| Sulfate | 845.4 | 0.500 | 10 | 810.8 | 346 | 80 - 120 | 844.9 | 0.0521 | 20 | SEO |

**The following samples were analyzed in this batch:** HS22011131-01

**ALS Houston, US** Date: 09-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** **HS22011131**

## QUALIFIERS, ACRONYMS, UNITS

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

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

| Unit Reported | Description |
|---|---|
| mg/L | Milligrams per Liter |

## CERTIFICATIONS,ACCREDITATIONS & LICENSES

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas | 21-022-0 | 26-Mar-2022 |
| Florida | E87611-33 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 09-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**Work Order:** HS22011131

## SAMPLE TRACKING

| Lab Samp ID | Client Sample ID | Action | Date | Person | New Location |
|---|---|---|---|---|---|
| HS22011131-01 | LH18/24-SP650_012522 | Login | 1/26/2022 11:55:55 AM | PMG | WET230 |
| HS22011131-01 | LH18/24-SP650_012522 | Login | 1/26/2022 11:55:55 AM | PMG | VOA191 |
| HS22011131-02 | Trip Blank | Login | 1/26/2022 11:55:55 AM | PMG | VOA191 |

**ALS Houston, US** Date: 09-Feb-22

## Sample Receipt Checklist

**Work Order ID:** HS22011131 **Date/Time Received:** **26-Jan-2022 10:45**

**Client Name:** Bhate Environmental **Received by:** **Paresh M. Giga**

**Completed By:** /S/ Paresh M. Giga (eSignature) 26-Jan-2022 12:02 (Date/Time) **Reviewed by:** /S/ Ragen Giga (eSignature) 27-Jan-2022 20:14 (Date/Time)

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

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

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 0.2C U/c | IR31 |
| Cooler(s)/Kit(s): | 6120 | |
| Date/Time sample(s) sent to storage: | 1/26/2022 12:10 | |

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

Page 1 of 1

**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:** GROUNDWATER TREATMENT PLANT BI-WEEKLY SAMPLES

**Prepared By:** Scott Beesinger

**P.O Number**

HS22011131
Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Bi-Weekly Samples

Analyses

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | VOC | CHLORIDE, SULFATE | | | | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_012522 | Water | 01/25/22 / 14:00 | | 3 | 3 | | | | | | | | | | HCL | |
| LH18/24-SP650_012522 | Water | 01/25/22 / 14:00 | | 1 | | 1 | | | | | | | | | NONE | |
| Trip Blank | Water | 01/25/22 | | 2 | 2 | | | | | | | | | | HCL | |

Additional Remarks: **Standard TAT on all parameters**

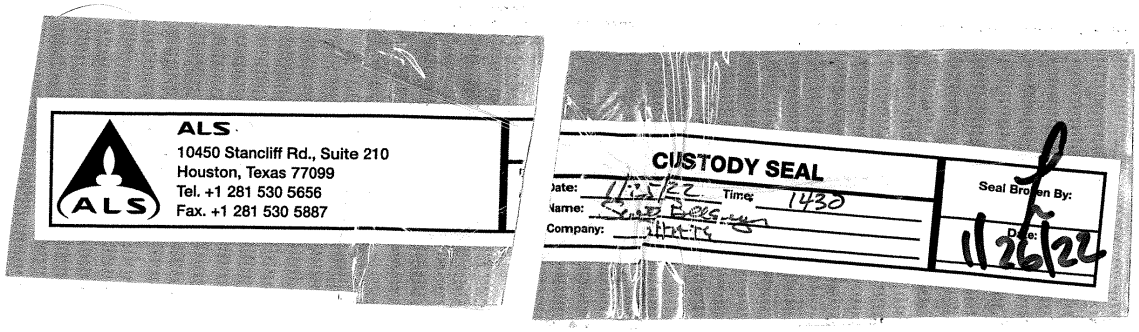
| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 01/25/22 | 14:30 | [illegible] | 1/26/2022 | 10:45 | | | | | | |

**9For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Remarks
6120 0.20
+1.31
9.5

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTODY SEAL
Date: 11-25-22
Time: 1430
Name:
Company:
Seal Broken By:
Date: 11/26/22

RMA:
FedEx
Express
FedEx
TRK# 0221 1251 0293 9831
WED – 26 JAN 10:30A
PRIORITY OVERNIGHT
AB SGRA
77099
TX-US IAH

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

February 21, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22020280**

Laboratory Results for: **Longhorn GW Treatment Plant Monthly Effluent Samples**

Dear Marcia Olive,

ALS Environmental received 3 sample(s) on Feb 07, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: JUMOKE.LAWAL**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**Work Order:** HS22020280

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22020280-01 | LH18/24-SP650_020222 | Water | | 02-Feb-2022 14:00 | 07-Feb-2022 09:20 | ☐ |
| HS22020280-02 | LH18/24-SP650_020222_AIX | Water | | 02-Feb-2022 14:00 | 07-Feb-2022 09:20 | ☐ |
| HS22020280-03 | Trip Blank | Water | CG-121321-569 | 02-Feb-2022 00:00 | 07-Feb-2022 09:20 | ☐ |

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**Work Order:** HS22020280

**CASE NARRATIVE**

## Work Order Comments

- Samples received out of hold (FEDEX weather related Delay), proceed with analyses per Client Confirmation

## Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached

## GCMS Semivolatiles by Method SW8270SIM

### Batch ID: 175123

**Sample ID: LH18/24-SP650_020222 (HS22020280-01)**

- The surrogate recoveries could not be determined due to dilution below the calibration range.

## GCMS Volatiles by Method SW8260

### Batch ID: R401839

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## Metals by Method SW6020A

### Batch ID: 175201

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method SW7196

### Batch ID: R401884

**Sample ID: LH18/24-SP650_020222 (HS22020280-01)**

- Sample holding time expired prior to sample receipt. It was analyzed at the request of the client. Results should be considered estimated.

**ALS Houston, US** Date: 21-Feb-22

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS22020280
Sample ID: LH18/24-SP650_020222 Lab ID:HS22020280-01
Collection Date: 02-Feb-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| 1,1,1,2-Tetrachloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| 1,1,1-Trichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| 1,1-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| 1,1-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| 1,1-Dichloropropene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| 1,2,3-Trichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| 1,2,3-Trichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| 1,2,4-Trichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| 1,2,4-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| 1,2-Dibromo-3-chloropropane | 1.0 | U | 0.20 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| 1,2-Dibromoethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| 1,2-Dichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| 1,2-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| 1,2-Dichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| 1,3,5-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| 1,3-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| 1,3-Dichloropropane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| 1,4-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| 2,2-Dichloropropane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| **2-Butanone** | **2.3** | | **0.50** | **1.0** | **2.0** | **ug/L** | 1 | 08-Feb-2022 14:25 |
| 2-Chlorotoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| 2-Hexanone | 2.0 | U | 1.0 | 2.0 | 2.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| 4-Chlorotoluene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| 4-Isopropyltoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| 4-Methyl-2-pentanone | 2.0 | U | 0.70 | 2.0 | 2.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Acetone | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Benzene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Bromobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Bromochloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Bromodichloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Bromoform | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Bromomethane | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Carbon disulfide | 2.0 | U | 0.60 | 2.0 | 2.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Carbon tetrachloride | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Chlorobenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Chloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Chloroform | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |

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

**ALS Houston, US** Date: 21-Feb-22

Client: Bhate Environmental Associates, Inc.

**ANALYTICAL REPORT**

Project: Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS22020280

Sample ID: LH18/24-SP650_020222 Lab ID:HS22020280-01

Collection Date: 02-Feb-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| Chloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| **cis-1,2-Dichloroethene** | **1.6** | | **0.20** | **0.50** | **1.0** | **ug/L** | 1 | 08-Feb-2022 14:25 |
| cis-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Dibromochloromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Dibromomethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Dichlorodifluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Ethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Hexachlorobutadiene | 1.0 | U | 1.0 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Isopropylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| m,p-Xylene | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Methylene chloride | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| n-Butylbenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| n-Propylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Naphthalene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| o-Xylene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| sec-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Styrene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| tert-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Tetrachloroethene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Toluene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| trans-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| trans-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Trichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Trichlorofluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| Vinyl chloride | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 14:25 |
| *Surr: 1,2-Dichloroethane-d4* | *103* | | | **0** | *81-118* | *%REC* | *1* | *08-Feb-2022 14:25* |
| *Surr: 4-Bromofluorobenzene* | *101* | | | **0** | *85-114* | *%REC* | *1* | *08-Feb-2022 14:25* |
| *Surr: Dibromofluoromethane* | *99.7* | | | **0** | *80-119* | *%REC* | *1* | *08-Feb-2022 14:25* |
| *Surr: Toluene-d8* | *104* | | | **0** | *89-112* | *%REC* | *1* | *08-Feb-2022 14:25* |
| **SEMIVOLATILES SIM** | | **Method:SW8270SIM** | | | | Prep:SW3510 / 08-Feb-2022 | | Analyst: JLJ |
| **1,4-Dioxane** | **7.7** | a | **1.0** | **1.0** | **1.0** | **ug/L** | 100 | 16-Feb-2022 19:48 |
| *Surr: 2-Fluorobiphenyl* | *0* | *S* | | 0 | *40-140* | *%REC* | *100* | *16-Feb-2022 19:48* |
| *Surr: 4-Terphenyl-d14* | *0* | *S* | | 0 | *40-140* | *%REC* | *100* | *16-Feb-2022 19:48* |
| *Surr: Nitrobenzene-d5* | *0* | *S* | | 0 | *40-140* | *%REC* | *100* | *16-Feb-2022 19:48* |
| **METALS BY ICPMS BY SW6020A** | | **Method:SW6020A** | | | | Prep:SW3010A / 09-Feb-2022 | | Analyst: JHD |
| **Barium** | **0.838** | | **0.00190** | **0.00250** | **0.00500** | **mg/L** | 1 | 09-Feb-2022 21:18 |
| Lead | 0.00100 | U | 0.000600 | 0.00100 | 0.00500 | mg/L | 1 | 09-Feb-2022 21:18 |
| Selenium | 0.00250 | U | 0.00110 | 0.00250 | 0.00500 | mg/L | 1 | 09-Feb-2022 21:18 |
| Silver | 0.000500 | U | 0.000200 | 0.000500 | 0.00500 | mg/L | 1 | 09-Feb-2022 21:18 |

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

**ALS Houston, US** Date: 21-Feb-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Monthly Effluent Samples | WorkOrder:HS22020280 |
| Sample ID: | LH18/24-SP650_020222 | Lab ID:HS22020280-01 |
| Collection Date: | 02-Feb-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **HEXAVALENT CHROMIUM BY SW7196A** | | **Method:SW7196** | | | | | | Analyst: AP |
| Chromium, Hexavalent | 0.0100 | HU | 0.00600 | 0.0100 | 0.0100 | mg/L | 1 | 07-Feb-2022 17:09 |

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

**ALS Houston, US** Date: 21-Feb-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Monthly Effluent Samples | WorkOrder:HS22020280 |
| Sample ID: | LH18/24-SP650_020222_AIX | Lab ID:HS22020280-02 |
| Collection Date: | 02-Feb-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 15-Feb-2022 13:50 |

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

**ALS Houston, US** Date: 21-Feb-22

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS22020280
Sample ID: Trip Blank Lab ID:HS22020280-03
Collection Date: 02-Feb-2022 00:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| 1,1,1,2-Tetrachloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 1,1,1-Trichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 1,1-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 1,1-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 1,1-Dichloropropene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 1,2,3-Trichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 1,2,3-Trichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 1,2,4-Trichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 1,2,4-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 1,2-Dibromo-3-chloropropane | 1.0 | U | 0.20 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 1,2-Dibromoethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 1,2-Dichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 1,2-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 1,2-Dichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 1,3,5-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 1,3-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 1,3-Dichloropropane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 1,4-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 2,2-Dichloropropane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 2-Butanone | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 2-Chlorotoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 2-Hexanone | 2.0 | U | 1.0 | 2.0 | 2.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 4-Chlorotoluene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 4-Isopropyltoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| 4-Methyl-2-pentanone | 2.0 | U | 0.70 | 2.0 | 2.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Acetone | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Benzene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Bromobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Bromochloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Bromodichloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Bromoform | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Bromomethane | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Carbon disulfide | 2.0 | U | 0.60 | 2.0 | 2.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Carbon tetrachloride | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Chlorobenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Chloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Chloroform | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |

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

**ALS Houston, US** Date: 21-Feb-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Monthly Effluent Samples | WorkOrder:HS22020280 |
| Sample ID: | Trip Blank | Lab ID:HS22020280-03 |
| Collection Date: | 02-Feb-2022 00:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| Chloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| cis-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| cis-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Dibromochloromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Dibromomethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Dichlorodifluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Ethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Hexachlorobutadiene | 1.0 | U | 1.0 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Isopropylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| m,p-Xylene | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Methylene chloride | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| n-Butylbenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| n-Propylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Naphthalene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| o-Xylene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| sec-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Styrene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| tert-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Tetrachloroethene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Toluene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| trans-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| trans-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Trichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Trichlorofluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| Vinyl chloride | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 08-Feb-2022 13:18 |
| *Surr: 1,2-Dichloroethane-d4* | *102* | | | **0** | *81-118* | *%REC* | *1* | *08-Feb-2022 13:18* |
| *Surr: 4-Bromofluorobenzene* | *102* | | | **0** | *85-114* | *%REC* | *1* | *08-Feb-2022 13:18* |
| *Surr: Dibromofluoromethane* | *99.3* | | | **0** | *80-119* | *%REC* | *1* | *08-Feb-2022 13:18* |
| *Surr: Toluene-d8* | *106* | | | **0** | *89-112* | *%REC* | *1* | *08-Feb-2022 13:18* |

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

## Weight / Prep Log

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22020280

**Batch ID:** 175123 **Start Date:** 08 Feb 2022 06:30 **End Date:** 08 Feb 2022 11:30
**Method:** SV AQ SEP FUN EXTRACT-LOWLEV - 3510C **Prep Code:** 3510_B_SIM

| Sample ID | Container | Sample Wt/Vol | Final Volume | Prep Factor | |
|---|---|---|---|---|---|
| HS22020280-01 | 1 | 1000 (mL) | 1 (mL) | 0.001 | 1-liter amber glass, Neat |

**Batch ID:** 175201 **Start Date:** 09 Feb 2022 10:00 **End Date:** 09 Feb 2022 14:00
**Method:** WATER - SW3010A **Prep Code:** 3010A

| Sample ID | Container | Sample Wt/Vol | Final Volume | Prep Factor | |
|---|---|---|---|---|---|
| HS22020280-01 | | 10 (mL) | 10 (mL) | 1 | 120 plastic HNO3 |

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22020280

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** 175123 ( 0 ) | **Test Name :** SEMIVOLATILES SIM | | | | **Matrix:** Water | |
| HS22020280-01 | LH18/24-SP650_020222 | 02 Feb 2022 14:00 | | 08 Feb 2022 07:49 | 16 Feb 2022 19:48 | 100 |
| **Batch ID:** 175201 ( 0 ) | **Test Name :** METALS BY ICPMS BY SW6020A | | | | **Matrix:** Water | |
| HS22020280-01 | LH18/24-SP650_020222 | 02 Feb 2022 14:00 | | 09 Feb 2022 14:00 | 09 Feb 2022 21:18 | 1 |
| **Batch ID:** R401839 ( 0 ) | **Test Name :** VOLATILES ORGANICS BY METHOD 8260C | | | | **Matrix:** Water | |
| HS22020280-01 | LH18/24-SP650_020222 | 02 Feb 2022 14:00 | | | 08 Feb 2022 14:25 | 1 |
| HS22020280-03 | Trip Blank | 02 Feb 2022 00:00 | | | 08 Feb 2022 13:18 | 1 |
| **Batch ID:** R401884 ( 0 ) | **Test Name :** HEXAVALENT CHROMIUM BY SW7196A | | | | **Matrix:** Water | |
| HS22020280-01 | LH18/24-SP650_020222 | 02 Feb 2022 14:00 | | | 07 Feb 2022 17:09 | 1 |
| **Batch ID:** R402280 ( 0 ) | **Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) | | | | **Matrix:** Water | |
| HS22020280-02 | LH18/24-SP650_020222_AIX | 02 Feb 2022 14:00 | | | 15 Feb 2022 13:50 | 1 |

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22020280

**QC BATCH REPORT**

**Batch ID: 175201 ( 0 )** **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

**MBLK** Sample ID: **MBLK-175201** Units: **mg/L** Analysis Date: **09-Feb-2022 20:55**
Client ID: Run ID: **ICPMS06_401893** SeqNo: **6496784** PrepDate: **09-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 0.00250 | 0.00500 | | | | | | | | U |
| Lead | 0.00100 | 0.00500 | | | | | | | | U |
| Selenium | 0.00250 | 0.00500 | | | | | | | | U |
| Silver | 0.000500 | 0.00500 | | | | | | | | U |

**LCS** Sample ID: **LCS-175201** Units: **mg/L** Analysis Date: **09-Feb-2022 20:57**
Client ID: Run ID: **ICPMS06_401893** SeqNo: **6496785** PrepDate: **09-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 0.05201 | 0.00500 | 0.05 | 0 | 104 | 86 - 114 | | | | |
| Lead | 0.05092 | 0.00500 | 0.05 | 0 | 102 | 88 - 115 | | | | |
| Selenium | 0.05092 | 0.00500 | 0.05 | 0 | 102 | 80 - 120 | | | | |

**LCS** Sample ID: **LCS-175201** Units: **mg/L** Analysis Date: **10-Feb-2022 12:17**
Client ID: Run ID: **ICPMS06_402006** SeqNo: **6497731** PrepDate: **09-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Silver | 0.05036 | 0.00500 | 0.05 | 0 | 101 | 85 - 116 | | | | |

**MS** Sample ID: **HS22011233-09MS** Units: **mg/L** Analysis Date: **09-Feb-2022 21:02**
Client ID: Run ID: **ICPMS06_401893** SeqNo: **6496788** PrepDate: **09-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 0.1203 | 0.00500 | 0.05 | 0.0681 | 104 | 86 - 114 | | | | |
| Lead | 0.05146 | 0.00500 | 0.05 | 0.000314 | 102 | 88 - 115 | | | | |
| Selenium | 0.05238 | 0.00500 | 0.05 | -0.000073 | 105 | 80 - 120 | | | | |

**MS** Sample ID: **HS22011233-09MS** Units: **mg/L** Analysis Date: **10-Feb-2022 12:19**
Client ID: Run ID: **ICPMS06_402006** SeqNo: **6497732** PrepDate: **09-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Silver | 0.05302 | 0.00500 | 0.05 | 0 | 106 | 85 - 116 | | | | |

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22020280

**QC BATCH REPORT**

**Batch ID: 175201 ( 0 )** **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

**MSD** Sample ID: **HS22011233-09MSD** Units: **mg/L** Analysis Date: **09-Feb-2022 21:04**
Client ID: Run ID: **ICPMS06_401893** SeqNo: **6496789** PrepDate: **09-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 0.117 | 0.00500 | 0.05 | 0.0681 | 97.8 | 86 - 114 | 0.1203 | 2.83 | 20 | |
| Lead | 0.04955 | 0.00500 | 0.05 | 0.000314 | 98.5 | 88 - 115 | 0.05146 | 3.78 | 20 | |
| Selenium | 0.05 | 0.00500 | 0.05 | -0.000073 | 100 | 80 - 120 | 0.05238 | 4.65 | 20 | |
| Silver | 0.05637 | 0.00500 | 0.05 | -0.000196 | 113 | 85 - 116 | 0.05909 | 4.71 | 20 | |

**PDS** Sample ID: **HS22011233-09PDS** Units: **mg/L** Analysis Date: **09-Feb-2022 21:06**
Client ID: Run ID: **ICPMS06_401893** SeqNo: **6496790** PrepDate: **09-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 0.1602 | 0.00500 | 0.1 | 0.0681 | 92.1 | 80 - 120 | | | | |
| Lead | 0.0946 | 0.00500 | 0.1 | 0.000314 | 94.3 | 80 - 120 | | | | |
| Selenium | 0.09387 | 0.00500 | 0.1 | -0.000073 | 93.9 | 80 - 120 | | | | |
| Silver | 0.0893 | 0.00500 | 0.1 | -0.000196 | 89.5 | 80 - 120 | | | | |

**SD** Sample ID: **HS22011233-09SD** Units: **mg/L** Analysis Date: **09-Feb-2022 21:00**
Client ID: Run ID: **ICPMS06_401893** SeqNo: **6496787** PrepDate: **09-Feb-2022** DF: **5**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %D | %D Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 0.06978 | 0.0250 | | | | | 0.0681 | 2.47 | 10 | |
| Lead | 0.00500 | 0.0250 | | | | | 0.000314 | 0 | 10 | U |
| Selenium | 0.0125 | 0.0250 | | | | | -0.000073 | 0 | 10 | U |
| Silver | 0.00250 | 0.0250 | | | | | -0.000196 | 0 | 10 | U |

**The following samples were analyzed in this batch:** HS22020280-01

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22020280

**QC BATCH REPORT**

**Batch ID: 175123 ( 0 )** **Instrument: SV-6** **Method: SEMIVOLATILES SIM**

**MBLK** Sample ID: **MBLK-175123** Units: **ug/L** Analysis Date: **16-Feb-2022 16:31**
Client ID: Run ID: **SV-6_402463** SeqNo: **6511740** PrepDate: **08-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,4-Dioxane | 0.010 | 0.010 | | | | | | | | U |
| *Surr: 2-Fluorobiphenyl* | *0.08312* | *0* | *0.08* | *0* | *104* | *40 - 140* | | | | |
| *Surr: 4-Terphenyl-d14* | *0.08893* | *0* | *0.08* | *0* | *111* | *40 - 140* | | | | |
| *Surr: Nitrobenzene-d5* | *0.07567* | *0* | *0.08* | *0* | *94.6* | *40 - 140* | | | | |

**LCS** Sample ID: **LCS-175123** Units: **ug/L** Analysis Date: **16-Feb-2022 16:49**
Client ID: Run ID: **SV-6_402463** SeqNo: **6511741** PrepDate: **08-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,4-Dioxane | 0.08454 | 0.010 | 0.08 | 0 | 106 | 40 - 140 | | | | |
| *Surr: 2-Fluorobiphenyl* | *0.06752* | *0* | *0.08* | *0* | *84.4* | *40 - 140* | | | | |
| *Surr: 4-Terphenyl-d14* | *0.08289* | *0* | *0.08* | *0* | *104* | *40 - 140* | | | | |
| *Surr: Nitrobenzene-d5* | *0.08582* | *0* | *0.08* | *0* | *107* | *40 - 140* | | | | |

**LCSD** Sample ID: **LCSD-175123** Units: **ug/L** Analysis Date: **16-Feb-2022 17:07**
Client ID: Run ID: **SV-6_402463** SeqNo: **6511742** PrepDate: **08-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,4-Dioxane | 0.08332 | 0.010 | 0.08 | 0 | 104 | 40 - 140 | 0.08454 | 1.45 | 20 | |
| *Surr: 2-Fluorobiphenyl* | *0.07719* | *0* | *0.08* | *0* | *96.5* | *40 - 140* | *0.06752* | *13.4* | *20* | |
| *Surr: 4-Terphenyl-d14* | *0.07441* | *0* | *0.08* | *0* | *93.0* | *40 - 140* | *0.08289* | *10.8* | *20* | |
| *Surr: Nitrobenzene-d5* | *0.07475* | *0* | *0.08* | *0* | *93.4* | *40 - 140* | *0.08582* | *13.8* | *20* | |

**The following samples were analyzed in this batch:** HS22020280-01

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22020280

**QC BATCH REPORT**

**Batch ID:** R401839 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220208** Units: **ug/L** Analysis Date: **08-Feb-2022 12:34**
Client ID: Run ID: **VOA9_401839** SeqNo: **6494360** PrepDate: DF: **1**

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

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22020280

**QC BATCH REPORT**

**Batch ID:** R401839 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220208** Units: **ug/L** Analysis Date: **08-Feb-2022 12:34**
Client ID: Run ID: **VOA9_401839** SeqNo: **6494360** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 2.0 | 2.0 | | | | | | | | U |
| Carbon tetrachloride | 1.0 | 1.0 | | | | | | | | U |
| Chlorobenzene | 1.0 | 1.0 | | | | | | | | U |
| Chloroethane | 1.0 | 1.0 | | | | | | | | U |
| Chloroform | 0.50 | 1.0 | | | | | | | | U |
| Chloromethane | 0.50 | 1.0 | | | | | | | | U |
| cis-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| cis-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Dibromochloromethane | 1.0 | 1.0 | | | | | | | | U |
| Dibromomethane | 0.50 | 1.0 | | | | | | | | U |
| Dichlorodifluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Ethylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Hexachlorobutadiene | 1.0 | 1.0 | | | | | | | | U |
| Isopropylbenzene | 1.0 | 1.0 | | | | | | | | U |
| m,p-Xylene | 1.0 | 2.0 | | | | | | | | U |
| Methylene chloride | 2.0 | 2.0 | | | | | | | | U |
| Naphthalene | 1.0 | 1.0 | | | | | | | | U |
| n-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| n-Propylbenzene | 1.0 | 1.0 | | | | | | | | U |
| o-Xylene | 1.0 | 1.0 | | | | | | | | U |
| sec-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Styrene | 1.0 | 1.0 | | | | | | | | U |
| tert-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Tetrachloroethene | 1.0 | 1.0 | | | | | | | | U |
| Toluene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Trichloroethene | 0.50 | 1.0 | | | | | | | | U |
| Trichlorofluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Vinyl chloride | 0.50 | 1.0 | | | | | | | | U |
| *Surr: 1,2-Dichloroethane-d4* | *51.12* | *1.0* | *50* | *0* | *102* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *51.18* | *1.0* | *50* | *0* | *102* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *49.05* | *1.0* | *50* | *0* | *98.1* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *52.29* | *1.0* | *50* | *0* | *105* | *89 - 112* | | | | |

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22020280

**QC BATCH REPORT**

**Batch ID:** R401839 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220208** Units: **ug/L** Analysis Date: **08-Feb-2022 11:49**
Client ID: Run ID: **VOA9_401839** SeqNo: **6494359** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 21.59 | 1.0 | 20 | 0 | 108 | 78 - 124 | | | | |
| 1,1,1-Trichloroethane | 20.94 | 1.0 | 20 | 0 | 105 | 74 - 131 | | | | |
| 1,1,2,2-Tetrachloroethane | 20.1 | 1.0 | 20 | 0 | 101 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 20.08 | 1.0 | 20 | 0 | 100 | 80 - 119 | | | | |
| 1,1-Dichloroethane | 21.72 | 1.0 | 20 | 0 | 109 | 77 - 125 | | | | |
| 1,1-Dichloroethene | 21.83 | 1.0 | 20 | 0 | 109 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 21.05 | 1.0 | 20 | 0 | 105 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 19.93 | 1.0 | 20 | 0 | 99.6 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 19.61 | 1.0 | 20 | 0 | 98.1 | 73 - 122 | | | | |
| 1,2,4-Trichlorobenzene | 20.65 | 1.0 | 20 | 0 | 103 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 23.71 | 1.0 | 20 | 0 | 119 | 76 - 124 | | | | |
| 1,2-Dibromo-3-chloropropane | 18.43 | 1.0 | 20 | 0 | 92.2 | 62 - 128 | | | | |
| 1,2-Dibromoethane | 20.78 | 1.0 | 20 | 0 | 104 | 77 - 121 | | | | |
| 1,2-Dichlorobenzene | 19.33 | 1.0 | 20 | 0 | 96.6 | 80 - 119 | | | | |
| 1,2-Dichloroethane | 21.85 | 1.0 | 20 | 0 | 109 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 19.86 | 1.0 | 20 | 0 | 99.3 | 78 - 122 | | | | |
| 1,3,5-Trimethylbenzene | 21.17 | 1.0 | 20 | 0 | 106 | 75 - 124 | | | | |
| 1,3-Dichlorobenzene | 20.37 | 1.0 | 20 | 0 | 102 | 80 - 119 | | | | |
| 1,3-Dichloropropane | 19.84 | 1.0 | 20 | 0 | 99.2 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 19.82 | 1.0 | 20 | 0 | 99.1 | 79 - 118 | | | | |
| 2,2-Dichloropropane | 21.17 | 1.0 | 20 | 0 | 106 | 60 - 139 | | | | |
| 2-Butanone | 42.81 | 2.0 | 40 | 0 | 107 | 56 - 143 | | | | |
| 2-Chlorotoluene | 21.24 | 1.0 | 20 | 0 | 106 | 79 - 122 | | | | |
| 2-Hexanone | 43.81 | 2.0 | 40 | 0 | 110 | 57 - 139 | | | | |
| 4-Chlorotoluene | 21.56 | 1.0 | 20 | 0 | 108 | 78 - 122 | | | | |
| 4-Isopropyltoluene | 21.43 | 1.0 | 20 | 0 | 107 | 77 - 127 | | | | |
| 4-Methyl-2-pentanone | 42.63 | 2.0 | 40 | 0 | 107 | 67 - 130 | | | | |
| Acetone | 51.69 | 2.0 | 40 | 0 | 129 | 39 - 160 | | | | |
| Benzene | 20.65 | 1.0 | 20 | 0 | 103 | 79 - 120 | | | | |
| Bromobenzene | 20.33 | 1.0 | 20 | 0 | 102 | 80 - 120 | | | | |
| Bromochloromethane | 19.47 | 1.0 | 20 | 0 | 97.3 | 78 - 123 | | | | |
| Bromodichloromethane | 21.52 | 1.0 | 20 | 0 | 108 | 79 - 125 | | | | |
| Bromoform | 18.54 | 1.0 | 20 | 0 | 92.7 | 66 - 130 | | | | |
| Bromomethane | 21.5 | 1.0 | 20 | 0 | 107 | 53 - 141 | | | | |

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22020280

**QC BATCH REPORT**

**Batch ID:** R401839 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220208** Units: **ug/L** Analysis Date: **08-Feb-2022 11:49**
Client ID: Run ID: **VOA9_401839** SeqNo: **6494359** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 46.67 | 2.0 | 40 | 0 | 117 | 64 - 133 | | | | |
| Carbon tetrachloride | 21.79 | 1.0 | 20 | 0 | 109 | 72 - 136 | | | | |
| Chlorobenzene | 20.23 | 1.0 | 20 | 0 | 101 | 82 - 118 | | | | |
| Chloroethane | 22.51 | 1.0 | 20 | 0 | 113 | 60 - 138 | | | | |
| Chloroform | 20.27 | 1.0 | 20 | 0 | 101 | 79 - 124 | | | | |
| Chloromethane | 19.15 | 1.0 | 20 | 0 | 95.8 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 20.02 | 1.0 | 20 | 0 | 100 | 78 - 123 | | | | |
| cis-1,3-Dichloropropene | 19.45 | 1.0 | 20 | 0 | 97.2 | 75 - 124 | | | | |
| Dibromochloromethane | 19.32 | 1.0 | 20 | 0 | 96.6 | 74 - 126 | | | | |
| Dibromomethane | 20.14 | 1.0 | 20 | 0 | 101 | 79 - 123 | | | | |
| Dichlorodifluoromethane | 20.69 | 1.0 | 20 | 0 | 103 | 32 - 152 | | | | |
| Ethylbenzene | 20.9 | 1.0 | 20 | 0 | 105 | 79 - 121 | | | | |
| Hexachlorobutadiene | 22.3 | 1.0 | 20 | 0 | 112 | 66 - 134 | | | | |
| Isopropylbenzene | 22.44 | 1.0 | 20 | 0 | 112 | 72 - 131 | | | | |
| m,p-Xylene | 44.68 | 2.0 | 40 | 0 | 112 | 80 - 121 | | | | |
| Methylene chloride | 21.7 | 2.0 | 20 | 0 | 108 | 74 - 124 | | | | |
| Naphthalene | 19.22 | 1.0 | 20 | 0 | 96.1 | 61 - 128 | | | | |
| n-Butylbenzene | 23.49 | 1.0 | 20 | 0 | 117 | 75 - 128 | | | | |
| n-Propylbenzene | 22.61 | 1.0 | 20 | 0 | 113 | 76 - 126 | | | | |
| o-Xylene | 22 | 1.0 | 20 | 0 | 110 | 78 - 122 | | | | |
| sec-Butylbenzene | 22.96 | 1.0 | 20 | 0 | 115 | 77 - 126 | | | | |
| Styrene | 22.33 | 1.0 | 20 | 0 | 112 | 78 - 123 | | | | |
| tert-Butylbenzene | 22.27 | 1.0 | 20 | 0 | 111 | 78 - 124 | | | | |
| Tetrachloroethene | 21.67 | 1.0 | 20 | 0 | 108 | 74 - 129 | | | | |
| Toluene | 21.37 | 1.0 | 20 | 0 | 107 | 80 - 121 | | | | |
| trans-1,2-Dichloroethene | 20.98 | 1.0 | 20 | 0 | 105 | 75 - 124 | | | | |
| trans-1,3-Dichloropropene | 19.13 | 1.0 | 20 | 0 | 95.6 | 73 - 127 | | | | |
| Trichloroethene | 19.67 | 1.0 | 20 | 0 | 98.3 | 79 - 123 | | | | |
| Trichlorofluoromethane | 22.6 | 1.0 | 20 | 0 | 113 | 65 - 141 | | | | |
| Vinyl chloride | 21.27 | 1.0 | 20 | 0 | 106 | 58 - 137 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *55.16* | *1.0* | *50* | *0* | *110* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *52.38* | *1.0* | *50* | *0* | *105* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *52.88* | *1.0* | *50* | *0* | *106* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *51.53* | *1.0* | *50* | *0* | *103* | *89 - 112* | | | | |

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22020280

**QC BATCH REPORT**

**Batch ID:** R401839 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS22020118-05MS** Units: **ug/L** Analysis Date: **08-Feb-2022 15:10**
Client ID: Run ID: **VOA9_401839** SeqNo: **6494367** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 21.36 | 1.0 | 20 | 0 | 107 | 78 - 124 | | | | |
| 1,1,1-Trichloroethane | 21.26 | 1.0 | 20 | 0 | 106 | 74 - 131 | | | | |
| 1,1,2,2-Tetrachloroethane | 19.72 | 1.0 | 20 | 0 | 98.6 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 19.97 | 1.0 | 20 | 0 | 99.8 | 80 - 119 | | | | |
| 1,1-Dichloroethane | 21.61 | 1.0 | 20 | 0 | 108 | 77 - 125 | | | | |
| 1,1-Dichloroethene | 21.31 | 1.0 | 20 | 0 | 107 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 22.27 | 1.0 | 20 | 0 | 111 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 18.68 | 1.0 | 20 | 0 | 93.4 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 19.17 | 1.0 | 20 | 0 | 95.8 | 73 - 122 | | | | |
| 1,2,4-Trichlorobenzene | 18.81 | 1.0 | 20 | 0 | 94.0 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 23.84 | 1.0 | 20 | 0 | 119 | 76 - 124 | | | | |
| 1,2-Dibromo-3-chloropropane | 17.47 | 1.0 | 20 | 0 | 87.3 | 62 - 128 | | | | |
| 1,2-Dibromoethane | 20.72 | 1.0 | 20 | 0 | 104 | 77 - 121 | | | | |
| 1,2-Dichlorobenzene | 19.48 | 1.0 | 20 | 0 | 97.4 | 80 - 119 | | | | |
| 1,2-Dichloroethane | 22.18 | 1.0 | 20 | 0 | 111 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 19.76 | 1.0 | 20 | 0 | 98.8 | 78 - 122 | | | | |
| 1,3,5-Trimethylbenzene | 21.53 | 1.0 | 20 | 0 | 108 | 75 - 124 | | | | |
| 1,3-Dichlorobenzene | 20.34 | 1.0 | 20 | 0 | 102 | 80 - 119 | | | | |
| 1,3-Dichloropropane | 20.43 | 1.0 | 20 | 0 | 102 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 19.15 | 1.0 | 20 | 0 | 95.7 | 79 - 118 | | | | |
| 2,2-Dichloropropane | 20.33 | 1.0 | 20 | 0 | 102 | 60 - 139 | | | | |
| 2-Butanone | 40.47 | 2.0 | 40 | 0 | 101 | 56 - 143 | | | | |
| 2-Chlorotoluene | 21.61 | 1.0 | 20 | 0 | 108 | 79 - 122 | | | | |
| 2-Hexanone | 42.38 | 2.0 | 40 | 0 | 106 | 57 - 139 | | | | |
| 4-Chlorotoluene | 22.17 | 1.0 | 20 | 0 | 111 | 78 - 122 | | | | |
| 4-Isopropyltoluene | 21.18 | 1.0 | 20 | 0 | 106 | 77 - 127 | | | | |
| 4-Methyl-2-pentanone | 42.72 | 2.0 | 40 | 0 | 107 | 67 - 130 | | | | |
| Acetone | 41.63 | 2.0 | 40 | 0 | 104 | 39 - 160 | | | | |
| Benzene | 20.93 | 1.0 | 20 | 0 | 105 | 79 - 120 | | | | |
| Bromobenzene | 20.48 | 1.0 | 20 | 0 | 102 | 80 - 120 | | | | |
| Bromochloromethane | 18.79 | 1.0 | 20 | 0 | 93.9 | 78 - 123 | | | | |
| Bromodichloromethane | 21.58 | 1.0 | 20 | 0 | 108 | 79 - 125 | | | | |
| Bromoform | 18.38 | 1.0 | 20 | 0 | 91.9 | 66 - 130 | | | | |
| Bromomethane | 14.72 | 1.0 | 20 | 0 | 73.6 | 53 - 141 | | | | |

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22020280

**QC BATCH REPORT**

**Batch ID:** R401839 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS22020118-05MS** Units: **ug/L** Analysis Date: **08-Feb-2022 15:10**
Client ID: Run ID: **VOA9_401839** SeqNo: **6494367** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 45.88 | 2.0 | 40 | 0 | 115 | 64 - 133 | | | | |
| Carbon tetrachloride | 23.35 | 1.0 | 20 | 0 | 117 | 72 - 136 | | | | |
| Chlorobenzene | 20.79 | 1.0 | 20 | 0 | 104 | 82 - 118 | | | | |
| Chloroethane | 23.8 | 1.0 | 20 | 0 | 119 | 60 - 138 | | | | |
| Chloroform | 19.71 | 1.0 | 20 | 0 | 98.6 | 79 - 124 | | | | |
| Chloromethane | 15.79 | 1.0 | 20 | 0 | 78.9 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 20.08 | 1.0 | 20 | 0 | 100 | 78 - 123 | | | | |
| cis-1,3-Dichloropropene | 18.51 | 1.0 | 20 | 0 | 92.5 | 75 - 124 | | | | |
| Dibromochloromethane | 19.59 | 1.0 | 20 | 0 | 98.0 | 74 - 126 | | | | |
| Dibromomethane | 19.58 | 1.0 | 20 | 0 | 97.9 | 79 - 123 | | | | |
| Dichlorodifluoromethane | 13.23 | 1.0 | 20 | 0 | 66.1 | 32 - 152 | | | | |
| Ethylbenzene | 22.1 | 1.0 | 20 | 0 | 111 | 79 - 121 | | | | |
| Hexachlorobutadiene | 18.38 | 1.0 | 20 | 0 | 91.9 | 66 - 134 | | | | |
| Isopropylbenzene | 23.47 | 1.0 | 20 | 0 | 117 | 72 - 131 | | | | |
| m,p-Xylene | 47.06 | 2.0 | 40 | 0 | 118 | 80 - 121 | | | | |
| Methylene chloride | 20.35 | 2.0 | 20 | 0 | 102 | 74 - 124 | | | | |
| Naphthalene | 18.72 | 1.0 | 20 | 0 | 93.6 | 61 - 128 | | | | |
| n-Butylbenzene | 22.3 | 1.0 | 20 | 0 | 112 | 75 - 128 | | | | |
| n-Propylbenzene | 22.94 | 1.0 | 20 | 0 | 115 | 76 - 126 | | | | |
| o-Xylene | 22.74 | 1.0 | 20 | 0 | 114 | 78 - 122 | | | | |
| sec-Butylbenzene | 23.01 | 1.0 | 20 | 0 | 115 | 77 - 126 | | | | |
| Styrene | 21.54 | 1.0 | 20 | 0 | 108 | 78 - 123 | | | | |
| tert-Butylbenzene | 22.5 | 1.0 | 20 | 0 | 112 | 78 - 124 | | | | |
| Tetrachloroethene | 23.2 | 1.0 | 20 | 0 | 116 | 74 - 129 | | | | |
| Toluene | 22.34 | 1.0 | 20 | 0 | 112 | 80 - 121 | | | | |
| trans-1,2-Dichloroethene | 20.42 | 1.0 | 20 | 0 | 102 | 75 - 124 | | | | |
| trans-1,3-Dichloropropene | 18.13 | 1.0 | 20 | 0 | 90.6 | 73 - 127 | | | | |
| Trichloroethene | 20.74 | 1.0 | 20 | 0 | 104 | 79 - 123 | | | | |
| Trichlorofluoromethane | 22.81 | 1.0 | 20 | 0 | 114 | 65 - 141 | | | | |
| Vinyl chloride | 19.21 | 1.0 | 20 | 0 | 96.1 | 58 - 137 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *49.82* | *1.0* | *50* | *0* | *99.6* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *53.81* | *1.0* | *50* | *0* | *108* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *50.05* | *1.0* | *50* | *0* | *100* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *53.26* | *1.0* | *50* | *0* | *107* | *89 - 112* | | | | |

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22020280

**QC BATCH REPORT**

**Batch ID:** R401839 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS22020118-05MSD** Units: **ug/L** Analysis Date: **08-Feb-2022 15:32**
Client ID: Run ID: **VOA9_401839** SeqNo: **6494368** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 20.66 | 1.0 | 20 | 0 | 103 | 78 - 124 | 21.36 | 3.3 | 20 | |
| 1,1,1-Trichloroethane | 20.56 | 1.0 | 20 | 0 | 103 | 74 - 131 | 21.26 | 3.35 | 20 | |
| 1,1,2,2-Tetrachloroethane | 18.99 | 1.0 | 20 | 0 | 94.9 | 71 - 121 | 19.72 | 3.76 | 20 | |
| 1,1,2-Trichloroethane | 19.47 | 1.0 | 20 | 0 | 97.4 | 80 - 119 | 19.97 | 2.5 | 20 | |
| 1,1-Dichloroethane | 20.51 | 1.0 | 20 | 0 | 103 | 77 - 125 | 21.61 | 5.18 | 20 | |
| 1,1-Dichloroethene | 20.7 | 1.0 | 20 | 0 | 104 | 71 - 131 | 21.31 | 2.9 | 20 | |
| 1,1-Dichloropropene | 21.2 | 1.0 | 20 | 0 | 106 | 78 - 125 | 22.27 | 4.94 | 20 | |
| 1,2,3-Trichlorobenzene | 18.62 | 1.0 | 20 | 0 | 93.1 | 69 - 129 | 18.68 | 0.334 | 20 | |
| 1,2,3-Trichloropropane | 18.41 | 1.0 | 20 | 0 | 92.0 | 73 - 122 | 19.17 | 4.05 | 20 | |
| 1,2,4-Trichlorobenzene | 18.36 | 1.0 | 20 | 0 | 91.8 | 69 - 130 | 18.81 | 2.41 | 20 | |
| 1,2,4-Trimethylbenzene | 23.3 | 1.0 | 20 | 0 | 117 | 76 - 124 | 23.84 | 2.29 | 20 | |
| 1,2-Dibromo-3-chloropropane | 17.78 | 1.0 | 20 | 0 | 88.9 | 62 - 128 | 17.47 | 1.77 | 20 | |
| 1,2-Dibromoethane | 20.06 | 1.0 | 20 | 0 | 100 | 77 - 121 | 20.72 | 3.25 | 20 | |
| 1,2-Dichlorobenzene | 18.85 | 1.0 | 20 | 0 | 94.2 | 80 - 119 | 19.48 | 3.32 | 20 | |
| 1,2-Dichloroethane | 20.76 | 1.0 | 20 | 0 | 104 | 73 - 128 | 22.18 | 6.65 | 20 | |
| 1,2-Dichloropropane | 18.72 | 1.0 | 20 | 0 | 93.6 | 78 - 122 | 19.76 | 5.39 | 20 | |
| 1,3,5-Trimethylbenzene | 20.67 | 1.0 | 20 | 0 | 103 | 75 - 124 | 21.53 | 4.1 | 20 | |
| 1,3-Dichlorobenzene | 19.39 | 1.0 | 20 | 0 | 96.9 | 80 - 119 | 20.34 | 4.78 | 20 | |
| 1,3-Dichloropropane | 19.64 | 1.0 | 20 | 0 | 98.2 | 80 - 119 | 20.43 | 3.94 | 20 | |
| 1,4-Dichlorobenzene | 18.76 | 1.0 | 20 | 0 | 93.8 | 79 - 118 | 19.15 | 2.03 | 20 | |
| 2,2-Dichloropropane | 18.89 | 1.0 | 20 | 0 | 94.4 | 60 - 139 | 20.33 | 7.33 | 20 | |
| 2-Butanone | 38.44 | 2.0 | 40 | 0 | 96.1 | 56 - 143 | 40.47 | 5.12 | 20 | |
| 2-Chlorotoluene | 20.76 | 1.0 | 20 | 0 | 104 | 79 - 122 | 21.61 | 4.04 | 20 | |
| 2-Hexanone | 42.48 | 2.0 | 40 | 0 | 106 | 57 - 139 | 42.38 | 0.249 | 20 | |
| 4-Chlorotoluene | 21.04 | 1.0 | 20 | 0 | 105 | 78 - 122 | 22.17 | 5.24 | 20 | |
| 4-Isopropyltoluene | 20.4 | 1.0 | 20 | 0 | 102 | 77 - 127 | 21.18 | 3.79 | 20 | |
| 4-Methyl-2-pentanone | 41.94 | 2.0 | 40 | 0 | 105 | 67 - 130 | 42.72 | 1.85 | 20 | |
| Acetone | 39.61 | 2.0 | 40 | 0 | 99.0 | 39 - 160 | 41.63 | 4.97 | 20 | |
| Benzene | 19.92 | 1.0 | 20 | 0 | 99.6 | 79 - 120 | 20.93 | 4.93 | 20 | |
| Bromobenzene | 19.76 | 1.0 | 20 | 0 | 98.8 | 80 - 120 | 20.48 | 3.59 | 20 | |
| Bromochloromethane | 17.73 | 1.0 | 20 | 0 | 88.7 | 78 - 123 | 18.79 | 5.78 | 20 | |
| Bromodichloromethane | 20.27 | 1.0 | 20 | 0 | 101 | 79 - 125 | 21.58 | 6.28 | 20 | |
| Bromoform | 17.81 | 1.0 | 20 | 0 | 89.1 | 66 - 130 | 18.38 | 3.16 | 20 | |
| Bromomethane | 15.61 | 1.0 | 20 | 0 | 78.1 | 53 - 141 | 14.72 | 5.9 | 20 | |

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22020280

**QC BATCH REPORT**

**Batch ID:** R401839 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS22020118-05MSD** Units: **ug/L** Analysis Date: **08-Feb-2022 15:32**
Client ID: Run ID: **VOA9_401839** SeqNo: **6494368** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 43.53 | 2.0 | 40 | 0 | 109 | 64 - 133 | 45.88 | 5.24 | 20 | |
| Carbon tetrachloride | 22.45 | 1.0 | 20 | 0 | 112 | 72 - 136 | 23.35 | 3.93 | 20 | |
| Chlorobenzene | 19.87 | 1.0 | 20 | 0 | 99.4 | 82 - 118 | 20.79 | 4.51 | 20 | |
| Chloroethane | 21.1 | 1.0 | 20 | 0 | 105 | 60 - 138 | 23.8 | 12 | 20 | |
| Chloroform | 18.8 | 1.0 | 20 | 0 | 94.0 | 79 - 124 | 19.71 | 4.77 | 20 | |
| Chloromethane | 15.3 | 1.0 | 20 | 0 | 76.5 | 50 - 139 | 15.79 | 3.1 | 20 | |
| cis-1,2-Dichloroethene | 19.27 | 1.0 | 20 | 0 | 96.3 | 78 - 123 | 20.08 | 4.14 | 20 | |
| cis-1,3-Dichloropropene | 17.91 | 1.0 | 20 | 0 | 89.6 | 75 - 124 | 18.51 | 3.28 | 20 | |
| Dibromochloromethane | 19 | 1.0 | 20 | 0 | 95.0 | 74 - 126 | 19.59 | 3.06 | 20 | |
| Dibromomethane | 19.09 | 1.0 | 20 | 0 | 95.4 | 79 - 123 | 19.58 | 2.56 | 20 | |
| Dichlorodifluoromethane | 12.84 | 1.0 | 20 | 0 | 64.2 | 32 - 152 | 13.23 | 2.95 | 20 | |
| Ethylbenzene | 21.25 | 1.0 | 20 | 0 | 106 | 79 - 121 | 22.1 | 3.93 | 20 | |
| Hexachlorobutadiene | 18.28 | 1.0 | 20 | 0 | 91.4 | 66 - 134 | 18.38 | 0.554 | 20 | |
| Isopropylbenzene | 22.72 | 1.0 | 20 | 0 | 114 | 72 - 131 | 23.47 | 3.27 | 20 | |
| m,p-Xylene | 44.62 | 2.0 | 40 | 0 | 112 | 80 - 121 | 47.06 | 5.32 | 20 | |
| Methylene chloride | 19.8 | 2.0 | 20 | 0 | 99.0 | 74 - 124 | 20.35 | 2.72 | 20 | |
| Naphthalene | 18.37 | 1.0 | 20 | 0 | 91.9 | 61 - 128 | 18.72 | 1.85 | 20 | |
| n-Butylbenzene | 21.73 | 1.0 | 20 | 0 | 109 | 75 - 128 | 22.3 | 2.59 | 20 | |
| n-Propylbenzene | 22.13 | 1.0 | 20 | 0 | 111 | 76 - 126 | 22.94 | 3.57 | 20 | |
| o-Xylene | 22 | 1.0 | 20 | 0 | 110 | 78 - 122 | 22.74 | 3.34 | 20 | |
| sec-Butylbenzene | 21.92 | 1.0 | 20 | 0 | 110 | 77 - 126 | 23.01 | 4.83 | 20 | |
| Styrene | 20.73 | 1.0 | 20 | 0 | 104 | 78 - 123 | 21.54 | 3.82 | 20 | |
| tert-Butylbenzene | 21.24 | 1.0 | 20 | 0 | 106 | 78 - 124 | 22.5 | 5.74 | 20 | |
| Tetrachloroethene | 21.46 | 1.0 | 20 | 0 | 107 | 74 - 129 | 23.2 | 7.8 | 20 | |
| Toluene | 21.6 | 1.0 | 20 | 0 | 108 | 80 - 121 | 22.34 | 3.34 | 20 | |
| trans-1,2-Dichloroethene | 19.83 | 1.0 | 20 | 0 | 99.1 | 75 - 124 | 20.42 | 2.93 | 20 | |
| trans-1,3-Dichloropropene | 18.01 | 1.0 | 20 | 0 | 90.0 | 73 - 127 | 18.13 | 0.675 | 20 | |
| Trichloroethene | 19.57 | 1.0 | 20 | 0 | 97.8 | 79 - 123 | 20.74 | 5.81 | 20 | |
| Trichlorofluoromethane | 21.75 | 1.0 | 20 | 0 | 109 | 65 - 141 | 22.81 | 4.76 | 20 | |
| Vinyl chloride | 18.35 | 1.0 | 20 | 0 | 91.8 | 58 - 137 | 19.21 | 4.59 | 20 | |
| *Surr: 1,2-Dichloroethane-d4* | *49.86* | *1.0* | *50* | *0* | *99.7* | *81 - 118* | *49.82* | *0.0662* | *20* | |
| *Surr: 4-Bromofluorobenzene* | *53.02* | *1.0* | *50* | *0* | *106* | *85 - 114* | *53.81* | *1.47* | *20* | |
| *Surr: Dibromofluoromethane* | *50.31* | *1.0* | *50* | *0* | *101* | *80 - 119* | *50.05* | *0.523* | *20* | |
| *Surr: Toluene-d8* | *53.3* | *1.0* | *50* | *0* | *107* | *89 - 112* | *53.26* | *0.0622* | *20* | |

**ALS Houston, US** Date: 21-Feb-22

| | | |
|---|---|---|
| **Client:** | Bhate Environmental Associates, Inc. | **QC BATCH REPORT** |
| **Project:** | Longhorn GW Treatment Plant Monthly Effluent Samples | |
| **WorkOrder:** | HS22020280 | |

| | | | | | |
|---|---|---|---|---|---|
| **Batch ID:** | **R401839 ( 0 )** | **Instrument:** | **VOA9** | **Method:** | **VOLATILES ORGANICS BY METHOD 8260C** |

**The following samples were analyzed in this batch:** HS22020280-01 HS22020280-03

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22020280

**QC BATCH REPORT**

**Batch ID:** R401884 ( 0 ) **Instrument:** UV-2450 **Method:** HEXAVALENT CHROMIUM BY SW7196A

**MBLK** Sample ID: **MBLK-R401884** Units: **mg/L** Analysis Date: **07-Feb-2022 17:09**
Client ID: Run ID: **UV-2450_401884** SeqNo: **6495304** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 0.0100 | 0.0100 | | | | | | | | U |

**LCS** Sample ID: **LCS-R401884** Units: **mg/L** Analysis Date: **07-Feb-2022 17:09**
Client ID: Run ID: **UV-2450_401884** SeqNo: **6495303** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 0.258 | 0.0100 | 0.25 | 0 | 103 | 90 - 111 | | | | |

**MS** Sample ID: **HS22020280-01MS** Units: **mg/L** Analysis Date: **07-Feb-2022 17:09**
Client ID: **LH18/24-SP650_020222** Run ID: **UV-2450_401884** SeqNo: **6495298** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 0.258 | 0.0100 | 0.25 | 0 | 103 | 90 - 111 | | | | |

**MSD** Sample ID: **HS22020280-01MSD** Units: **mg/L** Analysis Date: **07-Feb-2022 17:09**
Client ID: **LH18/24-SP650_020222** Run ID: **UV-2450_401884** SeqNo: **6495297** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 0.256 | 0.0100 | 0.25 | 0 | 102 | 90 - 111 | 0.258 | 0.778 | 20 | |

**The following samples were analyzed in this batch:** HS22020280-01

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** **HS22020280**

## 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 |
| Florida | E87611-34 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 21-Feb-22

## Sample Receipt Checklist

**Work Order ID:** HS22020280 **Date/Time Received:** **07-Feb-2022 09:20**

**Client Name:** Bhate Environmental **Received by:** **Nilesh D. Ranchod**

**Completed By:** /S/ Pablo Marinez (eSignature) 07-Feb-2022 11:57 (Date/Time) **Reviewed by:** /S/ Ragen Giga (eSignature) 07-Feb-2022 15:57 (Date/Time)

Matrices: **WATER** Carrier name: **FedEx Priority Overnight**

| | Yes | No | |
|---|---|---|---|
| Shipping container/cooler in good condition? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on shipping container/cooler? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on sample bottles? | ☐ | ☐ | Not Present ☑ |
| VOA/TX1005/TX1006 Solids in hermetically sealed vials? | ☐ | ☐ | Not Present ☑ |
| Chain of custody present? | ☑ | ☐ | 1 Page(s) |
| Chain of custody signed when relinquished and received? | ☑ | ☐ | COC IDs:CLIENT |
| Samplers name present on COC? | ☑ | ☐ | |
| Chain of custody agrees with sample labels? | ☑ | ☐ | |
| Samples in proper container/bottle? | ☑ | ☐ | |
| Sample containers intact? | ☑ | ☐ | |
| Sufficient sample volume for indicated test? | ☑ | ☐ | |
| All samples received within holding time? | ☐ | ☑ | |
| Container/Temp Blank temperature in compliance? | ☑ | ☐ | |

Temperature(s)/Thermometer(s): 1.0°C/1.5°C UC/C | IR 31

Cooler(s)/Kit(s): BLUE

Date/Time sample(s) sent to storage: 2/7/22 12:05

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

pH adjusted by:

Login Notes: Samples received out of hold (FEDEX weather related Delay), proceed with analyses per Client Confirmation

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: Ragen Gigi

Page 1 of 1

**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:**
## GROUNDWATER TREATMENT PLANT MONTHLY EFFLUENT SAMPLES

**Prepared By:** Scott Beesinger

**P.O. Number**

HS22020280
Bhate Environmental Associates, Inc.
ıghorn GW Treatment Plant Monthly Effluent Sample

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | VOLATILES | SILVER, SELENIUM, LEAD, BARIUM | HEXAVALENT CHROMIUM | 1, 4 - DIOXANE | PERCHLORATE | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_020222 | Water | 02/02/22 / 14:00 | | 3 | X | | | | | | | | | | HCL | |
| LH18/24-SP650_020222 | Water | 02/02/22 / 14:00 | | 2 | | | X | X | | | | | | | NONE | |
| LH18/24-SP650_020222_AIX | Water | 02/02/22 / 14:00 | | 1 | | | | | X | | | | | | NONE | |
| LH18/24-SP650_020222 | Water | 02/02/22 / 14:00 | | 1 | | X | | | | | | | | | HNO3 | |
| Trip Blank | Water | 02/02/22 | | 2 | X | | | | | | | | | | HCL | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Additional Remarks: **Standard TAT on all parameters**

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 02/02/22 | 14:30 | NW | 2/3/22 | 09.20 | | | | | | |

**For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Remarks:

Blue Temp U/C 1.0 Cl+0.5
IR 31

(Word) S:\1-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

BMC

**CUSTODY SEAL**

Date: 2/2/22 Time: 1430
Name: Scott Beesinger
Company: BHAT

Seal Broken By: SM
Date: 02/07/22

BMC FEB 07 2022

Part # 159469-434 RIT2 EXP 10/20

**Must Deliver Next Business Day**
**Time and Tempature Sensitive!**

BMC

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM
1203-B EAST GRAND AVE
PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 27JAN20
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 19x16x13 IN

DAC/FB/BF/23155

TO **CLIENT SERVICES**
**ALS LABORATORY GROUP**
**10450 STANCLIFF ROAD**
**SUITE 210**
**HOUSTON TX 77099**
(281) 530-5656
**REF: LHAAP 4 – RJ**

RMA:

FedEx Express

FedEx
TRK# 0221 1251 0293 9820

**THU - 03 FEB AA**
**PRIORITY OVERNIGHT**

**AB SGRA**

**77099**
TX-US
**IAH**

FedEx label THU-03 FEB
Received 02/07/22

February 14, 2022

Service Request No:E2200107

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS22020280**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory February 07, 2022
For your reference, these analyses have been assigned our service request number **E2200107.**

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**
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Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

**ALS Environmental**

| | | | |
|---|---|---|---|
| **Client:** | ALS Houston | **Service Request No.:** | E2200107 |
| **Project:** | HS22020280 | **Date Received:** | 02/07/22 |
| **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 02/07/22.

The sample was received in good condition and is 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:**

EQ2200053: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS-DLCS recoveries met acceptance criteria.

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:**E2200107
**Project:** HS22020280

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2200107-001 | LH18/24-SP650_020222_AIX | 2/2/2022 | 1400 |

# Service Request Summary

**Folder #:** **E2200107**
Client Name: ALS Environmental - US
Project Name: HS22020280
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 02/07/22
Internal Due Date: 2/21/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22020280
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON ClO4 DOD/6850 |
|---|---|---|---|---|
| E2200107-001 | LH18/24-SP650_020222_AIX | Ground Water | 02/02/22 1400 | **IV** |

# Service Request Summary

| | | | |
|---|---|---|---|
| **Folder #:** | **E2200107** | Project Chemist: | Corey Grandits |
| Client Name: | ALS Environmental - US | Originating Lab: | HOUSTON |
| Project Name: | HS22020280 | Logged By: | CGRANDITS |
| Project Number: | | Date Received: | 02/07/22 |
| | | Internal Due Date: | 2/21/2022 |
| **Report To:** | Ragen Giga<br>ALS Environmental - US<br>10450 Stancliff Rd Suite 210<br>Houston, TX 77099<br>USA | QAP: | LAB QAP |
| | | Qualifier Set: | Lab Standard |
| | | Formset: | Lab Standard |
| | | Merged?: | Y |
| Phone Number: | | Report to MDL?: | Y |
| Cell Number: | | P.O. Number: | HS22020280 |
| Fax Number: | | EDD: | No EDD Specified |
| E-mail: | ragenp.giga@alsglobal.com | | |

1 120 mL-Plastic Bottle Natural WM Unpreserved

**Location:** EHRMS-AirArch 1

**Pressure Gas:**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 1 | Level IV due 2/28 |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| + | Possible Tedlar bag artifact. |
| A | TIC is a suspected aldol-condensation product |
| B | Analyte found in the associated method blank as well as in the sample. |
| BC | Reported results are not blank corrected. |
| BH | The back section of the tube yielded higher results than the front. |
| BT | Results indicated possible breakthrough; back section >=10% front section. |
| C | Result identification confirmed. |
| D | Compound identified in an analysis at a secondary dilution factor |
| D | Spike was diluted out |
| DE | Reported results are corrected for desorption efficiency. |
| E | Estimated value. Concentration above calibration range |
| E | The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample. |
| F | The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard. |
| H | The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard. |
| H1 | Sample analysis performed past holding time. See case narrative. |
| H2 | Initial analysis within holding time. Reanalysis for the required dilution was past holding time. |
| H3 | Sample was received and analyzed past holding time. |
| H4 | Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative. |
| I | Internal standard not within the specified limits. See case narrative. |
| J | Estimated Value. Concentration found below MRL. |
| K | A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate. |
| K | Analyte was detected above the method reporting limit prior to normalization. |
| K | The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result. |
| L | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard. |
| L1 | Laboratory control sample recovery outside the specified limits; results may be biased high. |
| L2 | Laboratory control sample recovery outside the specified limits; results may be biased low. |
| L3 | Laboratory control sample recovery outside the specified limits. |
| M | Matrix interference; results may be biased high. |
| M | The duplicate injection precision not met. |
| M1 | Matrix interference due to coelution with a non-target compound; results may be biased high. |
| N | Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search. |
| N | The Matrix Spike sample recovery is not within control limits. See case narrative. |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| O | The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard. |
| P | Indicates chlorodiphenyl ether interference present at the retention time of the target compound. |
| P | Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns |
| Q | Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria. |
| R | Duplicate Precision not met. |
| R1 | Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated. |
| S | Surrogate recovery not within specified limits. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| T | Analyte is a tentatively identified compound, result is estimated. |
| U | Compound was analyzed for, but was not detected (ND). |
| V1 | The continuing calibration verification standard was outside (biased high) the specified limits for this compound. |
| V2 | The continuing calibration verification standard was outside (biased low) the specified limits for this compound. |
| W | Result quantified, but the corresponding peak was detected outside the generated retention time window. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| X | See case narrative. |
| Y | Recovery outside limits |
| Y | The chromatogram resembles a petroleum product but does not match the calibration standard. |
| Z | The chromatogram does not resemble a petroleum product. |
| i | The MRL/MDL has been elevated due to a matrix interference. |

# ALS Laboratory Group

## Acronyms

| | |
|---|---|
| Cal | Calibration |
| Conc | CONCentration |
| Dioxin(s) | Polychlorinated dibenzo-p-dioxin(s) |
| EDL | Estimated Detection Limit |
| EMPC | Estimated Maximum Possible Concentration |
| Flags | Data qualifiers |
| Furan(s) | Polychlorinated dibenzofuran(s) |
| g | Grams |
| ICAL | Initial CALibration |
| ID | IDentifier |
| Ions | Masses monitored for the analyte during data acquisition |
| L | Liter (s) |
| LCS | Laboratory Control Sample |
| DLCS | Duplicate Laboratory Control Sample |
| MB | Method Blank |
| MCL | Method Calibration Limit |
| MDL | Method Detection Limit |
| mL | Milliliters |
| MS | Matrix Spiked sample |
| DMS | Duplicate Matrix Spiked sample |
| NO | Number of peaks meeting all identification criteria |
| PCDD(s) | Polychlorinated dibenzo-p-dioxin(s) |
| PCDF(s) | Polychlorinated dibenzofuran(s) |
| ppb | Parts per billion |
| ppm | Parts per million |
| ppq | Parts per quadrillion |
| ppt | Parts per trillion |
| QA | Quality Assurance |
| QC | Quality Control |
| Ratio | Ratio of areas from monitored ions for an analyte |
| % Rec. | Percent recovery |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| RT | Retention Time |
| SDG | Sample Delivery Group |
| S/N | Signal-to-noise ratio |
| TEF | Toxicity Equivalence Factor |
| TEQ | Toxicity Equivalence Quotient |

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ALS Environmental

## State Certifications, Accreditations, and Licenses

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas Department of Environmental Quality | 19-028-0 | 6/30/2022 |
| Arkansas Department of Environmental Quality | 21-022-0 | 3/26/2022 |
| Florida Department of Health | E87611-33 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 5/1/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
**T:** +1 281 530 5656
**F:** +1 281 530 5887
**www.alsglobal.com**

# Subcontract Chain of Custody

**SAMPLING STATE:** **Dept of Defense** **COC ID:** **18105**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

**Company:** ALS Houston
**Contact:** Ragen Giga
**Address:** 10450 Stancliff Rd, Ste 210
**Phone:** +1 281 530 5656
**Email:** RagenP.Giga@ALSGlobal.com
**Alternate Contact:**
**Email:**

**INVOICE INFORMATION:**

**Company:** ALS Houston
**Contact:** Accounts Payable
**Address:** 10450 Stancliff Rd, Ste 210
**Phone:** +1 281 530 5656
**Reference:** HS22020280
**TSR:** Sonia West

| | LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | | | DUE DATE |
| **1.** | **HS22020280-02** | **LH18/24-SP650_020222_AIX** | **Water** | **02 Feb 2022 14:00** |
| | Provide Level II and Level IV reports in separate pdf | | | 21 Feb 2022 |

**Comments:** Please analyze for the analysis listed above.
Send report to the emails shown above.

**QC Level:** DOD IV (DoD Data Package)

Relinquished By: PaN Date/Time: 2-7-22 12:15
Received By: COREY G Date/Time: 2-7-22 1214
Cooler ID(s): Temperature(s):

ALS Environmental

# Cooler Receipt Form

Project Chemist: IG

Client/Project: ALS-H

Thermometer ID: IR\1 CF-US

Date/Time Received: 2-7-22 Initials: IG

Date/Time Logged in: 2-7-22 Initials: IG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☒ Courier (ALS) ○ Client
2. Samples received in: ☒ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ☒ No
   Were they intact? ○ Yes ○ No ☒ N/A
   Were they signed and dated? ○ Yes ○ No ☒ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ☒ Baggies ○ Bubble Wrap ○ Gel Packs ☒ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

| Cooler Tracking Number | COC ID | Date Opened | Time Opened | Opened By | Temp. °C | Temp Blank? |
|---|---|---|---|---|---|---|
| NA | | 2-7-22 | 1215 | IG | 1.7/2.2 | ☒ |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☒ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☒ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☒ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☒ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☒ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

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#:** 395241 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** **Prep Date/Time:** 2/14/22 10:28

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2200107-001 | LH18/24-SP650_020222_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 2 | E2200108-001 | LH18/24-SP650_020222_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 3 | E2200109-001 | LH18/24-SP140_020222 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 4 | E2200122-001 | LHAAP17_AreaH_021022 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 5 | E2200123-001 | LH18/24-SP650_021022_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 6 | EQ2200053-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 7 | EQ2200053-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 8 | EQ2200053-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |

## Spiking Solutions

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 221408 Logbook Ref: Perchlorate Internal Standard Expires On: 04/30/2022

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E2200107-001 | 100.00µL | E2200108-001 | 100.00µL | E2200109-001 | 100.00µL | E2200122-001 | 100.00µL | E2200123-001 | 100.00µL | EQ2200053-01 | 100.00µL |
| EQ2200053-02 | 100.00µL | EQ2200053-03 | 100.00µL | | | | | | | | |

Name: Perchlorate Intermediate Stock1 Inventory ID 221456 Logbook Ref: Perchlorate Expires On: 04/30/2022

| | | | |
|---|---|---|---|
| EQ2200053-02 | 1.00µL | EQ2200053-03 | 1.00µL |

## Preparation Materials

| | | | | | |
|---|---|---|---|---|---|
| Water HPLC Grade | 08/03/2021 Water (218530) | 6850 Amber Glass screw vial | 2mL Screw Top Vial (221308) | 6850 Luer-Lok Syringes | Luer-Lok Syringes (221305) |
| 6850 Pipette Tips 50-1000 uL | 6850 Pipette Tips (221307) | 6850 0.45um syringe filters | 6850 Syringe Filters (219639) | 537M Glass Culture Tubes | 537M Glass Tubes (218064) |

## Preparation Steps

Step: Preparation
Started: 2/14/22 10:28
Finished: 2/14/22 11:00
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 2/14/22

# 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:** | E2200107 |
| **Project:** | HS22020280 | **Date Collected:** | 2/ 2/22 1400 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 2/ 7/22 |
| **Sample Name:** | LH18/24-SP650_020222_AIX | **Units:** | µg/L |
| **Lab Code:** | E2200107-001 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | ND | U | 0.100 | 0.0500 | 0.0250 | 1 | 2/14/22 | 2/14/22 12:54 | 395241 | 754518 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200107 |
| **Project:** | HS22020280 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2200053-01 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | ND | U | 0.100 | 0.0500 | 0.0250 | 1 | 2/14/22 | 2/14/22 12:15 | 395241 | 754518 | |

# 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:** | E2200107 |
| **Project:** | HS22020280 | **Date Analyzed:** | 2/14/22 |
| **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:** | | **Basis:** | NA |
| | | **Extraction Lot:** | 395241 |

| | Lab Control Sample EQ2200053-02 | | | Duplicate Lab Control Sample EQ2200053-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.0863 | 0.100 | 86 | 0.0995 | 0.100 | 100 | 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:** | E2200107 |
| **Project:** | HS22020280 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200053-02 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.0863** | J | 0.100 | 0.0500 | 0.0250 | 1 | 2/14/22 | 2/14/22 12:22 | 395241 | 754518 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200107 |
| **Project:** | HS22020280 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200053-03 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.0995** | J | 0.100 | 0.0500 | 0.0250 | 1 | 2/14/22 | 2/14/22 12:30 | 395241 | 754518 | |

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

February 21, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22020282**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia Olive,

ALS Environmental received 2 sample(s) on Feb 07, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: JUMOKE.LAWAL**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22020282

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22020282-01 | LH18/24-SP650_020222 | Water | | 02-Feb-2022 14:00 | 07-Feb-2022 09:20 | ☐ |
| HS22020282-02 | LH18/24-SP650_020222_AIX | Water | | 02-Feb-2022 14:00 | 07-Feb-2022 09:20 | ☐ |

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22020282

**CASE NARRATIVE**

## Work Order Comments

- Samples received out of hold (weather related FEDEX Delay), proceed with analyses per Client confirmation.

## Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached

## WetChemistry by Method E415.1

### Batch ID: R402591

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E350.3

### Batch ID: R402440

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E365.3

### Batch ID: R402242

**Sample ID: LH18/24-SP650_020222 (HS22020282-01)**

- Sample was analyzed outside of the holding time at the request of the client. Results should be considered estimated.

**ALS Houston, US** Date: 21-Feb-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS22020282 |
| Sample ID: | LH18/24-SP650_020222 | Lab ID:HS22020282-01 |
| Collection Date: | 02-Feb-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **AMMONIA AS N BY E350.3(ISE)** | | **Method:E350.3** | | | | | | Analyst: MZD |
| **Nitrogen, Ammonia (As N)** | **25** | a | **0.10** | **0.20** | **0.20** | **mg/L** | 1 | 16-Feb-2022 13:40 |
| **ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978** | | **Method:E365.3** | | | | | | Analyst: MZD |
| **Phosphorus, Total Orthophosphate (As P)** | **0.967** | Ha | **0.0100** | **0.0250** | **0.0250** | **mg/L** | 1 | 09-Feb-2022 15:13 |
| **TOTAL ORGANIC CARBON BY E415.1** | | **Method:E415.1** | | | | | | Analyst: JAC |
| **Organic Carbon, Total** | **22.6** | a | **0.500** | **1.00** | **1.00** | **mg/L** | 1 | 18-Feb-2022 21:51 |

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

**ALS Houston, US** Date: 21-Feb-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS22020282 |
| Sample ID: | LH18/24-SP650_020222_AIX | Lab ID:HS22020282-02 |
| Collection Date: | 02-Feb-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 15-Feb-2022 13:50 |

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

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22020282

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** R402242 ( 0 ) | **Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978 | | | | **Matrix:** Water | |
| HS22020282-01 | LH18/24-SP650_020222 | 02 Feb 2022 14:00 | | | 09 Feb 2022 15:13 | 1 |
| **Batch ID:** R402280 ( 0 ) | **Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) | | | | **Matrix:** Water | |
| HS22020282-02 | LH18/24-SP650_020222_AIX | 02 Feb 2022 14:00 | | | 15 Feb 2022 13:50 | 1 |
| **Batch ID:** R402440 ( 0 ) | **Test Name :** AMMONIA AS N BY E350.3(ISE) | | | | **Matrix:** Water | |
| HS22020282-01 | LH18/24-SP650_020222 | 02 Feb 2022 14:00 | | | 16 Feb 2022 13:40 | 1 |
| **Batch ID:** R402591 ( 0 ) | **Test Name :** TOTAL ORGANIC CARBON BY E415.1 | | | | **Matrix:** Water | |
| HS22020282-01 | LH18/24-SP650_020222 | 02 Feb 2022 14:00 | | | 18 Feb 2022 21:51 | 1 |

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22020282

**QC BATCH REPORT**

**Batch ID:** R402242 ( 0 ) **Instrument:** UV-2450 **Method:** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978

**MBLK** Sample ID: **MBLK-R402242** Units: **mg/L** Analysis Date: **09-Feb-2022 15:13**
Client ID: Run ID: **UV-2450_402242** SeqNo: **6502530** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.0250 | 0.0250 | | | | | | | | U |

**LCS** Sample ID: **LCS-R402242** Units: **mg/L** Analysis Date: **09-Feb-2022 15:13**
Client ID: Run ID: **UV-2450_402242** SeqNo: **6502529** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.276 | 0.0250 | 0.25 | 0 | 110 | 85 - 115 | | | | |

**LCSD** Sample ID: **LCSD-R402242** Units: **mg/L** Analysis Date: **09-Feb-2022 15:13**
Client ID: Run ID: **UV-2450_402242** SeqNo: **6502528** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.276 | 0.0250 | 0.25 | 0 | 110 | 85 - 115 | 0.276 | 0 | 20 | |

**The following samples were analyzed in this batch:** HS22020282-01

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22020282

**QC BATCH REPORT**

**Batch ID: R402440 ( 0 )** **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

**MBLK** Sample ID: **MBLK-R402440** Units: **mg/L** Analysis Date: **16-Feb-2022 13:40**
Client ID: Run ID: **WetChem_HS_402440** SeqNo: **6507403** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 0.20 | 0.20 | | | | | | | | U |

**LCS** Sample ID: **LCS-R402440** Units: **mg/L** Analysis Date: **16-Feb-2022 13:40**
Client ID: Run ID: **WetChem_HS_402440** SeqNo: **6507402** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 10.51 | 0.20 | 10 | 0 | 105 | 80 - 120 | | | | |

**MS** Sample ID: **HS22020604-01MS** Units: **mg/L** Analysis Date: **16-Feb-2022 13:40**
Client ID: Run ID: **WetChem_HS_402440** SeqNo: **6507366** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 24.93 | 0.20 | 10 | 14.68 | 103 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22020604-01MSD** Units: **mg/L** Analysis Date: **16-Feb-2022 13:40**
Client ID: Run ID: **WetChem_HS_402440** SeqNo: **6507365** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 24.82 | 0.20 | 10 | 14.68 | 101 | 80 - 120 | 24.93 | 0.47 | 20 | |

**The following samples were analyzed in this batch:** HS22020282-01

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22020282

**QC BATCH REPORT**

**Batch ID: R402591 ( 0 )** **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON BY E415.1**

**MBLK** Sample ID: **MBLK-02182022** Units: **mg/L** Analysis Date: **18-Feb-2022 20:39**
Client ID: Run ID: **TOC_04_402591** SeqNo: **6510483** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 1.00 | 1.00 | | | | | | | | U |

**LCS** Sample ID: **LCS-02182022** Units: **mg/L** Analysis Date: **18-Feb-2022 20:53**
Client ID: Run ID: **TOC_04_402591** SeqNo: **6510484** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 10.26 | 1.00 | 10 | 0 | 103 | 85 - 115 | | | | |

**LCSD** Sample ID: **LCSD-02182022** Units: **mg/L** Analysis Date: **18-Feb-2022 21:09**
Client ID: Run ID: **TOC_04_402591** SeqNo: **6510485** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 10.38 | 1.00 | 10 | 0 | 104 | 85 - 115 | 10.26 | 1.16 | 20 | |

**MS** Sample ID: **HS22020158-01MS** Units: **mg/L** Analysis Date: **18-Feb-2022 21:37**
Client ID: Run ID: **TOC_04_402591** SeqNo: **6510487** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 15.01 | 1.00 | 10 | 3.969 | 110 | 80 - 120 | | | | |

**The following samples were analyzed in this batch:** HS22020282-01

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** **HS22020282**

## 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 |
| Florida | E87611-34 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 21-Feb-22

## Sample Receipt Checklist

**Work Order ID:** HS22020282 **Date/Time Received:** **07-Feb-2022 09:20**

**Client Name:** Bhate Environmental **Received by:** **Nilesh D. Ranchod**

**Completed By:** /S/ Pablo Marinez (eSignature) 07-Feb-2022 12:01 (Date/Time) **Reviewed by:** /S/ Ragen Giga (eSignature) 07-Feb-2022 18:28 (Date/Time)

Matrices: **WATER** Carrier name: **FedEx Priority Overnight**

| | Yes | No | |
|---|---|---|---|
| Shipping container/cooler in good condition? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on shipping container/cooler? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on sample bottles? | ☐ | ☐ | Not Present ☑ |
| VOA/TX1005/TX1006 Solids in hermetically sealed vials? | ☐ | ☐ | Not Present ☑ |
| Chain of custody present? | ☑ | ☐ | 1 Page(s) |
| Chain of custody signed when relinquished and received? | ☑ | ☐ | COC IDs:CLIENT |
| Samplers name present on COC? | ☑ | ☐ | |
| Chain of custody agrees with sample labels? | ☑ | ☐ | |
| Samples in proper container/bottle? | ☑ | ☐ | |
| Sample containers intact? | ☑ | ☐ | |
| Sufficient sample volume for indicated test? | ☑ | ☐ | |
| All samples received within holding time? | ☐ | ☑ | |
| Container/Temp Blank temperature in compliance? | ☑ | ☐ | |

Temperature(s)/Thermometer(s): 1.0°C/1.5°C UC/C | IR 31

Cooler(s)/Kit(s): BLUE

Date/Time sample(s) sent to storage: 2/7/22 12:05

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

pH adjusted by:

Login Notes: Samples received out of hold (weather related FEDEX Delay), proceed with analyses per Client confirmation.

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: Ragen Gigi

Page 1 of 1

**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:** GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

**Prepared By:** Scott Beesinger

**P.O. Number**

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | AMMONIA-N | TOTAL ORGANIC CARBON | ORTHO-PHOSPHATE | PERCHLORATE | | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_020222 | Water | 02/02/22 / 14:00 | | 3 | X | X | | | | | | | | | H2SO4 | |
| LH18/24-SP650_020222 | Water | 02/02/22 / 14:00 | | 1 | | | X | | | | | | | | NONE | |
| LH18/24–SP650_020222_AIX | Water | 02/02/22 / 14:00 | | 1 | | | | X | | | | | | | NONE | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Analyses

HS22020282
Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Weekly Samples

Additional Remarks: **Standard TAT on all parameters**

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 02/02/22 | 14:30 | NN | 2/7/22 | 09:20 | | | | | | |

**For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Remarks:

Bruce Tenant Acc 1-2 cl/f 0.5. 1A & 31

(Word) S:\1-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

BMC

**CUSTODY SEAL**

Date: 2/2/22 Time: 1430
Name: Scott Beesinger
Company: BHATT

Seal Broken By: SM
Date: 02/07/22

BMC FEB 07 2022

**Must Deliver Next Business Day**
**Time and Tempature Sensitive!**

BMC

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM
1203-B EAST GRAND AVE
PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 27JAN20
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 19x16x13 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP 4 – RJ

RMA:

FedEx Express

FedEx
TRK# 0221 1251 0293 9820

THU - 03 FEB AA
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FedEx label THU -03 FEB
Received 02/07/22

February 14, 2022

Service Request No:E2200108

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS22020282**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory February 07, 2022
For your reference, these analyses have been assigned our service request number **E2200108.**

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**
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Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

**ALS Environmental**

| | | | |
|---|---|---|---|
| **Client:** | ALS Houston | **Service Request No.:** | E2200108 |
| **Project:** | HS22020282 | **Date Received:** | 02/07/22 |
| **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 02/07/22.

The sample was received in good condition and is 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:**

EQ2200053: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS-DLCS recoveries met acceptance criteria.

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:**E2200108
**Project:** HS22020282

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2200108-001 | LH18/24-SP650_020222_AIX | 2/2/2022 | 1400 |

# Service Request Summary

**Folder #:** **E2200108**
Client Name: ALS Environmental - US
Project Name: HS22020282
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 02/07/22
Internal Due Date: 2/21/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22020282
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON CIO4 DOD/6850 |
|---|---|---|---|---|
| E2200108-001 | LH18/24-SP650_020222_AIX | Ground Water | 02/02/22 1400 | **IV** |

# Service Request Summary

| | |
|---|---|
| **Folder #:** | **E2200108** |
| Client Name: | ALS Environmental - US |
| Project Name: | HS22020282 |
| Project Number: | |

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA

| | |
|---|---|
| Phone Number: | |
| Cell Number: | |
| Fax Number: | |
| E-mail: | ragenp.giga@alsglobal.com |

| | |
|---|---|
| Project Chemist: | Corey Grandits |
| Originating Lab: | HOUSTON |
| Logged By: | CGRANDITS |
| Date Received: | 02/07/22 |
| Internal Due Date: | 2/21/2022 |
| QAP: | LAB QAP |
| Qualifier Set: | Lab Standard |
| Formset: | Lab Standard |
| Merged?: | Y |
| Report to MDL?: | Y |
| P.O. Number: | HS22020282 |
| EDD: | No EDD Specified |

1 120 mL-Plastic Bottle Natural WM Unpreserved

**Location:** EHRMS-AirArch 1

**Pressure Gas:**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 1 | Level IV due 2/28 |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| + | Possible Tedlar bag artifact. |
| A | TIC is a suspected aldol-condensation product |
| B | Analyte found in the associated method blank as well as in the sample. |
| BC | Reported results are not blank corrected. |
| BH | The back section of the tube yielded higher results than the front. |
| BT | Results indicated possible breakthrough; back section >=10% front section. |
| C | Result identification confirmed. |
| D | Compound identified in an analysis at a secondary dilution factor |
| D | Spike was diluted out |
| DE | Reported results are corrected for desorption efficiency. |
| E | Estimated value. Concentration above calibration range |
| E | The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample. |
| F | The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard. |
| H | The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard. |
| H1 | Sample analysis performed past holding time. See case narrative. |
| H2 | Initial analysis within holding time. Reanalysis for the required dilution was past holding time. |
| H3 | Sample was received and analyzed past holding time. |
| H4 | Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative. |
| I | Internal standard not within the specified limits. See case narrative. |
| J | Estimated Value. Concentration found below MRL. |
| K | A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate. |
| K | Analyte was detected above the method reporting limit prior to normalization. |
| K | The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result. |
| L | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard. |
| L1 | Laboratory control sample recovery outside the specified limits; results may be biased high. |
| L2 | Laboratory control sample recovery outside the specified limits; results may be biased low. |
| L3 | Laboratory control sample recovery outside the specified limits. |
| M | Matrix interference; results may be biased high. |
| M | The duplicate injection precision not met. |
| M1 | Matrix interference due to coelution with a non-target compound; results may be biased high. |
| N | Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search. |
| N | The Matrix Spike sample recovery is not within control limits. See case narrative. |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| O | The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard. |
| P | Indicates chlorodiphenyl ether interference present at the retention time of the target compound. |
| P | Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns |
| Q | Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria. |
| R | Duplicate Precision not met. |
| R1 | Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated. |
| S | Surrogate recovery not within specified limits. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| T | Analyte is a tentatively identified compound, result is estimated. |
| U | Compound was analyzed for, but was not detected (ND). |
| V1 | The continuing calibration verification standard was outside (biased high) the specified limits for this compound. |
| V2 | The continuing calibration verification standard was outside (biased low) the specified limits for this compound. |
| W | Result quantified, but the corresponding peak was detected outside the generated retention time window. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| X | See case narrative. |
| Y | Recovery outside limits |
| Y | The chromatogram resembles a petroleum product but does not match the calibration standard. |
| Z | The chromatogram does not resemble a petroleum product. |
| i | The MRL/MDL has been elevated due to a matrix interference. |

# ALS Laboratory Group

## Acronyms

| | |
|---|---|
| Cal | Calibration |
| Conc | CONCentration |
| Dioxin(s) | Polychlorinated dibenzo-p-dioxin(s) |
| EDL | Estimated Detection Limit |
| EMPC | Estimated Maximum Possible Concentration |
| Flags | Data qualifiers |
| Furan(s) | Polychlorinated dibenzofuran(s) |
| g | Grams |
| ICAL | Initial CALibration |
| ID | IDentifier |
| Ions | Masses monitored for the analyte during data acquisition |
| L | Liter (s) |
| LCS | Laboratory Control Sample |
| DLCS | Duplicate Laboratory Control Sample |
| MB | Method Blank |
| MCL | Method Calibration Limit |
| MDL | Method Detection Limit |
| mL | Milliliters |
| MS | Matrix Spiked sample |
| DMS | Duplicate Matrix Spiked sample |
| NO | Number of peaks meeting all identification criteria |
| PCDD(s) | Polychlorinated dibenzo-p-dioxin(s) |
| PCDF(s) | Polychlorinated dibenzofuran(s) |
| ppb | Parts per billion |
| ppm | Parts per million |
| ppq | Parts per quadrillion |
| ppt | Parts per trillion |
| QA | Quality Assurance |
| QC | Quality Control |
| Ratio | Ratio of areas from monitored ions for an analyte |
| % Rec. | Percent recovery |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| RT | Retention Time |
| SDG | Sample Delivery Group |
| S/N | Signal-to-noise ratio |
| TEF | Toxicity Equivalence Factor |
| TEQ | Toxicity Equivalence Quotient |

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ALS Environmental

## State Certifications, Accreditations, and Licenses

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas Department of Environmental Quality | 19-028-0 | 6/30/2022 |
| Arkansas Department of Environmental Quality | 21-022-0 | 3/26/2022 |
| Florida Department of Health | E87611-33 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 5/1/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd, Suite 210, Houston TX 77099
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www.alsglobal.com

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Houston, TX 77099
**T:** +1 281 530 5656
**F:** +1 281 530 5887
**www.alsglobal.com**

# Subcontract Chain of Custody

**SAMPLING STATE:** **Dept of Defense** **COC ID:** **18106**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

**Company:** ALS Houston
**Contact:** Ragen Giga
**Address:** 10450 Stancliff Rd, Ste 210
**Phone:** +1 281 530 5656
**Email:** RagenP.Giga@ALSGlobal.com
**Alternate Contact:**
**Email:**

**INVOICE INFORMATION:**

**Company:** ALS Houston
**Contact:** Accounts Payable
**Address:** 10450 Stancliff Rd, Ste 210
**Phone:** +1 281 530 5656
**Reference:** HS22020282
**TSR:** Houston House Acct

| | LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | | | DUE DATE |
| **1.** | **HS22020282-02** | **LH18/24-SP650_020222_AIX** | **Water** | **02 Feb 2022 14:00** |
| | 6850-Perch. DOD Level II & Level IV in separate pdf | | | 21 Feb 2022 |

**Comments:** Please analyze for the analysis listed above.
Send report to the emails shown above.

**QC Level:** DOD IV (DoD Data Package)

Relinquished By: Pat [illegible] Date/Time: 2.7.22 12:15

Received By: [illegible] Date/Time: 2-7-22 1214

Cooler ID(s): Temperature(s):

ALS Environmental

# Cooler Receipt Form

Project Chemist: IG

Client/Project: ALS-H

Thermometer ID: IR11 CF-US

Date/Time Received: 2-7-22 Initials: IG

Date/Time Logged in: 2-7-22 Initials: IG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☒ Courier (ALS) ○ Client

2. Samples received in: ☒ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ☒ No

Were they intact? ○ Yes ○ No ☒ N/A

Were they signed and dated? ○ Yes ○ No ☒ N/A

If yes, how many and where?

4. Packing Material: ○ Inserts ☒ Baggies ○ Bubble Wrap ○ Gel Packs ☒ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

| Cooler Tracking Number | COC ID | Date Opened | Time Opened | Opened By | Temp. °C | Temp Blank? |
|---|---|---|---|---|---|---|
| NA | | 2-7-22 | 1215 | IG | 1.7/2.2 | ☒ |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☒ Yes ○ No

7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☒ Yes ○ No

8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☒ Yes ○ No

9. Were appropriate bottles/containers and volumes received for the requested tests? ☒ Yes ○ No

10. Did sample labels and tags agree with custody documents? ☒ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

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**
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# *Preparation Information Benchsheet*

**Prep Run#:** 395241 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** **Prep Date/Time:** 2/14/22 10:28

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2200107-001 | LH18/24-SP650_020222_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 2 | E2200108-001 | LH18/24-SP650_020222_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 3 | E2200109-001 | LH18/24-SP140_020222 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 4 | E2200122-001 | LHAAP17_AreaH_021022 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 5 | E2200123-001 | LH18/24-SP650_021022_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 6 | EQ2200053-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 7 | EQ2200053-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 8 | EQ2200053-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |

## Spiking Solutions

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 221408 Logbook Ref: Perchlorate Internal Standard Expires On: 04/30/2022

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E2200107-001 | 100.00µL | E2200108-001 | 100.00µL | E2200109-001 | 100.00µL | E2200122-001 | 100.00µL | E2200123-001 | 100.00µL | EQ2200053-01 | 100.00µL |
| EQ2200053-02 | 100.00µL | EQ2200053-03 | 100.00µL | | | | | | | | |

Name: Perchlorate Intermediate Stock1 Inventory ID 221456 Logbook Ref: Perchlorate Expires On: 04/30/2022

| | | | |
|---|---|---|---|
| EQ2200053-02 | 1.00µL | EQ2200053-03 | 1.00µL |

## Preparation Materials

| | | | | | |
|---|---|---|---|---|---|
| Water HPLC Grade | 08/03/2021 Water (218530) | 6850 Amber Glass screw vial | 2mL Screw Top Vial (221308) | 6850 Luer-Lok Syringes | Luer-Lok Syringes (221305) |
| 6850 Pipette Tips 50-1000 uL | 6850 Pipette Tips (221307) | 6850 0.45um syringe filters | 6850 Syringe Filters (219639) | 537M Glass Culture Tubes | 537M Glass Tubes (218064) |

## Preparation Steps

Step: Preparation
Started: 2/14/22 10:28
Finished: 2/14/22 11:00
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 2/14/22

# Analytical Results

**ALS Environmental - Houston HRMS**
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**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200108 |
| **Project:** | HS22020282 | **Date Collected:** | 2/ 2/22 1400 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 2/ 7/22 |
| **Sample Name:** | LH18/24-SP650_020222_AIX | **Units:** | µg/L |
| **Lab Code:** | E2200108-001 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | ND | U | 0.100 | 0.0500 | 0.0250 | 1 | 2/14/22 | 2/14/22 13:02 | 395241 | 754518 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200108 |
| **Project:** | HS22020282 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2200053-01 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | ND | U | 0.100 | 0.0500 | 0.0250 | 1 | 2/14/22 | 2/14/22 12:15 | 395241 | 754518 | |

# Accuracy & Precision

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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:** | E2200108 |
| **Project:** | HS22020282 | **Date Analyzed:** | 2/14/22 |
| **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:** | | **Basis:** | NA |
| | | **Extraction Lot:** | 395241 |

| | Lab Control Sample EQ2200053-02 | | | Duplicate Lab Control Sample EQ2200053-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.0863 | 0.100 | 86 | 0.0995 | 0.100 | 100 | 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:** | E2200108 |
| **Project:** | HS22020282 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200053-02 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.0863** | J | 0.100 | 0.0500 | 0.0250 | 1 | 2/14/22 | 2/14/22 12:22 | 395241 | 754518 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200108 |
| **Project:** | HS22020282 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200053-03 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.0995** | J | 0.100 | 0.0500 | 0.0250 | 1 | 2/14/22 | 2/14/22 12:30 | 395241 | 754518 | |

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

February 16, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22020283**

Laboratory Results for: **Longhorn GW Treatment Plant Monthly Influent**

Dear Marcia Olive,

ALS Environmental received 1 sample(s) on Feb 07, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: JUMOKE.LAWAL**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 16-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent
**Work Order:** HS22020283

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22020283-01 | LH18/24-SP140_020222 | Water | | 02-Feb-2022 14:00 | 07-Feb-2022 09:20 | ☐ |

**ALS Houston, US** Date: 16-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent
**Work Order:** HS22020283

**CASE NARRATIVE**

## Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached

## Metals by Method SW6020A

### Batch ID: 175201

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method SW7196

### Batch ID: R401884

#### Sample ID: LH18/24-SP140_020222 (HS22020283-01)

- Sample holding time expired prior to sample receipt. It was analyzed at the request of the client. Results should be considered estimated.

**ALS Houston, US** Date: 16-Feb-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Monthly Influent | WorkOrder:HS22020283 |
| Sample ID: | LH18/24-SP140_020222 | Lab ID:HS22020283-01 |
| Collection Date: | 02-Feb-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **METALS BY ICPMS BY SW6020A** | | **Method:SW6020A** | | | | Prep:SW3010A / 09-Feb-2022 | | Analyst: JHD |
| Selenium | 0.00250 | U | 0.00110 | 0.00250 | 0.00500 | mg/L | 1 | 09-Feb-2022 21:20 |
| Silver | 0.000500 | U | 0.000200 | 0.000500 | 0.00500 | mg/L | 1 | 09-Feb-2022 21:20 |
| **HEXAVALENT CHROMIUM BY SW7196A** | | **Method:SW7196** | | | | | | Analyst: AP |
| Chromium, Hexavalent | 0.0100 | HU | 0.00600 | 0.0100 | 0.0100 | mg/L | 1 | 07-Feb-2022 17:09 |
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 15-Feb-2022 13:50 |

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

## Weight / Prep Log

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent
**WorkOrder:** HS22020283

**Batch ID:** 175201 **Start Date:** 09 Feb 2022 10:00 **End Date:** 09 Feb 2022 14:00
**Method:** WATER - SW3010A **Prep Code:** 3010A

| Sample ID | Container | Sample Wt/Vol | Final Volume | Prep Factor | |
|---|---|---|---|---|---|
| HS22020283-01 | | 10 (mL) | 10 (mL) | 1 | 120 plastic HNO3 |

**ALS Houston, US** Date: 16-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent
**WorkOrder:** HS22020283

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** 175201 ( 0 ) | **Test Name :** METALS BY ICPMS BY SW6020A | | | | **Matrix:** Water | |
| HS22020283-01 | LH18/24-SP140_020222 | 02 Feb 2022 14:00 | | 09 Feb 2022 14:00 | 09 Feb 2022 21:20 | 1 |
| **Batch ID:** R401884 ( 0 ) | **Test Name :** HEXAVALENT CHROMIUM BY SW7196A | | | | **Matrix:** Water | |
| HS22020283-01 | LH18/24-SP140_020222 | 02 Feb 2022 14:00 | | | 07 Feb 2022 17:09 | 1 |
| **Batch ID:** R402280 ( 0 ) | **Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) | | | | **Matrix:** Water | |
| HS22020283-01 | LH18/24-SP140_020222 | 02 Feb 2022 14:00 | | | 15 Feb 2022 13:50 | 1 |

**ALS Houston, US** Date: 16-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent
**WorkOrder:** HS22020283

**QC BATCH REPORT**

**Batch ID: 175201 ( 0 )** **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

**MBLK** Sample ID: **MBLK-175201** Units: **mg/L** Analysis Date: **09-Feb-2022 20:55**
Client ID: Run ID: **ICPMS06_401893** SeqNo: **6496784** PrepDate: **09-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Selenium | 0.00250 | 0.00500 | | | | | | | | U |
| Silver | 0.000500 | 0.00500 | | | | | | | | U |

**LCS** Sample ID: **LCS-175201** Units: **mg/L** Analysis Date: **09-Feb-2022 20:57**
Client ID: Run ID: **ICPMS06_401893** SeqNo: **6496785** PrepDate: **09-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Selenium | 0.05092 | 0.00500 | 0.05 | 0 | 102 | 80 - 120 | | | | |

**LCS** Sample ID: **LCS-175201** Units: **mg/L** Analysis Date: **10-Feb-2022 12:17**
Client ID: Run ID: **ICPMS06_402006** SeqNo: **6497731** PrepDate: **09-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Silver | 0.05036 | 0.00500 | 0.05 | 0 | 101 | 85 - 116 | | | | |

**MS** Sample ID: **HS22011233-09MS** Units: **mg/L** Analysis Date: **09-Feb-2022 21:02**
Client ID: Run ID: **ICPMS06_401893** SeqNo: **6496788** PrepDate: **09-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Selenium | 0.05238 | 0.00500 | 0.05 | -0.000073 | 105 | 80 - 120 | | | | |

**MS** Sample ID: **HS22011233-09MS** Units: **mg/L** Analysis Date: **10-Feb-2022 12:19**
Client ID: Run ID: **ICPMS06_402006** SeqNo: **6497732** PrepDate: **09-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Silver | 0.05302 | 0.00500 | 0.05 | 0 | 106 | 85 - 116 | | | | |

**MSD** Sample ID: **HS22011233-09MSD** Units: **mg/L** Analysis Date: **09-Feb-2022 21:04**
Client ID: Run ID: **ICPMS06_401893** SeqNo: **6496789** PrepDate: **09-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Selenium | 0.05 | 0.00500 | 0.05 | -0.000073 | 100 | 80 - 120 | 0.05238 | 4.65 | 20 | |
| Silver | 0.05637 | 0.00500 | 0.05 | -0.000196 | 113 | 85 - 116 | 0.05909 | 4.71 | 20 | |

**ALS Houston, US** Date: 16-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent
**WorkOrder:** HS22020283

**QC BATCH REPORT**

**Batch ID: 175201 ( 0 )** **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

**PDS** Sample ID: **HS22011233-09PDS** Units: **mg/L** Analysis Date: **09-Feb-2022 21:06**
Client ID: Run ID: **ICPMS06_401893** SeqNo: **6496790** PrepDate: **09-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Selenium | 0.09387 | 0.00500 | 0.1 | -0.000073 | 93.9 | 80 - 120 | | | | |
| Silver | 0.0893 | 0.00500 | 0.1 | -0.000196 | 89.5 | 80 - 120 | | | | |

**SD** Sample ID: **HS22011233-09SD** Units: **mg/L** Analysis Date: **09-Feb-2022 21:00**
Client ID: Run ID: **ICPMS06_401893** SeqNo: **6496787** PrepDate: **09-Feb-2022** DF: **5**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %D | %D Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Selenium | 0.0125 | 0.0250 | | | | | -0.000073 | 0 | 10 | U |
| Silver | 0.00250 | 0.0250 | | | | | -0.000196 | 0 | 10 | U |

**The following samples were analyzed in this batch:** HS22020283-01

**ALS Houston, US** Date: 16-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent
**WorkOrder:** HS22020283

**QC BATCH REPORT**

**Batch ID: R401884 ( 0 )** **Instrument: UV-2450** **Method: HEXAVALENT CHROMIUM BY SW7196A**

**MBLK** Sample ID: **MBLK-R401884** Units: **mg/L** Analysis Date: **07-Feb-2022 17:09**
Client ID: Run ID: **UV-2450_401884** SeqNo: **6495304** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 0.0100 | 0.0100 | | | | | | | | U |

**LCS** Sample ID: **LCS-R401884** Units: **mg/L** Analysis Date: **07-Feb-2022 17:09**
Client ID: Run ID: **UV-2450_401884** SeqNo: **6495303** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 0.258 | 0.0100 | 0.25 | 0 | 103 | 90 - 111 | | | | |

**MS** Sample ID: **HS22020280-01MS** Units: **mg/L** Analysis Date: **07-Feb-2022 17:09**
Client ID: Run ID: **UV-2450_401884** SeqNo: **6495298** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 0.258 | 0.0100 | 0.25 | 0 | 103 | 90 - 111 | | | | |

**MSD** Sample ID: **HS22020280-01MSD** Units: **mg/L** Analysis Date: **07-Feb-2022 17:09**
Client ID: Run ID: **UV-2450_401884** SeqNo: **6495297** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 0.256 | 0.0100 | 0.25 | 0 | 102 | 90 - 111 | 0.258 | 0.778 | 20 | |

**The following samples were analyzed in this batch:** HS22020283-01

**ALS Houston, US** Date: 16-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent
**WorkOrder:** **HS22020283**

## 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 |
| Florida | E87611-33 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 16-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent
**Work Order:** HS22020283

## SAMPLE TRACKING

| Lab Samp ID | Client Sample ID | Action | Date | Person | New Location |
|---|---|---|---|---|---|
| HS22020283-01 | LH18/24-SP140_020222 | Login | 2/7/2022 12:03:11 PM | PJM | MET071 |
| HS22020283-01 | LH18/24-SP140_020222 | Login | 2/7/2022 12:03:11 PM | PJM | Sub |
| HS22020283-01 | LH18/24-SP140_020222 | Login | 2/7/2022 12:03:11 PM | PJM | WET374 |

**ALS Houston, US** Date: 16-Feb-22

## Sample Receipt Checklist

**Work Order ID:** HS22020283 **Date/Time Received:** **07-Feb-2022 09:20**

**Client Name:** Bhate Environmental **Received by:** **Nilesh D. Ranchod**

**Completed By:** /S/ Pablo Marinez (eSignature) 07-Feb-2022 12:04 (Date/Time) **Reviewed by:** /S/ Ragen Giga (eSignature) 07-Feb-2022 18:33 (Date/Time)

Matrices: **WATER** Carrier name: **FedEx Priority Overnight**

| | Yes | No | |
|---|---|---|---|
| Shipping container/cooler in good condition? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on shipping container/cooler? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on sample bottles? | ☐ | ☐ | Not Present ☑ |
| VOA/TX1005/TX1006 Solids in hermetically sealed vials? | ☐ | ☐ | Not Present ☑ |
| Chain of custody present? | ☑ | ☐ | 1 Page(s) |
| Chain of custody signed when relinquished and received? | ☑ | ☐ | COC IDs:CLIENT |
| Samplers name present on COC? | ☑ | ☐ | |
| Chain of custody agrees with sample labels? | ☑ | ☐ | |
| Samples in proper container/bottle? | ☑ | ☐ | |
| Sample containers intact? | ☑ | ☐ | |
| Sufficient sample volume for indicated test? | ☑ | ☐ | |
| All samples received within holding time? | ☑ | ☐ | |
| Container/Temp Blank temperature in compliance? | ☑ | ☐ | |

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 1.0°C/1.5°C UC/C | IR 31 |
| Cooler(s)/Kit(s): | BLUE | |
| Date/Time sample(s) sent to storage: | 2/7/22 12:05 | |

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



**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:** GROUNDWATER TREATMENT PLANT MONTHLY INFLUENT SAMPLES

**Prepared By:** Scott Beesinger

**P.O. Number**

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | SILVER & SELENIUM | HEXAVALENT CHROMIUM | PERCHLORATE | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP140_020222 | Water | 02/02/22 / 14:00 | | 1 | X | | | HNO3 | |
| LH18/24-SP140_020222 | Water | 02/02/22 / 14:00 | | 2 | | X | X | NONE | |

HS22020283
Bhate Environmental Associates. Inc.
Longhorn GW Treatment Plant Monthly Influent

**Additional Remarks:** STANDARD TURN AROUND TIME

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 02/02/22 | 14:30 | NA | 2/7/22 | 09:00 | | | | | | |

**For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Remarks:

Blue Tag UCC 1.0 IRR 31
CCC +0.5

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

BMC

**CUSTODY SEAL**

Date: 2/7/22 Time: 1480
Name: Scott Beesinger
Company: BHAAP

Seal Broken By: SM
Date: 02/07/22

BMC FEB 07 2022

Must Deliver Next Business Day
Time and Tempature Sensitive!

BMC

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM
1203-B EAST GRAND AVE
PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 27JAN20
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 19x16x13 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP 4 – RJ

RMA:

FedEx Express

FedEx
TRK# 0221 1251 0293 9820

THU - 03 FEB AA
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FedEx Label THU -03 FEB
Received 02/07/22

February 14, 2022

Service Request No:E2200109

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS22020283**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory February 07, 2022
For your reference, these analyses have been assigned our service request number **E2200109.**

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.:** | E2200109 |
| **Project:** | HS22020283 | **Date Received:** | 02/07/22 |
| **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 02/07/22.

The sample was received in good condition and is 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:**

EQ2200053: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS-DLCS recoveries met acceptance criteria.

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:**E2200109
**Project:** HS22020283

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2200109-001 | LH18/24-SP140_020222 | 2/2/2022 | 1400 |

# Service Request Summary

**Folder #:** **E2200109**
Client Name: ALS Environmental - US
Project Name: HS22020283
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 02/07/22
Internal Due Date: 2/21/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22020283
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON ClO4 DOD/6850 |
|---|---|---|---|---|
| E2200109-001 | LH18/24-SP140_020222 | Ground Water | 02/02/22 1400 | **IV** |

# Service Request Summary

**Folder #:** **E2200109**
Client Name: ALS Environmental - US
Project Name: HS22020283
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 02/07/22
Internal Due Date: 2/21/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22020283
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 1 | Level IV due 2/28 |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| + | Possible Tedlar bag artifact. |
| A | TIC is a suspected aldol-condensation product |
| B | Analyte found in the associated method blank as well as in the sample. |
| BC | Reported results are not blank corrected. |
| BH | The back section of the tube yielded higher results than the front. |
| BT | Results indicated possible breakthrough; back section >=10% front section. |
| C | Result identification confirmed. |
| D | Compound identified in an analysis at a secondary dilution factor |
| D | Spike was diluted out |
| DE | Reported results are corrected for desorption efficiency. |
| E | Estimated value. Concentration above calibration range |
| E | The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample. |
| F | The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard. |
| H | The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard. |
| H1 | Sample analysis performed past holding time. See case narrative. |
| H2 | Initial analysis within holding time. Reanalysis for the required dilution was past holding time. |
| H3 | Sample was received and analyzed past holding time. |
| H4 | Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative. |
| I | Internal standard not within the specified limits. See case narrative. |
| J | Estimated Value. Concentration found below MRL. |
| K | A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate. |
| K | Analyte was detected above the method reporting limit prior to normalization. |
| K | The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result. |
| L | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard. |
| L1 | Laboratory control sample recovery outside the specified limits; results may be biased high. |
| L2 | Laboratory control sample recovery outside the specified limits; results may be biased low. |
| L3 | Laboratory control sample recovery outside the specified limits. |
| M | Matrix interference; results may be biased high. |
| M | The duplicate injection precision not met. |
| M1 | Matrix interference due to coelution with a non-target compound; results may be biased high. |
| N | Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search. |
| N | The Matrix Spike sample recovery is not within control limits. See case narrative. |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| O | The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard. |
| P | Indicates chlorodiphenyl ether interference present at the retention time of the target compound. |
| P | Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns |
| Q | Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria. |
| R | Duplicate Precision not met. |
| R1 | Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated. |
| S | Surrogate recovery not within specified limits. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| T | Analyte is a tentatively identified compound, result is estimated. |
| U | Compound was analyzed for, but was not detected (ND). |
| V1 | The continuing calibration verification standard was outside (biased high) the specified limits for this compound. |
| V2 | The continuing calibration verification standard was outside (biased low) the specified limits for this compound. |
| W | Result quantified, but the corresponding peak was detected outside the generated retention time window. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| X | See case narrative. |
| Y | Recovery outside limits |
| Y | The chromatogram resembles a petroleum product but does not match the calibration standard. |
| Z | The chromatogram does not resemble a petroleum product. |
| i | The MRL/MDL has been elevated due to a matrix interference. |

# ALS Laboratory Group

## Acronyms

| | |
|---|---|
| Cal | Calibration |
| Conc | CONCentration |
| Dioxin(s) | Polychlorinated dibenzo-p-dioxin(s) |
| EDL | Estimated Detection Limit |
| EMPC | Estimated Maximum Possible Concentration |
| Flags | Data qualifiers |
| Furan(s) | Polychlorinated dibenzofuran(s) |
| g | Grams |
| ICAL | Initial CALibration |
| ID | IDentifier |
| Ions | Masses monitored for the analyte during data acquisition |
| L | Liter (s) |
| LCS | Laboratory Control Sample |
| DLCS | Duplicate Laboratory Control Sample |
| MB | Method Blank |
| MCL | Method Calibration Limit |
| MDL | Method Detection Limit |
| mL | Milliliters |
| MS | Matrix Spiked sample |
| DMS | Duplicate Matrix Spiked sample |
| NO | Number of peaks meeting all identification criteria |
| PCDD(s) | Polychlorinated dibenzo-p-dioxin(s) |
| PCDF(s) | Polychlorinated dibenzofuran(s) |
| ppb | Parts per billion |
| ppm | Parts per million |
| ppq | Parts per quadrillion |
| ppt | Parts per trillion |
| QA | Quality Assurance |
| QC | Quality Control |
| Ratio | Ratio of areas from monitored ions for an analyte |
| % Rec. | Percent recovery |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| RT | Retention Time |
| SDG | Sample Delivery Group |
| S/N | Signal-to-noise ratio |
| TEF | Toxicity Equivalence Factor |
| TEQ | Toxicity Equivalence Quotient |

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ALS Environmental

## State Certifications, Accreditations, and Licenses

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas Department of Environmental Quality | 19-028-0 | 6/30/2022 |
| Arkansas Department of Environmental Quality | 21-022-0 | 3/26/2022 |
| Florida Department of Health | E87611-33 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 5/1/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
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Houston, TX 77099
**T:** +1 281 530 5656
**F:** +1 281 530 5887
**www.alsglobal.com**

# Subcontract Chain of Custody

**SAMPLING STATE:** **Dept of Defense** **COC ID: 18107**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

**Company:** ALS Houston
**Contact:** Ragen Giga
**Address:** 10450 Stancliff Rd, Ste 210
**Phone:** +1 281 530 5656
**Email:** RagenP.Giga@ALSGlobal.com
**Alternate Contact:**
**Email:**

**INVOICE INFORMATION:**

**Company:** ALS Houston
**Contact:** Accounts Payable
**Address:** 10450 Stancliff Rd, Ste 210
**Phone:** +1 281 530 5656
**Reference:** HS22020283
**TSR:** Sonia West

| | LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | | | DUE DATE |
| **1.** | **HS22020283-01** | **LH18/24-SP140_020222** | **Water** | **02 Feb 2022 14:00** |
| | 6850-Perch. DOD Level II & Level IV in separate pdf | | | 21 Feb 2022 |

**Comments:** Please analyze for the analysis listed above.
Send report to the emails shown above.

**QC Level:** DOD IV (DoD Data Package)

Relinquished By: Paul Date/Time: 2.7.22 1215
Received By: Cindy G Date/Time: 2-7-22 1214
Cooler ID(s): Temperature(s):

ALS Environmental

# Cooler Receipt Form

Project Chemist: CG

Client/Project: ALS-H

Thermometer ID: IR\1 CF-US

Date/Time Received: 2-7-22 Initials: CG Date/Time Logged in: 2-7-22 Initials: CG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☒ Courier (ALS) ○ Client
2. Samples received in: ☒ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ☒ No
   Were they intact? ○ Yes ○ No ☒ N/A
   Were they signed and dated? ○ Yes ○ No ☒ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ☒ Baggies ○ Bubble Wrap ○ Gel Packs ☒ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

| Cooler Tracking Number | COC ID | Date Opened | Time Opened | Opened By | Temp. °C | Temp Blank? |
|---|---|---|---|---|---|---|
| NA | | 2-7-22 | 1215 | CG | 1.7/2.2 | ☒ |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☒ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☒ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☒ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☒ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☒ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

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**
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Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

# *Preparation Information Benchsheet*

**Prep Run#:** 395241 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** **Prep Date/Time:** 2/14/22 10:28

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2200107-001 | LH18/24-SP650_020222_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 2 | E2200108-001 | LH18/24-SP650_020222_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 3 | E2200109-001 | LH18/24-SP140_020222 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 4 | E2200122-001 | LHAAP17_AreaH_021022 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 5 | E2200123-001 | LH18/24-SP650_021022_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 6 | EQ2200053-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 7 | EQ2200053-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 8 | EQ2200053-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |

## Spiking Solutions

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 221408 Logbook Ref: Perchlorate Internal Standard Expires On: 04/30/2022

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E2200107-001 | 100.00µL | E2200108-001 | 100.00µL | E2200109-001 | 100.00µL | E2200122-001 | 100.00µL | E2200123-001 | 100.00µL | EQ2200053-01 | 100.00µL |
| EQ2200053-02 | 100.00µL | EQ2200053-03 | 100.00µL | | | | | | | | |

Name: Perchlorate Intermediate Stock1 Inventory ID 221456 Logbook Ref: Perchlorate Expires On: 04/30/2022

| | | | |
|---|---|---|---|
| EQ2200053-02 | 1.00µL | EQ2200053-03 | 1.00µL |

## Preparation Materials

| | | | | | |
|---|---|---|---|---|---|
| Water HPLC Grade | 08/03/2021 Water (218530) | 6850 Amber Glass screw vial | 2mL Screw Top Vial (221308) | 6850 Luer-Lok Syringes | Luer-Lok Syringes (221305) |
| 6850 Pipette Tips 50-1000 uL | 6850 Pipette Tips (221307) | 6850 0.45um syringe filters | 6850 Syringe Filters (219639) | 537M Glass Culture Tubes | 537M Glass Tubes (218064) |

## Preparation Steps

Step: Preparation
Started: 2/14/22 10:28
Finished: 2/14/22 11:00
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 2/14/22

# Analytical Results

**ALS Environmental - Houston HRMS**
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Phone (713)266-1599 Fax (713)266-0130
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**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200109 |
| **Project:** | HS22020283 | **Date Collected:** | 2/ 2/22 1400 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 2/ 7/22 |
| **Sample Name:** | LH18/24-SP140_020222 | **Units:** | µg/L |
| **Lab Code:** | E2200109-001 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **18900** | | 50.0 | 25.0 | 12.5 | 500 | 2/14/22 | 2/14/22 13:49 | 395241 | 754518 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200109 |
| **Project:** | HS22020283 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2200053-01 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | ND | U | 0.100 | 0.0500 | 0.0250 | 1 | 2/14/22 | 2/14/22 12:15 | 395241 | 754518 | |

# 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:** | E2200109 |
| **Project:** | HS22020283 | **Date Analyzed:** | 2/14/22 |
| **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:** | | **Basis:** | NA |
| | | **Extraction Lot:** | 395241 |

| | Lab Control Sample EQ2200053-02 | | | Duplicate Lab Control Sample EQ2200053-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.0863 | 0.100 | 86 | 0.0995 | 0.100 | 100 | 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:** | E2200109 |
| **Project:** | HS22020283 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200053-02 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.0863** | J | 0.100 | 0.0500 | 0.0250 | 1 | 2/14/22 | 2/14/22 12:22 | 395241 | 754518 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200109 |
| **Project:** | HS22020283 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200053-03 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.0995** | J | 0.100 | 0.0500 | 0.0250 | 1 | 2/14/22 | 2/14/22 12:30 | 395241 | 754518 | |

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February 21, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22020588**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia Olive,

ALS Environmental received 2 sample(s) on Feb 11, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: JUMOKE.LAWAL**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22020588

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22020588-01 | LH18/24-SP650_021022 | Water | | 10-Feb-2022 14:00 | 11-Feb-2022 10:20 | ☐ |
| HS22020588-02 | LH18/24-SP650_021022_AIX | Water | | 10-Feb-2022 14:00 | 11-Feb-2022 10:20 | ☐ |

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22020588

**CASE NARRATIVE**

## Work Order Comments

- The Perchlorate analysis was subcontracted to the ALS specialty lab. Final report attached.

## WetChemistry by Method E415.1

### Batch ID: R402628

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E350.3

### Batch ID: R402440

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E365.3

### Batch ID: R402237

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

**ALS Houston, US** Date: 21-Feb-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS22020588 |
| Sample ID: | LH18/24-SP650_021022 | Lab ID:HS22020588-01 |
| Collection Date: | 10-Feb-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **AMMONIA AS N BY E350.3(ISE)** | | **Method:E350.3** | | | | | | Analyst: MZD |
| **Nitrogen, Ammonia (As N)** | **28** | a | **0.10** | **0.20** | **0.20** | **mg/L** | 1 | 16-Feb-2022 13:40 |
| **ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978** | | **Method:E365.3** | | | | | | Analyst: MZD |
| **Phosphorus, Total Orthophosphate (As P)** | **8.38** | a | **0.100** | **0.250** | **0.250** | **mg/L** | 10 | 11-Feb-2022 15:58 |
| **TOTAL ORGANIC CARBON BY E415.1** | | **Method:E415.1** | | | | | | Analyst: JAC |
| **Organic Carbon, Total** | **10.5** | a | **0.500** | **1.00** | **1.00** | **mg/L** | 1 | 19-Feb-2022 22:55 |

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

**ALS Houston, US** Date: 21-Feb-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS22020588 |
| Sample ID: | LH18/24-SP650_021022_AIX | Lab ID:HS22020588-02 |
| Collection Date: | 10-Feb-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 15-Feb-2022 13:50 |

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

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22020588

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** R402237 ( 0 ) | **Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978 | | | | **Matrix:** Water | |
| HS22020588-01 | LH18/24-SP650_021022 | 10 Feb 2022 14:00 | | | 11 Feb 2022 15:58 | 10 |
| **Batch ID:** R402280 ( 0 ) | **Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) | | | | **Matrix:** Water | |
| HS22020588-02 | LH18/24-SP650_021022_AIX | 10 Feb 2022 14:00 | | | 15 Feb 2022 13:50 | 1 |
| **Batch ID:** R402440 ( 0 ) | **Test Name :** AMMONIA AS N BY E350.3(ISE) | | | | **Matrix:** Water | |
| HS22020588-01 | LH18/24-SP650_021022 | 10 Feb 2022 14:00 | | | 16 Feb 2022 13:40 | 1 |
| **Batch ID:** R402628 ( 0 ) | **Test Name :** TOTAL ORGANIC CARBON BY E415.1 | | | | **Matrix:** Water | |
| HS22020588-01 | LH18/24-SP650_021022 | 10 Feb 2022 14:00 | | | 19 Feb 2022 22:55 | 1 |

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22020588

**QC BATCH REPORT**

**Batch ID:** R402237 ( 0 ) **Instrument:** UV-2450 **Method:** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978

**MBLK** Sample ID: **MBLK-R402237** Units: **mg/L** Analysis Date: **11-Feb-2022 15:58**
Client ID: Run ID: **UV-2450_402237** SeqNo: **6502469** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.0250 | 0.0250 | | | | | | | | U |

**LCS** Sample ID: **LCS-R402237** Units: **mg/L** Analysis Date: **11-Feb-2022 15:58**
Client ID: Run ID: **UV-2450_402237** SeqNo: **6502468** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.232 | 0.0250 | 0.25 | 0 | 92.8 | 85 - 115 | | | | |

**LCSD** Sample ID: **LCSD-R402237** Units: **mg/L** Analysis Date: **11-Feb-2022 15:58**
Client ID: Run ID: **UV-2450_402237** SeqNo: **6502467** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.232 | 0.0250 | 0.25 | 0 | 92.8 | 85 - 115 | 0.232 | 0 | 20 | |

**The following samples were analyzed in this batch:** HS22020588-01

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22020588

**QC BATCH REPORT**

**Batch ID: R402440 ( 0 )** **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

**MBLK** Sample ID: **MBLK-R402440** Units: **mg/L** Analysis Date: **16-Feb-2022 13:40**
Client ID: Run ID: **WetChem_HS_402440** SeqNo: **6507403** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 0.20 | 0.20 | | | | | | | | U |

**LCS** Sample ID: **LCS-R402440** Units: **mg/L** Analysis Date: **16-Feb-2022 13:40**
Client ID: Run ID: **WetChem_HS_402440** SeqNo: **6507402** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 10.51 | 0.20 | 10 | 0 | 105 | 80 - 120 | | | | |

**MS** Sample ID: **HS22020604-01MS** Units: **mg/L** Analysis Date: **16-Feb-2022 13:40**
Client ID: Run ID: **WetChem_HS_402440** SeqNo: **6507366** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 24.93 | 0.20 | 10 | 14.68 | 103 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22020604-01MSD** Units: **mg/L** Analysis Date: **16-Feb-2022 13:40**
Client ID: Run ID: **WetChem_HS_402440** SeqNo: **6507365** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 24.82 | 0.20 | 10 | 14.68 | 101 | 80 - 120 | 24.93 | 0.47 | 20 | |

**The following samples were analyzed in this batch:** HS22020588-01

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22020588

**QC BATCH REPORT**

**Batch ID:** R402628 ( 0 ) **Instrument:** TOC_04 **Method:** TOTAL ORGANIC CARBON BY E415.1

**MBLK** Sample ID: **MBLK-02192022** Units: **mg/L** Analysis Date: **19-Feb-2022 21:33**
Client ID: Run ID: **TOC_04_402628** SeqNo: **6511378** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 1.00 | 1.00 | | | | | | | | U |

**LCS** Sample ID: **LCS-02192022** Units: **mg/L** Analysis Date: **19-Feb-2022 21:47**
Client ID: Run ID: **TOC_04_402628** SeqNo: **6511379** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 10.07 | 1.00 | 10 | 0 | 101 | 85 - 115 | | | | |

**LCSD** Sample ID: **LCSD-02192022** Units: **mg/L** Analysis Date: **19-Feb-2022 22:00**
Client ID: Run ID: **TOC_04_402628** SeqNo: **6511380** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 10.38 | 1.00 | 10 | 0 | 104 | 85 - 115 | 10.07 | 3.03 | 20 | |

**MS** Sample ID: **HS22020842-18MS** Units: **mg/L** Analysis Date: **19-Feb-2022 22:28**
Client ID: Run ID: **TOC_04_402628** SeqNo: **6511382** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 15.79 | 1.00 | 10 | 4.7 | 111 | 80 - 120 | | | | |

**The following samples were analyzed in this batch:** HS22020588-01

**ALS Houston, US** Date: 21-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** **HS22020588**

## 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 |
| Florida | E87611-34 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 21-Feb-22

## Sample Receipt Checklist

**Work Order ID:** HS22020588 **Date/Time Received:** **11-Feb-2022 10:20**

**Client Name:** Bhate Environmental **Received by:** **Pablo Marinez**

**Completed By:** /S/ Pablo Marinez (eSignature) 11-Feb-2022 11:39 (Date/Time) **Reviewed by:** /S/ Corey Grandits (eSignature) 11-Feb-2022 14:18 (Date/Time)

Matrices: **WATER** Carrier name: **FedEx Priority Overnight**

| | Yes | No | |
|---|---|---|---|
| Shipping container/cooler in good condition? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on shipping container/cooler? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on sample bottles? | ☐ | ☐ | Not Present ☑ |
| VOA/TX1005/TX1006 Solids in hermetically sealed vials? | ☐ | ☐ | Not Present ☑ |
| Chain of custody present? | ☑ | ☐ | 1 Page(s) |
| Chain of custody signed when relinquished and received? | ☑ | ☐ | COC IDs:CLIENT |
| Samplers name present on COC? | ☑ | ☐ | |
| Chain of custody agrees with sample labels? | ☑ | ☐ | |
| Samples in proper container/bottle? | ☑ | ☐ | |
| Sample containers intact? | ☑ | ☐ | |
| Sufficient sample volume for indicated test? | ☑ | ☐ | |
| All samples received within holding time? | ☑ | ☐ | |
| Container/Temp Blank temperature in compliance? | ☑ | ☐ | |

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 0.9°C/1.4°C UC/C | IR 31 |
| Cooler(s)/Kit(s): | BLUE | |
| Date/Time sample(s) sent to storage: | 2/11/22 11:45 | |

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



**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:** GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

**Prepared By:** Scott Beesinger

**P.O. Number**

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | AMMONIA-N | TOTAL ORGANIC CARBON | ORTHO-PHOSPHATE | PERCHLORATE | | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_021022 | Water | 02/10/22 / 14:00 | | 3 | X | X | | | | | | | | | H2SO4 | |
| LH18/24-SP650_021022 | Water | 02/10/22 / 14:00 | | 1 | | | X | | | | | | | | NONE | |
| LH18/24–SP650_021022_AIX | Water | 02/10/22 / 14:00 | | 1 | | | | X | | | | | | | NONE | |

HS22020588

Bhate Environmental Associates. Inc.
Longhorn GW Treatment Plant Weekly Samples

**Additional Remarks:** Standard TAT on all parameters

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 02/10/22 | 14:30 | [illegible] | 2/11/22 | 10:20 | | | | | | |

**For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Remarks:

Blue 0.9c
(R3) cf+0.5

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

ALS
10450 Stancliff Rd.,
Houston, Texas 77
Tel. +1 281 530 565
Fax. +1 281 530 58

Suite 210
199
6
37

Blue

CUSTODY SEA

Date: 2/10/22 Time: 14
Name: Scott Bess
Company: BHATG

B03 917

Broken By:
Date: 2/11/22

TRK# 1251 0296 4913

FedEx.

PRIORITY OVERNIGHT

AB SGRA

Blue

77099
TX-US
IAH

4230674 10Feb2022 GGGA 56DG2/027C/1023

February 14, 2022

Service Request No:E2200123

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS22020588**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory February 11, 2022
For your reference, these analyses have been assigned our service request number **E2200123.**

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.:** | E2200123 |
| **Project:** | HS22020588 | **Date Received:** | 02/11/22 |
| **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 02/11/22.

The sample was received in good condition and is 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:**

EQ2200053: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS-DLCS recoveries met acceptance criteria.

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:**E2200123
**Project:** HS22020588

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2200123-001 | LH18/24-SP650_021022_AIX | 2/10/2022 | 1400 |

# Service Request Summary

**Folder #:** **E2200123**
Client Name: ALS Environmental - US
Project Name: HS22020588
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 02/11/22
Internal Due Date: 2/25/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22020588
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON CIO4 DOD/6850 |
|---|---|---|---|---|
| E2200123-001 | LH18/24-SP650_021022_AIX | Ground Water | 02/10/22 1400 | **IV** |

# Service Request Summary

**Folder #:** **E2200123**
Client Name: ALS Environmental - US
Project Name: HS22020588
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 02/11/22
Internal Due Date: 2/25/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22020588
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 1 | Level IV due 3/4 |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| + | Possible Tedlar bag artifact. |
| A | TIC is a suspected aldol-condensation product |
| B | Analyte found in the associated method blank as well as in the sample. |
| BC | Reported results are not blank corrected. |
| BH | The back section of the tube yielded higher results than the front. |
| BT | Results indicated possible breakthrough; back section >=10% front section. |
| C | Result identification confirmed. |
| D | Compound identified in an analysis at a secondary dilution factor |
| D | Spike was diluted out |
| DE | Reported results are corrected for desorption efficiency. |
| E | Estimated value. Concentration above calibration range |
| E | The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample. |
| F | The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard. |
| H | The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard. |
| H1 | Sample analysis performed past holding time. See case narrative. |
| H2 | Initial analysis within holding time. Reanalysis for the required dilution was past holding time. |
| H3 | Sample was received and analyzed past holding time. |
| H4 | Sample was extracted past required extraction holding time, but analyzed within analysis holding time. See case narrative. |
| I | Internal standard not within the specified limits. See case narrative. |
| J | Estimated Value. Concentration found below MRL. |
| K | A deflection in the QC ion may indicate interference with the quantitation of this ion. The concentration of this analyte should be considered as an estimate. |
| K | Analyte was detected above the method reporting limit prior to normalization. |
| K | The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result. |
| L | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard. |
| L1 | Laboratory control sample recovery outside the specified limits; results may be biased high. |
| L2 | Laboratory control sample recovery outside the specified limits; results may be biased low. |
| L3 | Laboratory control sample recovery outside the specified limits. |
| M | Matrix interference; results may be biased high. |
| M | The duplicate injection precision not met. |
| M1 | Matrix interference due to coelution with a non-target compound; results may be biased high. |
| N | Presumptive evidence of a compound for TICs that have been identified based on a mass spectral library search. |
| N | The Matrix Spike sample recovery is not within control limits. See case narrative. |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| O | The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard. |
| P | Indicates chlorodiphenyl ether interference present at the retention time of the target compound. |
| P | Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns |
| Q | Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria. |
| R | Duplicate Precision not met. |
| R1 | Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated. |
| S | Surrogate recovery not within specified limits. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| T | Analyte is a tentatively identified compound, result is estimated. |
| U | Compound was analyzed for, but was not detected (ND). |
| V1 | The continuing calibration verification standard was outside (biased high) the specified limits for this compound. |
| V2 | The continuing calibration verification standard was outside (biased low) the specified limits for this compound. |
| W | Result quantified, but the corresponding peak was detected outside the generated retention time window. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| X | See case narrative. |
| Y | Recovery outside limits |
| Y | The chromatogram resembles a petroleum product but does not match the calibration standard. |
| Z | The chromatogram does not resemble a petroleum product. |
| i | The MRL/MDL has been elevated due to a matrix interference. |

# ALS Laboratory Group

## Acronyms

| | |
|---|---|
| Cal | Calibration |
| Conc | CONCentration |
| Dioxin(s) | Polychlorinated dibenzo-p-dioxin(s) |
| EDL | Estimated Detection Limit |
| EMPC | Estimated Maximum Possible Concentration |
| Flags | Data qualifiers |
| Furan(s) | Polychlorinated dibenzofuran(s) |
| g | Grams |
| ICAL | Initial CALibration |
| ID | IDentifier |
| Ions | Masses monitored for the analyte during data acquisition |
| L | Liter (s) |
| LCS | Laboratory Control Sample |
| DLCS | Duplicate Laboratory Control Sample |
| MB | Method Blank |
| MCL | Method Calibration Limit |
| MDL | Method Detection Limit |
| mL | Milliliters |
| MS | Matrix Spiked sample |
| DMS | Duplicate Matrix Spiked sample |
| NO | Number of peaks meeting all identification criteria |
| PCDD(s) | Polychlorinated dibenzo-p-dioxin(s) |
| PCDF(s) | Polychlorinated dibenzofuran(s) |
| ppb | Parts per billion |
| ppm | Parts per million |
| ppq | Parts per quadrillion |
| ppt | Parts per trillion |
| QA | Quality Assurance |
| QC | Quality Control |
| Ratio | Ratio of areas from monitored ions for an analyte |
| % Rec. | Percent recovery |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| RT | Retention Time |
| SDG | Sample Delivery Group |
| S/N | Signal-to-noise ratio |
| TEF | Toxicity Equivalence Factor |
| TEQ | Toxicity Equivalence Quotient |

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ALS Environmental

## State Certifications, Accreditations, and Licenses

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas Department of Environmental Quality | 19-028-0 | 6/30/2022 |
| Arkansas Department of Environmental Quality | 21-022-0 | 3/26/2022 |
| Florida Department of Health | E87611-33 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 5/1/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd, Suite 210, Houston TX 77099
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# Subcontract Chain of Custody

**SAMPLING STATE:** **Dept of Defense** **COC ID:** **18136**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084
**Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

**Company:** ALS Houston
**Contact:** Ragen Giga
**Address:** 10450 Stancliff Rd, Ste 210
**Phone:** +1 281 530 5656
**Email:** RagenP.Giga@ALSGlobal.com
**Alternate Contact:**
**Email:**

**INVOICE INFORMATION:**

**Company:** ALS Houston
**Contact:** Accounts Payable
**Address:** 10450 Stancliff Rd, Ste 210
**Phone:** +1 281 530 5656
**Reference:** HS22020588
**TSR:** Houston House Acct

| | LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | | | DUE DATE |
| 1. | **HS22020588-02** | **LH18/24-SP650_021022_AIX** | **Water** | **10 Feb 2022 14:00** |
| | 6850-Perch. DOD Level II & Level IV in separate pdf | | | 25 Feb 2022 |

**Comments:** Please analyze for the analysis listed above.
Send report to the emails shown above.

**QC Level:** DOD IV (DoD Data Package)

Relinquished By: Patty [illegible] Date/Time: 2/11/22 11:45

Received By: [illegible] Date/Time: 2-11-22 11:45

Cooler ID(s): Temperature(s):

ALS Environmental

# Cooler Receipt Form

Project Chemist: CH

Client/Project: ALH-H

Thermometer ID: 1231

Date/Time Received: 2-11-22 Initials: CH

Date/Time Logged in: 2-11-22 Initials: CH

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL (X) ALH Courier ○ Client

2. Samples received in: (X) Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes (X) No

Were they intact? ○ Yes ○ No (X) N/A

Were they signed and dated? ○ Yes ○ No (X) N/A

If yes, how many and where?

4. Packing Material: ○ Inserts (X) Baggies ○ Bubble Wrap ○ Gel Packs (X) 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 | | 2-11-22 | 1145 | CH | 4.9 | [X] |
| | | | | | | [ ] |
| | | | | | | [ ] |
| | | | | | | [ ] |

6. Were custody papers properly filled out (ink, signed, dated, etc)? (X) Yes ○ No

7. Did all bottles arrive in good condition (not broken, no signs of leakage)? (X) Yes ○ No

8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? (X) Yes ○ No

9. Were appropriate bottles/containers and volumes received for the requested tests? (X) Yes ○ No

10. Did sample labels and tags agree with custody documents? (X) Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

ALS Environmental - Houston HRMS

10450 Stancliff Rd., Suite 210
Houston, TX 77099
**T:** +1 713 266 1599
**F:** +1 713 266 1599
**www.alsglobal.com**

# SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

**Cooler Custody Seals (desirable, mandatory if specified in SAP):**

- ✓ Intact on outside of cooler, signed and dated

**Chain-of-Custody (COC) documentation (mandatory):**

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

**Sample Integrity (mandatory):**

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

**Temperature Requirement (varies by sample matrix):**

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

# Preparation Information Benchsheets

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

# *Preparation Information Benchsheet*

**Prep Run#:** 395241 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** **Prep Date/Time:** 2/14/22 10:28

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2200107-001 | LH18/24-SP650_020222_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 2 | E2200108-001 | LH18/24-SP650_020222_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 3 | E2200109-001 | LH18/24-SP140_020222 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 4 | E2200122-001 | LHAAP17_AreaH_021022 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 5 | E2200123-001 | LH18/24-SP650_021022_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 6 | EQ2200053-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 7 | EQ2200053-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 8 | EQ2200053-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |

## Spiking Solutions

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 221408 Logbook Ref: Perchlorate Internal Standard Expires On: 04/30/2022

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E2200107-001 | 100.00µL | E2200108-001 | 100.00µL | E2200109-001 | 100.00µL | E2200122-001 | 100.00µL | E2200123-001 | 100.00µL | EQ2200053-01 | 100.00µL |
| EQ2200053-02 | 100.00µL | EQ2200053-03 | 100.00µL | | | | | | | | |

Name: Perchlorate Intermediate Stock1 Inventory ID 221456 Logbook Ref: Perchlorate Expires On: 04/30/2022

| | | | |
|---|---|---|---|
| EQ2200053-02 | 1.00µL | EQ2200053-03 | 1.00µL |

## Preparation Materials

| | | | | | |
|---|---|---|---|---|---|
| Water HPLC Grade | 08/03/2021 Water (218530) | 6850 Amber Glass screw vial | 2mL Screw Top Vial (221308) | 6850 Luer-Lok Syringes | Luer-Lok Syringes (221305) |
| 6850 Pipette Tips 50-1000 uL | 6850 Pipette Tips (221307) | 6850 0.45um syringe filters | 6850 Syringe Filters (219639) | 537M Glass Culture Tubes | 537M Glass Tubes (218064) |

## Preparation Steps

Step: Preparation
Started: 2/14/22 10:28
Finished: 2/14/22 11:00
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 2/14/22

# Analytical Results

**ALS Environmental - Houston HRMS**
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**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200123 |
| **Project:** | HS22020588 | **Date Collected:** | 2/10/22 1400 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 2/11/22 |
| **Sample Name:** | LH18/24-SP650_021022_AIX | **Units:** | µg/L |
| **Lab Code:** | E2200123-001 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | ND | U | 0.100 | 0.0500 | 0.0250 | 1 | 2/14/22 | 2/14/22 13:41 | 395241 | 754518 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200123 |
| **Project:** | HS22020588 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2200053-01 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | ND | U | 0.100 | 0.0500 | 0.0250 | 1 | 2/14/22 | 2/14/22 12:15 | 395241 | 754518 | |

# Accuracy & Precision

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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:** | E2200123 |
| **Project:** | HS22020588 | **Date Analyzed:** | 2/14/22 |
| **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:** | | **Basis:** | NA |
| | | **Extraction Lot:** | 395241 |

| | Lab Control Sample EQ2200053-02 | | | Duplicate Lab Control Sample EQ2200053-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.0863 | 0.100 | 86 | 0.0995 | 0.100 | 100 | 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:** | E2200123 |
| **Project:** | HS22020588 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200053-02 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.0863** | J | 0.100 | 0.0500 | 0.0250 | 1 | 2/14/22 | 2/14/22 12:22 | 395241 | 754518 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200123 |
| **Project:** | HS22020588 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200053-03 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.0995** | J | 0.100 | 0.0500 | 0.0250 | 1 | 2/14/22 | 2/14/22 12:30 | 395241 | 754518 | |

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February 25, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22020621**

Laboratory Results for: **Longhorn GW Treatment Plant Bi-Weekly Samples**

Dear Marcia Olive,

ALS Environmental received 2 sample(s) on Feb 11, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: JUMOKE.LAWAL**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 25-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**Work Order:** HS22020621

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22020621-01 | LH18/24-SP650_021022 | Water | | 10-Feb-2022 14:00 | 11-Feb-2022 10:20 | ☐ |
| HS22020621-02 | Trip Blank | Water | CG-121321-567 | 10-Feb-2022 14:00 | 11-Feb-2022 10:20 | ☐ |

**ALS Houston, US** Date: 25-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**Work Order:** HS22020621

**CASE NARRATIVE**

## GCMS Volatiles by Method SW8260

### Batch ID: R402210

#### Sample ID: HS22020668-13MS

- MS and MSD are for an unrelated sample

## WetChemistry by Method SW9056

### Batch ID: R403033

#### Sample ID: HS22021175-01MS

- MS and MSD are for an unrelated sample (Chloride,Sulfate)

**ALS Houston, US** Date: 25-Feb-22

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS22020621
Sample ID: LH18/24-SP650_021022 Lab ID:HS22020621-01
Collection Date: 10-Feb-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| 1,1,1,2-Tetrachloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 1,1,1-Trichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 1,1-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 1,1-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 1,1-Dichloropropene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 1,2,3-Trichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 1,2,3-Trichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 1,2,4-Trichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 1,2,4-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 1,2-Dibromo-3-chloropropane | 1.0 | U | 0.20 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 1,2-Dibromoethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 1,2-Dichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 1,2-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 1,2-Dichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 1,3,5-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 1,3-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 1,3-Dichloropropane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 1,4-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 2,2-Dichloropropane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 2-Butanone | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 2-Chlorotoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 2-Hexanone | 2.0 | U | 1.0 | 2.0 | 2.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 4-Chlorotoluene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 4-Isopropyltoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| 4-Methyl-2-pentanone | 2.0 | U | 0.70 | 2.0 | 2.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Acetone | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Benzene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Bromobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Bromochloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Bromodichloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Bromoform | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Bromomethane | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Carbon disulfide | 2.0 | U | 0.60 | 2.0 | 2.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Carbon tetrachloride | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Chlorobenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Chloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Chloroform | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |

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

**ALS Houston, US** Date: 25-Feb-22

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Sample ID: LH18/24-SP650_021022
Collection Date: 10-Feb-2022 14:00

**ANALYTICAL REPORT**
WorkOrder:HS22020621
Lab ID:HS22020621-01
Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| Chloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| **cis-1,2-Dichloroethene** | **1.4** | | **0.20** | **0.50** | **1.0** | **ug/L** | 1 | 14-Feb-2022 18:58 |
| cis-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Dibromochloromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Dibromomethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Dichlorodifluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Ethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Hexachlorobutadiene | 1.0 | U | 1.0 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Isopropylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| m,p-Xylene | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Methylene chloride | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| n-Butylbenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| n-Propylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Naphthalene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| o-Xylene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| sec-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Styrene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| tert-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Tetrachloroethene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Toluene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| trans-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| trans-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Trichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Trichlorofluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| Vinyl chloride | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:58 |
| *Surr: 1,2-Dichloroethane-d4* | *103* | | | **0** | *81-118* | *%REC* | *1* | *14-Feb-2022 18:58* |
| *Surr: 4-Bromofluorobenzene* | *102* | | | **0** | *85-114* | *%REC* | *1* | *14-Feb-2022 18:58* |
| *Surr: Dibromofluoromethane* | *98.1* | | | **0** | *80-119* | *%REC* | *1* | *14-Feb-2022 18:58* |
| *Surr: Toluene-d8* | *107* | | | **0** | *89-112* | *%REC* | *1* | *14-Feb-2022 18:58* |
| **ANIONS BY SW9056A** | | **Method:SW9056** | | | | | | Analyst: YP |
| **Chloride** | **916** | | **4.00** | **10.0** | **10.0** | **mg/L** | 20 | 24-Feb-2022 23:07 |
| **Sulfate** | **43.1** | | **0.200** | **0.500** | **0.500** | **mg/L** | 1 | 24-Feb-2022 23:01 |

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

**ALS Houston, US** Date: 25-Feb-22

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Sample ID: Trip Blank
Collection Date: 10-Feb-2022 14:00

**ANALYTICAL REPORT**
WorkOrder:HS22020621
Lab ID:HS22020621-02
Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| 1,1,1,2-Tetrachloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 1,1,1-Trichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 1,1-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 1,1-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 1,1-Dichloropropene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 1,2,3-Trichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 1,2,3-Trichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 1,2,4-Trichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 1,2,4-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 1,2-Dibromo-3-chloropropane | 1.0 | U | 0.20 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 1,2-Dibromoethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 1,2-Dichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 1,2-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 1,2-Dichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 1,3,5-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 1,3-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 1,3-Dichloropropane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 1,4-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 2,2-Dichloropropane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 2-Butanone | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 2-Chlorotoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 2-Hexanone | 2.0 | U | 1.0 | 2.0 | 2.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 4-Chlorotoluene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 4-Isopropyltoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| 4-Methyl-2-pentanone | 2.0 | U | 0.70 | 2.0 | 2.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Acetone | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Benzene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Bromobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Bromochloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Bromodichloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Bromoform | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Bromomethane | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Carbon disulfide | 2.0 | U | 0.60 | 2.0 | 2.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Carbon tetrachloride | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Chlorobenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Chloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Chloroform | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |

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

**ALS Houston, US** Date: 25-Feb-22

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Sample ID: Trip Blank
Collection Date: 10-Feb-2022 14:00

**ANALYTICAL REPORT**
WorkOrder:HS22020621
Lab ID:HS22020621-02
Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| Chloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| cis-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| cis-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Dibromochloromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Dibromomethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Dichlorodifluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Ethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Hexachlorobutadiene | 1.0 | U | 1.0 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Isopropylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| m,p-Xylene | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Methylene chloride | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| n-Butylbenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| n-Propylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Naphthalene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| o-Xylene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| sec-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Styrene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| tert-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Tetrachloroethene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Toluene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| trans-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| trans-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Trichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Trichlorofluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| Vinyl chloride | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 14-Feb-2022 18:36 |
| *Surr: 1,2-Dichloroethane-d4* | *103* | | | **0** | *81-118* | *%REC* | *1* | *14-Feb-2022 18:36* |
| *Surr: 4-Bromofluorobenzene* | *100* | | | **0** | *85-114* | *%REC* | *1* | *14-Feb-2022 18:36* |
| *Surr: Dibromofluoromethane* | *97.1* | | | **0** | *80-119* | *%REC* | *1* | *14-Feb-2022 18:36* |
| *Surr: Toluene-d8* | *106* | | | **0** | *89-112* | *%REC* | *1* | *14-Feb-2022 18:36* |

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

**ALS Houston, US** Date: 25-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22020621

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** R402210 ( 0 ) | **Test Name :** VOLATILES ORGANICS BY METHOD 8260C | | | | **Matrix:** Water | |
| HS22020621-01 | LH18/24-SP650_021022 | 10 Feb 2022 14:00 | | | 14 Feb 2022 18:58 | 1 |
| HS22020621-02 | Trip Blank | 10 Feb 2022 14:00 | | | 14 Feb 2022 18:36 | 1 |
| **Batch ID:** R403033 ( 0 ) | **Test Name :** ANIONS BY SW9056A | | | | **Matrix:** Water | |
| HS22020621-01 | LH18/24-SP650_021022 | 10 Feb 2022 14:00 | | | 24 Feb 2022 23:07 | 20 |
| HS22020621-01 | LH18/24-SP650_021022 | 10 Feb 2022 14:00 | | | 24 Feb 2022 23:01 | 1 |

**ALS Houston, US** Date: 25-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22020621

**QC BATCH REPORT**

**Batch ID:** R402210 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220213** Units: **ug/L** Analysis Date: **14-Feb-2022 13:14**
Client ID: Run ID: **VOA9_402210** SeqNo: **6501848** PrepDate: DF: **1**

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

**ALS Houston, US** Date: 25-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22020621

**QC BATCH REPORT**

**Batch ID:** R402210 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220213** Units: **ug/L** Analysis Date: **14-Feb-2022 13:14**
Client ID: Run ID: **VOA9_402210** SeqNo: **6501848** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 2.0 | 2.0 | | | | | | | | U |
| Carbon tetrachloride | 1.0 | 1.0 | | | | | | | | U |
| Chlorobenzene | 1.0 | 1.0 | | | | | | | | U |
| Chloroethane | 1.0 | 1.0 | | | | | | | | U |
| Chloroform | 0.50 | 1.0 | | | | | | | | U |
| Chloromethane | 0.50 | 1.0 | | | | | | | | U |
| cis-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| cis-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Dibromochloromethane | 1.0 | 1.0 | | | | | | | | U |
| Dibromomethane | 0.50 | 1.0 | | | | | | | | U |
| Dichlorodifluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Ethylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Hexachlorobutadiene | 1.0 | 1.0 | | | | | | | | U |
| Isopropylbenzene | 1.0 | 1.0 | | | | | | | | U |
| m,p-Xylene | 1.0 | 2.0 | | | | | | | | U |
| Methylene chloride | 2.0 | 2.0 | | | | | | | | U |
| Naphthalene | 1.0 | 1.0 | | | | | | | | U |
| n-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| n-Propylbenzene | 1.0 | 1.0 | | | | | | | | U |
| o-Xylene | 1.0 | 1.0 | | | | | | | | U |
| sec-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Styrene | 1.0 | 1.0 | | | | | | | | U |
| tert-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Tetrachloroethene | 1.0 | 1.0 | | | | | | | | U |
| Toluene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Trichloroethene | 0.50 | 1.0 | | | | | | | | U |
| Trichlorofluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Vinyl chloride | 0.50 | 1.0 | | | | | | | | U |
| *Surr: 1,2-Dichloroethane-d4* | *50.75* | *1.0* | *50* | *0* | *102* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *51.63* | *1.0* | *50* | *0* | *103* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *47.88* | *1.0* | *50* | *0* | *95.8* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *53.17* | *1.0* | *50* | *0* | *106* | *89 - 112* | | | | |

**ALS Houston, US** Date: 25-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22020621

**QC BATCH REPORT**

**Batch ID:** R402210 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220214** Units: **ug/L** Analysis Date: **14-Feb-2022 12:29**
Client ID: Run ID: **VOA9_402210** SeqNo: **6501847** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 21.56 | 1.0 | 20 | 0 | 108 | 78 - 124 | | | | |
| 1,1,1-Trichloroethane | 20.8 | 1.0 | 20 | 0 | 104 | 74 - 131 | | | | |
| 1,1,2,2-Tetrachloroethane | 20.31 | 1.0 | 20 | 0 | 102 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 19.8 | 1.0 | 20 | 0 | 99.0 | 80 - 119 | | | | |
| 1,1-Dichloroethane | 21.21 | 1.0 | 20 | 0 | 106 | 77 - 125 | | | | |
| 1,1-Dichloroethene | 19.81 | 1.0 | 20 | 0 | 99.1 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 21.26 | 1.0 | 20 | 0 | 106 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 19.65 | 1.0 | 20 | 0 | 98.3 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 19.7 | 1.0 | 20 | 0 | 98.5 | 73 - 122 | | | | |
| 1,2,4-Trichlorobenzene | 19.9 | 1.0 | 20 | 0 | 99.5 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 23.65 | 1.0 | 20 | 0 | 118 | 76 - 124 | | | | |
| 1,2-Dibromo-3-chloropropane | 18.31 | 1.0 | 20 | 0 | 91.5 | 62 - 128 | | | | |
| 1,2-Dibromoethane | 20.76 | 1.0 | 20 | 0 | 104 | 77 - 121 | | | | |
| 1,2-Dichlorobenzene | 19.92 | 1.0 | 20 | 0 | 99.6 | 80 - 119 | | | | |
| 1,2-Dichloroethane | 22.13 | 1.0 | 20 | 0 | 111 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 19.88 | 1.0 | 20 | 0 | 99.4 | 78 - 122 | | | | |
| 1,3,5-Trimethylbenzene | 21.17 | 1.0 | 20 | 0 | 106 | 75 - 124 | | | | |
| 1,3-Dichlorobenzene | 20.59 | 1.0 | 20 | 0 | 103 | 80 - 119 | | | | |
| 1,3-Dichloropropane | 20.65 | 1.0 | 20 | 0 | 103 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 19.39 | 1.0 | 20 | 0 | 97.0 | 79 - 118 | | | | |
| 2,2-Dichloropropane | 21.29 | 1.0 | 20 | 0 | 106 | 60 - 139 | | | | |
| 2-Butanone | 45.02 | 2.0 | 40 | 0 | 113 | 56 - 143 | | | | |
| 2-Chlorotoluene | 21.74 | 1.0 | 20 | 0 | 109 | 79 - 122 | | | | |
| 2-Hexanone | 45.87 | 2.0 | 40 | 0 | 115 | 57 - 139 | | | | |
| 4-Chlorotoluene | 21.96 | 1.0 | 20 | 0 | 110 | 78 - 122 | | | | |
| 4-Isopropyltoluene | 20.69 | 1.0 | 20 | 0 | 103 | 77 - 127 | | | | |
| 4-Methyl-2-pentanone | 44.87 | 2.0 | 40 | 0 | 112 | 67 - 130 | | | | |
| Acetone | 49.92 | 2.0 | 40 | 0 | 125 | 39 - 160 | | | | |
| Benzene | 20.65 | 1.0 | 20 | 0 | 103 | 79 - 120 | | | | |
| Bromobenzene | 20.55 | 1.0 | 20 | 0 | 103 | 80 - 120 | | | | |
| Bromochloromethane | 19.63 | 1.0 | 20 | 0 | 98.1 | 78 - 123 | | | | |
| Bromodichloromethane | 20.68 | 1.0 | 20 | 0 | 103 | 79 - 125 | | | | |
| Bromoform | 17.99 | 1.0 | 20 | 0 | 89.9 | 66 - 130 | | | | |
| Bromomethane | 21.36 | 1.0 | 20 | 0 | 107 | 53 - 141 | | | | |

**ALS Houston, US** Date: 25-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22020621

**QC BATCH REPORT**

**Batch ID:** R402210 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220214** Units: **ug/L** Analysis Date: **14-Feb-2022 12:29**
Client ID: Run ID: **VOA9_402210** SeqNo: **6501847** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 43.86 | 2.0 | 40 | 0 | 110 | 64 - 133 | | | | |
| Carbon tetrachloride | 21.18 | 1.0 | 20 | 0 | 106 | 72 - 136 | | | | |
| Chlorobenzene | 20.67 | 1.0 | 20 | 0 | 103 | 82 - 118 | | | | |
| Chloroethane | 22.6 | 1.0 | 20 | 0 | 113 | 60 - 138 | | | | |
| Chloroform | 20.9 | 1.0 | 20 | 0 | 104 | 79 - 124 | | | | |
| Chloromethane | 18.85 | 1.0 | 20 | 0 | 94.2 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 20.23 | 1.0 | 20 | 0 | 101 | 78 - 123 | | | | |
| cis-1,3-Dichloropropene | 19.04 | 1.0 | 20 | 0 | 95.2 | 75 - 124 | | | | |
| Dibromochloromethane | 19.12 | 1.0 | 20 | 0 | 95.6 | 74 - 126 | | | | |
| Dibromomethane | 19.52 | 1.0 | 20 | 0 | 97.6 | 79 - 123 | | | | |
| Dichlorodifluoromethane | 17.94 | 1.0 | 20 | 0 | 89.7 | 32 - 152 | | | | |
| Ethylbenzene | 20.84 | 1.0 | 20 | 0 | 104 | 79 - 121 | | | | |
| Hexachlorobutadiene | 21.32 | 1.0 | 20 | 0 | 107 | 66 - 134 | | | | |
| Isopropylbenzene | 21.97 | 1.0 | 20 | 0 | 110 | 72 - 131 | | | | |
| m,p-Xylene | 44.7 | 2.0 | 40 | 0 | 112 | 80 - 121 | | | | |
| Methylene chloride | 20.54 | 2.0 | 20 | 0 | 103 | 74 - 124 | | | | |
| Naphthalene | 19.19 | 1.0 | 20 | 0 | 96.0 | 61 - 128 | | | | |
| n-Butylbenzene | 22.66 | 1.0 | 20 | 0 | 113 | 75 - 128 | | | | |
| n-Propylbenzene | 22.34 | 1.0 | 20 | 0 | 112 | 76 - 126 | | | | |
| o-Xylene | 21.86 | 1.0 | 20 | 0 | 109 | 78 - 122 | | | | |
| sec-Butylbenzene | 22.22 | 1.0 | 20 | 0 | 111 | 77 - 126 | | | | |
| Styrene | 22.38 | 1.0 | 20 | 0 | 112 | 78 - 123 | | | | |
| tert-Butylbenzene | 21.46 | 1.0 | 20 | 0 | 107 | 78 - 124 | | | | |
| Tetrachloroethene | 20.59 | 1.0 | 20 | 0 | 103 | 74 - 129 | | | | |
| Toluene | 21.68 | 1.0 | 20 | 0 | 108 | 80 - 121 | | | | |
| trans-1,2-Dichloroethene | 19.81 | 1.0 | 20 | 0 | 99.1 | 75 - 124 | | | | |
| trans-1,3-Dichloropropene | 18.44 | 1.0 | 20 | 0 | 92.2 | 73 - 127 | | | | |
| Trichloroethene | 19.71 | 1.0 | 20 | 0 | 98.5 | 79 - 123 | | | | |
| Trichlorofluoromethane | 21.97 | 1.0 | 20 | 0 | 110 | 65 - 141 | | | | |
| Vinyl chloride | 19.88 | 1.0 | 20 | 0 | 99.4 | 58 - 137 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *56.42* | *1.0* | *50* | *0* | *113* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *52.67* | *1.0* | *50* | *0* | *105* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *53.76* | *1.0* | *50* | *0* | *108* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *52.4* | *1.0* | *50* | *0* | *105* | *89 - 112* | | | | |

**ALS Houston, US** Date: 25-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22020621

**QC BATCH REPORT**

**Batch ID:** R402210 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS22020668-13MS** Units: **ug/L** Analysis Date: **14-Feb-2022 14:31**
Client ID: Run ID: **VOA9_402210** SeqNo: **6501851** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 21.05 | 1.0 | 20 | 0 | 105 | 78 - 124 | | | | |
| 1,1,1-Trichloroethane | 20.12 | 1.0 | 20 | 0 | 101 | 74 - 131 | | | | |
| 1,1,2,2-Tetrachloroethane | 19.54 | 1.0 | 20 | 0 | 97.7 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 19.32 | 1.0 | 20 | 0 | 96.6 | 80 - 119 | | | | |
| 1,1-Dichloroethane | 20.28 | 1.0 | 20 | 0 | 101 | 77 - 125 | | | | |
| 1,1-Dichloroethene | 19.35 | 1.0 | 20 | 0 | 96.7 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 22.12 | 1.0 | 20 | 0 | 111 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 18.85 | 1.0 | 20 | 0 | 94.3 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 19.24 | 1.0 | 20 | 0 | 96.2 | 73 - 122 | | | | |
| 1,2,4-Trichlorobenzene | 19.47 | 1.0 | 20 | 0 | 97.4 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 24.78 | 1.0 | 20 | 0 | 124 | 76 - 124 | | | | |
| 1,2-Dibromo-3-chloropropane | 16.28 | 1.0 | 20 | 0 | 81.4 | 62 - 128 | | | | |
| 1,2-Dibromoethane | 19.88 | 1.0 | 20 | 0 | 99.4 | 77 - 121 | | | | |
| 1,2-Dichlorobenzene | 20.14 | 1.0 | 20 | 0 | 101 | 80 - 119 | | | | |
| 1,2-Dichloroethane | 21.93 | 1.0 | 20 | 0.8451 | 105 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 19.35 | 1.0 | 20 | 0 | 96.8 | 78 - 122 | | | | |
| 1,3,5-Trimethylbenzene | 22.49 | 1.0 | 20 | 0 | 112 | 75 - 124 | | | | |
| 1,3-Dichlorobenzene | 21.13 | 1.0 | 20 | 0 | 106 | 80 - 119 | | | | |
| 1,3-Dichloropropane | 19.65 | 1.0 | 20 | 0 | 98.2 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 20.59 | 1.0 | 20 | 0 | 103 | 79 - 118 | | | | |
| 2,2-Dichloropropane | 20.73 | 1.0 | 20 | 0 | 104 | 60 - 139 | | | | |
| 2-Butanone | 39.09 | 2.0 | 40 | 0 | 97.7 | 56 - 143 | | | | |
| 2-Chlorotoluene | 22.71 | 1.0 | 20 | 0 | 114 | 79 - 122 | | | | |
| 2-Hexanone | 40.78 | 2.0 | 40 | 0 | 102 | 57 - 139 | | | | |
| 4-Chlorotoluene | 23.43 | 1.0 | 20 | 0 | 117 | 78 - 122 | | | | |
| 4-Isopropyltoluene | 22.29 | 1.0 | 20 | 0 | 111 | 77 - 127 | | | | |
| 4-Methyl-2-pentanone | 40.56 | 2.0 | 40 | 0 | 101 | 67 - 130 | | | | |
| Acetone | 37 | 2.0 | 40 | 3.333 | 84.2 | 39 - 160 | | | | |
| Benzene | 20.79 | 1.0 | 20 | 0 | 104 | 79 - 120 | | | | |
| Bromobenzene | 21.55 | 1.0 | 20 | 0 | 108 | 80 - 120 | | | | |
| Bromochloromethane | 17.7 | 1.0 | 20 | 0 | 88.5 | 78 - 123 | | | | |
| Bromodichloromethane | 20.27 | 1.0 | 20 | 0 | 101 | 79 - 125 | | | | |
| Bromoform | 16.95 | 1.0 | 20 | 0 | 84.7 | 66 - 130 | | | | |
| Bromomethane | 16.87 | 1.0 | 20 | 0 | 84.4 | 53 - 141 | | | | |

**ALS Houston, US** Date: 25-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22020621

**QC BATCH REPORT**

**Batch ID:** R402210 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS22020668-13MS** Units: **ug/L** Analysis Date: **14-Feb-2022 14:31**
Client ID: Run ID: **VOA9_402210** SeqNo: **6501851** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 40 | 2.0 | 40 | 0 | 100.0 | 64 - 133 | | | | |
| Carbon tetrachloride | 22.45 | 1.0 | 20 | 0 | 112 | 72 - 136 | | | | |
| Chlorobenzene | 20.49 | 1.0 | 20 | 0 | 102 | 82 - 118 | | | | |
| Chloroethane | 18.05 | 1.0 | 20 | 0 | 90.3 | 60 - 138 | | | | |
| Chloroform | 19.37 | 1.0 | 20 | 0 | 96.8 | 79 - 124 | | | | |
| Chloromethane | 11.77 | 1.0 | 20 | 0 | 58.8 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 20.11 | 1.0 | 20 | 2.378 | 88.7 | 78 - 123 | | | | |
| cis-1,3-Dichloropropene | 18.46 | 1.0 | 20 | 0 | 92.3 | 75 - 124 | | | | |
| Dibromochloromethane | 18.49 | 1.0 | 20 | 0 | 92.5 | 74 - 126 | | | | |
| Dibromomethane | 18.68 | 1.0 | 20 | 0 | 93.4 | 79 - 123 | | | | |
| Dichlorodifluoromethane | 6.406 | 1.0 | 20 | 0 | 32.0 | 32 - 152 | | | | |
| Ethylbenzene | 22.29 | 1.0 | 20 | 0 | 111 | 79 - 121 | | | | |
| Hexachlorobutadiene | 22.16 | 1.0 | 20 | 0 | 111 | 66 - 134 | | | | |
| Isopropylbenzene | 23.64 | 1.0 | 20 | 0 | 118 | 72 - 131 | | | | |
| m,p-Xylene | 46.49 | 2.0 | 40 | 0 | 116 | 80 - 121 | | | | |
| Methylene chloride | 18.69 | 2.0 | 20 | 0 | 93.5 | 74 - 124 | | | | |
| Naphthalene | 17.66 | 1.0 | 20 | 0 | 88.3 | 61 - 128 | | | | |
| n-Butylbenzene | 24.9 | 1.0 | 20 | 0 | 125 | 75 - 128 | | | | |
| n-Propylbenzene | 24.59 | 1.0 | 20 | 0 | 123 | 76 - 126 | | | | |
| o-Xylene | 21.96 | 1.0 | 20 | 0 | 110 | 78 - 122 | | | | |
| sec-Butylbenzene | 25.02 | 1.0 | 20 | 0 | 125 | 77 - 126 | | | | |
| Styrene | 5.841 | 1.0 | 20 | 0 | 29.2 | 78 - 123 | | | | S |
| tert-Butylbenzene | 23.58 | 1.0 | 20 | 0 | 118 | 78 - 124 | | | | |
| Tetrachloroethene | 23.71 | 1.0 | 20 | 0 | 119 | 74 - 129 | | | | |
| Toluene | 22.3 | 1.0 | 20 | 0 | 112 | 80 - 121 | | | | |
| trans-1,2-Dichloroethene | 19.11 | 1.0 | 20 | 0 | 95.6 | 75 - 124 | | | | |
| trans-1,3-Dichloropropene | 17.81 | 1.0 | 20 | 0 | 89.0 | 73 - 127 | | | | |
| Trichloroethene | 59.72 | 1.0 | 20 | 36.25 | 117 | 79 - 123 | | | | |
| Trichlorofluoromethane | 20.41 | 1.0 | 20 | 0 | 102 | 65 - 141 | | | | |
| Vinyl chloride | 14.75 | 1.0 | 20 | 0 | 73.7 | 58 - 137 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *50.18* | *1.0* | *50* | *0* | *100* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *53* | *1.0* | *50* | *0* | *106* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *49.37* | *1.0* | *50* | *0* | *98.7* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *53.85* | *1.0* | *50* | *0* | *108* | *89 - 112* | | | | |

**ALS Houston, US** Date: 25-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22020621

**QC BATCH REPORT**

**Batch ID:** R402210 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS22020668-13MSD** Units: **ug/L** Analysis Date: **14-Feb-2022 14:54**
Client ID: Run ID: **VOA9_402210** SeqNo: **6501852** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 21.71 | 1.0 | 20 | 0 | 109 | 78 - 124 | 21.05 | 3.11 | 20 | |
| 1,1,1-Trichloroethane | 19.82 | 1.0 | 20 | 0 | 99.1 | 74 - 131 | 20.12 | 1.5 | 20 | |
| 1,1,2,2-Tetrachloroethane | 19.83 | 1.0 | 20 | 0 | 99.2 | 71 - 121 | 19.54 | 1.45 | 20 | |
| 1,1,2-Trichloroethane | 19.44 | 1.0 | 20 | 0 | 97.2 | 80 - 119 | 19.32 | 0.602 | 20 | |
| 1,1-Dichloroethane | 19.7 | 1.0 | 20 | 0 | 98.5 | 77 - 125 | 20.28 | 2.89 | 20 | |
| 1,1-Dichloroethene | 18.67 | 1.0 | 20 | 0 | 93.4 | 71 - 131 | 19.35 | 3.55 | 20 | |
| 1,1-Dichloropropene | 21.62 | 1.0 | 20 | 0 | 108 | 78 - 125 | 22.12 | 2.27 | 20 | |
| 1,2,3-Trichlorobenzene | 18.94 | 1.0 | 20 | 0 | 94.7 | 69 - 129 | 18.85 | 0.471 | 20 | |
| 1,2,3-Trichloropropane | 19.44 | 1.0 | 20 | 0 | 97.2 | 73 - 122 | 19.24 | 1.03 | 20 | |
| 1,2,4-Trichlorobenzene | 19.98 | 1.0 | 20 | 0 | 99.9 | 69 - 130 | 19.47 | 2.59 | 20 | |
| 1,2,4-Trimethylbenzene | 24.39 | 1.0 | 20 | 0 | 122 | 76 - 124 | 24.78 | 1.56 | 20 | |
| 1,2-Dibromo-3-chloropropane | 17.18 | 1.0 | 20 | 0 | 85.9 | 62 - 128 | 16.28 | 5.33 | 20 | |
| 1,2-Dibromoethane | 20.5 | 1.0 | 20 | 0 | 102 | 77 - 121 | 19.88 | 3.05 | 20 | |
| 1,2-Dichlorobenzene | 19.65 | 1.0 | 20 | 0 | 98.3 | 80 - 119 | 20.14 | 2.46 | 20 | |
| 1,2-Dichloroethane | 22.1 | 1.0 | 20 | 0.8451 | 106 | 73 - 128 | 21.93 | 0.747 | 20 | |
| 1,2-Dichloropropane | 19.47 | 1.0 | 20 | 0 | 97.4 | 78 - 122 | 19.35 | 0.616 | 20 | |
| 1,3,5-Trimethylbenzene | 22.01 | 1.0 | 20 | 0 | 110 | 75 - 124 | 22.49 | 2.19 | 20 | |
| 1,3-Dichlorobenzene | 20.69 | 1.0 | 20 | 0 | 103 | 80 - 119 | 21.13 | 2.07 | 20 | |
| 1,3-Dichloropropane | 20.26 | 1.0 | 20 | 0 | 101 | 80 - 119 | 19.65 | 3.09 | 20 | |
| 1,4-Dichlorobenzene | 19.96 | 1.0 | 20 | 0 | 99.8 | 79 - 118 | 20.59 | 3.1 | 20 | |
| 2,2-Dichloropropane | 19.97 | 1.0 | 20 | 0 | 99.8 | 60 - 139 | 20.73 | 3.78 | 20 | |
| 2-Butanone | 38.27 | 2.0 | 40 | 0 | 95.7 | 56 - 143 | 39.09 | 2.11 | 20 | |
| 2-Chlorotoluene | 22.23 | 1.0 | 20 | 0 | 111 | 79 - 122 | 22.71 | 2.15 | 20 | |
| 2-Hexanone | 43.2 | 2.0 | 40 | 0 | 108 | 57 - 139 | 40.78 | 5.75 | 20 | |
| 4-Chlorotoluene | 22.76 | 1.0 | 20 | 0 | 114 | 78 - 122 | 23.43 | 2.91 | 20 | |
| 4-Isopropyltoluene | 21.91 | 1.0 | 20 | 0 | 110 | 77 - 127 | 22.29 | 1.7 | 20 | |
| 4-Methyl-2-pentanone | 44.19 | 2.0 | 40 | 0 | 110 | 67 - 130 | 40.56 | 8.58 | 20 | |
| Acetone | 38.97 | 2.0 | 40 | 3.333 | 89.1 | 39 - 160 | 37 | 5.17 | 20 | |
| Benzene | 20.66 | 1.0 | 20 | 0 | 103 | 79 - 120 | 20.79 | 0.636 | 20 | |
| Bromobenzene | 20.67 | 1.0 | 20 | 0 | 103 | 80 - 120 | 21.55 | 4.21 | 20 | |
| Bromochloromethane | 17.69 | 1.0 | 20 | 0 | 88.4 | 78 - 123 | 17.7 | 0.0987 | 20 | |
| Bromodichloromethane | 20.6 | 1.0 | 20 | 0 | 103 | 79 - 125 | 20.27 | 1.64 | 20 | |
| Bromoform | 17.69 | 1.0 | 20 | 0 | 88.5 | 66 - 130 | 16.95 | 4.31 | 20 | |
| Bromomethane | 15.77 | 1.0 | 20 | 0 | 78.9 | 53 - 141 | 16.87 | 6.74 | 20 | |

**ALS Houston, US** Date: 25-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22020621

**QC BATCH REPORT**

**Batch ID:** R402210 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS22020668-13MSD** Units: **ug/L** Analysis Date: **14-Feb-2022 14:54**
Client ID: Run ID: **VOA9_402210** SeqNo: **6501852** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 38.61 | 2.0 | 40 | 0 | 96.5 | 64 - 133 | 40 | 3.53 | 20 | |
| Carbon tetrachloride | 22.42 | 1.0 | 20 | 0 | 112 | 72 - 136 | 22.45 | 0.138 | 20 | |
| Chlorobenzene | 20.48 | 1.0 | 20 | 0 | 102 | 82 - 118 | 20.49 | 0.0402 | 20 | |
| Chloroethane | 17.62 | 1.0 | 20 | 0 | 88.1 | 60 - 138 | 18.05 | 2.42 | 20 | |
| Chloroform | 19.26 | 1.0 | 20 | 0 | 96.3 | 79 - 124 | 19.37 | 0.55 | 20 | |
| Chloromethane | 11.69 | 1.0 | 20 | 0 | 58.5 | 50 - 139 | 11.77 | 0.624 | 20 | |
| cis-1,2-Dichloroethene | 20.76 | 1.0 | 20 | 2.378 | 91.9 | 78 - 123 | 20.11 | 3.16 | 20 | |
| cis-1,3-Dichloropropene | 18.53 | 1.0 | 20 | 0 | 92.6 | 75 - 124 | 18.46 | 0.396 | 20 | |
| Dibromochloromethane | 18.93 | 1.0 | 20 | 0 | 94.7 | 74 - 126 | 18.49 | 2.36 | 20 | |
| Dibromomethane | 18.99 | 1.0 | 20 | 0 | 95.0 | 79 - 123 | 18.68 | 1.65 | 20 | |
| Dichlorodifluoromethane | 5.939 | 1.0 | 20 | 0 | 29.7 | 32 - 152 | 6.406 | 7.56 | 20 | S |
| Ethylbenzene | 22.13 | 1.0 | 20 | 0 | 111 | 79 - 121 | 22.29 | 0.698 | 20 | |
| Hexachlorobutadiene | 21.54 | 1.0 | 20 | 0 | 108 | 66 - 134 | 22.16 | 2.86 | 20 | |
| Isopropylbenzene | 23.36 | 1.0 | 20 | 0 | 117 | 72 - 131 | 23.64 | 1.17 | 20 | |
| m,p-Xylene | 46.3 | 2.0 | 40 | 0 | 116 | 80 - 121 | 46.49 | 0.424 | 20 | |
| Methylene chloride | 18.5 | 2.0 | 20 | 0 | 92.5 | 74 - 124 | 18.69 | 1.03 | 20 | |
| Naphthalene | 19.03 | 1.0 | 20 | 0 | 95.1 | 61 - 128 | 17.66 | 7.49 | 20 | |
| n-Butylbenzene | 24.27 | 1.0 | 20 | 0 | 121 | 75 - 128 | 24.9 | 2.57 | 20 | |
| n-Propylbenzene | 23.93 | 1.0 | 20 | 0 | 120 | 76 - 126 | 24.59 | 2.7 | 20 | |
| o-Xylene | 22.64 | 1.0 | 20 | 0 | 113 | 78 - 122 | 21.96 | 3.06 | 20 | |
| sec-Butylbenzene | 23.89 | 1.0 | 20 | 0 | 119 | 77 - 126 | 25.02 | 4.62 | 20 | |
| Styrene | 2.071 | 1.0 | 20 | 0 | 10.4 | 78 - 123 | 5.841 | 95.3 | 20 | SR |
| tert-Butylbenzene | 22.89 | 1.0 | 20 | 0 | 114 | 78 - 124 | 23.58 | 2.97 | 20 | |
| Tetrachloroethene | 23.04 | 1.0 | 20 | 0 | 115 | 74 - 129 | 23.71 | 2.9 | 20 | |
| Toluene | 22.57 | 1.0 | 20 | 0 | 113 | 80 - 121 | 22.3 | 1.18 | 20 | |
| trans-1,2-Dichloroethene | 18.89 | 1.0 | 20 | 0 | 94.4 | 75 - 124 | 19.11 | 1.16 | 20 | |
| trans-1,3-Dichloropropene | 18.16 | 1.0 | 20 | 0 | 90.8 | 73 - 127 | 17.81 | 1.97 | 20 | |
| Trichloroethene | 58.64 | 1.0 | 20 | 36.25 | 112 | 79 - 123 | 59.72 | 1.82 | 20 | |
| Trichlorofluoromethane | 19.66 | 1.0 | 20 | 0 | 98.3 | 65 - 141 | 20.41 | 3.78 | 20 | |
| Vinyl chloride | 14.22 | 1.0 | 20 | 0 | 71.1 | 58 - 137 | 14.75 | 3.66 | 20 | |
| *Surr: 1,2-Dichloroethane-d4* | *49.76* | *1.0* | *50* | *0* | *99.5* | *81 - 118* | *50.18* | *0.854* | *20* | |
| *Surr: 4-Bromofluorobenzene* | *53.36* | *1.0* | *50* | *0* | *107* | *85 - 114* | *53* | *0.687* | *20* | |
| *Surr: Dibromofluoromethane* | *49.02* | *1.0* | *50* | *0* | *98.0* | *80 - 119* | *49.37* | *0.717* | *20* | |
| *Surr: Toluene-d8* | *53.98* | *1.0* | *50* | *0* | *108* | *89 - 112* | *53.85* | *0.24* | *20* | |

**ALS Houston, US** Date: 25-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22020621

**QC BATCH REPORT**

| Batch ID: | R402210 ( 0 ) | Instrument: | VOA9 | Method: | VOLATILES ORGANICS BY METHOD 8260C |
|---|---|---|---|---|---|

**The following samples were analyzed in this batch:** HS22020621-01 HS22020621-02

**ALS Houston, US** Date: 25-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22020621

**QC BATCH REPORT**

**Batch ID: R403033 ( 0 )** **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

**MBLK** Sample ID: **MBLK** Units: **mg/L** Analysis Date: **24-Feb-2022 17:06**
Client ID: Run ID: **ICS-Integrion_403033** SeqNo: **6520615** 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: **24-Feb-2022 17:11**
Client ID: Run ID: **ICS-Integrion_403033** SeqNo: **6520616** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 19.05 | 0.500 | 20 | 0 | 95.2 | 80 - 120 | | | | |
| Sulfate | 19.3 | 0.500 | 20 | 0 | 96.5 | 80 - 120 | | | | |

**MS** Sample ID: **HS22021175-01MS** Units: **mg/L** Analysis Date: **24-Feb-2022 17:37**
Client ID: Run ID: **ICS-Integrion_403033** SeqNo: **6520619** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 246.6 | 0.500 | 10 | 241.7 | 48.8 | 80 - 120 | | | | SEO |
| Sulfate | 568.7 | 0.500 | 10 | 571.3 | -26.5 | 80 - 120 | | | | SEO |

**MS** Sample ID: **HS22020641-01MS** Units: **mg/L** Analysis Date: **24-Feb-2022 22:40**
Client ID: Run ID: **ICS-Integrion_403033** SeqNo: **6520647** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 32.91 | 0.500 | 10 | 23.1 | 98.1 | 80 - 120 | | | | |
| Sulfate | 10.34 | 0.500 | 10 | 0.1433 | 102 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22021175-01MSD** Units: **mg/L** Analysis Date: **24-Feb-2022 17:43**
Client ID: Run ID: **ICS-Integrion_403033** SeqNo: **6520620** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 246.1 | 0.500 | 10 | 241.7 | 43.8 | 80 - 120 | 246.6 | 0.2 | 20 | SEO |
| Sulfate | 567.4 | 0.500 | 10 | 571.3 | -39.2 | 80 - 120 | 568.7 | 0.223 | 20 | SEO |

**ALS Houston, US** Date: 25-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22020621

**QC BATCH REPORT**

**Batch ID:** **R403033 ( 0 )** **Instrument:** **ICS-Integrion** **Method:** **ANIONS BY SW9056A**

**MSD** Sample ID: **HS22020641-01MSD** Units: **mg/L** Analysis Date: **24-Feb-2022 22:45**
Client ID: Run ID: **ICS-Integrion_403033** SeqNo: **6520648** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 32.89 | 0.500 | 10 | 23.1 | 97.8 | 80 - 120 | 32.91 | 0.079 | 20 | |
| Sulfate | 10.37 | 0.500 | 10 | 0.1433 | 102 | 80 - 120 | 10.34 | 0.303 | 20 | |

**The following samples were analyzed in this batch:** HS22020621-01

**ALS Houston, US** Date: 25-Feb-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** **HS22020621**

## QUALIFIERS, ACRONYMS, UNITS

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

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

| Unit Reported | Description |
|---|---|
| mg/L | Milligrams per Liter |

## CERTIFICATIONS,ACCREDITATIONS & LICENSES

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas | 21-022-0 | 26-Mar-2022 |
| Florida | E87611-34 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 25-Feb-22

## Sample Receipt Checklist

**Work Order ID:** HS22020621 **Date/Time Received:** **11-Feb-2022 10:20**

**Client Name:** Bhate Environmental **Received by:** **Pablo Marinez**

**Completed By:** /S/ Pablo Marinez (eSignature) 11-Feb-2022 14:05 (Date/Time) **Reviewed by:** /S/ Ragen Giga (eSignature) 12-Feb-2022 12:39 (Date/Time)

Matrices: **WATER** Carrier name: **FedEx Priority Overnight**

| | Yes | No | |
|---|---|---|---|
| Shipping container/cooler in good condition? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on shipping container/cooler? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on sample bottles? | ☐ | ☐ | Not Present ☑ |
| VOA/TX1005/TX1006 Solids in hermetically sealed vials? | ☐ | ☐ | Not Present ☑ |
| Chain of custody present? | ☑ | ☐ | 1 Page(s) |
| Chain of custody signed when relinquished and received? | ☑ | ☐ | COC IDs:CLIENT |
| Samplers name present on COC? | ☑ | ☐ | |
| Chain of custody agrees with sample labels? | ☑ | ☐ | |
| Samples in proper container/bottle? | ☑ | ☐ | |
| Sample containers intact? | ☑ | ☐ | |
| Sufficient sample volume for indicated test? | ☑ | ☐ | |
| All samples received within holding time? | ☑ | ☐ | |
| Container/Temp Blank temperature in compliance? | ☑ | ☐ | |

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 0.9°C/1.4°C UC/C | IR 31 |
| Cooler(s)/Kit(s): | BLUE | |
| Date/Time sample(s) sent to storage: | 2/11/22 14:10 | |

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

Page 1 of 1

**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:**
**GROUNDWATER TREATMENT PLANT BI-WEEKLY SAMPLES**

**Prepared By:** Scott Beesinger

**P.O Number**

HS22020621
Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Bi-Weekly Samples

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | VOC | CHLORIDE, SULFATE | | | | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_021022 | Water | 02/10/22 / 14:00 | | 3 | 3 | | | | | | | | | | HCL | |
| LH18/24-SP650_021022 | Water | 02/10/22 / 14:00 | | 1 | | 1 | | | | | | | | | NONE | |
| Trip Blank | Water | 02/10/22 | | 2 | 2 | | | | | | | | | | HCL | |

Additional Remarks: **Standard TAT on all parameters**

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 02/10/22 | 14:30 | Paul [illegible] | 2/1/22 | 1000 | | | | | | |

**9For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Remarks

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

Blue OAC
UR31 1P4U8

ALS
10450 Stancliff Rd.,
Houston, Texas 770
Tel. +1 281 530 565
Fax. +1 281 530 58

Suite 210
199
6
37

Blue

CUSTODY SEA
Date: 2/10/22
Time: 14
Name:
Company:

917 B03

Broken By:
Date: 2/10/22

FedEx 1251 0296 4913

PRIORITY OVERNIGHT

AB SGRA

Blue

77099
TX-US
IAH

4230674 10Feb2022 GGGA 56DG2/027C/1023

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

March 02, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22020807**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia Olive,

ALS Environmental received 2 sample(s) on Feb 16, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: COREY.GRANDITS**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22020807

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22020807-01 | LH18/24-SP650_021522 | Water | | 15-Feb-2022 14:00 | 16-Feb-2022 10:00 | ☐ |
| HS22020807-02 | LH18/24-SP650_021522_AIX | Water | | 15-Feb-2022 14:00 | 16-Feb-2022 10:00 | ☐ |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22020807

**CASE NARRATIVE**

## Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached

## WetChemistry by Method E350.3

### Batch ID: R403370

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E415.1

### Batch ID: R402628

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E365.3

### Batch ID: R402381

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

**ALS Houston, US** Date: 02-Mar-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS22020807 |
| Sample ID: | LH18/24-SP650_021522 | Lab ID:HS22020807-01 |
| Collection Date: | 15-Feb-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **AMMONIA AS N BY E350.3(ISE)** | | **Method:E350.3** | | | | | | Analyst: MZD |
| **Nitrogen, Ammonia (As N)** | **11** | a | **0.10** | **0.20** | **0.20** | **mg/L** | 1 | 02-Mar-2022 14:15 |
| **ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978** | | **Method:E365.3** | | | | | | Analyst: MZD |
| **Phosphorus, Total Orthophosphate (As P)** | **9.20** | a | **0.100** | **0.250** | **0.250** | **mg/L** | 10 | 16-Feb-2022 15:59 |
| **TOTAL ORGANIC CARBON BY E415.1** | | **Method:E415.1** | | | | | | Analyst: JAC |
| **Organic Carbon, Total** | **22.9** | a | **0.500** | **1.00** | **1.00** | **mg/L** | 1 | 19-Feb-2022 23:09 |

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

**ALS Houston, US**

Date: 02-Mar-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS22020807 |
| Sample ID: | LH18/24-SP650_021522_AIX | Lab ID:HS22020807-02 |
| Collection Date: | 15-Feb-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 28-Feb-2022 11:20 |

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

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22020807

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** R402381 ( 0 ) | **Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978 | | | | **Matrix:** Water | |
| HS22020807-01 | LH18/24-SP650_021522 | 15 Feb 2022 14:00 | | | 16 Feb 2022 15:59 | 10 |
| **Batch ID:** R402628 ( 0 ) | **Test Name :** TOTAL ORGANIC CARBON BY E415.1 | | | | **Matrix:** Water | |
| HS22020807-01 | LH18/24-SP650_021522 | 15 Feb 2022 14:00 | | | 19 Feb 2022 23:09 | 1 |
| **Batch ID:** R403161 ( 0 ) | **Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) | | | | **Matrix:** Water | |
| HS22020807-02 | LH18/24-SP650_021522_AIX | 15 Feb 2022 14:00 | | | 28 Feb 2022 11:20 | 1 |
| **Batch ID:** R403370 ( 0 ) | **Test Name :** AMMONIA AS N BY E350.3(ISE) | | | | **Matrix:** Water | |
| HS22020807-01 | LH18/24-SP650_021522 | 15 Feb 2022 14:00 | | | 02 Mar 2022 14:15 | 1 |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22020807

**QC BATCH REPORT**

**Batch ID:** R402381 ( 0 ) **Instrument:** UV-2450 **Method:** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978

**MBLK** Sample ID: **MBLK-R402381** Units: **mg/L** Analysis Date: **16-Feb-2022 15:59**
Client ID: Run ID: **UV-2450_402381** SeqNo: **6506188** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.0250 | 0.0250 | | | | | | | | U |

**LCS** Sample ID: **LCS-R402381** Units: **mg/L** Analysis Date: **16-Feb-2022 15:59**
Client ID: Run ID: **UV-2450_402381** SeqNo: **6506187** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.231 | 0.0250 | 0.25 | 0 | 92.4 | 85 - 115 | | | | |

**LCSD** Sample ID: **LCSD-R402381** Units: **mg/L** Analysis Date: **16-Feb-2022 15:59**
Client ID: Run ID: **UV-2450_402381** SeqNo: **6506186** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.232 | 0.0250 | 0.25 | 0 | 92.8 | 85 - 115 | 0.231 | 0.432 | 20 | |

**The following samples were analyzed in this batch:** HS22020807-01

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22020807

**QC BATCH REPORT**

**Batch ID: R402628 ( 0 )** **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON BY E415.1**

**MBLK** Sample ID: **MBLK-02192022** Units: **mg/L** Analysis Date: **19-Feb-2022 21:33**
Client ID: Run ID: **TOC_04_402628** SeqNo: **6511378** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 1.00 | 1.00 | | | | | | | | U |

**LCS** Sample ID: **LCS-02192022** Units: **mg/L** Analysis Date: **19-Feb-2022 21:47**
Client ID: Run ID: **TOC_04_402628** SeqNo: **6511379** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 10.07 | 1.00 | 10 | 0 | 101 | 85 - 115 | | | | |

**LCSD** Sample ID: **LCSD-02192022** Units: **mg/L** Analysis Date: **19-Feb-2022 22:00**
Client ID: Run ID: **TOC_04_402628** SeqNo: **6511380** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 10.38 | 1.00 | 10 | 0 | 104 | 85 - 115 | 10.07 | 3.03 | 20 | |

**MS** Sample ID: **HS22020842-18MS** Units: **mg/L** Analysis Date: **19-Feb-2022 22:28**
Client ID: Run ID: **TOC_04_402628** SeqNo: **6511382** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 15.79 | 1.00 | 10 | 4.7 | 111 | 80 - 120 | | | | |

**The following samples were analyzed in this batch:** HS22020807-01

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22020807

**QC BATCH REPORT**

**Batch ID: R403370 ( 0 )** **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

**MBLK** Sample ID: **MBLK-R403370** Units: **mg/L** Analysis Date: **02-Mar-2022 14:15**
Client ID: Run ID: **WetChem_HS_403370** SeqNo: **6527953** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 0.20 | 0.20 | | | | | | | | U |

**LCS** Sample ID: **LCS-R403370** Units: **mg/L** Analysis Date: **02-Mar-2022 14:15**
Client ID: Run ID: **WetChem_HS_403370** SeqNo: **6527952** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 9.35 | 0.20 | 10 | 0 | 93.5 | 80 - 120 | | | | |

**MS** Sample ID: **HS22021256-01MS** Units: **mg/L** Analysis Date: **02-Mar-2022 14:15**
Client ID: Run ID: **WetChem_HS_403370** SeqNo: **6527956** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 17.1 | 0.20 | 10 | 7.383 | 97.2 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22021256-01MSD** Units: **mg/L** Analysis Date: **02-Mar-2022 14:15**
Client ID: Run ID: **WetChem_HS_403370** SeqNo: **6527955** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 17.09 | 0.20 | 10 | 7.383 | 97.1 | 80 - 120 | 17.1 | 0.0409 | 20 | |

**The following samples were analyzed in this batch:** HS22020807-01

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** **HS22020807**

## 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: 02-Mar-22

## CERTIFICATIONS,ACCREDITATIONS & LICENSES

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas | 21-022-0 | 26-Mar-2022 |
| Florida | E87611-34 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 02-Mar-22

## Sample Receipt Checklist

**Work Order ID:** HS22020807 **Date/Time Received:** **16-Feb-2022 10:00**

**Client Name:** Bhate Environmental **Received by:** **Paresh M. Giga**

**Completed By:** /S/ Paresh M. Giga (eSignature) 16-Feb-2022 11:55 (Date/Time) **Reviewed by:** /S/ Ragen Giga (eSignature) 17-Feb-2022 18:04 (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 ☐ | 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): | 0.2C/0.7C U/C | IR31 |
| Cooler(s)/Kit(s): | 48337 | |
| Date/Time sample(s) sent to storage: | 2/16/2022 12:05 | |

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

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

# CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: Ragen Gigi



**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:** GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

**Prepared By:** Scott Beesinger

**P.O. Number**

HS22020807

Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Weekly Samples

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | AMMONIA-N | TOTAL ORGANIC CARBON | ORTHO-PHOSPHATE | PERCHLORATE | | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_021522 | Water | 02/15/22 / 14:00 | | 3 | X | X | | | | | | | | | H2SO4 | |
| LH18/24-SP650_021522 | Water | 02/15/22 / 14:00 | | 1 | | | X | | | | | | | | NONE | |
| LH18/24–SP650_021522_AIX | Water | 02/15/22 / 14:00 | | 1 | | | | X | | | | | | | NONE | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Analyses

Additional Remarks: **Standard TAT on all parameters**

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 02/15/22 | 14:30 | [illegible] | 2/16/22 | 10:00 | | | | | | |

**For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Remarks:

48337 VIC. 0.20 $31 CIF 0.10

(Word) S:\1-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

48337

**CUSTODY SEAL**

Date: 2/15/22 Time: 1430
Name: Scott Beesinger
Company: BHATG

Seal Broken By: SM
Date: 02/16/22

48337

FEB 16 2022

Must Deliver Next Business Day
Time and Tempature Sensitive!

ALS

48337

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM ENVIROMENTAL & INFASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 01NOV19
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 19x16x13 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP 37 - RJ

RMA:

FedEx Express

FedEx
TRK# 0221 1251 0291 2515

WED - 16 FEB 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

February 25, 2022

Service Request No:E2200140

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS22020807**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory February 16, 2022
For your reference, these analyses have been assigned our service request number **E2200140.**

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.:** | E2200140 |
| **Project:** | HS22020807 | **Date Received:** | 02/16/22 |
| **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 02/16/22.

The sample was received in good condition and is 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:**

EQ2200066: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS-DLCS recoveries met acceptance criteria.

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:**E2200140
**Project:** HS22020807

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2200140-001 | LH18/24-SP650_021522_AIX | 2/15/2022 | 1400 |

# Service Request Summary

**Folder #:** **E2200140**
Client Name: ALS Environmental - US
Project Name: HS22020807
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 02/16/22
Internal Due Date: 3/2/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22020807
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON CIO4 DOD/6850 |
|---|---|---|---|---|
| E2200140-001 | LH18/24-SP650_021522_AIX | Ground Water | 02/15/22 1400 | **IV** |

## Folder Comments:

Send DWELR confirmation to Middletown PM for PADEP samples.

# Service Request Summary

| | |
|---|---|
| **Folder #:** | **E2200140** |
| Client Name: | ALS Environmental - US |
| Project Name: | HS22020807 |
| Project Number: | |

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA

| | |
|---|---|
| Phone Number: | |
| Cell Number: | |
| Fax Number: | |
| E-mail: | ragenp.giga@alsglobal.com |

| | |
|---|---|
| Project Chemist: | Corey Grandits |
| Originating Lab: | HOUSTON |
| Logged By: | CGRANDITS |
| Date Received: | 02/16/22 |
| Internal Due Date: | 3/2/2022 |
| QAP: | LAB QAP |
| Qualifier Set: | Lab Standard |
| Formset: | Lab Standard |
| Merged?: | Y |
| Report to MDL?: | Y |
| P.O. Number: | HS22020807 |
| EDD: | No EDD Specified |

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 1 | Level IV due 3/9 |

# 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 | (Auto) The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result. |
| 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. |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| 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. |
| P | Indicates chlorodiphenyl ether interference present at the retention time of the target compound. |
| P | Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns |
| Q | Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria. |
| R | Duplicate Precision not met. |
| R1 | Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated. |
| S | Surrogate recovery not within specified limits. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| T | Analyte is a tentatively identified compound, result is estimated. |
| U | Compound was analyzed for, but was not detected (ND). |
| V1 | The continuing calibration verification standard was outside (biased high) the specified limits for this compound. |
| V2 | The continuing calibration verification standard was outside (biased low) the specified limits for this compound. |
| W | Result quantified, but the corresponding peak was detected outside the generated retention time window. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| X | See case narrative. |
| Y | Recovery outside limits |
| Y | The chromatogram resembles a petroleum product but does not match the calibration standard. |
| Z | The chromatogram does not resemble a petroleum product. |
| i | The MRL/MDL has been elevated due to a matrix interference. |

# ALS Laboratory Group

## Acronyms

| | |
|---|---|
| Cal | Calibration |
| Conc | CONCentration |
| Dioxin(s) | Polychlorinated dibenzo-p-dioxin(s) |
| EDL | Estimated Detection Limit |
| EMPC | Estimated Maximum Possible Concentration |
| Flags | Data qualifiers |
| Furan(s) | Polychlorinated dibenzofuran(s) |
| g | Grams |
| ICAL | Initial CALibration |
| ID | IDentifier |
| Ions | Masses monitored for the analyte during data acquisition |
| L | Liter (s) |
| LCS | Laboratory Control Sample |
| DLCS | Duplicate Laboratory Control Sample |
| MB | Method Blank |
| MCL | Method Calibration Limit |
| MDL | Method Detection Limit |
| mL | Milliliters |
| MS | Matrix Spiked sample |
| DMS | Duplicate Matrix Spiked sample |
| NO | Number of peaks meeting all identification criteria |
| PCDD(s) | Polychlorinated dibenzo-p-dioxin(s) |
| PCDF(s) | Polychlorinated dibenzofuran(s) |
| ppb | Parts per billion |
| ppm | Parts per million |
| ppq | Parts per quadrillion |
| ppt | Parts per trillion |
| QA | Quality Assurance |
| QC | Quality Control |
| Ratio | Ratio of areas from monitored ions for an analyte |
| % Rec. | Percent recovery |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| RT | Retention Time |
| SDG | Sample Delivery Group |
| S/N | Signal-to-noise ratio |
| TEF | Toxicity Equivalence Factor |
| TEQ | Toxicity Equivalence Quotient |

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ALS Environmental

## State Certifications, Accreditations, and Licenses

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas Department of Environmental Quality | 19-028-0 | 6/30/2022 |
| Arkansas Department of Environmental Quality | 21-022-0 | 3/26/2022 |
| Florida Department of Health | E87611-33 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 5/1/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

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Houston, TX 77099
**T:** +1 281 530 5656
**F:** +1 281 530 5887
**www.alsglobal.com**

# Subcontract Chain of Custody

**SAMPLING STATE:** **Dept of Defense** **COC ID: 18160**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

| | |
|---|---|
| **Company:** | ALS Houston |
| **Contact:** | Ragen Giga |
| **Address:** | 10450 Stancliff Rd, Ste 210 |
| **Phone:** | +1 281 530 5656 |
| **Email:** | RagenP.Giga@ALSGlobal.com |
| **Alternate Contact:** | 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:** | HS22020807 |
| **TSR:** | Houston House Acct |

| | LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | | | DUE DATE |
| **1.** | **HS22020807-02** | **LH18/24-SP650_021522_AIX** | **Water** | **15 Feb 2022 14:00** |
| | 6850-Perch. DOD Level II & Level IV in separate pdf | | | 02 Mar 2022 |

**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: 2-16-22 1501

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

# Cooler Receipt Form

Project Chemist: CH

Client/Project: ALS-H

Thermometer ID: IR31

Date/Time Received: 2-16-22 Initials: CH Date/Time Logged in: 2-16-22 Initials: CH

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL (X) Courier (ALS) ○ Client
2. Samples received in: (X) Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes (X) No
   Were they intact? ○ Yes ○ No (X) N/A
   Were they signed and dated? ○ Yes ○ No (X) N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts (X) Baggies ○ Bubble Wrap ○ Gel Packs (X) 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 | | 2-16-22 | 1501 | CH | 4.1/4.6 | (X) |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? (X) Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? (X) Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? (X) Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? (X) Yes ○ No
10. Did sample labels and tags agree with custody documents? (X) Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

ALS Environmental - Houston HRMS

10450 Stancliff Rd., Suite 210
Houston, TX 77099
**T:** +1 713 266 1599
**F:** +1 713 266 1599
**www.alsglobal.com**

# SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

**Cooler Custody Seals (desirable, mandatory if specified in SAP):**

- ✓ Intact on outside of cooler, signed and dated

**Chain-of-Custody (COC) documentation (mandatory):**

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

**Sample Integrity (mandatory):**

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

**Temperature Requirement (varies by sample matrix):**

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

# Preparation Information Benchsheets

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

# *Preparation Information Benchsheet*

**Prep Run#:** 395659 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 2/23/22 08:59

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2200140-001 | LH18/24-SP650_021522_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 2 | E2200141-001 | LH18/24-SP650_021522_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 3 | E2200142-001 | LH18/24-SP140_021522 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 4 | EQ2200066-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 5 | EQ2200066-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 6 | EQ2200066-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |

## Spiking Solutions

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 221408 Logbook Ref: Perchlorate Internal Standard Expires On: 04/30/2022

E2200140-001 100.00µL E2200141-001 100.00µL E2200142-001 100.00µL EQ2200066-01 100.00µL EQ2200066-02 100.00µL EQ2200066-03 100.00µL

Name: Perchlorate Intermediate Stock1 Inventory ID 221456 Logbook Ref: Perchlorate Expires On: 04/30/2022

EQ2200066-02 1.00µL EQ2200066-03 1.00µL

## Preparation Materials

| | | | | | |
|---|---|---|---|---|---|
| Water HPLC Grade | 08/03/2021 Water (218532) | 6850 Amber Glass screw vial | 2mL Screw Top Vial (221308) | 537M Glass Culture Tubes | 537M Glass Tubes (218064) |
| 6850 Luer-Lok Syringes | Luer-Lok Syringes (221305) | 6850 Pipette Tips 50-1000 uL | 6850 Pipette Tips (221307) | 6850 0.45um syringe filters | 6850 Syringe Filters (219639) |

## Preparation Steps

Step: Preparation
Started: 2/23/22 08:59
Finished: 2/23/22 09:30
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 2/23/22

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:** | E2200140 |
| **Project:** | HS22020807 | **Date Collected:** | 2/15/22 1400 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 2/16/22 |
| **Sample Name:** | LH18/24-SP650_021522_AIX | **Units:** | µg/L |
| **Lab Code:** | E2200140-001 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850
**Prep Method:** Method

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | ND | U | 0.100 | 0.0500 | 0.0250 | 1 | 2/23/22 | 2/23/22 15:38 | 395659 | 755514 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200140 |
| **Project:** | HS22020807 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2200066-01 | **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 | 2/23/22 | 2/23/22 14:58 | 395659 | 755514 | |

# 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:** | E2200140 |
| **Project:** | HS22020807 | **Date Analyzed:** | 2/23/22 |
| **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:** | 395659 |

| | Lab Control Sample EQ2200066-02 | | | Duplicate Lab Control Sample EQ2200066-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.105 | 0.100 | 105 | 0.102 | 0.100 | 102 | 84 - 119 | 4 | 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:** | E2200140 |
| **Project:** | HS22020807 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200066-02 | **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 | **0.105** | | 0.100 | 0.0500 | 0.0250 | 1 | 2/23/22 | 2/23/22 15:22 | 395659 | 755514 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200140 |
| **Project:** | HS22020807 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200066-03 | **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 | **0.102** | | 0.100 | 0.0500 | 0.0250 | 1 | 2/23/22 | 2/23/22 14:42 | 395659 | 755514 | |

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

March 02, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22020822**

Laboratory Results for: **Groundwater Treatment Plant Quarterly Effluent Samples**

Dear Marcia Olive,

ALS Environmental received 3 sample(s) on Feb 16, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: COREY.GRANDITS**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Effluent Samples
**Work Order:** HS22020822

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22020822-01 | LH18/24-SP650_021522 | Water | | 15-Feb-2022 14:00 | 16-Feb-2022 10:00 | ☐ |
| HS22020822-02 | LH18/24-SP650_021522_AIX | Water | | 15-Feb-2022 14:00 | 16-Feb-2022 10:00 | ☐ |
| HS22020822-03 | Trip Blank | Water | CG-121321-570 | 15-Feb-2022 14:00 | 16-Feb-2022 10:00 | ☐ |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Effluent Samples
**Work Order:** HS22020822

**CASE NARRATIVE**

## Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached

## GCMS Semivolatiles by Method SW8270SIM

### Batch ID: 175559

**Sample ID: LH18/24-SP650_021522 (HS22020822-01)**

- The surrogate recoveries could not be determined due to dilution below the calibration range.

## GCMS Volatiles by Method SW8260

### Batch ID: R403119

**Sample ID: HS22020769-07MS/MSD**

- MS and MSD are for an unrelated sample.

## Metals by Method SW6020A

### Batch ID: 175865

**Sample ID: LH18/24-SP650_021522 (HS22020822-01MSD)**

- Magnesium and Manganese Failed for MSD but passed for MS and PDS.

- 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. (Barium,Calcium,Sodium)

## Metals by Method SW7470A

### Batch ID: 175445

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method SW9056

### Batch ID: R403374

**Sample ID: HS22020823-01MS**

- MS and MSD are for an unrelated sample

## WetChemistry by Method E1664A

### Batch ID: R403145

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E410.4

### Batch ID: R402778

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

**ALS Houston, US** Date: 02-Mar-22

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Groundwater Treatment Plant Quarterly Effluent Samples WorkOrder:HS22020822
Sample ID: LH18/24-SP650_021522 Lab ID:HS22020822-01
Collection Date: 15-Feb-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: DLB |
| 1,1,1,2-Tetrachloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 1,1,1-Trichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 1,1-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 1,1-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 1,1-Dichloropropene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 1,2,3-Trichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 1,2,3-Trichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 1,2,4-Trichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 1,2,4-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 1,2-Dibromo-3-chloropropane | 1.0 | U | 0.20 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 1,2-Dibromoethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 1,2-Dichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 1,2-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 1,2-Dichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 1,3,5-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 1,3-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 1,3-Dichloropropane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 1,4-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 2,2-Dichloropropane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 2-Butanone | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 2-Chlorotoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 2-Hexanone | 2.0 | U | 1.0 | 2.0 | 2.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 4-Chlorotoluene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 4-Isopropyltoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| 4-Methyl-2-pentanone | 2.0 | U | 0.70 | 2.0 | 2.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Acetone | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Benzene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Bromobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Bromochloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Bromodichloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Bromoform | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Bromomethane | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Carbon disulfide | 2.0 | U | 0.60 | 2.0 | 2.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Carbon tetrachloride | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Chlorobenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Chloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Chloroform | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |

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

**ALS Houston, US** Date: 02-Mar-22

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Groundwater Treatment Plant Quarterly Effluent Samples WorkOrder:HS22020822
Sample ID: LH18/24-SP650_021522 Lab ID:HS22020822-01
Collection Date: 15-Feb-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: DLB |
| Chloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| **cis-1,2-Dichloroethene** | **0.61** | J | **0.20** | **0.50** | **1.0** | **ug/L** | 1 | 25-Feb-2022 09:20 |
| cis-1,3-Dichloropropene | 0.50 | U | 0.10 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Dibromochloromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Dibromomethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Dichlorodifluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Ethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Hexachlorobutadiene | 1.0 | U | 1.0 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Isopropylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| m,p-Xylene | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Methylene chloride | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| n-Butylbenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| n-Propylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Naphthalene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| o-Xylene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| sec-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Styrene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| tert-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Tetrachloroethene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Toluene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| trans-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| trans-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Trichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Trichlorofluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| Vinyl chloride | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 09:20 |
| *Surr: 1,2-Dichloroethane-d4* | *100* | | | **0** | *81-118* | *%REC* | *1* | *25-Feb-2022 09:20* |
| *Surr: 4-Bromofluorobenzene* | *101* | | | **0** | *85-114* | *%REC* | *1* | *25-Feb-2022 09:20* |
| *Surr: Dibromofluoromethane* | *94.9* | | | **0** | *80-119* | *%REC* | *1* | *25-Feb-2022 09:20* |
| *Surr: Toluene-d8* | *106* | | | **0** | *89-112* | *%REC* | *1* | *25-Feb-2022 09:20* |
| **SEMIVOLATILES SIM** | | **Method:SW8270SIM** | | | | Prep:SW3510 / 21-Feb-2022 | | Analyst: JLJ |
| **1,4-Dioxane** | **4.5** | | **0.20** | **0.20** | **0.20** | **ug/L** | 20 | 28-Feb-2022 15:30 |
| *Surr: 2-Fluorobiphenyl* | *0* | *S* | | 0 | *40-140* | *%REC* | *20* | *28-Feb-2022 15:30* |
| *Surr: 4-Terphenyl-d14* | *0* | *S* | | 0 | *40-140* | *%REC* | *20* | *28-Feb-2022 15:30* |
| *Surr: Nitrobenzene-d5* | *0* | *S* | | 0 | *40-140* | *%REC* | *20* | *28-Feb-2022 15:30* |

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

**ALS Houston, US** Date: 02-Mar-22

Client: Bhate Environmental Associates, Inc.

**ANALYTICAL REPORT**

Project: Groundwater Treatment Plant Quarterly Effluent Samples WorkOrder:HS22020822

Sample ID: LH18/24-SP650_021522 Lab ID:HS22020822-01

Collection Date: 15-Feb-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **METALS BY ICPMS BY SW6020A** | | **Method:SW6020A** | | | | Prep:SW3010A / 01-Mar-2022 | | Analyst: JHD |
| **Aluminum** | **0.0254** | | **0.00180** | **0.00500** | **0.0100** | **mg/L** | 1 | 02-Mar-2022 12:54 |
| Antimony | 0.00100 | U | 0.000400 | 0.00100 | 0.00500 | mg/L | 1 | 02-Mar-2022 12:54 |
| **Arsenic** | **0.000415** | J | **0.000400** | **0.00100** | **0.00500** | **mg/L** | 1 | 02-Mar-2022 12:54 |
| **Barium** | **1.05** | | **0.00190** | **0.00250** | **0.00500** | **mg/L** | 1 | 02-Mar-2022 12:54 |
| Beryllium | 0.000500 | U | 0.000200 | 0.000500 | 0.00200 | mg/L | 1 | 02-Mar-2022 12:54 |
| Cadmium | 0.000500 | U | 0.000200 | 0.000500 | 0.00200 | mg/L | 1 | 02-Mar-2022 12:54 |
| **Calcium** | **66.5** | | **0.0340** | **0.0500** | **0.500** | **mg/L** | 1 | 02-Mar-2022 12:54 |
| **Chromium** | **0.00206** | J | **0.000400** | **0.00100** | **0.00500** | **mg/L** | 1 | 02-Mar-2022 12:54 |
| **Cobalt** | **0.000898** | J | **0.000100** | **0.000500** | **0.00500** | **mg/L** | 1 | 02-Mar-2022 12:54 |
| **Iron** | **0.159** | J | **0.0120** | **0.0500** | **0.200** | **mg/L** | 1 | 02-Mar-2022 12:54 |
| Lead | 0.00100 | U | 0.000600 | 0.00100 | 0.00500 | mg/L | 1 | 02-Mar-2022 12:54 |
| **Magnesium** | **17.7** | | **0.0100** | **0.0500** | **0.200** | **mg/L** | 1 | 02-Mar-2022 12:54 |
| **Manganese** | **0.165** | | **0.000700** | **0.00250** | **0.00500** | **mg/L** | 1 | 02-Mar-2022 12:54 |
| **Nickel** | **0.00254** | J | **0.000600** | **0.00100** | **0.00500** | **mg/L** | 1 | 02-Mar-2022 12:54 |
| **Potassium** | **1.72** | | **0.0180** | **0.0500** | **0.200** | **mg/L** | 1 | 02-Mar-2022 12:54 |
| Selenium | 0.00250 | U | 0.00110 | 0.00250 | 0.00500 | mg/L | 1 | 02-Mar-2022 12:54 |
| Silver | 0.000500 | U | 0.000200 | 0.000500 | 0.00500 | mg/L | 1 | 02-Mar-2022 12:54 |
| **Sodium** | **579** | | **0.700** | **2.50** | **10.0** | **mg/L** | 50 | 02-Mar-2022 14:43 |
| Thallium | 0.000500 | U | 0.000200 | 0.000500 | 0.00200 | mg/L | 1 | 02-Mar-2022 12:54 |
| **Vanadium** | **0.000900** | J | **0.000600** | **0.00100** | **0.00500** | **mg/L** | 1 | 02-Mar-2022 12:54 |
| **Zinc** | **0.0257** | | **0.00200** | **0.00250** | **0.00500** | **mg/L** | 1 | 02-Mar-2022 12:54 |
| **MERCURY BY SW7470A** | | **Method:SW7470A** | | | | Prep:SW7470A / 17-Feb-2022 | | Analyst: MSC |
| **Mercury** | **0.0000580** | J | **0.0000300** | **0.000100** | **0.000200** | **mg/L** | 1 | 17-Feb-2022 14:38 |
| **OIL & GREASE (HEM) BY E1664A** | | **Method:E1664A** | | | | | | Analyst: KAH |
| Oil and Grease | 1.00 | U | 0.610 | 1.00 | 2.00 | mg/L | 1 | 25-Feb-2022 13:50 |
| **CHEMICAL OXYGEN DEMAND BY E410.4, REV 2.0, 1993** | | **Method:E410.4** | | | | | | Analyst: TH |
| **Chemical Oxygen Demand** | **61.0** | | **5.00** | **7.50** | **15.0** | **mg/L** | 1 | 22-Feb-2022 18:00 |
| **ANIONS BY SW9056A** | | **Method:SW9056** | | | | | | Analyst: YP |
| **Chloride** | **878** | | **4.00** | **10.0** | **10.0** | **mg/L** | 20 | 01-Mar-2022 16:55 |
| **Sulfate** | **41.7** | | **0.200** | **0.500** | **0.500** | **mg/L** | 1 | 01-Mar-2022 16:50 |

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

**ALS Houston, US** Date: 02-Mar-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Groundwater Treatment Plant Quarterly Effluent Samples | WorkOrder:HS22020822 |
| Sample ID: | LH18/24-SP650_021522_AIX | Lab ID:HS22020822-02 |
| Collection Date: | 15-Feb-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 28-Feb-2022 11:20 |

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

**ALS Houston, US** Date: 02-Mar-22

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Groundwater Treatment Plant Quarterly Effluent Samples WorkOrder:HS22020822
Sample ID: Trip Blank Lab ID:HS22020822-03
Collection Date: 15-Feb-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: DLB |
| 1,1,1,2-Tetrachloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 1,1,1-Trichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 1,1-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 1,1-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 1,1-Dichloropropene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 1,2,3-Trichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 1,2,3-Trichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 1,2,4-Trichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 1,2,4-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 1,2-Dibromo-3-chloropropane | 1.0 | U | 0.20 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 1,2-Dibromoethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 1,2-Dichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 1,2-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 1,2-Dichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 1,3,5-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 1,3-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 1,3-Dichloropropane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 1,4-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 2,2-Dichloropropane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 2-Butanone | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 2-Chlorotoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 2-Hexanone | 2.0 | U | 1.0 | 2.0 | 2.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 4-Chlorotoluene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 4-Isopropyltoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| 4-Methyl-2-pentanone | 2.0 | U | 0.70 | 2.0 | 2.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Acetone | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Benzene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Bromobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Bromochloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Bromodichloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Bromoform | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Bromomethane | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Carbon disulfide | 2.0 | U | 0.60 | 2.0 | 2.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Carbon tetrachloride | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Chlorobenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Chloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Chloroform | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |

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

**ALS Houston, US** Date: 02-Mar-22

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Groundwater Treatment Plant Quarterly Effluent Samples WorkOrder:HS22020822
Sample ID: Trip Blank Lab ID:HS22020822-03
Collection Date: 15-Feb-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: DLB |
| Chloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| cis-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| cis-1,3-Dichloropropene | 0.50 | U | 0.10 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Dibromochloromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Dibromomethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Dichlorodifluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Ethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Hexachlorobutadiene | 1.0 | U | 1.0 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Isopropylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| m,p-Xylene | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Methylene chloride | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| n-Butylbenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| n-Propylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Naphthalene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| o-Xylene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| sec-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Styrene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| tert-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Tetrachloroethene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Toluene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| trans-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| trans-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Trichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Trichlorofluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| Vinyl chloride | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:33 |
| *Surr: 1,2-Dichloroethane-d4* | *95.8* | | | **0** | *81-118* | *%REC* | *1* | *25-Feb-2022 01:33* |
| *Surr: 4-Bromofluorobenzene* | *102* | | | **0** | *85-114* | *%REC* | *1* | *25-Feb-2022 01:33* |
| *Surr: Dibromofluoromethane* | *90.9* | | | **0** | *80-119* | *%REC* | *1* | *25-Feb-2022 01:33* |
| *Surr: Toluene-d8* | *107* | | | **0** | *89-112* | *%REC* | *1* | *25-Feb-2022 01:33* |

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

## Weight / Prep Log

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Effluent Samples
**WorkOrder:** HS22020822

**Batch ID:** 175445 **Start Date:** 17 Feb 2022 08:30 **End Date:** 17 Feb 2022 11:30
**Method:** MERCURY PREP BY 7470A- WATER **Prep Code:** HG_WPR

| Sample ID | Container | Sample Wt/Vol | Final Volume | Prep Factor | |
|---|---|---|---|---|---|
| HS22020822-01 | | 10 (mL) | 10 (mL) | 1 | 120 plastic HNO3 |

**Batch ID:** 175559 **Start Date:** 21 Feb 2022 06:30 **End Date:** 21 Feb 2022 11:30
**Method:** SV AQ SEP FUN EXTRACT-LOWLEV - 3510C **Prep Code:** 3510_B_SIM

| Sample ID | Container | Sample Wt/Vol | Final Volume | Prep Factor | |
|---|---|---|---|---|---|
| HS22020822-01 | 1 | 1000 (mL) | 1 (mL) | 0.001 | 1-liter amber glass, Neat |

**Batch ID:** 175865 **Start Date:** 01 Mar 2022 08:00 **End Date:** 01 Mar 2022 12:00
**Method:** WATER - SW3010A **Prep Code:** 3010A

| Sample ID | Container | Sample Wt/Vol | Final Volume | Prep Factor | |
|---|---|---|---|---|---|
| HS22020822-01 | | 10 (mL) | 10 (mL) | 1 | 120 plastic HNO3 |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Effluent Samples
**WorkOrder:** HS22020822

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** 175445 ( 0 ) | **Test Name :** MERCURY BY SW7470A | | | | **Matrix:** Water | |
| HS22020822-01 | LH18/24-SP650_021522 | 15 Feb 2022 14:00 | | 17 Feb 2022 08:30 | 17 Feb 2022 14:38 | 1 |
| **Batch ID:** 175559 ( 0 ) | **Test Name :** SEMIVOLATILES SIM | | | | **Matrix:** Water | |
| HS22020822-01 | LH18/24-SP650_021522 | 15 Feb 2022 14:00 | | 21 Feb 2022 08:46 | 28 Feb 2022 15:30 | 20 |
| **Batch ID:** 175865 ( 0 ) | **Test Name :** METALS BY ICPMS BY SW6020A | | | | **Matrix:** Water | |
| HS22020822-01 | LH18/24-SP650_021522 | 15 Feb 2022 14:00 | | 01 Mar 2022 12:00 | 02 Mar 2022 14:43 | 50 |
| HS22020822-01 | LH18/24-SP650_021522 | 15 Feb 2022 14:00 | | 01 Mar 2022 12:00 | 02 Mar 2022 12:54 | 1 |
| **Batch ID:** R402778 ( 0 ) | **Test Name :** CHEMICAL OXYGEN DEMAND BY E410.4, REV 2.0, 1993 | | | | **Matrix:** Water | |
| HS22020822-01 | LH18/24-SP650_021522 | 15 Feb 2022 14:00 | | | 22 Feb 2022 18:00 | 1 |
| **Batch ID:** R403119 ( 0 ) | **Test Name :** VOLATILES ORGANICS BY METHOD 8260C | | | | **Matrix:** Water | |
| HS22020822-01 | LH18/24-SP650_021522 | 15 Feb 2022 14:00 | | | 25 Feb 2022 09:20 | 1 |
| HS22020822-03 | Trip Blank | 15 Feb 2022 14:00 | | | 25 Feb 2022 01:33 | 1 |
| **Batch ID:** R403145 ( 0 ) | **Test Name :** OIL & GREASE (HEM) BY E1664A | | | | **Matrix:** Water | |
| HS22020822-01 | LH18/24-SP650_021522 | 15 Feb 2022 14:00 | | | 25 Feb 2022 13:50 | 1 |
| **Batch ID:** R403161 ( 0 ) | **Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) | | | | **Matrix:** Water | |
| HS22020822-02 | LH18/24-SP650_021522_AIX | 15 Feb 2022 14:00 | | | 28 Feb 2022 11:20 | 1 |
| **Batch ID:** R403374 ( 0 ) | **Test Name :** ANIONS BY SW9056A | | | | **Matrix:** Water | |
| HS22020822-01 | LH18/24-SP650_021522 | 15 Feb 2022 14:00 | | | 01 Mar 2022 16:55 | 20 |
| HS22020822-01 | LH18/24-SP650_021522 | 15 Feb 2022 14:00 | | | 01 Mar 2022 16:50 | 1 |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Effluent Samples
**WorkOrder:** HS22020822

**QC BATCH REPORT**

**Batch ID: 175445 ( 0 )** **Instrument: HG03** **Method: MERCURY BY SW7470A**

**MBLK** Sample ID: **MBLK-175445** Units: **mg/L** Analysis Date: **17-Feb-2022 13:31**
Client ID: Run ID: **HG03_402462** SeqNo: **6507736** PrepDate: **17-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.000100 | 0.000200 | | | | | | | | U |

**LCS** Sample ID: **LCS-175445** Units: **mg/L** Analysis Date: **17-Feb-2022 13:33**
Client ID: Run ID: **HG03_402462** SeqNo: **6507737** PrepDate: **17-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.00438 | 0.000200 | 0.005 | 0 | 87.6 | 82 - 119 | | | | |

**MS** Sample ID: **HS22020676-07MS** Units: **mg/L** Analysis Date: **17-Feb-2022 13:36**
Client ID: Run ID: **HG03_402462** SeqNo: **6507739** PrepDate: **17-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.00501 | 0.000200 | 0.005 | -0.00002000 | 101 | 82 - 119 | | | | |

**MSD** Sample ID: **HS22020676-07MSD** Units: **mg/L** Analysis Date: **17-Feb-2022 13:40**
Client ID: Run ID: **HG03_402462** SeqNo: **6507740** PrepDate: **17-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.00483 | 0.000200 | 0.005 | -0.00002000 | 97.0 | 82 - 119 | 0.005010 | 3.66 | 20 | |

**The following samples were analyzed in this batch:** HS22020822-01

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Effluent Samples
**WorkOrder:** HS22020822

**QC BATCH REPORT**

**Batch ID: 175865 ( 0 )** **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

**MBLK** Sample ID: **MBLK-175865** Units: **mg/L** Analysis Date: **02-Mar-2022 12:50**
Client ID: Run ID: **ICPMS06_403358** SeqNo: **6527699** PrepDate: **01-Mar-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 0.005767 | 0.0100 | | | | | | | | J |
| Antimony | 0.00100 | 0.00500 | | | | | | | | U |
| Arsenic | 0.00100 | 0.00500 | | | | | | | | U |
| Barium | 0.00250 | 0.00500 | | | | | | | | U |
| Beryllium | 0.000500 | 0.00200 | | | | | | | | U |
| Cadmium | 0.000500 | 0.00200 | | | | | | | | U |
| Calcium | 0.0500 | 0.500 | | | | | | | | U |
| Chromium | 0.00100 | 0.00500 | | | | | | | | U |
| Cobalt | 0.000500 | 0.00500 | | | | | | | | U |
| Iron | 0.0500 | 0.200 | | | | | | | | U |
| Lead | 0.00100 | 0.00500 | | | | | | | | U |
| Magnesium | 0.01142 | 0.200 | | | | | | | | J |
| Manganese | 0.00250 | 0.00500 | | | | | | | | U |
| Nickel | 0.000704 | 0.00500 | | | | | | | | J |
| Potassium | 0.0500 | 0.200 | | | | | | | | U |
| Selenium | 0.00250 | 0.00500 | | | | | | | | U |
| Silver | 0.000500 | 0.00500 | | | | | | | | U |
| Sodium | 0.0500 | 0.200 | | | | | | | | U |
| Thallium | 0.000500 | 0.00200 | | | | | | | | U |
| Vanadium | 0.00100 | 0.00500 | | | | | | | | U |
| Zinc | 0.00250 | 0.00500 | | | | | | | | U |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Effluent Samples
**WorkOrder:** HS22020822

**QC BATCH REPORT**

**Batch ID: 175865 ( 0 )** **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

**LCS** Sample ID: **LCS-175865** Units: **mg/L** Analysis Date: **02-Mar-2022 12:52**
Client ID: Run ID: **ICPMS06_403358** SeqNo: **6527700** PrepDate: **01-Mar-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 0.1132 | 0.0100 | 0.1 | 0 | 113 | 84 - 117 | | | | |
| Antimony | 0.05053 | 0.00500 | 0.05 | 0 | 101 | 85 - 117 | | | | |
| Arsenic | 0.05357 | 0.00500 | 0.05 | 0 | 107 | 84 - 116 | | | | |
| Barium | 0.05314 | 0.00500 | 0.05 | 0 | 106 | 86 - 114 | | | | |
| Beryllium | 0.05136 | 0.00200 | 0.05 | 0 | 103 | 83 - 121 | | | | |
| Cadmium | 0.05454 | 0.00200 | 0.05 | 0 | 109 | 87 - 115 | | | | |
| Calcium | 5.223 | 0.500 | 5 | 0 | 104 | 87 - 118 | | | | |
| Chromium | 0.05338 | 0.00500 | 0.05 | 0 | 107 | 85 - 116 | | | | |
| Cobalt | 0.05377 | 0.00500 | 0.05 | 0 | 108 | 86 - 115 | | | | |
| Iron | 5.242 | 0.200 | 5 | 0 | 105 | 87 - 118 | | | | |
| Lead | 0.05264 | 0.00500 | 0.05 | 0 | 105 | 88 - 115 | | | | |
| Magnesium | 5.206 | 0.200 | 5 | 0 | 104 | 83 - 118 | | | | |
| Manganese | 0.0534 | 0.00500 | 0.05 | 0 | 107 | 87 - 115 | | | | |
| Nickel | 0.05434 | 0.00500 | 0.05 | 0 | 109 | 85 - 117 | | | | |
| Potassium | 5.227 | 0.200 | 5 | 0 | 105 | 87 - 115 | | | | |
| Selenium | 0.0557 | 0.00500 | 0.05 | 0 | 111 | 80 - 120 | | | | |
| Silver | 0.05256 | 0.00500 | 0.05 | 0 | 105 | 85 - 116 | | | | |
| Sodium | 5.292 | 0.200 | 5 | 0 | 106 | 85 - 117 | | | | |
| Thallium | 0.05376 | 0.00200 | 0.05 | 0 | 108 | 82 - 116 | | | | |
| Vanadium | 0.05295 | 0.00500 | 0.05 | 0 | 106 | 86 - 115 | | | | |
| Zinc | 0.05624 | 0.00500 | 0.05 | 0 | 112 | 83 - 119 | | | | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Effluent Samples
**WorkOrder:** HS22020822

**QC BATCH REPORT**

**Batch ID:** 175865 ( 0 ) **Instrument:** ICPMS06 **Method:** METALS BY ICPMS BY SW6020A

**MS** Sample ID: **HS22020822-01MS** Units: **mg/L** Analysis Date: **02-Mar-2022 12:58**
Client ID: **LH18/24-SP650_021522** Run ID: **ICPMS06_403358** SeqNo: **6527703** PrepDate: **01-Mar-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 0.1327 | 0.0100 | 0.1 | 0.02543 | 107 | 84 - 117 | | | | |
| Antimony | 0.05086 | 0.00500 | 0.05 | 0.000205 | 101 | 85 - 117 | | | | |
| Arsenic | 0.05606 | 0.00500 | 0.05 | 0.000415 | 111 | 84 - 116 | | | | |
| Barium | 1.108 | 0.00500 | 0.05 | 1.052 | 113 | 86 - 114 | | | | O |
| Beryllium | 0.05322 | 0.00200 | 0.05 | 0.000023 | 106 | 83 - 121 | | | | |
| Cadmium | 0.05398 | 0.00200 | 0.05 | 0.000031 | 108 | 87 - 115 | | | | |
| Calcium | 71.7 | 0.500 | 5 | 66.53 | 104 | 87 - 118 | | | | O |
| Chromium | 0.05568 | 0.00500 | 0.05 | 0.002058 | 107 | 85 - 116 | | | | |
| Cobalt | 0.05364 | 0.00500 | 0.05 | 0.000898 | 105 | 86 - 115 | | | | |
| Iron | 5.327 | 0.200 | 5 | 0.1587 | 103 | 87 - 118 | | | | |
| Lead | 0.05327 | 0.00500 | 0.05 | 0.000217 | 106 | 88 - 115 | | | | |
| Magnesium | 22.91 | 0.200 | 5 | 17.67 | 105 | 83 - 118 | | | | |
| Manganese | 0.22 | 0.00500 | 0.05 | 0.1645 | 111 | 87 - 115 | | | | |
| Nickel | 0.05625 | 0.00500 | 0.05 | 0.002543 | 107 | 85 - 117 | | | | |
| Potassium | 6.757 | 0.200 | 5 | 1.72 | 101 | 87 - 115 | | | | |
| Selenium | 0.05271 | 0.00500 | 0.05 | 0.000277 | 105 | 80 - 120 | | | | |
| Silver | 0.0511 | 0.00500 | 0.05 | 0.000013 | 102 | 85 - 116 | | | | |
| Sodium | 574.5 | 0.200 | 5 | 569.8 | 93.6 | 85 - 117 | | | | EO |
| Thallium | 0.05236 | 0.00200 | 0.05 | 0.000126 | 104 | 82 - 116 | | | | |
| Vanadium | 0.05635 | 0.00500 | 0.05 | 0.0009 | 111 | 86 - 115 | | | | |
| Zinc | 0.08036 | 0.00500 | 0.05 | 0.02569 | 109 | 83 - 119 | | | | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Effluent Samples
**WorkOrder:** HS22020822

**QC BATCH REPORT**

**Batch ID:** 175865 ( 0 ) **Instrument:** ICPMS06 **Method:** METALS BY ICPMS BY SW6020A

**MSD** Sample ID: **HS22020822-01MSD** Units: **mg/L** Analysis Date: **02-Mar-2022 13:00**
Client ID: **LH18/24-SP650_021522** Run ID: **ICPMS06_403358** SeqNo: **6527689** PrepDate: **01-Mar-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 0.1376 | 0.0100 | 0.1 | 0.02543 | 112 | 84 - 117 | 0.1327 | 3.65 | 20 | |
| Antimony | 0.05123 | 0.00500 | 0.05 | 0.000205 | 102 | 85 - 117 | 0.05086 | 0.717 | 20 | |
| Arsenic | 0.05616 | 0.00500 | 0.05 | 0.000415 | 111 | 84 - 116 | 0.05606 | 0.18 | 20 | |
| Barium | 1.116 | 0.00500 | 0.05 | 1.052 | 129 | 86 - 114 | 1.108 | 0.727 | 20 | SO |
| Beryllium | 0.0513 | 0.00200 | 0.05 | 0.000023 | 103 | 83 - 121 | 0.05322 | 3.69 | 20 | |
| Cadmium | 0.05357 | 0.00200 | 0.05 | 0.000031 | 107 | 87 - 115 | 0.05398 | 0.748 | 20 | |
| Calcium | 73.24 | 0.500 | 5 | 66.53 | 134 | 87 - 118 | 71.7 | 2.12 | 20 | SO |
| Chromium | 0.05647 | 0.00500 | 0.05 | 0.002058 | 109 | 85 - 116 | 0.05568 | 1.42 | 20 | |
| Cobalt | 0.05406 | 0.00500 | 0.05 | 0.000898 | 106 | 86 - 115 | 0.05364 | 0.776 | 20 | |
| Iron | 5.415 | 0.200 | 5 | 0.1587 | 105 | 87 - 118 | 5.327 | 1.63 | 20 | |
| Lead | 0.0527 | 0.00500 | 0.05 | 0.000217 | 105 | 88 - 115 | 0.05327 | 1.08 | 20 | |
| Magnesium | 23.88 | 0.200 | 5 | 17.67 | 124 | 83 - 118 | 22.91 | 4.14 | 20 | S |
| Manganese | 0.2229 | 0.00500 | 0.05 | 0.1645 | 117 | 87 - 115 | 0.22 | 1.3 | 20 | S |
| Nickel | 0.05657 | 0.00500 | 0.05 | 0.002543 | 108 | 85 - 117 | 0.05625 | 0.564 | 20 | |
| Potassium | 6.978 | 0.200 | 5 | 1.72 | 105 | 87 - 115 | 6.757 | 3.22 | 20 | |
| Selenium | 0.0526 | 0.00500 | 0.05 | 0.000277 | 105 | 80 - 120 | 0.05271 | 0.213 | 20 | |
| Silver | 0.04992 | 0.00500 | 0.05 | 0.000013 | 99.8 | 85 - 116 | 0.0511 | 2.34 | 20 | |
| Sodium | 594.4 | 0.200 | 5 | 569.8 | 492 | 85 - 117 | 574.5 | 3.41 | 20 | SEO |
| Thallium | 0.05109 | 0.00200 | 0.05 | 0.000126 | 102 | 82 - 116 | 0.05236 | 2.46 | 20 | |
| Vanadium | 0.05702 | 0.00500 | 0.05 | 0.0009 | 112 | 86 - 115 | 0.05635 | 1.18 | 20 | |
| Zinc | 0.08142 | 0.00500 | 0.05 | 0.02569 | 111 | 83 - 119 | 0.08036 | 1.31 | 20 | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Effluent Samples
**WorkOrder:** HS22020822

**QC BATCH REPORT**

**Batch ID: 175865 ( 0 )** **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

**PDS** Sample ID: **HS22020822-01PDS** Units: **mg/L** Analysis Date: **02-Mar-2022 13:01**
Client ID: **LH18/24-SP650_021522** Run ID: **ICPMS06_403358** SeqNo: **6527690** PrepDate: **01-Mar-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 0.1393 | 0.0100 | 0.1 | 0.02543 | 114 | 80 - 120 | | | | |
| Antimony | 0.1004 | 0.00500 | 0.1 | 0.000205 | 100 | 80 - 120 | | | | |
| Arsenic | 0.1152 | 0.00500 | 0.1 | 0.000415 | 115 | 80 - 120 | | | | |
| Barium | 1.144 | 0.00500 | 0.1 | 1.052 | 92.9 | 80 - 120 | | | | O |
| Beryllium | 0.1046 | 0.00200 | 0.1 | 0.000023 | 105 | 80 - 120 | | | | |
| Cadmium | 0.1105 | 0.00200 | 0.1 | 0.000031 | 110 | 80 - 120 | | | | |
| Calcium | 77.5 | 0.500 | 10 | 66.53 | 110 | 80 - 120 | | | | O |
| Chromium | 0.1134 | 0.00500 | 0.1 | 0.002058 | 111 | 80 - 120 | | | | |
| Cobalt | 0.1103 | 0.00500 | 0.1 | 0.000898 | 109 | 80 - 120 | | | | |
| Iron | 10.8 | 0.200 | 10 | 0.1587 | 106 | 80 - 120 | | | | |
| Lead | 0.1097 | 0.00500 | 0.1 | 0.000217 | 109 | 80 - 120 | | | | |
| Magnesium | 28.5 | 0.200 | 10 | 17.67 | 108 | 80 - 120 | | | | |
| Manganese | 0.2842 | 0.00500 | 0.1 | 0.1645 | 120 | 80 - 120 | | | | |
| Nickel | 0.1131 | 0.00500 | 0.1 | 0.002543 | 111 | 80 - 120 | | | | |
| Potassium | 12.55 | 0.200 | 10 | 1.72 | 108 | 80 - 120 | | | | |
| Selenium | 0.1143 | 0.00500 | 0.1 | 0.000277 | 114 | 80 - 120 | | | | |
| Silver | 0.1058 | 0.00500 | 0.1 | 0.000013 | 106 | 80 - 120 | | | | |
| Thallium | 0.1098 | 0.00200 | 0.1 | 0.000126 | 110 | 80 - 120 | | | | |
| Vanadium | 0.1146 | 0.00500 | 0.1 | 0.0009 | 114 | 80 - 120 | | | | |
| Zinc | 0.1418 | 0.00500 | 0.1 | 0.02569 | 116 | 80 - 120 | | | | |

**PDS** Sample ID: **HS22020822-01PDS** Units: **mg/L** Analysis Date: **02-Mar-2022 14:47**
Client ID: **LH18/24-SP650_021522** Run ID: **ICPMS06_403358** SeqNo: **6527892** PrepDate: **01-Mar-2022** DF: **50**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Sodium | 1074 | 10.0 | 500 | 579 | 99.0 | 80 - 120 | | | | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Effluent Samples
**WorkOrder:** HS22020822

**QC BATCH REPORT**

**Batch ID: 175865 ( 0 )** **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

**SD** Sample ID: **HS22020822-01SD** Units: **mg/L** Analysis Date: **02-Mar-2022 12:56**
Client ID: **LH18/24-SP650_021522** Run ID: **ICPMS06_403358** SeqNo: **6527702** PrepDate: **01-Mar-2022** DF: **5**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %D | %D Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 0.02711 | 0.0500 | | | | | 0.02543 | 0 | 10 | J |
| Antimony | 0.00500 | 0.0250 | | | | | 0.000205 | 0 | 10 | U |
| Arsenic | 0.00500 | 0.0250 | | | | | 0.000415 | 0 | 10 | U |
| Barium | 1.06 | 0.0250 | | | | | 1.052 | 0.75 | 10 | |
| Beryllium | 0.00250 | 0.0100 | | | | | 0.000023 | 0 | 10 | U |
| Cadmium | 0.00250 | 0.0100 | | | | | 0.000031 | 0 | 10 | U |
| Calcium | 66.35 | 2.50 | | | | | 66.53 | 0.27 | 10 | |
| Chromium | 0.002204 | 0.0250 | | | | | 0.002058 | 0 | 10 | J |
| Cobalt | 0.000922 | 0.0250 | | | | | 0.000898 | 0 | 10 | J |
| Iron | 0.1317 | 1.00 | | | | | 0.1587 | 0 | 10 | J |
| Lead | 0.00500 | 0.0250 | | | | | 0.000217 | 0 | 10 | U |
| Magnesium | 18.07 | 1.00 | | | | | 17.67 | 2.25 | 10 | |
| Manganese | 0.1694 | 0.0250 | | | | | 0.1645 | 2.98 | 10 | |
| Nickel | 0.00500 | 0.0250 | | | | | 0.002543 | 0 | 10 | U |
| Potassium | 1.673 | 1.00 | | | | | 1.72 | 2.72 | 10 | |
| Selenium | 0.0125 | 0.0250 | | | | | 0.000277 | 0 | 10 | U |
| Silver | 0.00250 | 0.0250 | | | | | 0.000013 | 0 | 10 | U |
| Thallium | 0.00250 | 0.0100 | | | | | 0.000126 | 0 | 10 | U |
| Vanadium | 0.005331 | 0.0250 | | | | | 0.0009 | 0 | 10 | J |
| Zinc | 0.0257 | 0.0250 | | | | | 0.02569 | 0.0428 | 10 | |

**SD** Sample ID: **HS22020822-01SD** Units: **mg/L** Analysis Date: **02-Mar-2022 14:45**
Client ID: **LH18/24-SP650_021522** Run ID: **ICPMS06_403358** SeqNo: **6527891** PrepDate: **01-Mar-2022** DF: **250**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %D | %D Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Sodium | 619.8 | 50.0 | | | | | 579 | 7.04 | 10 | |

**The following samples were analyzed in this batch:** HS22020822-01

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Effluent Samples
**WorkOrder:** HS22020822

**QC BATCH REPORT**

**Batch ID: 175559 ( 0 )** **Instrument: SV-6** **Method: SEMIVOLATILES SIM**

**MBLK** Sample ID: **MBLK-175559** Units: **ug/L** Analysis Date: **28-Feb-2022 14:01**
Client ID: Run ID: **SV-6_403343** SeqNo: **6527380** PrepDate: **21-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,4-Dioxane | 0.010 | 0.010 | | | | | | | | U |
| *Surr: 2-Fluorobiphenyl* | *0.07178* | *0* | *0.08* | *0* | *89.7* | *40 - 140* | | | | |
| *Surr: 4-Terphenyl-d14* | *0.08194* | *0* | *0.08* | *0* | *102* | *40 - 140* | | | | |
| *Surr: Nitrobenzene-d5* | *0.06483* | *0* | *0.08* | *0* | *81.0* | *40 - 140* | | | | |

**LCS** Sample ID: **LCS-175559** Units: **ug/L** Analysis Date: **28-Feb-2022 14:19**
Client ID: Run ID: **SV-6_403343** SeqNo: **6527418** PrepDate: **21-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,4-Dioxane | 0.105 | 0.010 | 0.08 | 0 | 131 | 40 - 140 | | | | |
| *Surr: 2-Fluorobiphenyl* | *0.07433* | *0* | *0.08* | *0* | *92.9* | *40 - 140* | | | | |
| *Surr: 4-Terphenyl-d14* | *0.07104* | *0* | *0.08* | *0* | *88.8* | *40 - 140* | | | | |
| *Surr: Nitrobenzene-d5* | *0.06338* | *0* | *0.08* | *0* | *79.2* | *40 - 140* | | | | |

**LCSD** Sample ID: **LCSD-175559** Units: **ug/L** Analysis Date: **28-Feb-2022 14:37**
Client ID: Run ID: **SV-6_403343** SeqNo: **6527419** PrepDate: **21-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,4-Dioxane | 0.1057 | 0.010 | 0.08 | 0 | 132 | 40 - 140 | 0.105 | 0.673 | 20 | |
| *Surr: 2-Fluorobiphenyl* | *0.0787* | *0* | *0.08* | *0* | *98.4* | *40 - 140* | *0.07433* | *5.71* | *20* | |
| *Surr: 4-Terphenyl-d14* | *0.07008* | *0* | *0.08* | *0* | *87.6* | *40 - 140* | *0.07104* | *1.36* | *20* | |
| *Surr: Nitrobenzene-d5* | *0.06142* | *0* | *0.08* | *0* | *76.8* | *40 - 140* | *0.06338* | *3.14* | *20* | |

**The following samples were analyzed in this batch:** HS22020822-01

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Effluent Samples
**WorkOrder:** HS22020822

**QC BATCH REPORT**

**Batch ID:** R403119 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220224** Units: **ug/L** Analysis Date: **25-Feb-2022 00:49**
Client ID: Run ID: **VOA9_403119** SeqNo: **6522649** PrepDate: DF: **1**

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

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Effluent Samples
**WorkOrder:** HS22020822

**QC BATCH REPORT**

**Batch ID:** R403119 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220224** Units: **ug/L** Analysis Date: **25-Feb-2022 00:49**
Client ID: Run ID: **VOA9_403119** SeqNo: **6522649** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 2.0 | 2.0 | | | | | | | | U |
| Carbon tetrachloride | 1.0 | 1.0 | | | | | | | | U |
| Chlorobenzene | 1.0 | 1.0 | | | | | | | | U |
| Chloroethane | 1.0 | 1.0 | | | | | | | | U |
| Chloroform | 0.50 | 1.0 | | | | | | | | U |
| Chloromethane | 0.50 | 1.0 | | | | | | | | U |
| cis-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| cis-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Dibromochloromethane | 1.0 | 1.0 | | | | | | | | U |
| Dibromomethane | 0.50 | 1.0 | | | | | | | | U |
| Dichlorodifluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Ethylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Hexachlorobutadiene | 1.0 | 1.0 | | | | | | | | U |
| Isopropylbenzene | 1.0 | 1.0 | | | | | | | | U |
| m,p-Xylene | 1.0 | 2.0 | | | | | | | | U |
| Methylene chloride | 2.0 | 2.0 | | | | | | | | U |
| Naphthalene | 1.0 | 1.0 | | | | | | | | U |
| n-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| n-Propylbenzene | 1.0 | 1.0 | | | | | | | | U |
| o-Xylene | 1.0 | 1.0 | | | | | | | | U |
| sec-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Styrene | 1.0 | 1.0 | | | | | | | | U |
| tert-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Tetrachloroethene | 1.0 | 1.0 | | | | | | | | U |
| Toluene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Trichloroethene | 0.50 | 1.0 | | | | | | | | U |
| Trichlorofluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Vinyl chloride | 0.50 | 1.0 | | | | | | | | U |
| *Surr: 1,2-Dichloroethane-d4* | *47.21* | *1.0* | *50* | *0* | *94.4* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *50.37* | *1.0* | *50* | *0* | *101* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *45.07* | *1.0* | *50* | *0* | *90.1* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *53.26* | *1.0* | *50* | *0* | *107* | *89 - 112* | | | | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Effluent Samples
**WorkOrder:** HS22020822

**QC BATCH REPORT**

**Batch ID:** R403119 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220224** Units: **ug/L** Analysis Date: **25-Feb-2022 00:05**
Client ID: Run ID: **VOA9_403119** SeqNo: **6522601** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 19.36 | 1.0 | 20 | 0 | 96.8 | 78 - 124 | | | | |
| 1,1,1-Trichloroethane | 19.9 | 1.0 | 20 | 0 | 99.5 | 74 - 131 | | | | |
| 1,1,2,2-Tetrachloroethane | 19.35 | 1.0 | 20 | 0 | 96.7 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 19.8 | 1.0 | 20 | 0 | 99.0 | 80 - 119 | | | | |
| 1,1-Dichloroethane | 20.33 | 1.0 | 20 | 0 | 102 | 77 - 125 | | | | |
| 1,1-Dichloroethene | 20.62 | 1.0 | 20 | 0 | 103 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 20.19 | 1.0 | 20 | 0 | 101 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 19.41 | 1.0 | 20 | 0 | 97.0 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 18.34 | 1.0 | 20 | 0 | 91.7 | 73 - 122 | | | | |
| 1,2,4-Trichlorobenzene | 18.52 | 1.0 | 20 | 0 | 92.6 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 19.57 | 1.0 | 20 | 0 | 97.9 | 76 - 124 | | | | |
| 1,2-Dibromo-3-chloropropane | 16.37 | 1.0 | 20 | 0 | 81.9 | 62 - 128 | | | | |
| 1,2-Dibromoethane | 19.9 | 1.0 | 20 | 0 | 99.5 | 77 - 121 | | | | |
| 1,2-Dichlorobenzene | 16.77 | 1.0 | 20 | 0 | 83.8 | 80 - 119 | | | | |
| 1,2-Dichloroethane | 21.55 | 1.0 | 20 | 0 | 108 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 19.9 | 1.0 | 20 | 0 | 99.5 | 78 - 122 | | | | |
| 1,3,5-Trimethylbenzene | 19.57 | 1.0 | 20 | 0 | 97.8 | 75 - 124 | | | | |
| 1,3-Dichlorobenzene | 19.19 | 1.0 | 20 | 0 | 95.9 | 80 - 119 | | | | |
| 1,3-Dichloropropane | 20.35 | 1.0 | 20 | 0 | 102 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 19.76 | 1.0 | 20 | 0 | 98.8 | 79 - 118 | | | | |
| 2,2-Dichloropropane | 18.45 | 1.0 | 20 | 0 | 92.3 | 60 - 139 | | | | |
| 2-Butanone | 39.93 | 2.0 | 40 | 0 | 99.8 | 56 - 143 | | | | |
| 2-Chlorotoluene | 19.97 | 1.0 | 20 | 0 | 99.9 | 79 - 122 | | | | |
| 2-Hexanone | 37.93 | 2.0 | 40 | 0 | 94.8 | 57 - 139 | | | | |
| 4-Chlorotoluene | 19.5 | 1.0 | 20 | 0 | 97.5 | 78 - 122 | | | | |
| 4-Isopropyltoluene | 18.93 | 1.0 | 20 | 0 | 94.7 | 77 - 127 | | | | |
| 4-Methyl-2-pentanone | 38.53 | 2.0 | 40 | 0 | 96.3 | 67 - 130 | | | | |
| Acetone | 41.37 | 2.0 | 40 | 0 | 103 | 39 - 160 | | | | |
| Benzene | 20.39 | 1.0 | 20 | 0 | 102 | 79 - 120 | | | | |
| Bromobenzene | 19.5 | 1.0 | 20 | 0 | 97.5 | 80 - 120 | | | | |
| Bromochloromethane | 21.35 | 1.0 | 20 | 0 | 107 | 78 - 123 | | | | |
| Bromodichloromethane | 19.41 | 1.0 | 20 | 0 | 97.0 | 79 - 125 | | | | |
| Bromoform | 17.59 | 1.0 | 20 | 0 | 87.9 | 66 - 130 | | | | |
| Bromomethane | 20.78 | 1.0 | 20 | 0 | 104 | 53 - 141 | | | | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Effluent Samples
**WorkOrder:** HS22020822

**QC BATCH REPORT**

**Batch ID:** R403119 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220224** Units: **ug/L** Analysis Date: **25-Feb-2022 00:05**
Client ID: Run ID: **VOA9_403119** SeqNo: **6522601** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 39.99 | 2.0 | 40 | 0 | 100.0 | 64 - 133 | | | | |
| Carbon tetrachloride | 19.4 | 1.0 | 20 | 0 | 97.0 | 72 - 136 | | | | |
| Chlorobenzene | 19.98 | 1.0 | 20 | 0 | 99.9 | 82 - 118 | | | | |
| Chloroethane | 20.47 | 1.0 | 20 | 0 | 102 | 60 - 138 | | | | |
| Chloroform | 20.65 | 1.0 | 20 | 0 | 103 | 79 - 124 | | | | |
| Chloromethane | 21.18 | 1.0 | 20 | 0 | 106 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 20.19 | 1.0 | 20 | 0 | 101 | 78 - 123 | | | | |
| cis-1,3-Dichloropropene | 17.86 | 1.0 | 20 | 0 | 89.3 | 75 - 124 | | | | |
| Dibromochloromethane | 18.47 | 1.0 | 20 | 0 | 92.3 | 74 - 126 | | | | |
| Dibromomethane | 20.15 | 1.0 | 20 | 0 | 101 | 79 - 123 | | | | |
| Dichlorodifluoromethane | 20.64 | 1.0 | 20 | 0 | 103 | 32 - 152 | | | | |
| Ethylbenzene | 19.33 | 1.0 | 20 | 0 | 96.6 | 79 - 121 | | | | |
| Hexachlorobutadiene | 18.85 | 1.0 | 20 | 0 | 94.2 | 66 - 134 | | | | |
| Isopropylbenzene | 19.65 | 1.0 | 20 | 0 | 98.2 | 72 - 131 | | | | |
| m,p-Xylene | 39 | 2.0 | 40 | 0 | 97.5 | 80 - 121 | | | | |
| Methylene chloride | 20.07 | 2.0 | 20 | 0 | 100 | 74 - 124 | | | | |
| Naphthalene | 18.26 | 1.0 | 20 | 0 | 91.3 | 61 - 128 | | | | |
| n-Butylbenzene | 18.91 | 1.0 | 20 | 0 | 94.6 | 75 - 128 | | | | |
| n-Propylbenzene | 19.36 | 1.0 | 20 | 0 | 96.8 | 76 - 126 | | | | |
| o-Xylene | 19.92 | 1.0 | 20 | 0 | 99.6 | 78 - 122 | | | | |
| sec-Butylbenzene | 18.89 | 1.0 | 20 | 0 | 94.5 | 77 - 126 | | | | |
| Styrene | 19.79 | 1.0 | 20 | 0 | 98.9 | 78 - 123 | | | | |
| tert-Butylbenzene | 19.71 | 1.0 | 20 | 0 | 98.5 | 78 - 124 | | | | |
| Tetrachloroethene | 20.23 | 1.0 | 20 | 0 | 101 | 74 - 129 | | | | |
| Toluene | 20.41 | 1.0 | 20 | 0 | 102 | 80 - 121 | | | | |
| trans-1,2-Dichloroethene | 20.53 | 1.0 | 20 | 0 | 103 | 75 - 124 | | | | |
| trans-1,3-Dichloropropene | 18.05 | 1.0 | 20 | 0 | 90.2 | 73 - 127 | | | | |
| Trichloroethene | 20.68 | 1.0 | 20 | 0 | 103 | 79 - 123 | | | | |
| Trichlorofluoromethane | 20.57 | 1.0 | 20 | 0 | 103 | 65 - 141 | | | | |
| Vinyl chloride | 20.04 | 1.0 | 20 | 0 | 100 | 58 - 137 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *53.21* | *1.0* | *50* | *0* | *106* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *50.63* | *1.0* | *50* | *0* | *101* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *51.29* | *1.0* | *50* | *0* | *103* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *51.69* | *1.0* | *50* | *0* | *103* | *89 - 112* | | | | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Effluent Samples
**WorkOrder:** HS22020822

**QC BATCH REPORT**

**Batch ID:** R403119 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS22020769-07MS** Units: **ug/L** Analysis Date: **25-Feb-2022 03:46**
Client ID: Run ID: **VOA9_403119** SeqNo: **6522610** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 15.08 | 1.0 | 20 | 0 | 75.4 | 78 - 124 | | | | S |
| 1,1,1-Trichloroethane | 14.36 | 1.0 | 20 | 0 | 71.8 | 74 - 131 | | | | S |
| 1,1,2,2-Tetrachloroethane | 15.05 | 1.0 | 20 | 0 | 75.3 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 15.75 | 1.0 | 20 | 0 | 78.7 | 80 - 119 | | | | S |
| 1,1-Dichloroethane | 14.49 | 1.0 | 20 | 0 | 72.5 | 77 - 125 | | | | S |
| 1,1-Dichloroethene | 14.38 | 1.0 | 20 | 0 | 71.9 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 16.06 | 1.0 | 20 | 0 | 80.3 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 13.8 | 1.0 | 20 | 0 | 69.0 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 14.16 | 1.0 | 20 | 0 | 70.8 | 73 - 122 | | | | S |
| 1,2,4-Trichlorobenzene | 13.83 | 1.0 | 20 | 0 | 69.1 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 14.5 | 1.0 | 20 | 0 | 72.5 | 76 - 124 | | | | S |
| 1,2-Dibromo-3-chloropropane | 11.99 | 1.0 | 20 | 0 | 60.0 | 62 - 128 | | | | S |
| 1,2-Dibromoethane | 15.38 | 1.0 | 20 | 0 | 76.9 | 77 - 121 | | | | S |
| 1,2-Dichlorobenzene | 13.16 | 1.0 | 20 | 0 | 65.8 | 80 - 119 | | | | S |
| 1,2-Dichloroethane | 16.54 | 1.0 | 20 | 0 | 82.7 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 15.23 | 1.0 | 20 | 0 | 76.2 | 78 - 122 | | | | S |
| 1,3,5-Trimethylbenzene | 14.95 | 1.0 | 20 | 0 | 74.8 | 75 - 124 | | | | S |
| 1,3-Dichlorobenzene | 15.13 | 1.0 | 20 | 0 | 75.6 | 80 - 119 | | | | S |
| 1,3-Dichloropropane | 16.01 | 1.0 | 20 | 0 | 80.1 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 15 | 1.0 | 20 | 0 | 75.0 | 79 - 118 | | | | S |
| 2,2-Dichloropropane | 11.75 | 1.0 | 20 | 0 | 58.7 | 60 - 139 | | | | S |
| 2-Butanone | 28.36 | 2.0 | 40 | 0 | 70.9 | 56 - 143 | | | | |
| 2-Chlorotoluene | 15.61 | 1.0 | 20 | 0 | 78.0 | 79 - 122 | | | | S |
| 2-Hexanone | 30.49 | 2.0 | 40 | 0 | 76.2 | 57 - 139 | | | | |
| 4-Chlorotoluene | 15.37 | 1.0 | 20 | 0 | 76.8 | 78 - 122 | | | | S |
| 4-Isopropyltoluene | 14.35 | 1.0 | 20 | 0 | 71.7 | 77 - 127 | | | | S |
| 4-Methyl-2-pentanone | 30.52 | 2.0 | 40 | 0 | 76.3 | 67 - 130 | | | | |
| Acetone | 28.69 | 2.0 | 40 | 0 | 71.7 | 39 - 160 | | | | |
| Benzene | 15.62 | 1.0 | 20 | 0 | 78.1 | 79 - 120 | | | | S |
| Bromobenzene | 15.15 | 1.0 | 20 | 0 | 75.8 | 80 - 120 | | | | S |
| Bromochloromethane | 14.09 | 1.0 | 20 | 0 | 70.4 | 78 - 123 | | | | S |
| Bromodichloromethane | 14.9 | 1.0 | 20 | 0 | 74.5 | 79 - 125 | | | | S |
| Bromoform | 14.2 | 1.0 | 20 | 0 | 71.0 | 66 - 130 | | | | |
| Bromomethane | 12.8 | 1.0 | 20 | 0 | 64.0 | 53 - 141 | | | | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Effluent Samples
**WorkOrder:** HS22020822

**QC BATCH REPORT**

**Batch ID:** R403119 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS22020769-07MS** Units: **ug/L** Analysis Date: **25-Feb-2022 03:46**
Client ID: Run ID: **VOA9_403119** SeqNo: **6522610** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 25.66 | 2.0 | 40 | 0 | 64.1 | 64 - 133 | | | | |
| Carbon tetrachloride | 15.97 | 1.0 | 20 | 0 | 79.9 | 72 - 136 | | | | |
| Chlorobenzene | 15.77 | 1.0 | 20 | 0 | 78.8 | 82 - 118 | | | | S |
| Chloroethane | 13.94 | 1.0 | 20 | 0 | 69.7 | 60 - 138 | | | | |
| Chloroform | 14.74 | 1.0 | 20 | 0 | 73.7 | 79 - 124 | | | | S |
| Chloromethane | 10.95 | 1.0 | 20 | 0 | 54.8 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 14.52 | 1.0 | 20 | 0 | 72.6 | 78 - 123 | | | | S |
| cis-1,3-Dichloropropene | 13.21 | 1.0 | 20 | 0 | 66.1 | 75 - 124 | | | | S |
| Dibromochloromethane | 14.29 | 1.0 | 20 | 0 | 71.5 | 74 - 126 | | | | S |
| Dibromomethane | 15.62 | 1.0 | 20 | 0 | 78.1 | 79 - 123 | | | | S |
| Dichlorodifluoromethane | 6.727 | 1.0 | 20 | 0 | 33.6 | 32 - 152 | | | | |
| Ethylbenzene | 15.57 | 1.0 | 20 | 0 | 77.9 | 79 - 121 | | | | S |
| Hexachlorobutadiene | 13.88 | 1.0 | 20 | 0 | 69.4 | 66 - 134 | | | | |
| Isopropylbenzene | 15.79 | 1.0 | 20 | 0 | 79.0 | 72 - 131 | | | | |
| m,p-Xylene | 31.09 | 2.0 | 40 | 0 | 77.7 | 80 - 121 | | | | S |
| Methylene chloride | 13.37 | 2.0 | 20 | 0 | 66.8 | 74 - 124 | | | | S |
| Naphthalene | 13.94 | 1.0 | 20 | 0 | 69.7 | 61 - 128 | | | | |
| n-Butylbenzene | 14.1 | 1.0 | 20 | 0 | 70.5 | 75 - 128 | | | | S |
| n-Propylbenzene | 15.16 | 1.0 | 20 | 0 | 75.8 | 76 - 126 | | | | S |
| o-Xylene | 15.44 | 1.0 | 20 | 0 | 77.2 | 78 - 122 | | | | S |
| sec-Butylbenzene | 14.96 | 1.0 | 20 | 0 | 74.8 | 77 - 126 | | | | S |
| Styrene | 15.01 | 1.0 | 20 | 0 | 75.0 | 78 - 123 | | | | S |
| tert-Butylbenzene | 15.64 | 1.0 | 20 | 0 | 78.2 | 78 - 124 | | | | |
| Tetrachloroethene | 16.45 | 1.0 | 20 | 0 | 82.2 | 74 - 129 | | | | |
| Toluene | 16.42 | 1.0 | 20 | 0 | 82.1 | 80 - 121 | | | | |
| trans-1,2-Dichloroethene | 14.21 | 1.0 | 20 | 0 | 71.0 | 75 - 124 | | | | S |
| trans-1,3-Dichloropropene | 13.38 | 1.0 | 20 | 0 | 66.9 | 73 - 127 | | | | S |
| Trichloroethene | 15.76 | 1.0 | 20 | 0 | 78.8 | 79 - 123 | | | | S |
| Trichlorofluoromethane | 14.29 | 1.0 | 20 | 0 | 71.5 | 65 - 141 | | | | |
| Vinyl chloride | 11.38 | 1.0 | 20 | 0 | 56.9 | 58 - 137 | | | | S |
| *Surr: 1,2-Dichloroethane-d4* | *47.11* | *1.0* | *50* | *0* | *94.2* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *53.39* | *1.0* | *50* | *0* | *107* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *46.28* | *1.0* | *50* | *0* | *92.6* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *53.82* | *1.0* | *50* | *0* | *108* | *89 - 112* | | | | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Effluent Samples
**WorkOrder:** HS22020822

**QC BATCH REPORT**

**Batch ID:** R403119 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS22020769-07MSD** Units: **ug/L** Analysis Date: **25-Feb-2022 04:08**
Client ID: Run ID: **VOA9_403119** SeqNo: **6522648** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 15.17 | 1.0 | 20 | 0 | 75.9 | 78 - 124 | 15.08 | 0.607 | 20 | S |
| 1,1,1-Trichloroethane | 14.59 | 1.0 | 20 | 0 | 73.0 | 74 - 131 | 14.36 | 1.59 | 20 | S |
| 1,1,2,2-Tetrachloroethane | 15.02 | 1.0 | 20 | 0 | 75.1 | 71 - 121 | 15.05 | 0.226 | 20 | |
| 1,1,2-Trichloroethane | 15.78 | 1.0 | 20 | 0 | 78.9 | 80 - 119 | 15.75 | 0.166 | 20 | S |
| 1,1-Dichloroethane | 14.6 | 1.0 | 20 | 0 | 73.0 | 77 - 125 | 14.49 | 0.756 | 20 | S |
| 1,1-Dichloroethene | 13.9 | 1.0 | 20 | 0 | 69.5 | 71 - 131 | 14.38 | 3.43 | 20 | S |
| 1,1-Dichloropropene | 15.95 | 1.0 | 20 | 0 | 79.7 | 78 - 125 | 16.06 | 0.726 | 20 | |
| 1,2,3-Trichlorobenzene | 14.64 | 1.0 | 20 | 0 | 73.2 | 69 - 129 | 13.8 | 5.92 | 20 | |
| 1,2,3-Trichloropropane | 14.37 | 1.0 | 20 | 0 | 71.9 | 73 - 122 | 14.16 | 1.48 | 20 | S |
| 1,2,4-Trichlorobenzene | 14.61 | 1.0 | 20 | 0 | 73.0 | 69 - 130 | 13.83 | 5.49 | 20 | |
| 1,2,4-Trimethylbenzene | 15.04 | 1.0 | 20 | 0 | 75.2 | 76 - 124 | 14.5 | 3.66 | 20 | S |
| 1,2-Dibromo-3-chloropropane | 13.32 | 1.0 | 20 | 0 | 66.6 | 62 - 128 | 11.99 | 10.4 | 20 | |
| 1,2-Dibromoethane | 15.69 | 1.0 | 20 | 0 | 78.4 | 77 - 121 | 15.38 | 2 | 20 | |
| 1,2-Dichlorobenzene | 13.29 | 1.0 | 20 | 0 | 66.4 | 80 - 119 | 13.16 | 0.945 | 20 | S |
| 1,2-Dichloroethane | 16.43 | 1.0 | 20 | 0 | 82.2 | 73 - 128 | 16.54 | 0.625 | 20 | |
| 1,2-Dichloropropane | 15.42 | 1.0 | 20 | 0 | 77.1 | 78 - 122 | 15.23 | 1.25 | 20 | S |
| 1,3,5-Trimethylbenzene | 15.15 | 1.0 | 20 | 0 | 75.8 | 75 - 124 | 14.95 | 1.34 | 20 | |
| 1,3-Dichlorobenzene | 14.97 | 1.0 | 20 | 0 | 74.8 | 80 - 119 | 15.13 | 1.04 | 20 | S |
| 1,3-Dichloropropane | 15.86 | 1.0 | 20 | 0 | 79.3 | 80 - 119 | 16.01 | 0.954 | 20 | S |
| 1,4-Dichlorobenzene | 14.84 | 1.0 | 20 | 0 | 74.2 | 79 - 118 | 15 | 1.08 | 20 | S |
| 2,2-Dichloropropane | 11.81 | 1.0 | 20 | 0 | 59.1 | 60 - 139 | 11.75 | 0.546 | 20 | S |
| 2-Butanone | 28.84 | 2.0 | 40 | 0 | 72.1 | 56 - 143 | 28.36 | 1.7 | 20 | |
| 2-Chlorotoluene | 15.3 | 1.0 | 20 | 0 | 76.5 | 79 - 122 | 15.61 | 1.98 | 20 | S |
| 2-Hexanone | 30.15 | 2.0 | 40 | 0 | 75.4 | 57 - 139 | 30.49 | 1.12 | 20 | |
| 4-Chlorotoluene | 15.52 | 1.0 | 20 | 0 | 77.6 | 78 - 122 | 15.37 | 1.01 | 20 | S |
| 4-Isopropyltoluene | 14.51 | 1.0 | 20 | 0 | 72.5 | 77 - 127 | 14.35 | 1.11 | 20 | S |
| 4-Methyl-2-pentanone | 30.52 | 2.0 | 40 | 0 | 76.3 | 67 - 130 | 30.52 | 0.0151 | 20 | |
| Acetone | 28.66 | 2.0 | 40 | 0 | 71.7 | 39 - 160 | 28.69 | 0.0864 | 20 | |
| Benzene | 15.42 | 1.0 | 20 | 0 | 77.1 | 79 - 120 | 15.62 | 1.3 | 20 | S |
| Bromobenzene | 14.94 | 1.0 | 20 | 0 | 74.7 | 80 - 120 | 15.15 | 1.38 | 20 | S |
| Bromochloromethane | 15.36 | 1.0 | 20 | 0 | 76.8 | 78 - 123 | 14.09 | 8.64 | 20 | S |
| Bromodichloromethane | 15.01 | 1.0 | 20 | 0 | 75.1 | 79 - 125 | 14.9 | 0.746 | 20 | S |
| Bromoform | 13.84 | 1.0 | 20 | 0 | 69.2 | 66 - 130 | 14.2 | 2.51 | 20 | |
| Bromomethane | 12.58 | 1.0 | 20 | 0 | 62.9 | 53 - 141 | 12.8 | 1.8 | 20 | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Effluent Samples
**WorkOrder:** HS22020822

**QC BATCH REPORT**

**Batch ID:** R403119 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS22020769-07MSD** Units: **ug/L** Analysis Date: **25-Feb-2022 04:08**
Client ID: Run ID: **VOA9_403119** SeqNo: **6522648** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 25.64 | 2.0 | 40 | 0 | 64.1 | 64 - 133 | 25.66 | 0.0738 | 20 | |
| Carbon tetrachloride | 15.32 | 1.0 | 20 | 0 | 76.6 | 72 - 136 | 15.97 | 4.17 | 20 | |
| Chlorobenzene | 15.7 | 1.0 | 20 | 0 | 78.5 | 82 - 118 | 15.77 | 0.412 | 20 | S |
| Chloroethane | 13.68 | 1.0 | 20 | 0 | 68.4 | 60 - 138 | 13.94 | 1.88 | 20 | |
| Chloroform | 14.73 | 1.0 | 20 | 0 | 73.6 | 79 - 124 | 14.74 | 0.0653 | 20 | S |
| Chloromethane | 11 | 1.0 | 20 | 0 | 55.0 | 50 - 139 | 10.95 | 0.409 | 20 | |
| cis-1,2-Dichloroethene | 14.37 | 1.0 | 20 | 0 | 71.8 | 78 - 123 | 14.52 | 1.02 | 20 | S |
| cis-1,3-Dichloropropene | 12.97 | 1.0 | 20 | 0 | 64.9 | 75 - 124 | 13.21 | 1.81 | 20 | S |
| Dibromochloromethane | 14.7 | 1.0 | 20 | 0 | 73.5 | 74 - 126 | 14.29 | 2.84 | 20 | S |
| Dibromomethane | 15.5 | 1.0 | 20 | 0 | 77.5 | 79 - 123 | 15.62 | 0.787 | 20 | S |
| Dichlorodifluoromethane | 6.481 | 1.0 | 20 | 0 | 32.4 | 32 - 152 | 6.727 | 3.72 | 20 | |
| Ethylbenzene | 15.58 | 1.0 | 20 | 0 | 77.9 | 79 - 121 | 15.57 | 0.0587 | 20 | S |
| Hexachlorobutadiene | 14.34 | 1.0 | 20 | 0 | 71.7 | 66 - 134 | 13.88 | 3.31 | 20 | |
| Isopropylbenzene | 15.6 | 1.0 | 20 | 0 | 78.0 | 72 - 131 | 15.79 | 1.25 | 20 | |
| m,p-Xylene | 31.39 | 2.0 | 40 | 0 | 78.5 | 80 - 121 | 31.09 | 0.967 | 20 | S |
| Methylene chloride | 13.18 | 2.0 | 20 | 0 | 65.9 | 74 - 124 | 13.37 | 1.44 | 20 | S |
| Naphthalene | 14.41 | 1.0 | 20 | 0 | 72.0 | 61 - 128 | 13.94 | 3.29 | 20 | |
| n-Butylbenzene | 14.3 | 1.0 | 20 | 0 | 71.5 | 75 - 128 | 14.1 | 1.41 | 20 | S |
| n-Propylbenzene | 15.14 | 1.0 | 20 | 0 | 75.7 | 76 - 126 | 15.16 | 0.127 | 20 | S |
| o-Xylene | 15.38 | 1.0 | 20 | 0 | 76.9 | 78 - 122 | 15.44 | 0.354 | 20 | S |
| sec-Butylbenzene | 14.88 | 1.0 | 20 | 0 | 74.4 | 77 - 126 | 14.96 | 0.532 | 20 | S |
| Styrene | 15.09 | 1.0 | 20 | 0 | 75.4 | 78 - 123 | 15.01 | 0.534 | 20 | S |
| tert-Butylbenzene | 15.5 | 1.0 | 20 | 0 | 77.5 | 78 - 124 | 15.64 | 0.862 | 20 | S |
| Tetrachloroethene | 15.74 | 1.0 | 20 | 0 | 78.7 | 74 - 129 | 16.45 | 4.36 | 20 | |
| Toluene | 16.11 | 1.0 | 20 | 0 | 80.5 | 80 - 121 | 16.42 | 1.92 | 20 | |
| trans-1,2-Dichloroethene | 14.22 | 1.0 | 20 | 0 | 71.1 | 75 - 124 | 14.21 | 0.11 | 20 | S |
| trans-1,3-Dichloropropene | 13.31 | 1.0 | 20 | 0 | 66.6 | 73 - 127 | 13.38 | 0.475 | 20 | S |
| Trichloroethene | 15.82 | 1.0 | 20 | 0 | 79.1 | 79 - 123 | 15.76 | 0.347 | 20 | |
| Trichlorofluoromethane | 14.01 | 1.0 | 20 | 0 | 70.0 | 65 - 141 | 14.29 | 2.02 | 20 | |
| Vinyl chloride | 11.53 | 1.0 | 20 | 0 | 57.6 | 58 - 137 | 11.38 | 1.27 | 20 | S |
| *Surr: 1,2-Dichloroethane-d4* | *47.44* | *1.0* | *50* | *0* | *94.9* | *81 - 118* | *47.11* | *0.705* | *20* | |
| *Surr: 4-Bromofluorobenzene* | *52.77* | *1.0* | *50* | *0* | *106* | *85 - 114* | *53.39* | *1.17* | *20* | |
| *Surr: Dibromofluoromethane* | *46.49* | *1.0* | *50* | *0* | *93.0* | *80 - 119* | *46.28* | *0.443* | *20* | |
| *Surr: Toluene-d8* | *53.74* | *1.0* | *50* | *0* | *107* | *89 - 112* | *53.82* | *0.148* | *20* | |

**ALS Houston, US** Date: 02-Mar-22

| | | |
|---|---|---|
| **Client:** | Bhate Environmental Associates, Inc. | **QC BATCH REPORT** |
| **Project:** | Groundwater Treatment Plant Quarterly Effluent Samples | |
| **WorkOrder:** | HS22020822 | |

| **Batch ID:** | **R403119 ( 0 )** | **Instrument:** | **VOA9** | **Method:** | **VOLATILES ORGANICS BY METHOD 8260C** |
|---|---|---|---|---|---|

**The following samples were analyzed in this batch:** HS22020822-01 HS22020822-03

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Effluent Samples
**WorkOrder:** HS22020822

**QC BATCH REPORT**

**Batch ID:** R402778 ( 0 ) **Instrument:** WetChem_HS **Method:** CHEMICAL OXYGEN DEMAND BY E410.4, REV 2.0, 1993

**MBLK** Sample ID: **MBLK-R402778** Units: **mg/L** Analysis Date: **22-Feb-2022 18:00**
Client ID: Run ID: **WetChem_HS_402778** SeqNo: **6514736** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | 7.50 | 15.0 | | | | | | | | U |

**LCS** Sample ID: **LCS-R402778** Units: **mg/L** Analysis Date: **22-Feb-2022 18:00**
Client ID: Run ID: **WetChem_HS_402778** SeqNo: **6514735** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | 99 | 15.0 | 100 | 0 | 99.0 | 85 - 115 | | | | |

**LCSD** Sample ID: **LCSD-R402778** Units: **mg/L** Analysis Date: **22-Feb-2022 18:00**
Client ID: Run ID: **WetChem_HS_402778** SeqNo: **6514734** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | 99 | 15.0 | 100 | 0 | 99.0 | 85 - 115 | 99 | 0 | 20 | |

**MS** Sample ID: **HS22020801-01MS** Units: **mg/L** Analysis Date: **22-Feb-2022 18:00**
Client ID: Run ID: **WetChem_HS_402778** SeqNo: **6514738** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | 80 | 15.0 | 50 | 31 | 98.0 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22020801-01MSD** Units: **mg/L** Analysis Date: **22-Feb-2022 18:00**
Client ID: Run ID: **WetChem_HS_402778** SeqNo: **6514737** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | 79 | 15.0 | 50 | 31 | 96.0 | 80 - 120 | 80 | 1.26 | 20 | |

**The following samples were analyzed in this batch:** HS22020822-01

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Effluent Samples
**WorkOrder:** HS22020822

**QC BATCH REPORT**

**Batch ID: R403145 ( 0 )** **Instrument: Balance1** **Method: OIL & GREASE (HEM) BY E1664A**

**MBLK** Sample ID: **WBLKW-022522** Units: **mg/L** Analysis Date: **25-Feb-2022 13:50**
Client ID: Run ID: **Balance1_403145** SeqNo: **6523128** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Oil and Grease | 1.00 | 2.00 | | | | | | | | U |

**LCS** Sample ID: **WLCSW-022522** Units: **mg/L** Analysis Date: **25-Feb-2022 13:50**
Client ID: Run ID: **Balance1_403145** SeqNo: **6523130** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Oil and Grease | 39.1 | 2.00 | 40 | 0 | 97.8 | 78 - 114 | | | | |

**LCSD** Sample ID: **WLCSDW-022522** Units: **mg/L** Analysis Date: **25-Feb-2022 13:50**
Client ID: Run ID: **Balance1_403145** SeqNo: **6523129** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Oil and Grease | 36.4 | 2.00 | 40 | 0 | 91.0 | 78 - 114 | 39.1 | 7.15 | 18 | |

**MS** Sample ID: **HS22021030-01MS** Units: **mg/L** Analysis Date: **25-Feb-2022 13:50**
Client ID: Run ID: **Balance1_403145** SeqNo: **6523115** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Oil and Grease | 38.1 | 2.00 | 40 | 1.22 | 92.2 | 78 - 114 | | | | |

**The following samples were analyzed in this batch:** HS22020822-01

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Effluent Samples
**WorkOrder:** HS22020822

**QC BATCH REPORT**

**Batch ID: R403374 ( 0 )** **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

**MBLK** Sample ID: **MBLK** Units: **mg/L** Analysis Date: **01-Mar-2022 18:46**
Client ID: Run ID: **ICS-Integrion_403374** SeqNo: **6528076** 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: **01-Mar-2022 18:52**
Client ID: Run ID: **ICS-Integrion_403374** SeqNo: **6528077** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 19.23 | 0.500 | 20 | 0 | 96.1 | 80 - 120 | | | | |
| Sulfate | 19.45 | 0.500 | 20 | 0 | 97.3 | 80 - 120 | | | | |

**MS** Sample ID: **HS22020823-01MS** Units: **mg/L** Analysis Date: **01-Mar-2022 17:43**
Client ID: Run ID: **ICS-Integrion_403374** SeqNo: **6528071** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 396.7 | 0.500 | 10 | 393.6 | 30.2 | 80 - 120 | | | | SEO |
| Sulfate | 49.8 | 0.500 | 10 | 40.3 | 95.0 | 80 - 120 | | | | O |

**MSD** Sample ID: **HS22020823-01MSD** Units: **mg/L** Analysis Date: **01-Mar-2022 17:48**
Client ID: Run ID: **ICS-Integrion_403374** SeqNo: **6528072** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 397.5 | 0.500 | 10 | 393.6 | 38.7 | 80 - 120 | 396.7 | 0.212 | 20 | SEO |
| Sulfate | 50.16 | 0.500 | 10 | 40.3 | 98.6 | 80 - 120 | 49.8 | 0.712 | 20 | O |

**The following samples were analyzed in this batch:** HS22020822-01

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Effluent Samples
**WorkOrder:** **HS22020822**

## QUALIFIERS, ACRONYMS, UNITS

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

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

| Unit Reported | Description |
|---|---|
| mg/L | Milligrams per Liter |

**ALS Houston, US** Date: 02-Mar-22

## CERTIFICATIONS,ACCREDITATIONS & LICENSES

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas | 21-022-0 | 26-Mar-2022 |
| Florida | E87611-34 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 02-Mar-22

## Sample Receipt Checklist

**Work Order ID:** HS22020822 **Date/Time Received:** **16-Feb-2022 10:00**

**Client Name:** Bhate Environmental **Received by:** **Paresh M. Giga**

**Completed By:** /S/ Paresh M. Giga (eSignature) 16-Feb-2022 15:41 (Date/Time) **Reviewed by:** /S/ Ragen Giga (eSignature) 17-Feb-2022 18:14 (Date/Time)

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

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

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 0.2C/0.7C U/C | IR31 |
| Cooler(s)/Kit(s): | 48337 | |
| Date/Time sample(s) sent to storage: | 2/16/2022 15:55 | |

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

Login Notes: Trip Blank 1 x vial (2nd vial for Influent)

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

# CHAIN OF CUSTODY

**HS22020822**

Name Of Lab Shipping To: ALS 10450 Stancliff Rd., Suite 210 Houston, Tx. 77099 ATTN: RJ Modashia
1

Bhate Environmental Associates, Inc.
oundwater Treatment Plant Quarterly Effluent Sampl

**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:**
## GROUNDWATER TREATMENT PLANT QUARTERLY EFFLUENT SAMPLES

**Prepared By:** Scott Beesinger

**P. O. Number**

An:

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | ROD Volatiles | Total Metals | Oil & Grease | Chemical Oxygen Demand | Chloride & Sulfate | 1, 4 - DIOXANE | PERCHLORATE | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_021522 | Water | 02/15/22 / 14:00 | | 4 | 3 | | 1 | | | | | | | | HCL | |
| LH18/24-SP650_021522 | Water | 02/15/22 / 14:00 | | 1 | | 1 | | | | | | | | | HNO3 | |
| LH18/24-SP650_021522 | Water | 02/15/22 / 14:00 | | 2 | | | | | 1 | 1 | | | | | NONE | |
| LH18/24-SP650_021522 | Water | 02/15/22 / 14:00 | | 1 | | | | 1 | | | | | | | H2SO4 | |
| LH18/24-SP650_021522_AIX | Water | 02/15/22 / 14:00 | | 1 | | | | | | | 1 | | | | NONE | |
| Trip Blank | Water | 02/15/22 | | 2 | 2 | | | | | | | | | | HCL | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

**Additional Remarks:** **Standard TAT**

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 02/15/22 | 14:30 | [signature] | 2/16/22 | 10:00 | | | | | | |

**For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

**Remarks:**
48337 VIC- 0.20
#31 CR-0.5

(Word) S:\1-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

48337

**CUSTODY SEAL**

Date: 2/15/22 Time: 1430
Name: Scott Beesinger
Company: BHATT

Seal Broken By: SM
Date: 02/16/22

48337 FEB 15 2022

Must Deliver Next Business Day
Time and Tempature Sensitive!

ALS

48337

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM ENVIROMENTAL & INFASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 01NOV19
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 19x16x13 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP 37 – RJ

RMA: |||| |||| |||

FedEx Express

FedEx
TRK# 0221 1251 0291 2515

WED – 16 FEB 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

February 25, 2022

Service Request No:E2200141

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS22020822**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory February 16, 2022
For your reference, these analyses have been assigned our service request number **E2200141.**

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.:** | E2200141 |
| **Project:** | HS22020822 | **Date Received:** | 02/16/22 |
| **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 02/16/22.

The sample was received in good condition and is 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:**

EQ2200066: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS-DLCS recoveries met acceptance criteria.

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:**E2200141
**Project:** HS22020822

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2200141-001 | LH18/24-SP650_021522_AIX | 2/15/2022 | 1400 |

# Service Request Summary

**Folder #:** **E2200141**
Client Name: ALS Environmental - US
Project Name: HS22020822
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 02/16/22
Internal Due Date: 3/2/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22020822
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON CIO4 DOD/6850 |
|---|---|---|---|---|
| E2200141-001 | LH18/24-SP650_021522_AIX | Ground Water | 02/15/22 1400 | **IV** |

## Folder Comments:

Send DWELR confirmation to Middletown PM for PADEP samples.

# Service Request Summary

| | | | |
|---|---|---|---|
| **Folder #:** | **E2200141** | Project Chemist: | Corey Grandits |
| Client Name: | ALS Environmental - US | Originating Lab: | HOUSTON |
| Project Name: | HS22020822 | Logged By: | CGRANDITS |
| Project Number: | | Date Received: | 02/16/22 |
| | | Internal Due Date: | 3/2/2022 |
| **Report To:** | Ragen Giga<br>ALS Environmental - US<br>10450 Stancliff Rd Suite 210<br>Houston, TX 77099<br>USA | QAP: | LAB QAP |
| | | Qualifier Set: | Lab Standard |
| | | Formset: | Lab Standard |
| | | Merged?: | Y |
| Phone Number: | | Report to MDL?: | Y |
| Cell Number: | | P.O. Number: | HS22020822 |
| Fax Number: | | EDD: | No EDD Specified |
| E-mail: | ragenp.giga@alsglobal.com | | |

1 120 mL-Plastic Bottle Natural WM Unpreserved

**Location:** EHRMS-AirArch 1

**Pressure Gas:**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 1 | Level IV due 3/9 |

# 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 | (Auto) The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result. |
| 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. |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| 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. |
| P | Indicates chlorodiphenyl ether interference present at the retention time of the target compound. |
| P | Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns |
| Q | Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria. |
| R | Duplicate Precision not met. |
| R1 | Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated. |
| S | Surrogate recovery not within specified limits. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| T | Analyte is a tentatively identified compound, result is estimated. |
| U | Compound was analyzed for, but was not detected (ND). |
| V1 | The continuing calibration verification standard was outside (biased high) the specified limits for this compound. |
| V2 | The continuing calibration verification standard was outside (biased low) the specified limits for this compound. |
| W | Result quantified, but the corresponding peak was detected outside the generated retention time window. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| X | See case narrative. |
| Y | Recovery outside limits |
| Y | The chromatogram resembles a petroleum product but does not match the calibration standard. |
| Z | The chromatogram does not resemble a petroleum product. |
| i | The MRL/MDL has been elevated due to a matrix interference. |

# ALS Laboratory Group

## Acronyms

| | |
|---|---|
| Cal | Calibration |
| Conc | CONCentration |
| Dioxin(s) | Polychlorinated dibenzo-p-dioxin(s) |
| EDL | Estimated Detection Limit |
| EMPC | Estimated Maximum Possible Concentration |
| Flags | Data qualifiers |
| Furan(s) | Polychlorinated dibenzofuran(s) |
| g | Grams |
| ICAL | Initial CALibration |
| ID | IDentifier |
| Ions | Masses monitored for the analyte during data acquisition |
| L | Liter (s) |
| LCS | Laboratory Control Sample |
| DLCS | Duplicate Laboratory Control Sample |
| MB | Method Blank |
| MCL | Method Calibration Limit |
| MDL | Method Detection Limit |
| mL | Milliliters |
| MS | Matrix Spiked sample |
| DMS | Duplicate Matrix Spiked sample |
| NO | Number of peaks meeting all identification criteria |
| PCDD(s) | Polychlorinated dibenzo-p-dioxin(s) |
| PCDF(s) | Polychlorinated dibenzofuran(s) |
| ppb | Parts per billion |
| ppm | Parts per million |
| ppq | Parts per quadrillion |
| ppt | Parts per trillion |
| QA | Quality Assurance |
| QC | Quality Control |
| Ratio | Ratio of areas from monitored ions for an analyte |
| % Rec. | Percent recovery |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| RT | Retention Time |
| SDG | Sample Delivery Group |
| S/N | Signal-to-noise ratio |
| TEF | Toxicity Equivalence Factor |
| TEQ | Toxicity Equivalence Quotient |

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ALS Environmental

## State Certifications, Accreditations, and Licenses

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas Department of Environmental Quality | 19-028-0 | 6/30/2022 |
| Arkansas Department of Environmental Quality | 21-022-0 | 3/26/2022 |
| Florida Department of Health | E87611-33 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 5/1/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
**T:** +1 281 530 5656
**F:** +1 281 530 5887
**www.alsglobal.com**

# Subcontract Chain of Custody

**SAMPLING STATE:** **Colorado** **COC ID:** **18167**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

| | |
|---|---|
| **Company:** | ALS Houston |
| **Contact:** | Ragen Giga |
| **Address:** | 10450 Stancliff Rd, Ste 210 |
| **Phone:** | +1 281 530 5656 |
| **Email:** | RagenP.Giga@ALSGlobal.com |
| **Alternate Contact:** | 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:** | HS22020822 |
| **TSR:** | Sonia West |

| | LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | | | DUE DATE |
| **1.** | **HS22020822-02** | **LH18/24-SP650_021522_AIX** | **Water** | **15 Feb 2022 14:00** |
| | SUB_Perch-6850 | | | 02 Mar 2022 |

**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: Cuest K Date/Time: 2-16-22 1541

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

# Cooler Receipt Form

Project Chemist: CH

Client/Project: ALS-H

Thermometer ID: IR31

Date/Time Received: 2-16-22 Initials: CH

Date/Time Logged in: 2-16-22 Initials: CH

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL (X) Courier (ALS) ○ Client
2. Samples received in: (X) Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes (X) No
   Were they intact? ○ Yes ○ No (X) N/A
   Were they signed and dated? ○ Yes ○ No (X) N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts (X) Baggies ○ Bubble Wrap ○ Gel Packs (X) 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 | | 2-16-22 | 1501 | CH | 4.1/4.6 | (X) |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? (X) Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? (X) Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? (X) Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? (X) Yes ○ No
10. Did sample labels and tags agree with custody documents? (X) Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

ALS Environmental - Houston HRMS

10450 Stancliff Rd., Suite 210
Houston, TX 77099
**T:** +1 713 266 1599
**F:** +1 713 266 1599
**www.alsglobal.com**

# SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

**Cooler Custody Seals (desirable, mandatory if specified in SAP):**

- ✓ Intact on outside of cooler, signed and dated

**Chain-of-Custody (COC) documentation (mandatory):**

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

**Sample Integrity (mandatory):**

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

**Temperature Requirement (varies by sample matrix):**

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

# Preparation Information Benchsheets

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

# *Preparation Information Benchsheet*

**Prep Run#:** 395659 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 2/23/22 08:59

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2200140-001 | LH18/24-SP650_021522_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 2 | E2200141-001 | LH18/24-SP650_021522_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 3 | E2200142-001 | LH18/24-SP140_021522 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 4 | EQ2200066-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 5 | EQ2200066-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 6 | EQ2200066-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |

## Spiking Solutions

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 221408 Logbook Ref: Perchlorate Internal Standard Expires On: 04/30/2022

E2200140-001 100.00µL E2200141-001 100.00µL E2200142-001 100.00µL EQ2200066-01 100.00µL EQ2200066-02 100.00µL EQ2200066-03 100.00µL

Name: Perchlorate Intermediate Stock1 Inventory ID 221456 Logbook Ref: Perchlorate Expires On: 04/30/2022

EQ2200066-02 1.00µL EQ2200066-03 1.00µL

## Preparation Materials

| | | | | | |
|---|---|---|---|---|---|
| Water HPLC Grade | 08/03/2021 Water (218532) | 6850 Amber Glass screw vial | 2mL Screw Top Vial (221308) | 537M Glass Culture Tubes | 537M Glass Tubes (218064) |
| 6850 Luer-Lok Syringes | Luer-Lok Syringes (221305) | 6850 Pipette Tips 50-1000 uL | 6850 Pipette Tips (221307) | 6850 0.45um syringe filters | 6850 Syringe Filters (219639) |

## Preparation Steps

Step: Preparation
Started: 2/23/22 08:59
Finished: 2/23/22 09:30
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 2/23/22

Chain of Custody

Relinquished By: _____ Date: _____ Extracts Examined

Received By: _____ Date: _____ Yes No

# Analytical Results

**ALS Environmental - Houston HRMS**
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Phone (713)266-1599 Fax (713)266-0130
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**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200141 |
| **Project:** | HS22020822 | **Date Collected:** | 2/15/22 1400 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 2/16/22 |
| **Sample Name:** | LH18/24-SP650_021522_AIX | **Units:** | µg/L |
| **Lab Code:** | E2200141-001 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850
**Prep Method:** Method

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | ND | U | 0.100 | 0.0500 | 0.0250 | 1 | 2/23/22 | 2/23/22 15:46 | 395659 | 755514 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200141 |
| **Project:** | HS22020822 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2200066-01 | **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 | 2/23/22 | 2/23/22 14:58 | 395659 | 755514 | |

# 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:** | E2200141 |
| **Project:** | HS22020822 | **Date Analyzed:** | 2/23/22 |
| **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:** | 395659 |

| | Lab Control Sample EQ2200066-02 | | | Duplicate Lab Control Sample EQ2200066-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.105 | 0.100 | 105 | 0.102 | 0.100 | 102 | 84 - 119 | 4 | 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:** | E2200141 |
| **Project:** | HS22020822 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200066-02 | **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 | **0.105** | | 0.100 | 0.0500 | 0.0250 | 1 | 2/23/22 | 2/23/22 15:22 | 395659 | 755514 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200141 |
| **Project:** | HS22020822 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200066-03 | **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 | **0.102** | | 0.100 | 0.0500 | 0.0250 | 1 | 2/23/22 | 2/23/22 14:42 | 395659 | 755514 | |

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March 02, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22020823**

Laboratory Results for: **Groundwater Treatment Plant Quarterly Influent Samples**

Dear Marcia Olive,

ALS Environmental received 2 sample(s) on Feb 16, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: COREY.GRANDITS**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**Work Order:** HS22020823

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22020823-01 | LH18/24-SP140_021522 | Water | | 15-Feb-2022 14:00 | 16-Feb-2022 10:00 | ☐ |
| HS22020823-02 | Trip Blank | Water | CG-121321-570 | 15-Feb-2022 14:00 | 16-Feb-2022 10:00 | ☐ |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc. **CASE NARRATIVE**
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**Work Order:** HS22020823

## Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached

## GCMS Semivolatiles by Method SW8270SIM

### Batch ID: 175559

**Sample ID: LH18/24-SP140_021522 (HS22020823-01)**

- The surrogate recoveries could not be determined due to dilution below the calibration range.

## GCMS Volatiles by Method SW8260

### Batch ID: R403140

**Sample ID: HS22020796-04MS**

- MS and MSD are for an unrelated sample

### Batch ID: R403119

**Sample ID: HS22020796-07MS**

- MS and MSD are for an unrelated sample

## Metals by Method SW6020A

### Batch ID: 175865

**Sample ID: HS22020822-01MSD**

- MSD is for an unrelated sample

## Metals by Method SW7470A

### Batch ID: 175445

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method SW9056

### Batch ID: R403374

**Sample ID: LH18/24-SP140_021522 (HS22020823-01MS)**

- 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)

## WetChemistry by Method E1664A

### Batch ID: R403145

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**Work Order:** HS22020823

**CASE NARRATIVE**

## WetChemistry by Method E410.4

### Batch ID: R402778

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

**ALS Houston, US** Date: 02-Mar-22

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Groundwater Treatment Plant Quarterly Influent Samples WorkOrder:HS22020823
Sample ID: LH18/24-SP140_021522 Lab ID:HS22020823-01
Collection Date: 15-Feb-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: DLB |
| 1,1,1,2-Tetrachloroethane | 10 | U | 3.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| 1,1,1-Trichloroethane | 5.0 | U | 2.0 | 5.0 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| 1,1,2,2-Tetrachloroethane | 10 | U | 5.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| 1,1,2-Trichloroethane | 10 | U | 3.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| 1,1-Dichloroethane | 5.0 | U | 2.0 | 5.0 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| **1,1-Dichloroethene** | **24** | | **2.0** | **5.0** | **10** | **ug/L** | 10 | 25-Feb-2022 16:57 |
| 1,1-Dichloropropene | 10 | U | 3.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| 1,2,3-Trichlorobenzene | 10 | U | 4.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| 1,2,3-Trichloropropane | 10 | U | 5.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| 1,2,4-Trichlorobenzene | 10 | U | 5.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| 1,2,4-Trimethylbenzene | 10 | U | 3.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| 1,2-Dibromo-3-chloropropane | 10 | U | 2.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| 1,2-Dibromoethane | 5.0 | U | 2.0 | 5.0 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| 1,2-Dichlorobenzene | 10 | U | 5.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| **1,2-Dichloroethane** | **21** | | **2.0** | **5.0** | **10** | **ug/L** | 10 | 25-Feb-2022 16:57 |
| 1,2-Dichloropropane | 10 | U | 5.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| 1,3,5-Trimethylbenzene | 10 | U | 3.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| 1,3-Dichlorobenzene | 10 | U | 4.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| 1,3-Dichloropropane | 10 | U | 3.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| 1,4-Dichlorobenzene | 10 | U | 4.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| 2,2-Dichloropropane | 5.0 | U | 2.0 | 5.0 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| 2-Butanone | 10 | U | 5.0 | 10 | 20 | ug/L | 10 | 25-Feb-2022 16:57 |
| 2-Chlorotoluene | 10 | U | 3.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| 2-Hexanone | 20 | U | 10 | 20 | 20 | ug/L | 10 | 25-Feb-2022 16:57 |
| 4-Chlorotoluene | 10 | U | 4.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| 4-Isopropyltoluene | 10 | U | 3.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| 4-Methyl-2-pentanone | 20 | U | 7.0 | 20 | 20 | ug/L | 10 | 25-Feb-2022 16:57 |
| Acetone | 20 | U | 4.0 | 20 | 20 | ug/L | 10 | 25-Feb-2022 16:57 |
| Benzene | 5.0 | U | 2.0 | 5.0 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| Bromobenzene | 10 | U | 4.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| Bromochloromethane | 5.0 | U | 2.0 | 5.0 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| Bromodichloromethane | 5.0 | U | 2.0 | 5.0 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| Bromoform | 10 | U | 4.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| Bromomethane | 10 | U | 4.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| Carbon disulfide | 20 | U | 6.0 | 20 | 20 | ug/L | 10 | 25-Feb-2022 16:57 |
| **Carbon tetrachloride** | **12** | | **5.0** | **10** | **10** | **ug/L** | 10 | 25-Feb-2022 16:57 |
| Chlorobenzene | 10 | U | 3.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| Chloroethane | 10 | U | 3.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| Chloroform | 5.0 | U | 2.0 | 5.0 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |

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

**ALS Houston, US** Date: 02-Mar-22

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Groundwater Treatment Plant Quarterly Influent Samples WorkOrder:HS22020823
Sample ID: LH18/24-SP140_021522 Lab ID:HS22020823-01
Collection Date: 15-Feb-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: DLB |
| Chloromethane | 5.0 | U | 2.0 | 5.0 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| **cis-1,2-Dichloroethene** | **930** | | **2.0** | **5.0** | **10** | **ug/L** | 10 | 25-Feb-2022 16:57 |
| cis-1,3-Dichloropropene | 5.0 | U | 1.0 | 5.0 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| Dibromochloromethane | 10 | U | 3.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| Dibromomethane | 5.0 | U | 2.0 | 5.0 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| Dichlorodifluoromethane | 10 | U | 3.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| Ethylbenzene | 10 | U | 3.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| Hexachlorobutadiene | 10 | U | 10 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| Isopropylbenzene | 10 | U | 3.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| m,p-Xylene | 10 | U | 5.0 | 10 | 20 | ug/L | 10 | 25-Feb-2022 16:57 |
| **Methylene chloride** | **220** | | **4.0** | **20** | **20** | **ug/L** | 10 | 25-Feb-2022 16:57 |
| n-Butylbenzene | 10 | U | 4.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| n-Propylbenzene | 10 | U | 3.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| Naphthalene | 10 | U | 3.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| o-Xylene | 10 | U | 3.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| sec-Butylbenzene | 10 | U | 3.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| Styrene | 10 | U | 3.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| tert-Butylbenzene | 10 | U | 3.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| Tetrachloroethene | 10 | U | 3.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| Toluene | 5.0 | U | 2.0 | 5.0 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| trans-1,2-Dichloroethene | 5.0 | U | 2.0 | 5.0 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| trans-1,3-Dichloropropene | 5.0 | U | 2.0 | 5.0 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| **Trichloroethene** | **3,500** | | **20** | **50** | **100** | **ug/L** | 100 | 25-Feb-2022 17:19 |
| Trichlorofluoromethane | 10 | U | 3.0 | 10 | 10 | ug/L | 10 | 25-Feb-2022 16:57 |
| **Vinyl chloride** | **22** | | **2.0** | **5.0** | **10** | **ug/L** | 10 | 25-Feb-2022 16:57 |
| *Surr: 1,2-Dichloroethane-d4* | *98.4* | | | **0** | *81-118* | *%REC* | *10* | *25-Feb-2022 16:57* |
| *Surr: 1,2-Dichloroethane-d4* | *99.1* | | | **0** | *81-118* | *%REC* | *100* | *25-Feb-2022 17:19* |
| *Surr: 4-Bromofluorobenzene* | *101* | | | **0** | *85-114* | *%REC* | *10* | *25-Feb-2022 16:57* |
| *Surr: 4-Bromofluorobenzene* | *102* | | | **0** | *85-114* | *%REC* | *100* | *25-Feb-2022 17:19* |
| *Surr: Dibromofluoromethane* | *92.4* | | | **0** | *80-119* | *%REC* | *100* | *25-Feb-2022 17:19* |
| *Surr: Dibromofluoromethane* | *93.2* | | | **0** | *80-119* | *%REC* | *10* | *25-Feb-2022 16:57* |
| *Surr: Toluene-d8* | *106* | | | **0** | *89-112* | *%REC* | *100* | *25-Feb-2022 17:19* |
| *Surr: Toluene-d8* | *106* | | | **0** | *89-112* | *%REC* | *10* | *25-Feb-2022 16:57* |
| **SEMIVOLATILES SIM** | | **Method:SW8270SIM** | | | | Prep:SW3510 / 21-Feb-2022 | | Analyst: JLJ |
| **1,4-Dioxane** | **12** | | **0.50** | **0.50** | **0.50** | **ug/L** | 50 | 28-Feb-2022 15:48 |
| *Surr: 2-Fluorobiphenyl* | *0* | *S* | | 0 | *40-140* | *%REC* | *50* | *28-Feb-2022 15:48* |
| *Surr: 4-Terphenyl-d14* | *0* | *S* | | 0 | *40-140* | *%REC* | *50* | *28-Feb-2022 15:48* |
| *Surr: Nitrobenzene-d5* | *0* | *S* | | 0 | *40-140* | *%REC* | *50* | *28-Feb-2022 15:48* |

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

**ALS Houston, US** Date: 02-Mar-22

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
Sample ID: LH18/24-SP140_021522
Collection Date: 15-Feb-2022 14:00

**ANALYTICAL REPORT**
WorkOrder:HS22020823
Lab ID:HS22020823-01
Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **METALS BY ICPMS BY SW6020A** | | **Method:SW6020A** | | | | Prep:SW3010A / 01-Mar-2022 | | Analyst: JHD |
| **Aluminum** | **0.0720** | | **0.00180** | **0.00500** | **0.0100** | **mg/L** | 1 | 02-Mar-2022 13:03 |
| **Antimony** | **0.00109** | J | **0.000400** | **0.00100** | **0.00500** | **mg/L** | 1 | 02-Mar-2022 13:03 |
| **Arsenic** | **0.00131** | J | **0.000400** | **0.00100** | **0.00500** | **mg/L** | 1 | 02-Mar-2022 13:03 |
| **Barium** | **0.491** | | **0.00190** | **0.00250** | **0.00500** | **mg/L** | 1 | 02-Mar-2022 13:03 |
| Beryllium | 0.000500 | U | 0.000200 | 0.000500 | 0.00200 | mg/L | 1 | 02-Mar-2022 13:03 |
| Cadmium | 0.000500 | U | 0.000200 | 0.000500 | 0.00200 | mg/L | 1 | 02-Mar-2022 13:03 |
| **Calcium** | **33.2** | | **0.0340** | **0.0500** | **0.500** | **mg/L** | 1 | 02-Mar-2022 13:03 |
| **Chromium** | **0.00354** | J | **0.000400** | **0.00100** | **0.00500** | **mg/L** | 1 | 02-Mar-2022 13:03 |
| **Cobalt** | **0.00182** | J | **0.000100** | **0.000500** | **0.00500** | **mg/L** | 1 | 02-Mar-2022 13:03 |
| **Iron** | **0.260** | | **0.0120** | **0.0500** | **0.200** | **mg/L** | 1 | 02-Mar-2022 13:03 |
| **Lead** | **0.00101** | J | **0.000600** | **0.00100** | **0.00500** | **mg/L** | 1 | 02-Mar-2022 13:03 |
| **Magnesium** | **22.8** | | **0.0100** | **0.0500** | **0.200** | **mg/L** | 1 | 02-Mar-2022 13:03 |
| **Manganese** | **0.110** | | **0.000700** | **0.00250** | **0.00500** | **mg/L** | 1 | 02-Mar-2022 13:03 |
| **Nickel** | **0.00950** | | **0.000600** | **0.00100** | **0.00500** | **mg/L** | 1 | 02-Mar-2022 13:03 |
| **Potassium** | **1.35** | | **0.0180** | **0.0500** | **0.200** | **mg/L** | 1 | 02-Mar-2022 13:03 |
| Selenium | 0.00250 | U | 0.00110 | 0.00250 | 0.00500 | mg/L | 1 | 02-Mar-2022 13:03 |
| Silver | 0.000500 | U | 0.000200 | 0.000500 | 0.00500 | mg/L | 1 | 02-Mar-2022 13:03 |
| **Sodium** | **288** | | **0.700** | **2.50** | **10.0** | **mg/L** | 50 | 02-Mar-2022 14:49 |
| Thallium | 0.000500 | U | 0.000200 | 0.000500 | 0.00200 | mg/L | 1 | 02-Mar-2022 13:03 |
| **Vanadium** | **0.00208** | J | **0.000600** | **0.00100** | **0.00500** | **mg/L** | 1 | 02-Mar-2022 13:03 |
| **Zinc** | **0.0344** | | **0.00200** | **0.00250** | **0.00500** | **mg/L** | 1 | 02-Mar-2022 13:03 |
| **MERCURY BY SW7470A** | | **Method:SW7470A** | | | | Prep:SW7470A / 17-Feb-2022 | | Analyst: MSC |
| **Mercury** | **0.0000540** | J | **0.0000300** | **0.000100** | **0.000200** | **mg/L** | 1 | 17-Feb-2022 14:39 |
| **OIL & GREASE (HEM) BY E1664A** | | **Method:E1664A** | | | | | | Analyst: KAH |
| Oil and Grease | 1.00 | U | 0.610 | 1.00 | 2.00 | mg/L | 1 | 25-Feb-2022 13:50 |
| **CHEMICAL OXYGEN DEMAND BY E410.4, REV 2.0, 1993** | | **Method:E410.4** | | | | | | Analyst: TH |
| **Chemical Oxygen Demand** | **14.0** | J | **5.00** | **7.50** | **15.0** | **mg/L** | 1 | 22-Feb-2022 18:00 |
| **ANIONS BY SW9056A** | | **Method:SW9056** | | | | | | Analyst: YP |
| **Chloride** | **407** | | **4.00** | **10.0** | **10.0** | **mg/L** | 20 | 01-Mar-2022 17:53 |
| **Sulfate** | **40.3** | | **0.200** | **0.500** | **0.500** | **mg/L** | 1 | 01-Mar-2022 17:37 |
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 28-Feb-2022 11:20 |

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

**ALS Houston, US** Date: 02-Mar-22

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Groundwater Treatment Plant Quarterly Influent Samples WorkOrder:HS22020823
Sample ID: Trip Blank Lab ID:HS22020823-02
Collection Date: 15-Feb-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: DLB |
| 1,1,1,2-Tetrachloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 1,1,1-Trichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 1,1-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 1,1-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 1,1-Dichloropropene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 1,2,3-Trichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 1,2,3-Trichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 1,2,4-Trichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 1,2,4-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 1,2-Dibromo-3-chloropropane | 1.0 | U | 0.20 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 1,2-Dibromoethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 1,2-Dichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 1,2-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 1,2-Dichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 1,3,5-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 1,3-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 1,3-Dichloropropane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 1,4-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 2,2-Dichloropropane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 2-Butanone | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 2-Chlorotoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 2-Hexanone | 2.0 | U | 1.0 | 2.0 | 2.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 4-Chlorotoluene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 4-Isopropyltoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| 4-Methyl-2-pentanone | 2.0 | U | 0.70 | 2.0 | 2.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Acetone | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Benzene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Bromobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Bromochloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Bromodichloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Bromoform | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Bromomethane | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Carbon disulfide | 2.0 | U | 0.60 | 2.0 | 2.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Carbon tetrachloride | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Chlorobenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Chloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Chloroform | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |

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

**ALS Houston, US** Date: 02-Mar-22

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Groundwater Treatment Plant Quarterly Influent Samples WorkOrder:HS22020823
Sample ID: Trip Blank Lab ID:HS22020823-02
Collection Date: 15-Feb-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: DLB |
| Chloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| cis-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| cis-1,3-Dichloropropene | 0.50 | U | 0.10 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Dibromochloromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Dibromomethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Dichlorodifluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Ethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Hexachlorobutadiene | 1.0 | U | 1.0 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Isopropylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| m,p-Xylene | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Methylene chloride | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| n-Butylbenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| n-Propylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Naphthalene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| o-Xylene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| sec-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Styrene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| tert-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Tetrachloroethene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Toluene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| trans-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| trans-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Trichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Trichlorofluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| Vinyl chloride | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 25-Feb-2022 01:11 |
| *Surr: 1,2-Dichloroethane-d4* | *93.6* | | | **0** | *81-118* | *%REC* | *1* | *25-Feb-2022 01:11* |
| *Surr: 4-Bromofluorobenzene* | *101* | | | **0** | *85-114* | *%REC* | *1* | *25-Feb-2022 01:11* |
| *Surr: Dibromofluoromethane* | *91.2* | | | **0** | *80-119* | *%REC* | *1* | *25-Feb-2022 01:11* |
| *Surr: Toluene-d8* | *107* | | | **0** | *89-112* | *%REC* | *1* | *25-Feb-2022 01:11* |

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

## Weight / Prep Log

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**Batch ID:** 175445 **Start Date:** 17 Feb 2022 08:30 **End Date:** 17 Feb 2022 11:30
**Method:** MERCURY PREP BY 7470A- WATER **Prep Code:** HG_WPR

| Sample ID | Container | Sample Wt/Vol | Final Volume | Prep Factor | |
|---|---|---|---|---|---|
| HS22020823-01 | | 10 (mL) | 10 (mL) | 1 | 120 plastic HNO3 |

**Batch ID:** 175559 **Start Date:** 21 Feb 2022 06:30 **End Date:** 21 Feb 2022 11:30
**Method:** SV AQ SEP FUN EXTRACT-LOWLEV - 3510C **Prep Code:** 3510_B_SIM

| Sample ID | Container | Sample Wt/Vol | Final Volume | Prep Factor | |
|---|---|---|---|---|---|
| HS22020823-01 | 1 | 1000 (mL) | 1 (mL) | 0.001 | 1-liter amber glass, Neat |

**Batch ID:** 175865 **Start Date:** 01 Mar 2022 08:00 **End Date:** 01 Mar 2022 12:00
**Method:** WATER - SW3010A **Prep Code:** 3010A

| Sample ID | Container | Sample Wt/Vol | Final Volume | Prep Factor | |
|---|---|---|---|---|---|
| HS22020823-01 | | 10 (mL) | 10 (mL) | 1 | 120 plastic HNO3 |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** 175445 ( 0 ) | **Test Name :** | MERCURY BY SW7470A | | | **Matrix:** Water | |
| HS22020823-01 | LH18/24-SP140_021522 | 15 Feb 2022 14:00 | | 17 Feb 2022 08:30 | 17 Feb 2022 14:39 | 1 |
| **Batch ID:** 175559 ( 0 ) | **Test Name :** | SEMIVOLATILES SIM | | | **Matrix:** Water | |
| HS22020823-01 | LH18/24-SP140_021522 | 15 Feb 2022 14:00 | | 21 Feb 2022 08:46 | 28 Feb 2022 15:48 | 50 |
| **Batch ID:** 175865 ( 0 ) | **Test Name :** | METALS BY ICPMS BY SW6020A | | | **Matrix:** Water | |
| HS22020823-01 | LH18/24-SP140_021522 | 15 Feb 2022 14:00 | | 01 Mar 2022 12:00 | 02 Mar 2022 14:49 | 50 |
| HS22020823-01 | LH18/24-SP140_021522 | 15 Feb 2022 14:00 | | 01 Mar 2022 12:00 | 02 Mar 2022 13:03 | 1 |
| **Batch ID:** R402778 ( 0 ) | **Test Name :** | CHEMICAL OXYGEN DEMAND BY E410.4, REV 2.0, 1993 | | | **Matrix:** Water | |
| HS22020823-01 | LH18/24-SP140_021522 | 15 Feb 2022 14:00 | | | 22 Feb 2022 18:00 | 1 |
| **Batch ID:** R403119 ( 0 ) | **Test Name :** | VOLATILES ORGANICS BY METHOD 8260C | | | **Matrix:** Water | |
| HS22020823-02 | Trip Blank | 15 Feb 2022 14:00 | | | 25 Feb 2022 01:11 | 1 |
| **Batch ID:** R403140 ( 0 ) | **Test Name :** | VOLATILES ORGANICS BY METHOD 8260C | | | **Matrix:** Water | |
| HS22020823-01 | LH18/24-SP140_021522 | 15 Feb 2022 14:00 | | | 25 Feb 2022 17:19 | 100 |
| HS22020823-01 | LH18/24-SP140_021522 | 15 Feb 2022 14:00 | | | 25 Feb 2022 16:57 | 10 |
| **Batch ID:** R403145 ( 0 ) | **Test Name :** | OIL & GREASE (HEM) BY E1664A | | | **Matrix:** Water | |
| HS22020823-01 | LH18/24-SP140_021522 | 15 Feb 2022 14:00 | | | 25 Feb 2022 13:50 | 1 |
| **Batch ID:** R403161 ( 0 ) | **Test Name :** | SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) | | | **Matrix:** Water | |
| HS22020823-01 | LH18/24-SP140_021522 | 15 Feb 2022 14:00 | | | 28 Feb 2022 11:20 | 1 |
| **Batch ID:** R403374 ( 0 ) | **Test Name :** | ANIONS BY SW9056A | | | **Matrix:** Water | |
| HS22020823-01 | LH18/24-SP140_021522 | 15 Feb 2022 14:00 | | | 01 Mar 2022 17:53 | 20 |
| HS22020823-01 | LH18/24-SP140_021522 | 15 Feb 2022 14:00 | | | 01 Mar 2022 17:37 | 1 |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID: 175445 ( 0 )** **Instrument: HG03** **Method: MERCURY BY SW7470A**

**MBLK** Sample ID: **MBLK-175445** Units: **mg/L** Analysis Date: **17-Feb-2022 13:31**
Client ID: Run ID: **HG03_402462** SeqNo: **6507736** PrepDate: **17-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.000100 | 0.000200 | | | | | | | | U |

**LCS** Sample ID: **LCS-175445** Units: **mg/L** Analysis Date: **17-Feb-2022 13:33**
Client ID: Run ID: **HG03_402462** SeqNo: **6507737** PrepDate: **17-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.00438 | 0.000200 | 0.005 | 0 | 87.6 | 82 - 119 | | | | |

**MS** Sample ID: **HS22020676-07MS** Units: **mg/L** Analysis Date: **17-Feb-2022 13:36**
Client ID: Run ID: **HG03_402462** SeqNo: **6507739** PrepDate: **17-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.00501 | 0.000200 | 0.005 | -0.00002000 | 101 | 82 - 119 | | | | |

**MSD** Sample ID: **HS22020676-07MSD** Units: **mg/L** Analysis Date: **17-Feb-2022 13:40**
Client ID: Run ID: **HG03_402462** SeqNo: **6507740** PrepDate: **17-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.00483 | 0.000200 | 0.005 | -0.00002000 | 97.0 | 82 - 119 | 0.005010 | 3.66 | 20 | |

**The following samples were analyzed in this batch:** HS22020823-01

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID: 175865 ( 0 )** **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

**MBLK** Sample ID: **MBLK-175865** Units: **mg/L** Analysis Date: **02-Mar-2022 12:50**
Client ID: Run ID: **ICPMS06_403358** SeqNo: **6527699** PrepDate: **01-Mar-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 0.005767 | 0.0100 | | | | | | | | J |
| Antimony | 0.00100 | 0.00500 | | | | | | | | U |
| Arsenic | 0.00100 | 0.00500 | | | | | | | | U |
| Barium | 0.00250 | 0.00500 | | | | | | | | U |
| Beryllium | 0.000500 | 0.00200 | | | | | | | | U |
| Cadmium | 0.000500 | 0.00200 | | | | | | | | U |
| Calcium | 0.0500 | 0.500 | | | | | | | | U |
| Chromium | 0.00100 | 0.00500 | | | | | | | | U |
| Cobalt | 0.000500 | 0.00500 | | | | | | | | U |
| Iron | 0.0500 | 0.200 | | | | | | | | U |
| Lead | 0.00100 | 0.00500 | | | | | | | | U |
| Magnesium | 0.01142 | 0.200 | | | | | | | | J |
| Manganese | 0.00250 | 0.00500 | | | | | | | | U |
| Nickel | 0.000704 | 0.00500 | | | | | | | | J |
| Potassium | 0.0500 | 0.200 | | | | | | | | U |
| Selenium | 0.00250 | 0.00500 | | | | | | | | U |
| Silver | 0.000500 | 0.00500 | | | | | | | | U |
| Sodium | 0.0500 | 0.200 | | | | | | | | U |
| Thallium | 0.000500 | 0.00200 | | | | | | | | U |
| Vanadium | 0.00100 | 0.00500 | | | | | | | | U |
| Zinc | 0.00250 | 0.00500 | | | | | | | | U |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID: 175865 ( 0 )** **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

**LCS** Sample ID: **LCS-175865** Units: **mg/L** Analysis Date: **02-Mar-2022 12:52**
Client ID: Run ID: **ICPMS06_403358** SeqNo: **6527700** PrepDate: **01-Mar-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 0.1132 | 0.0100 | 0.1 | 0 | 113 | 84 - 117 | | | | |
| Antimony | 0.05053 | 0.00500 | 0.05 | 0 | 101 | 85 - 117 | | | | |
| Arsenic | 0.05357 | 0.00500 | 0.05 | 0 | 107 | 84 - 116 | | | | |
| Barium | 0.05314 | 0.00500 | 0.05 | 0 | 106 | 86 - 114 | | | | |
| Beryllium | 0.05136 | 0.00200 | 0.05 | 0 | 103 | 83 - 121 | | | | |
| Cadmium | 0.05454 | 0.00200 | 0.05 | 0 | 109 | 87 - 115 | | | | |
| Calcium | 5.223 | 0.500 | 5 | 0 | 104 | 87 - 118 | | | | |
| Chromium | 0.05338 | 0.00500 | 0.05 | 0 | 107 | 85 - 116 | | | | |
| Cobalt | 0.05377 | 0.00500 | 0.05 | 0 | 108 | 86 - 115 | | | | |
| Iron | 5.242 | 0.200 | 5 | 0 | 105 | 87 - 118 | | | | |
| Lead | 0.05264 | 0.00500 | 0.05 | 0 | 105 | 88 - 115 | | | | |
| Magnesium | 5.206 | 0.200 | 5 | 0 | 104 | 83 - 118 | | | | |
| Manganese | 0.0534 | 0.00500 | 0.05 | 0 | 107 | 87 - 115 | | | | |
| Nickel | 0.05434 | 0.00500 | 0.05 | 0 | 109 | 85 - 117 | | | | |
| Potassium | 5.227 | 0.200 | 5 | 0 | 105 | 87 - 115 | | | | |
| Selenium | 0.0557 | 0.00500 | 0.05 | 0 | 111 | 80 - 120 | | | | |
| Silver | 0.05256 | 0.00500 | 0.05 | 0 | 105 | 85 - 116 | | | | |
| Sodium | 5.292 | 0.200 | 5 | 0 | 106 | 85 - 117 | | | | |
| Thallium | 0.05376 | 0.00200 | 0.05 | 0 | 108 | 82 - 116 | | | | |
| Vanadium | 0.05295 | 0.00500 | 0.05 | 0 | 106 | 86 - 115 | | | | |
| Zinc | 0.05624 | 0.00500 | 0.05 | 0 | 112 | 83 - 119 | | | | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID: 175865 ( 0 )** **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

**MS** Sample ID: **HS22020822-01MS** Units: **mg/L** Analysis Date: **02-Mar-2022 12:58**
Client ID: Run ID: **ICPMS06_403358** SeqNo: **6527703** PrepDate: **01-Mar-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 0.1327 | 0.0100 | 0.1 | 0.02543 | 107 | 84 - 117 | | | | |
| Antimony | 0.05086 | 0.00500 | 0.05 | 0.000205 | 101 | 85 - 117 | | | | |
| Arsenic | 0.05606 | 0.00500 | 0.05 | 0.000415 | 111 | 84 - 116 | | | | |
| Barium | 1.108 | 0.00500 | 0.05 | 1.052 | 113 | 86 - 114 | | | | O |
| Beryllium | 0.05322 | 0.00200 | 0.05 | 0.000023 | 106 | 83 - 121 | | | | |
| Cadmium | 0.05398 | 0.00200 | 0.05 | 0.000031 | 108 | 87 - 115 | | | | |
| Calcium | 71.7 | 0.500 | 5 | 66.53 | 104 | 87 - 118 | | | | O |
| Chromium | 0.05568 | 0.00500 | 0.05 | 0.002058 | 107 | 85 - 116 | | | | |
| Cobalt | 0.05364 | 0.00500 | 0.05 | 0.000898 | 105 | 86 - 115 | | | | |
| Iron | 5.327 | 0.200 | 5 | 0.1587 | 103 | 87 - 118 | | | | |
| Lead | 0.05327 | 0.00500 | 0.05 | 0.000217 | 106 | 88 - 115 | | | | |
| Magnesium | 22.91 | 0.200 | 5 | 17.67 | 105 | 83 - 118 | | | | |
| Manganese | 0.22 | 0.00500 | 0.05 | 0.1645 | 111 | 87 - 115 | | | | |
| Nickel | 0.05625 | 0.00500 | 0.05 | 0.002543 | 107 | 85 - 117 | | | | |
| Potassium | 6.757 | 0.200 | 5 | 1.72 | 101 | 87 - 115 | | | | |
| Selenium | 0.05271 | 0.00500 | 0.05 | 0.000277 | 105 | 80 - 120 | | | | |
| Silver | 0.0511 | 0.00500 | 0.05 | 0.000013 | 102 | 85 - 116 | | | | |
| Sodium | 574.5 | 0.200 | 5 | 569.8 | 93.6 | 85 - 117 | | | | EO |
| Thallium | 0.05236 | 0.00200 | 0.05 | 0.000126 | 104 | 82 - 116 | | | | |
| Vanadium | 0.05635 | 0.00500 | 0.05 | 0.0009 | 111 | 86 - 115 | | | | |
| Zinc | 0.08036 | 0.00500 | 0.05 | 0.02569 | 109 | 83 - 119 | | | | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID: 175865 ( 0 )** **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

**MSD** Sample ID: **HS22020822-01MSD** Units: **mg/L** Analysis Date: **02-Mar-2022 13:00**
Client ID: Run ID: **ICPMS06_403358** SeqNo: **6527689** PrepDate: **01-Mar-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 0.1376 | 0.0100 | 0.1 | 0.02543 | 112 | 84 - 117 | 0.1327 | 3.65 | 20 | |
| Antimony | 0.05123 | 0.00500 | 0.05 | 0.000205 | 102 | 85 - 117 | 0.05086 | 0.717 | 20 | |
| Arsenic | 0.05616 | 0.00500 | 0.05 | 0.000415 | 111 | 84 - 116 | 0.05606 | 0.18 | 20 | |
| Barium | 1.116 | 0.00500 | 0.05 | 1.052 | 129 | 86 - 114 | 1.108 | 0.727 | 20 | SO |
| Beryllium | 0.0513 | 0.00200 | 0.05 | 0.000023 | 103 | 83 - 121 | 0.05322 | 3.69 | 20 | |
| Cadmium | 0.05357 | 0.00200 | 0.05 | 0.000031 | 107 | 87 - 115 | 0.05398 | 0.748 | 20 | |
| Calcium | 73.24 | 0.500 | 5 | 66.53 | 134 | 87 - 118 | 71.7 | 2.12 | 20 | SO |
| Chromium | 0.05647 | 0.00500 | 0.05 | 0.002058 | 109 | 85 - 116 | 0.05568 | 1.42 | 20 | |
| Cobalt | 0.05406 | 0.00500 | 0.05 | 0.000898 | 106 | 86 - 115 | 0.05364 | 0.776 | 20 | |
| Iron | 5.415 | 0.200 | 5 | 0.1587 | 105 | 87 - 118 | 5.327 | 1.63 | 20 | |
| Lead | 0.0527 | 0.00500 | 0.05 | 0.000217 | 105 | 88 - 115 | 0.05327 | 1.08 | 20 | |
| Magnesium | 23.88 | 0.200 | 5 | 17.67 | 124 | 83 - 118 | 22.91 | 4.14 | 20 | S |
| Manganese | 0.2229 | 0.00500 | 0.05 | 0.1645 | 117 | 87 - 115 | 0.22 | 1.3 | 20 | S |
| Nickel | 0.05657 | 0.00500 | 0.05 | 0.002543 | 108 | 85 - 117 | 0.05625 | 0.564 | 20 | |
| Potassium | 6.978 | 0.200 | 5 | 1.72 | 105 | 87 - 115 | 6.757 | 3.22 | 20 | |
| Selenium | 0.0526 | 0.00500 | 0.05 | 0.000277 | 105 | 80 - 120 | 0.05271 | 0.213 | 20 | |
| Silver | 0.04992 | 0.00500 | 0.05 | 0.000013 | 99.8 | 85 - 116 | 0.0511 | 2.34 | 20 | |
| Sodium | 594.4 | 0.200 | 5 | 569.8 | 492 | 85 - 117 | 574.5 | 3.41 | 20 | SEO |
| Thallium | 0.05109 | 0.00200 | 0.05 | 0.000126 | 102 | 82 - 116 | 0.05236 | 2.46 | 20 | |
| Vanadium | 0.05702 | 0.00500 | 0.05 | 0.0009 | 112 | 86 - 115 | 0.05635 | 1.18 | 20 | |
| Zinc | 0.08142 | 0.00500 | 0.05 | 0.02569 | 111 | 83 - 119 | 0.08036 | 1.31 | 20 | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID: 175865 ( 0 )** **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

**PDS** Sample ID: **HS22020822-01PDS** Units: **mg/L** Analysis Date: **02-Mar-2022 13:01**
Client ID: Run ID: **ICPMS06_403358** SeqNo: **6527690** PrepDate: **01-Mar-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 0.1393 | 0.0100 | 0.1 | 0.02543 | 114 | 80 - 120 | | | | |
| Antimony | 0.1004 | 0.00500 | 0.1 | 0.000205 | 100 | 80 - 120 | | | | |
| Arsenic | 0.1152 | 0.00500 | 0.1 | 0.000415 | 115 | 80 - 120 | | | | |
| Barium | 1.144 | 0.00500 | 0.1 | 1.052 | 92.9 | 80 - 120 | | | | O |
| Beryllium | 0.1046 | 0.00200 | 0.1 | 0.000023 | 105 | 80 - 120 | | | | |
| Cadmium | 0.1105 | 0.00200 | 0.1 | 0.000031 | 110 | 80 - 120 | | | | |
| Calcium | 77.5 | 0.500 | 10 | 66.53 | 110 | 80 - 120 | | | | O |
| Chromium | 0.1134 | 0.00500 | 0.1 | 0.002058 | 111 | 80 - 120 | | | | |
| Cobalt | 0.1103 | 0.00500 | 0.1 | 0.000898 | 109 | 80 - 120 | | | | |
| Iron | 10.8 | 0.200 | 10 | 0.1587 | 106 | 80 - 120 | | | | |
| Lead | 0.1097 | 0.00500 | 0.1 | 0.000217 | 109 | 80 - 120 | | | | |
| Magnesium | 28.5 | 0.200 | 10 | 17.67 | 108 | 80 - 120 | | | | |
| Manganese | 0.2842 | 0.00500 | 0.1 | 0.1645 | 120 | 80 - 120 | | | | |
| Nickel | 0.1131 | 0.00500 | 0.1 | 0.002543 | 111 | 80 - 120 | | | | |
| Potassium | 12.55 | 0.200 | 10 | 1.72 | 108 | 80 - 120 | | | | |
| Selenium | 0.1143 | 0.00500 | 0.1 | 0.000277 | 114 | 80 - 120 | | | | |
| Silver | 0.1058 | 0.00500 | 0.1 | 0.000013 | 106 | 80 - 120 | | | | |
| Thallium | 0.1098 | 0.00200 | 0.1 | 0.000126 | 110 | 80 - 120 | | | | |
| Vanadium | 0.1146 | 0.00500 | 0.1 | 0.0009 | 114 | 80 - 120 | | | | |
| Zinc | 0.1418 | 0.00500 | 0.1 | 0.02569 | 116 | 80 - 120 | | | | |

**PDS** Sample ID: **HS22020822-01PDS** Units: **mg/L** Analysis Date: **02-Mar-2022 14:47**
Client ID: Run ID: **ICPMS06_403358** SeqNo: **6527892** PrepDate: **01-Mar-2022** DF: **50**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Sodium | 1074 | 10.0 | 500 | 579 | 99.0 | 80 - 120 | | | | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID: 175865 ( 0 )** **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

**SD** Sample ID: **HS22020822-01SD** Units: **mg/L** Analysis Date: **02-Mar-2022 12:56**
Client ID: Run ID: **ICPMS06_403358** SeqNo: **6527702** PrepDate: **01-Mar-2022** DF: **5**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %D | %D Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 0.02711 | 0.0500 | | | | | 0.02543 | 0 | 10 | J |
| Antimony | 0.00500 | 0.0250 | | | | | 0.000205 | 0 | 10 | U |
| Arsenic | 0.00500 | 0.0250 | | | | | 0.000415 | 0 | 10 | U |
| Barium | 1.06 | 0.0250 | | | | | 1.052 | 0.75 | 10 | |
| Beryllium | 0.00250 | 0.0100 | | | | | 0.000023 | 0 | 10 | U |
| Cadmium | 0.00250 | 0.0100 | | | | | 0.000031 | 0 | 10 | U |
| Calcium | 66.35 | 2.50 | | | | | 66.53 | 0.27 | 10 | |
| Chromium | 0.002204 | 0.0250 | | | | | 0.002058 | 0 | 10 | J |
| Cobalt | 0.000922 | 0.0250 | | | | | 0.000898 | 0 | 10 | J |
| Iron | 0.1317 | 1.00 | | | | | 0.1587 | 0 | 10 | J |
| Lead | 0.00500 | 0.0250 | | | | | 0.000217 | 0 | 10 | U |
| Magnesium | 18.07 | 1.00 | | | | | 17.67 | 2.25 | 10 | |
| Manganese | 0.1694 | 0.0250 | | | | | 0.1645 | 2.98 | 10 | |
| Nickel | 0.00500 | 0.0250 | | | | | 0.002543 | 0 | 10 | U |
| Potassium | 1.673 | 1.00 | | | | | 1.72 | 2.72 | 10 | |
| Selenium | 0.0125 | 0.0250 | | | | | 0.000277 | 0 | 10 | U |
| Silver | 0.00250 | 0.0250 | | | | | 0.000013 | 0 | 10 | U |
| Thallium | 0.00250 | 0.0100 | | | | | 0.000126 | 0 | 10 | U |
| Vanadium | 0.005331 | 0.0250 | | | | | 0.0009 | 0 | 10 | J |
| Zinc | 0.0257 | 0.0250 | | | | | 0.02569 | 0.0428 | 10 | |

**SD** Sample ID: **HS22020822-01SD** Units: **mg/L** Analysis Date: **02-Mar-2022 14:45**
Client ID: Run ID: **ICPMS06_403358** SeqNo: **6527891** PrepDate: **01-Mar-2022** DF: **250**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %D | %D Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Sodium | 619.8 | 50.0 | | | | | 579 | 7.04 | 10 | |

**The following samples were analyzed in this batch:** HS22020823-01

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID: 175559 ( 0 )** **Instrument: SV-6** **Method: SEMIVOLATILES SIM**

**MBLK** Sample ID: **MBLK-175559** Units: **ug/L** Analysis Date: **28-Feb-2022 14:01**
Client ID: Run ID: **SV-6_403343** SeqNo: **6527380** PrepDate: **21-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,4-Dioxane | 0.010 | 0.010 | | | | | | | | U |
| *Surr: 2-Fluorobiphenyl* | *0.07178* | *0* | *0.08* | *0* | *89.7* | *40 - 140* | | | | |
| *Surr: 4-Terphenyl-d14* | *0.08194* | *0* | *0.08* | *0* | *102* | *40 - 140* | | | | |
| *Surr: Nitrobenzene-d5* | *0.06483* | *0* | *0.08* | *0* | *81.0* | *40 - 140* | | | | |

**LCS** Sample ID: **LCS-175559** Units: **ug/L** Analysis Date: **28-Feb-2022 14:19**
Client ID: Run ID: **SV-6_403343** SeqNo: **6527418** PrepDate: **21-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,4-Dioxane | 0.105 | 0.010 | 0.08 | 0 | 131 | 40 - 140 | | | | |
| *Surr: 2-Fluorobiphenyl* | *0.07433* | *0* | *0.08* | *0* | *92.9* | *40 - 140* | | | | |
| *Surr: 4-Terphenyl-d14* | *0.07104* | *0* | *0.08* | *0* | *88.8* | *40 - 140* | | | | |
| *Surr: Nitrobenzene-d5* | *0.06338* | *0* | *0.08* | *0* | *79.2* | *40 - 140* | | | | |

**LCSD** Sample ID: **LCSD-175559** Units: **ug/L** Analysis Date: **28-Feb-2022 14:37**
Client ID: Run ID: **SV-6_403343** SeqNo: **6527419** PrepDate: **21-Feb-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,4-Dioxane | 0.1057 | 0.010 | 0.08 | 0 | 132 | 40 - 140 | 0.105 | 0.673 | 20 | |
| *Surr: 2-Fluorobiphenyl* | *0.0787* | *0* | *0.08* | *0* | *98.4* | *40 - 140* | *0.07433* | *5.71* | *20* | |
| *Surr: 4-Terphenyl-d14* | *0.07008* | *0* | *0.08* | *0* | *87.6* | *40 - 140* | *0.07104* | *1.36* | *20* | |
| *Surr: Nitrobenzene-d5* | *0.06142* | *0* | *0.08* | *0* | *76.8* | *40 - 140* | *0.06338* | *3.14* | *20* | |

**The following samples were analyzed in this batch:** HS22020823-01

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID:** R403119 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220224** Units: **ug/L** Analysis Date: **25-Feb-2022 00:49**
Client ID: Run ID: **VOA9_403119** SeqNo: **6522649** PrepDate: DF: **1**

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

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID:** R403119 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220224** Units: **ug/L** Analysis Date: **25-Feb-2022 00:49**
Client ID: Run ID: **VOA9_403119** SeqNo: **6522649** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 2.0 | 2.0 | | | | | | | | U |
| Carbon tetrachloride | 1.0 | 1.0 | | | | | | | | U |
| Chlorobenzene | 1.0 | 1.0 | | | | | | | | U |
| Chloroethane | 1.0 | 1.0 | | | | | | | | U |
| Chloroform | 0.50 | 1.0 | | | | | | | | U |
| Chloromethane | 0.50 | 1.0 | | | | | | | | U |
| cis-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| cis-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Dibromochloromethane | 1.0 | 1.0 | | | | | | | | U |
| Dibromomethane | 0.50 | 1.0 | | | | | | | | U |
| Dichlorodifluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Ethylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Hexachlorobutadiene | 1.0 | 1.0 | | | | | | | | U |
| Isopropylbenzene | 1.0 | 1.0 | | | | | | | | U |
| m,p-Xylene | 1.0 | 2.0 | | | | | | | | U |
| Methylene chloride | 2.0 | 2.0 | | | | | | | | U |
| Naphthalene | 1.0 | 1.0 | | | | | | | | U |
| n-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| n-Propylbenzene | 1.0 | 1.0 | | | | | | | | U |
| o-Xylene | 1.0 | 1.0 | | | | | | | | U |
| sec-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Styrene | 1.0 | 1.0 | | | | | | | | U |
| tert-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Tetrachloroethene | 1.0 | 1.0 | | | | | | | | U |
| Toluene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Trichloroethene | 0.50 | 1.0 | | | | | | | | U |
| Trichlorofluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Vinyl chloride | 0.50 | 1.0 | | | | | | | | U |
| *Surr: 1,2-Dichloroethane-d4* | *47.21* | *1.0* | *50* | *0* | *94.4* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *50.37* | *1.0* | *50* | *0* | *101* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *45.07* | *1.0* | *50* | *0* | *90.1* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *53.26* | *1.0* | *50* | *0* | *107* | *89 - 112* | | | | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID:** R403119 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220224** Units: **ug/L** Analysis Date: **25-Feb-2022 00:05**
Client ID: Run ID: **VOA9_403119** SeqNo: **6522601** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 19.36 | 1.0 | 20 | 0 | 96.8 | 78 - 124 | | | | |
| 1,1,1-Trichloroethane | 19.9 | 1.0 | 20 | 0 | 99.5 | 74 - 131 | | | | |
| 1,1,2,2-Tetrachloroethane | 19.35 | 1.0 | 20 | 0 | 96.7 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 19.8 | 1.0 | 20 | 0 | 99.0 | 80 - 119 | | | | |
| 1,1-Dichloroethane | 20.33 | 1.0 | 20 | 0 | 102 | 77 - 125 | | | | |
| 1,1-Dichloroethene | 20.62 | 1.0 | 20 | 0 | 103 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 20.19 | 1.0 | 20 | 0 | 101 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 19.41 | 1.0 | 20 | 0 | 97.0 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 18.34 | 1.0 | 20 | 0 | 91.7 | 73 - 122 | | | | |
| 1,2,4-Trichlorobenzene | 18.52 | 1.0 | 20 | 0 | 92.6 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 19.57 | 1.0 | 20 | 0 | 97.9 | 76 - 124 | | | | |
| 1,2-Dibromo-3-chloropropane | 16.37 | 1.0 | 20 | 0 | 81.9 | 62 - 128 | | | | |
| 1,2-Dibromoethane | 19.9 | 1.0 | 20 | 0 | 99.5 | 77 - 121 | | | | |
| 1,2-Dichlorobenzene | 16.77 | 1.0 | 20 | 0 | 83.8 | 80 - 119 | | | | |
| 1,2-Dichloroethane | 21.55 | 1.0 | 20 | 0 | 108 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 19.9 | 1.0 | 20 | 0 | 99.5 | 78 - 122 | | | | |
| 1,3,5-Trimethylbenzene | 19.57 | 1.0 | 20 | 0 | 97.8 | 75 - 124 | | | | |
| 1,3-Dichlorobenzene | 19.19 | 1.0 | 20 | 0 | 95.9 | 80 - 119 | | | | |
| 1,3-Dichloropropane | 20.35 | 1.0 | 20 | 0 | 102 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 19.76 | 1.0 | 20 | 0 | 98.8 | 79 - 118 | | | | |
| 2,2-Dichloropropane | 18.45 | 1.0 | 20 | 0 | 92.3 | 60 - 139 | | | | |
| 2-Butanone | 39.93 | 2.0 | 40 | 0 | 99.8 | 56 - 143 | | | | |
| 2-Chlorotoluene | 19.97 | 1.0 | 20 | 0 | 99.9 | 79 - 122 | | | | |
| 2-Hexanone | 37.93 | 2.0 | 40 | 0 | 94.8 | 57 - 139 | | | | |
| 4-Chlorotoluene | 19.5 | 1.0 | 20 | 0 | 97.5 | 78 - 122 | | | | |
| 4-Isopropyltoluene | 18.93 | 1.0 | 20 | 0 | 94.7 | 77 - 127 | | | | |
| 4-Methyl-2-pentanone | 38.53 | 2.0 | 40 | 0 | 96.3 | 67 - 130 | | | | |
| Acetone | 41.37 | 2.0 | 40 | 0 | 103 | 39 - 160 | | | | |
| Benzene | 20.39 | 1.0 | 20 | 0 | 102 | 79 - 120 | | | | |
| Bromobenzene | 19.5 | 1.0 | 20 | 0 | 97.5 | 80 - 120 | | | | |
| Bromochloromethane | 21.35 | 1.0 | 20 | 0 | 107 | 78 - 123 | | | | |
| Bromodichloromethane | 19.41 | 1.0 | 20 | 0 | 97.0 | 79 - 125 | | | | |
| Bromoform | 17.59 | 1.0 | 20 | 0 | 87.9 | 66 - 130 | | | | |
| Bromomethane | 20.78 | 1.0 | 20 | 0 | 104 | 53 - 141 | | | | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID:** R403119 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220224** Units: **ug/L** Analysis Date: **25-Feb-2022 00:05**
Client ID: Run ID: **VOA9_403119** SeqNo: **6522601** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 39.99 | 2.0 | 40 | 0 | 100.0 | 64 - 133 | | | | |
| Carbon tetrachloride | 19.4 | 1.0 | 20 | 0 | 97.0 | 72 - 136 | | | | |
| Chlorobenzene | 19.98 | 1.0 | 20 | 0 | 99.9 | 82 - 118 | | | | |
| Chloroethane | 20.47 | 1.0 | 20 | 0 | 102 | 60 - 138 | | | | |
| Chloroform | 20.65 | 1.0 | 20 | 0 | 103 | 79 - 124 | | | | |
| Chloromethane | 21.18 | 1.0 | 20 | 0 | 106 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 20.19 | 1.0 | 20 | 0 | 101 | 78 - 123 | | | | |
| cis-1,3-Dichloropropene | 17.86 | 1.0 | 20 | 0 | 89.3 | 75 - 124 | | | | |
| Dibromochloromethane | 18.47 | 1.0 | 20 | 0 | 92.3 | 74 - 126 | | | | |
| Dibromomethane | 20.15 | 1.0 | 20 | 0 | 101 | 79 - 123 | | | | |
| Dichlorodifluoromethane | 20.64 | 1.0 | 20 | 0 | 103 | 32 - 152 | | | | |
| Ethylbenzene | 19.33 | 1.0 | 20 | 0 | 96.6 | 79 - 121 | | | | |
| Hexachlorobutadiene | 18.85 | 1.0 | 20 | 0 | 94.2 | 66 - 134 | | | | |
| Isopropylbenzene | 19.65 | 1.0 | 20 | 0 | 98.2 | 72 - 131 | | | | |
| m,p-Xylene | 39 | 2.0 | 40 | 0 | 97.5 | 80 - 121 | | | | |
| Methylene chloride | 20.07 | 2.0 | 20 | 0 | 100 | 74 - 124 | | | | |
| Naphthalene | 18.26 | 1.0 | 20 | 0 | 91.3 | 61 - 128 | | | | |
| n-Butylbenzene | 18.91 | 1.0 | 20 | 0 | 94.6 | 75 - 128 | | | | |
| n-Propylbenzene | 19.36 | 1.0 | 20 | 0 | 96.8 | 76 - 126 | | | | |
| o-Xylene | 19.92 | 1.0 | 20 | 0 | 99.6 | 78 - 122 | | | | |
| sec-Butylbenzene | 18.89 | 1.0 | 20 | 0 | 94.5 | 77 - 126 | | | | |
| Styrene | 19.79 | 1.0 | 20 | 0 | 98.9 | 78 - 123 | | | | |
| tert-Butylbenzene | 19.71 | 1.0 | 20 | 0 | 98.5 | 78 - 124 | | | | |
| Tetrachloroethene | 20.23 | 1.0 | 20 | 0 | 101 | 74 - 129 | | | | |
| Toluene | 20.41 | 1.0 | 20 | 0 | 102 | 80 - 121 | | | | |
| trans-1,2-Dichloroethene | 20.53 | 1.0 | 20 | 0 | 103 | 75 - 124 | | | | |
| trans-1,3-Dichloropropene | 18.05 | 1.0 | 20 | 0 | 90.2 | 73 - 127 | | | | |
| Trichloroethene | 20.68 | 1.0 | 20 | 0 | 103 | 79 - 123 | | | | |
| Trichlorofluoromethane | 20.57 | 1.0 | 20 | 0 | 103 | 65 - 141 | | | | |
| Vinyl chloride | 20.04 | 1.0 | 20 | 0 | 100 | 58 - 137 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *53.21* | *1.0* | *50* | *0* | *106* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *50.63* | *1.0* | *50* | *0* | *101* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *51.29* | *1.0* | *50* | *0* | *103* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *51.69* | *1.0* | *50* | *0* | *103* | *89 - 112* | | | | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID:** R403119 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS22020769-07MS** Units: **ug/L** Analysis Date: **25-Feb-2022 03:46**
Client ID: Run ID: **VOA9_403119** SeqNo: **6522610** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 15.08 | 1.0 | 20 | 0 | 75.4 | 78 - 124 | | | | S |
| 1,1,1-Trichloroethane | 14.36 | 1.0 | 20 | 0 | 71.8 | 74 - 131 | | | | S |
| 1,1,2,2-Tetrachloroethane | 15.05 | 1.0 | 20 | 0 | 75.3 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 15.75 | 1.0 | 20 | 0 | 78.7 | 80 - 119 | | | | S |
| 1,1-Dichloroethane | 14.49 | 1.0 | 20 | 0 | 72.5 | 77 - 125 | | | | S |
| 1,1-Dichloroethene | 14.38 | 1.0 | 20 | 0 | 71.9 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 16.06 | 1.0 | 20 | 0 | 80.3 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 13.8 | 1.0 | 20 | 0 | 69.0 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 14.16 | 1.0 | 20 | 0 | 70.8 | 73 - 122 | | | | S |
| 1,2,4-Trichlorobenzene | 13.83 | 1.0 | 20 | 0 | 69.1 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 14.5 | 1.0 | 20 | 0 | 72.5 | 76 - 124 | | | | S |
| 1,2-Dibromo-3-chloropropane | 11.99 | 1.0 | 20 | 0 | 60.0 | 62 - 128 | | | | S |
| 1,2-Dibromoethane | 15.38 | 1.0 | 20 | 0 | 76.9 | 77 - 121 | | | | S |
| 1,2-Dichlorobenzene | 13.16 | 1.0 | 20 | 0 | 65.8 | 80 - 119 | | | | S |
| 1,2-Dichloroethane | 16.54 | 1.0 | 20 | 0 | 82.7 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 15.23 | 1.0 | 20 | 0 | 76.2 | 78 - 122 | | | | S |
| 1,3,5-Trimethylbenzene | 14.95 | 1.0 | 20 | 0 | 74.8 | 75 - 124 | | | | S |
| 1,3-Dichlorobenzene | 15.13 | 1.0 | 20 | 0 | 75.6 | 80 - 119 | | | | S |
| 1,3-Dichloropropane | 16.01 | 1.0 | 20 | 0 | 80.1 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 15 | 1.0 | 20 | 0 | 75.0 | 79 - 118 | | | | S |
| 2,2-Dichloropropane | 11.75 | 1.0 | 20 | 0 | 58.7 | 60 - 139 | | | | S |
| 2-Butanone | 28.36 | 2.0 | 40 | 0 | 70.9 | 56 - 143 | | | | |
| 2-Chlorotoluene | 15.61 | 1.0 | 20 | 0 | 78.0 | 79 - 122 | | | | S |
| 2-Hexanone | 30.49 | 2.0 | 40 | 0 | 76.2 | 57 - 139 | | | | |
| 4-Chlorotoluene | 15.37 | 1.0 | 20 | 0 | 76.8 | 78 - 122 | | | | S |
| 4-Isopropyltoluene | 14.35 | 1.0 | 20 | 0 | 71.7 | 77 - 127 | | | | S |
| 4-Methyl-2-pentanone | 30.52 | 2.0 | 40 | 0 | 76.3 | 67 - 130 | | | | |
| Acetone | 28.69 | 2.0 | 40 | 0 | 71.7 | 39 - 160 | | | | |
| Benzene | 15.62 | 1.0 | 20 | 0 | 78.1 | 79 - 120 | | | | S |
| Bromobenzene | 15.15 | 1.0 | 20 | 0 | 75.8 | 80 - 120 | | | | S |
| Bromochloromethane | 14.09 | 1.0 | 20 | 0 | 70.4 | 78 - 123 | | | | S |
| Bromodichloromethane | 14.9 | 1.0 | 20 | 0 | 74.5 | 79 - 125 | | | | S |
| Bromoform | 14.2 | 1.0 | 20 | 0 | 71.0 | 66 - 130 | | | | |
| Bromomethane | 12.8 | 1.0 | 20 | 0 | 64.0 | 53 - 141 | | | | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID:** R403119 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS22020769-07MS** Units: **ug/L** Analysis Date: **25-Feb-2022 03:46**
Client ID: Run ID: **VOA9_403119** SeqNo: **6522610** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 25.66 | 2.0 | 40 | 0 | 64.1 | 64 - 133 | | | | |
| Carbon tetrachloride | 15.97 | 1.0 | 20 | 0 | 79.9 | 72 - 136 | | | | |
| Chlorobenzene | 15.77 | 1.0 | 20 | 0 | 78.8 | 82 - 118 | | | | S |
| Chloroethane | 13.94 | 1.0 | 20 | 0 | 69.7 | 60 - 138 | | | | |
| Chloroform | 14.74 | 1.0 | 20 | 0 | 73.7 | 79 - 124 | | | | S |
| Chloromethane | 10.95 | 1.0 | 20 | 0 | 54.8 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 14.52 | 1.0 | 20 | 0 | 72.6 | 78 - 123 | | | | S |
| cis-1,3-Dichloropropene | 13.21 | 1.0 | 20 | 0 | 66.1 | 75 - 124 | | | | S |
| Dibromochloromethane | 14.29 | 1.0 | 20 | 0 | 71.5 | 74 - 126 | | | | S |
| Dibromomethane | 15.62 | 1.0 | 20 | 0 | 78.1 | 79 - 123 | | | | S |
| Dichlorodifluoromethane | 6.727 | 1.0 | 20 | 0 | 33.6 | 32 - 152 | | | | |
| Ethylbenzene | 15.57 | 1.0 | 20 | 0 | 77.9 | 79 - 121 | | | | S |
| Hexachlorobutadiene | 13.88 | 1.0 | 20 | 0 | 69.4 | 66 - 134 | | | | |
| Isopropylbenzene | 15.79 | 1.0 | 20 | 0 | 79.0 | 72 - 131 | | | | |
| m,p-Xylene | 31.09 | 2.0 | 40 | 0 | 77.7 | 80 - 121 | | | | S |
| Methylene chloride | 13.37 | 2.0 | 20 | 0 | 66.8 | 74 - 124 | | | | S |
| Naphthalene | 13.94 | 1.0 | 20 | 0 | 69.7 | 61 - 128 | | | | |
| n-Butylbenzene | 14.1 | 1.0 | 20 | 0 | 70.5 | 75 - 128 | | | | S |
| n-Propylbenzene | 15.16 | 1.0 | 20 | 0 | 75.8 | 76 - 126 | | | | S |
| o-Xylene | 15.44 | 1.0 | 20 | 0 | 77.2 | 78 - 122 | | | | S |
| sec-Butylbenzene | 14.96 | 1.0 | 20 | 0 | 74.8 | 77 - 126 | | | | S |
| Styrene | 15.01 | 1.0 | 20 | 0 | 75.0 | 78 - 123 | | | | S |
| tert-Butylbenzene | 15.64 | 1.0 | 20 | 0 | 78.2 | 78 - 124 | | | | |
| Tetrachloroethene | 16.45 | 1.0 | 20 | 0 | 82.2 | 74 - 129 | | | | |
| Toluene | 16.42 | 1.0 | 20 | 0 | 82.1 | 80 - 121 | | | | |
| trans-1,2-Dichloroethene | 14.21 | 1.0 | 20 | 0 | 71.0 | 75 - 124 | | | | S |
| trans-1,3-Dichloropropene | 13.38 | 1.0 | 20 | 0 | 66.9 | 73 - 127 | | | | S |
| Trichloroethene | 15.76 | 1.0 | 20 | 0 | 78.8 | 79 - 123 | | | | S |
| Trichlorofluoromethane | 14.29 | 1.0 | 20 | 0 | 71.5 | 65 - 141 | | | | |
| Vinyl chloride | 11.38 | 1.0 | 20 | 0 | 56.9 | 58 - 137 | | | | S |
| *Surr: 1,2-Dichloroethane-d4* | *47.11* | *1.0* | *50* | *0* | *94.2* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *53.39* | *1.0* | *50* | *0* | *107* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *46.28* | *1.0* | *50* | *0* | *92.6* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *53.82* | *1.0* | *50* | *0* | *108* | *89 - 112* | | | | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID:** R403119 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS22020769-07MSD** Units: **ug/L** Analysis Date: **25-Feb-2022 04:08**
Client ID: Run ID: **VOA9_403119** SeqNo: **6522648** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 15.17 | 1.0 | 20 | 0 | 75.9 | 78 - 124 | 15.08 | 0.607 | 20 | S |
| 1,1,1-Trichloroethane | 14.59 | 1.0 | 20 | 0 | 73.0 | 74 - 131 | 14.36 | 1.59 | 20 | S |
| 1,1,2,2-Tetrachloroethane | 15.02 | 1.0 | 20 | 0 | 75.1 | 71 - 121 | 15.05 | 0.226 | 20 | |
| 1,1,2-Trichloroethane | 15.78 | 1.0 | 20 | 0 | 78.9 | 80 - 119 | 15.75 | 0.166 | 20 | S |
| 1,1-Dichloroethane | 14.6 | 1.0 | 20 | 0 | 73.0 | 77 - 125 | 14.49 | 0.756 | 20 | S |
| 1,1-Dichloroethene | 13.9 | 1.0 | 20 | 0 | 69.5 | 71 - 131 | 14.38 | 3.43 | 20 | S |
| 1,1-Dichloropropene | 15.95 | 1.0 | 20 | 0 | 79.7 | 78 - 125 | 16.06 | 0.726 | 20 | |
| 1,2,3-Trichlorobenzene | 14.64 | 1.0 | 20 | 0 | 73.2 | 69 - 129 | 13.8 | 5.92 | 20 | |
| 1,2,3-Trichloropropane | 14.37 | 1.0 | 20 | 0 | 71.9 | 73 - 122 | 14.16 | 1.48 | 20 | S |
| 1,2,4-Trichlorobenzene | 14.61 | 1.0 | 20 | 0 | 73.0 | 69 - 130 | 13.83 | 5.49 | 20 | |
| 1,2,4-Trimethylbenzene | 15.04 | 1.0 | 20 | 0 | 75.2 | 76 - 124 | 14.5 | 3.66 | 20 | S |
| 1,2-Dibromo-3-chloropropane | 13.32 | 1.0 | 20 | 0 | 66.6 | 62 - 128 | 11.99 | 10.4 | 20 | |
| 1,2-Dibromoethane | 15.69 | 1.0 | 20 | 0 | 78.4 | 77 - 121 | 15.38 | 2 | 20 | |
| 1,2-Dichlorobenzene | 13.29 | 1.0 | 20 | 0 | 66.4 | 80 - 119 | 13.16 | 0.945 | 20 | S |
| 1,2-Dichloroethane | 16.43 | 1.0 | 20 | 0 | 82.2 | 73 - 128 | 16.54 | 0.625 | 20 | |
| 1,2-Dichloropropane | 15.42 | 1.0 | 20 | 0 | 77.1 | 78 - 122 | 15.23 | 1.25 | 20 | S |
| 1,3,5-Trimethylbenzene | 15.15 | 1.0 | 20 | 0 | 75.8 | 75 - 124 | 14.95 | 1.34 | 20 | |
| 1,3-Dichlorobenzene | 14.97 | 1.0 | 20 | 0 | 74.8 | 80 - 119 | 15.13 | 1.04 | 20 | S |
| 1,3-Dichloropropane | 15.86 | 1.0 | 20 | 0 | 79.3 | 80 - 119 | 16.01 | 0.954 | 20 | S |
| 1,4-Dichlorobenzene | 14.84 | 1.0 | 20 | 0 | 74.2 | 79 - 118 | 15 | 1.08 | 20 | S |
| 2,2-Dichloropropane | 11.81 | 1.0 | 20 | 0 | 59.1 | 60 - 139 | 11.75 | 0.546 | 20 | S |
| 2-Butanone | 28.84 | 2.0 | 40 | 0 | 72.1 | 56 - 143 | 28.36 | 1.7 | 20 | |
| 2-Chlorotoluene | 15.3 | 1.0 | 20 | 0 | 76.5 | 79 - 122 | 15.61 | 1.98 | 20 | S |
| 2-Hexanone | 30.15 | 2.0 | 40 | 0 | 75.4 | 57 - 139 | 30.49 | 1.12 | 20 | |
| 4-Chlorotoluene | 15.52 | 1.0 | 20 | 0 | 77.6 | 78 - 122 | 15.37 | 1.01 | 20 | S |
| 4-Isopropyltoluene | 14.51 | 1.0 | 20 | 0 | 72.5 | 77 - 127 | 14.35 | 1.11 | 20 | S |
| 4-Methyl-2-pentanone | 30.52 | 2.0 | 40 | 0 | 76.3 | 67 - 130 | 30.52 | 0.0151 | 20 | |
| Acetone | 28.66 | 2.0 | 40 | 0 | 71.7 | 39 - 160 | 28.69 | 0.0864 | 20 | |
| Benzene | 15.42 | 1.0 | 20 | 0 | 77.1 | 79 - 120 | 15.62 | 1.3 | 20 | S |
| Bromobenzene | 14.94 | 1.0 | 20 | 0 | 74.7 | 80 - 120 | 15.15 | 1.38 | 20 | S |
| Bromochloromethane | 15.36 | 1.0 | 20 | 0 | 76.8 | 78 - 123 | 14.09 | 8.64 | 20 | S |
| Bromodichloromethane | 15.01 | 1.0 | 20 | 0 | 75.1 | 79 - 125 | 14.9 | 0.746 | 20 | S |
| Bromoform | 13.84 | 1.0 | 20 | 0 | 69.2 | 66 - 130 | 14.2 | 2.51 | 20 | |
| Bromomethane | 12.58 | 1.0 | 20 | 0 | 62.9 | 53 - 141 | 12.8 | 1.8 | 20 | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID:** R403119 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS22020769-07MSD** Units: **ug/L** Analysis Date: **25-Feb-2022 04:08**
Client ID: Run ID: **VOA9_403119** SeqNo: **6522648** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 25.64 | 2.0 | 40 | 0 | 64.1 | 64 - 133 | 25.66 | 0.0738 | 20 | |
| Carbon tetrachloride | 15.32 | 1.0 | 20 | 0 | 76.6 | 72 - 136 | 15.97 | 4.17 | 20 | |
| Chlorobenzene | 15.7 | 1.0 | 20 | 0 | 78.5 | 82 - 118 | 15.77 | 0.412 | 20 | S |
| Chloroethane | 13.68 | 1.0 | 20 | 0 | 68.4 | 60 - 138 | 13.94 | 1.88 | 20 | |
| Chloroform | 14.73 | 1.0 | 20 | 0 | 73.6 | 79 - 124 | 14.74 | 0.0653 | 20 | S |
| Chloromethane | 11 | 1.0 | 20 | 0 | 55.0 | 50 - 139 | 10.95 | 0.409 | 20 | |
| cis-1,2-Dichloroethene | 14.37 | 1.0 | 20 | 0 | 71.8 | 78 - 123 | 14.52 | 1.02 | 20 | S |
| cis-1,3-Dichloropropene | 12.97 | 1.0 | 20 | 0 | 64.9 | 75 - 124 | 13.21 | 1.81 | 20 | S |
| Dibromochloromethane | 14.7 | 1.0 | 20 | 0 | 73.5 | 74 - 126 | 14.29 | 2.84 | 20 | S |
| Dibromomethane | 15.5 | 1.0 | 20 | 0 | 77.5 | 79 - 123 | 15.62 | 0.787 | 20 | S |
| Dichlorodifluoromethane | 6.481 | 1.0 | 20 | 0 | 32.4 | 32 - 152 | 6.727 | 3.72 | 20 | |
| Ethylbenzene | 15.58 | 1.0 | 20 | 0 | 77.9 | 79 - 121 | 15.57 | 0.0587 | 20 | S |
| Hexachlorobutadiene | 14.34 | 1.0 | 20 | 0 | 71.7 | 66 - 134 | 13.88 | 3.31 | 20 | |
| Isopropylbenzene | 15.6 | 1.0 | 20 | 0 | 78.0 | 72 - 131 | 15.79 | 1.25 | 20 | |
| m,p-Xylene | 31.39 | 2.0 | 40 | 0 | 78.5 | 80 - 121 | 31.09 | 0.967 | 20 | S |
| Methylene chloride | 13.18 | 2.0 | 20 | 0 | 65.9 | 74 - 124 | 13.37 | 1.44 | 20 | S |
| Naphthalene | 14.41 | 1.0 | 20 | 0 | 72.0 | 61 - 128 | 13.94 | 3.29 | 20 | |
| n-Butylbenzene | 14.3 | 1.0 | 20 | 0 | 71.5 | 75 - 128 | 14.1 | 1.41 | 20 | S |
| n-Propylbenzene | 15.14 | 1.0 | 20 | 0 | 75.7 | 76 - 126 | 15.16 | 0.127 | 20 | S |
| o-Xylene | 15.38 | 1.0 | 20 | 0 | 76.9 | 78 - 122 | 15.44 | 0.354 | 20 | S |
| sec-Butylbenzene | 14.88 | 1.0 | 20 | 0 | 74.4 | 77 - 126 | 14.96 | 0.532 | 20 | S |
| Styrene | 15.09 | 1.0 | 20 | 0 | 75.4 | 78 - 123 | 15.01 | 0.534 | 20 | S |
| tert-Butylbenzene | 15.5 | 1.0 | 20 | 0 | 77.5 | 78 - 124 | 15.64 | 0.862 | 20 | S |
| Tetrachloroethene | 15.74 | 1.0 | 20 | 0 | 78.7 | 74 - 129 | 16.45 | 4.36 | 20 | |
| Toluene | 16.11 | 1.0 | 20 | 0 | 80.5 | 80 - 121 | 16.42 | 1.92 | 20 | |
| trans-1,2-Dichloroethene | 14.22 | 1.0 | 20 | 0 | 71.1 | 75 - 124 | 14.21 | 0.11 | 20 | S |
| trans-1,3-Dichloropropene | 13.31 | 1.0 | 20 | 0 | 66.6 | 73 - 127 | 13.38 | 0.475 | 20 | S |
| Trichloroethene | 15.82 | 1.0 | 20 | 0 | 79.1 | 79 - 123 | 15.76 | 0.347 | 20 | |
| Trichlorofluoromethane | 14.01 | 1.0 | 20 | 0 | 70.0 | 65 - 141 | 14.29 | 2.02 | 20 | |
| Vinyl chloride | 11.53 | 1.0 | 20 | 0 | 57.6 | 58 - 137 | 11.38 | 1.27 | 20 | S |
| *Surr: 1,2-Dichloroethane-d4* | *47.44* | *1.0* | *50* | *0* | *94.9* | *81 - 118* | *47.11* | *0.705* | *20* | |
| *Surr: 4-Bromofluorobenzene* | *52.77* | *1.0* | *50* | *0* | *106* | *85 - 114* | *53.39* | *1.17* | *20* | |
| *Surr: Dibromofluoromethane* | *46.49* | *1.0* | *50* | *0* | *93.0* | *80 - 119* | *46.28* | *0.443* | *20* | |
| *Surr: Toluene-d8* | *53.74* | *1.0* | *50* | *0* | *107* | *89 - 112* | *53.82* | *0.148* | *20* | |

**ALS Houston, US** Date: 02-Mar-22

| | | |
|---|---|---|
| **Client:** | Bhate Environmental Associates, Inc. | **QC BATCH REPORT** |
| **Project:** | Groundwater Treatment Plant Quarterly Influent Samples | |
| **WorkOrder:** | HS22020823 | |

| | | | | | |
|---|---|---|---|---|---|
| **Batch ID:** | **R403119 ( 0 )** | **Instrument:** | **VOA9** | **Method:** | **VOLATILES ORGANICS BY METHOD 8260C** |

**The following samples were analyzed in this batch:** HS22020823-02

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID:** R403140 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220225** Units: **ug/L** Analysis Date: **25-Feb-2022 15:28**
Client ID: Run ID: **VOA9_403140** SeqNo: **6523040** PrepDate: DF: **1**

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

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID:** R403140 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220225** Units: **ug/L** Analysis Date: **25-Feb-2022 15:28**
Client ID: Run ID: **VOA9_403140** SeqNo: **6523040** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 2.0 | 2.0 | | | | | | | | U |
| Carbon tetrachloride | 1.0 | 1.0 | | | | | | | | U |
| Chlorobenzene | 1.0 | 1.0 | | | | | | | | U |
| Chloroethane | 1.0 | 1.0 | | | | | | | | U |
| Chloroform | 0.50 | 1.0 | | | | | | | | U |
| Chloromethane | 0.50 | 1.0 | | | | | | | | U |
| cis-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| cis-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Dibromochloromethane | 1.0 | 1.0 | | | | | | | | U |
| Dibromomethane | 0.50 | 1.0 | | | | | | | | U |
| Dichlorodifluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Ethylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Hexachlorobutadiene | 1.0 | 1.0 | | | | | | | | U |
| Isopropylbenzene | 1.0 | 1.0 | | | | | | | | U |
| m,p-Xylene | 1.0 | 2.0 | | | | | | | | U |
| Methylene chloride | 2.0 | 2.0 | | | | | | | | U |
| Naphthalene | 1.0 | 1.0 | | | | | | | | U |
| n-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| n-Propylbenzene | 1.0 | 1.0 | | | | | | | | U |
| o-Xylene | 1.0 | 1.0 | | | | | | | | U |
| sec-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Styrene | 1.0 | 1.0 | | | | | | | | U |
| tert-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Tetrachloroethene | 1.0 | 1.0 | | | | | | | | U |
| Toluene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Trichloroethene | 0.50 | 1.0 | | | | | | | | U |
| Trichlorofluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Vinyl chloride | 0.50 | 1.0 | | | | | | | | U |
| *Surr: 1,2-Dichloroethane-d4* | *49.13* | *1.0* | *50* | *0* | *98.3* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *50.98* | *1.0* | *50* | *0* | *102* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *45.45* | *1.0* | *50* | *0* | *90.9* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *53.69* | *1.0* | *50* | *0* | *107* | *89 - 112* | | | | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID:** R403140 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220225** Units: **ug/L** Analysis Date: **25-Feb-2022 14:44**
Client ID: Run ID: **VOA9_403140** SeqNo: **6523039** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 18.52 | 1.0 | 20 | 0 | 92.6 | 78 - 124 | | | | |
| 1,1,1-Trichloroethane | 19.66 | 1.0 | 20 | 0 | 98.3 | 74 - 131 | | | | |
| 1,1,2,2-Tetrachloroethane | 18.39 | 1.0 | 20 | 0 | 91.9 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 18.76 | 1.0 | 20 | 0 | 93.8 | 80 - 119 | | | | |
| 1,1-Dichloroethane | 20.22 | 1.0 | 20 | 0 | 101 | 77 - 125 | | | | |
| 1,1-Dichloroethene | 20.02 | 1.0 | 20 | 0 | 100 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 19.24 | 1.0 | 20 | 0 | 96.2 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 17.99 | 1.0 | 20 | 0 | 89.9 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 17.21 | 1.0 | 20 | 0 | 86.1 | 73 - 122 | | | | |
| 1,2,4-Trichlorobenzene | 18.06 | 1.0 | 20 | 0 | 90.3 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 18.48 | 1.0 | 20 | 0 | 92.4 | 76 - 124 | | | | |
| 1,2-Dibromo-3-chloropropane | 15.26 | 1.0 | 20 | 0 | 76.3 | 62 - 128 | | | | |
| 1,2-Dibromoethane | 18.74 | 1.0 | 20 | 0 | 93.7 | 77 - 121 | | | | |
| 1,2-Dichlorobenzene | 16.16 | 1.0 | 20 | 0 | 80.8 | 80 - 119 | | | | |
| 1,2-Dichloroethane | 20.95 | 1.0 | 20 | 0 | 105 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 19.6 | 1.0 | 20 | 0 | 98.0 | 78 - 122 | | | | |
| 1,3,5-Trimethylbenzene | 18.37 | 1.0 | 20 | 0 | 91.8 | 75 - 124 | | | | |
| 1,3-Dichlorobenzene | 18.22 | 1.0 | 20 | 0 | 91.1 | 80 - 119 | | | | |
| 1,3-Dichloropropane | 19.06 | 1.0 | 20 | 0 | 95.3 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 18.47 | 1.0 | 20 | 0 | 92.3 | 79 - 118 | | | | |
| 2,2-Dichloropropane | 18.39 | 1.0 | 20 | 0 | 91.9 | 60 - 139 | | | | |
| 2-Butanone | 39.58 | 2.0 | 40 | 0 | 98.9 | 56 - 143 | | | | |
| 2-Chlorotoluene | 18.76 | 1.0 | 20 | 0 | 93.8 | 79 - 122 | | | | |
| 2-Hexanone | 35.94 | 2.0 | 40 | 0 | 89.8 | 57 - 139 | | | | |
| 4-Chlorotoluene | 18.62 | 1.0 | 20 | 0 | 93.1 | 78 - 122 | | | | |
| 4-Isopropyltoluene | 18.06 | 1.0 | 20 | 0 | 90.3 | 77 - 127 | | | | |
| 4-Methyl-2-pentanone | 36.91 | 2.0 | 40 | 0 | 92.3 | 67 - 130 | | | | |
| Acetone | 41.13 | 2.0 | 40 | 0 | 103 | 39 - 160 | | | | |
| Benzene | 19.22 | 1.0 | 20 | 0 | 96.1 | 79 - 120 | | | | |
| Bromobenzene | 18.36 | 1.0 | 20 | 0 | 91.8 | 80 - 120 | | | | |
| Bromochloromethane | 20.45 | 1.0 | 20 | 0 | 102 | 78 - 123 | | | | |
| Bromodichloromethane | 18.79 | 1.0 | 20 | 0 | 94.0 | 79 - 125 | | | | |
| Bromoform | 17.08 | 1.0 | 20 | 0 | 85.4 | 66 - 130 | | | | |
| Bromomethane | 20.52 | 1.0 | 20 | 0 | 103 | 53 - 141 | | | | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID:** R403140 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220225** Units: **ug/L** Analysis Date: **25-Feb-2022 14:44**
Client ID: Run ID: **VOA9_403140** SeqNo: **6523039** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 39.2 | 2.0 | 40 | 0 | 98.0 | 64 - 133 | | | | |
| Carbon tetrachloride | 19.1 | 1.0 | 20 | 0 | 95.5 | 72 - 136 | | | | |
| Chlorobenzene | 18.94 | 1.0 | 20 | 0 | 94.7 | 82 - 118 | | | | |
| Chloroethane | 19.44 | 1.0 | 20 | 0 | 97.2 | 60 - 138 | | | | |
| Chloroform | 20.38 | 1.0 | 20 | 0 | 102 | 79 - 124 | | | | |
| Chloromethane | 19.88 | 1.0 | 20 | 0 | 99.4 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 19.2 | 1.0 | 20 | 0 | 96.0 | 78 - 123 | | | | |
| cis-1,3-Dichloropropene | 17.47 | 1.0 | 20 | 0 | 87.3 | 75 - 124 | | | | |
| Dibromochloromethane | 17.61 | 1.0 | 20 | 0 | 88.1 | 74 - 126 | | | | |
| Dibromomethane | 19.47 | 1.0 | 20 | 0 | 97.3 | 79 - 123 | | | | |
| Dichlorodifluoromethane | 21.11 | 1.0 | 20 | 0 | 106 | 32 - 152 | | | | |
| Ethylbenzene | 18.5 | 1.0 | 20 | 0 | 92.5 | 79 - 121 | | | | |
| Hexachlorobutadiene | 18.13 | 1.0 | 20 | 0 | 90.6 | 66 - 134 | | | | |
| Isopropylbenzene | 18.61 | 1.0 | 20 | 0 | 93.1 | 72 - 131 | | | | |
| m,p-Xylene | 37.22 | 2.0 | 40 | 0 | 93.0 | 80 - 121 | | | | |
| Methylene chloride | 19.91 | 2.0 | 20 | 0 | 99.5 | 74 - 124 | | | | |
| Naphthalene | 17.02 | 1.0 | 20 | 0 | 85.1 | 61 - 128 | | | | |
| n-Butylbenzene | 18.31 | 1.0 | 20 | 0 | 91.5 | 75 - 128 | | | | |
| n-Propylbenzene | 18.09 | 1.0 | 20 | 0 | 90.4 | 76 - 126 | | | | |
| o-Xylene | 18.6 | 1.0 | 20 | 0 | 93.0 | 78 - 122 | | | | |
| sec-Butylbenzene | 18.24 | 1.0 | 20 | 0 | 91.2 | 77 - 126 | | | | |
| Styrene | 18.42 | 1.0 | 20 | 0 | 92.1 | 78 - 123 | | | | |
| tert-Butylbenzene | 18.42 | 1.0 | 20 | 0 | 92.1 | 78 - 124 | | | | |
| Tetrachloroethene | 18.93 | 1.0 | 20 | 0 | 94.6 | 74 - 129 | | | | |
| Toluene | 18.96 | 1.0 | 20 | 0 | 94.8 | 80 - 121 | | | | |
| trans-1,2-Dichloroethene | 19.97 | 1.0 | 20 | 0 | 99.9 | 75 - 124 | | | | |
| trans-1,3-Dichloropropene | 17.37 | 1.0 | 20 | 0 | 86.8 | 73 - 127 | | | | |
| Trichloroethene | 18.85 | 1.0 | 20 | 0 | 94.2 | 79 - 123 | | | | |
| Trichlorofluoromethane | 21.21 | 1.0 | 20 | 0 | 106 | 65 - 141 | | | | |
| Vinyl chloride | 19.26 | 1.0 | 20 | 0 | 96.3 | 58 - 137 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *53.88* | *1.0* | *50* | *0* | *108* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *49.13* | *1.0* | *50* | *0* | *98.3* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *50.42* | *1.0* | *50* | *0* | *101* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *48.4* | *1.0* | *50* | *0* | *96.8* | *89 - 112* | | | | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID:** R403140 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS22020796-04MS** Units: **ug/L** Analysis Date: **25-Feb-2022 18:48**
Client ID: Run ID: **VOA9_403140** SeqNo: **6523049** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 15.74 | 1.0 | 20 | 0 | 78.7 | 78 - 124 | | | | |
| 1,1,1-Trichloroethane | 15.37 | 1.0 | 20 | 0 | 76.8 | 74 - 131 | | | | |
| 1,1,2,2-Tetrachloroethane | 15.07 | 1.0 | 20 | 0 | 75.3 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 15.86 | 1.0 | 20 | 0 | 79.3 | 80 - 119 | | | | S |
| 1,1-Dichloroethane | 14.97 | 1.0 | 20 | 0 | 74.8 | 77 - 125 | | | | S |
| 1,1-Dichloroethene | 14.86 | 1.0 | 20 | 0 | 74.3 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 16.63 | 1.0 | 20 | 0 | 83.2 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 14.74 | 1.0 | 20 | 0 | 73.7 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 14.16 | 1.0 | 20 | 0 | 70.8 | 73 - 122 | | | | S |
| 1,2,4-Trichlorobenzene | 14.36 | 1.0 | 20 | 0 | 71.8 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 14.98 | 1.0 | 20 | 0 | 74.9 | 76 - 124 | | | | S |
| 1,2-Dibromo-3-chloropropane | 12.99 | 1.0 | 20 | 0 | 64.9 | 62 - 128 | | | | |
| 1,2-Dibromoethane | 15.56 | 1.0 | 20 | 0 | 77.8 | 77 - 121 | | | | |
| 1,2-Dichlorobenzene | 13.43 | 1.0 | 20 | 0 | 67.1 | 80 - 119 | | | | S |
| 1,2-Dichloroethane | 17.4 | 1.0 | 20 | 0 | 87.0 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 15.8 | 1.0 | 20 | 0 | 79.0 | 78 - 122 | | | | |
| 1,3,5-Trimethylbenzene | 15.55 | 1.0 | 20 | 0 | 77.8 | 75 - 124 | | | | |
| 1,3-Dichlorobenzene | 15.35 | 1.0 | 20 | 0 | 76.8 | 80 - 119 | | | | S |
| 1,3-Dichloropropane | 16.35 | 1.0 | 20 | 0 | 81.7 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 15.64 | 1.0 | 20 | 0 | 78.2 | 79 - 118 | | | | S |
| 2,2-Dichloropropane | 13.91 | 1.0 | 20 | 0 | 69.5 | 60 - 139 | | | | |
| 2-Butanone | 27.48 | 2.0 | 40 | 0 | 68.7 | 56 - 143 | | | | |
| 2-Chlorotoluene | 16.1 | 1.0 | 20 | 0 | 80.5 | 79 - 122 | | | | |
| 2-Hexanone | 28.64 | 2.0 | 40 | 0 | 71.6 | 57 - 139 | | | | |
| 4-Chlorotoluene | 16.07 | 1.0 | 20 | 0 | 80.4 | 78 - 122 | | | | |
| 4-Isopropyltoluene | 15.39 | 1.0 | 20 | 0 | 76.9 | 77 - 127 | | | | S |
| 4-Methyl-2-pentanone | 29.31 | 2.0 | 40 | 0 | 73.3 | 67 - 130 | | | | |
| Acetone | 27.15 | 2.0 | 40 | 0 | 67.9 | 39 - 160 | | | | |
| Benzene | 16.16 | 1.0 | 20 | 0 | 80.8 | 79 - 120 | | | | |
| Bromobenzene | 15.94 | 1.0 | 20 | 0 | 79.7 | 80 - 120 | | | | S |
| Bromochloromethane | 14.81 | 1.0 | 20 | 0 | 74.1 | 78 - 123 | | | | S |
| Bromodichloromethane | 16.1 | 1.0 | 20 | 0 | 80.5 | 79 - 125 | | | | |
| Bromoform | 14.22 | 1.0 | 20 | 0 | 71.1 | 66 - 130 | | | | |
| Bromomethane | 14.03 | 1.0 | 20 | 0 | 70.1 | 53 - 141 | | | | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID:** R403140 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS22020796-04MS** Units: **ug/L** Analysis Date: **25-Feb-2022 18:48**
Client ID: Run ID: **VOA9_403140** SeqNo: **6523049** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 27.13 | 2.0 | 40 | 0 | 67.8 | 64 - 133 | | | | |
| Carbon tetrachloride | 16.64 | 1.0 | 20 | 0 | 83.2 | 72 - 136 | | | | |
| Chlorobenzene | 16.31 | 1.0 | 20 | 0 | 81.5 | 82 - 118 | | | | S |
| Chloroethane | 19.24 | 1.0 | 20 | 0 | 96.2 | 60 - 138 | | | | |
| Chloroform | 15.61 | 1.0 | 20 | 0 | 78.0 | 79 - 124 | | | | S |
| Chloromethane | 11.69 | 1.0 | 20 | 0 | 58.4 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 16.83 | 1.0 | 20 | 0.9351 | 79.5 | 78 - 123 | | | | |
| cis-1,3-Dichloropropene | 13.68 | 1.0 | 20 | 0 | 68.4 | 75 - 124 | | | | S |
| Dibromochloromethane | 15.08 | 1.0 | 20 | 0 | 75.4 | 74 - 126 | | | | |
| Dibromomethane | 15.93 | 1.0 | 20 | 0 | 79.7 | 79 - 123 | | | | |
| Dichlorodifluoromethane | 6.791 | 1.0 | 20 | 0 | 34.0 | 32 - 152 | | | | |
| Ethylbenzene | 16.27 | 1.0 | 20 | 0 | 81.3 | 79 - 121 | | | | |
| Hexachlorobutadiene | 16.31 | 1.0 | 20 | 0 | 81.5 | 66 - 134 | | | | |
| Isopropylbenzene | 16.15 | 1.0 | 20 | 0 | 80.8 | 72 - 131 | | | | |
| m,p-Xylene | 32.7 | 2.0 | 40 | 0 | 81.7 | 80 - 121 | | | | |
| Methylene chloride | 13.98 | 2.0 | 20 | 0 | 69.9 | 74 - 124 | | | | S |
| Naphthalene | 13.7 | 1.0 | 20 | 0 | 68.5 | 61 - 128 | | | | |
| n-Butylbenzene | 15.28 | 1.0 | 20 | 0 | 76.4 | 75 - 128 | | | | |
| n-Propylbenzene | 16.04 | 1.0 | 20 | 0 | 80.2 | 76 - 126 | | | | |
| o-Xylene | 15.69 | 1.0 | 20 | 0 | 78.5 | 78 - 122 | | | | |
| sec-Butylbenzene | 15.86 | 1.0 | 20 | 0 | 79.3 | 77 - 126 | | | | |
| Styrene | 15.76 | 1.0 | 20 | 0 | 78.8 | 78 - 123 | | | | |
| tert-Butylbenzene | 16.02 | 1.0 | 20 | 0 | 80.1 | 78 - 124 | | | | |
| Tetrachloroethene | 21.38 | 1.0 | 20 | 1.908 | 97.4 | 74 - 129 | | | | |
| Toluene | 16.59 | 1.0 | 20 | 0 | 82.9 | 80 - 121 | | | | |
| trans-1,2-Dichloroethene | 14.81 | 1.0 | 20 | 0 | 74.0 | 75 - 124 | | | | S |
| trans-1,3-Dichloropropene | 14.01 | 1.0 | 20 | 0 | 70.1 | 73 - 127 | | | | S |
| Trichloroethene | 44.48 | 1.0 | 20 | 1.368 | 216 | 79 - 123 | | | | S |
| Trichlorofluoromethane | 15.11 | 1.0 | 20 | 0 | 75.5 | 65 - 141 | | | | |
| Vinyl chloride | 12.03 | 1.0 | 20 | 0 | 60.2 | 58 - 137 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *48.43* | *1.0* | *50* | *0* | *96.9* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *52.46* | *1.0* | *50* | *0* | *105* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *46.14* | *1.0* | *50* | *0* | *92.3* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *53.91* | *1.0* | *50* | *0* | *108* | *89 - 112* | | | | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID:** R403140 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS22020796-04MSD** Units: **ug/L** Analysis Date: **25-Feb-2022 19:10**
Client ID: Run ID: **VOA9_403140** SeqNo: **6523050** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 15.01 | 1.0 | 20 | 0 | 75.0 | 78 - 124 | 15.74 | 4.79 | 20 | S |
| 1,1,1-Trichloroethane | 14.91 | 1.0 | 20 | 0 | 74.6 | 74 - 131 | 15.37 | 3.01 | 20 | |
| 1,1,2,2-Tetrachloroethane | 15.08 | 1.0 | 20 | 0 | 75.4 | 71 - 121 | 15.07 | 0.0558 | 20 | |
| 1,1,2-Trichloroethane | 15.73 | 1.0 | 20 | 0 | 78.7 | 80 - 119 | 15.86 | 0.794 | 20 | S |
| 1,1-Dichloroethane | 14.66 | 1.0 | 20 | 0 | 73.3 | 77 - 125 | 14.97 | 2.06 | 20 | S |
| 1,1-Dichloroethene | 14.03 | 1.0 | 20 | 0 | 70.2 | 71 - 131 | 14.86 | 5.73 | 20 | S |
| 1,1-Dichloropropene | 15.81 | 1.0 | 20 | 0 | 79.0 | 78 - 125 | 16.63 | 5.08 | 20 | |
| 1,2,3-Trichlorobenzene | 15.23 | 1.0 | 20 | 0 | 76.2 | 69 - 129 | 14.74 | 3.29 | 20 | |
| 1,2,3-Trichloropropane | 14.3 | 1.0 | 20 | 0 | 71.5 | 73 - 122 | 14.16 | 0.964 | 20 | S |
| 1,2,4-Trichlorobenzene | 15.2 | 1.0 | 20 | 0 | 76.0 | 69 - 130 | 14.36 | 5.67 | 20 | |
| 1,2,4-Trimethylbenzene | 15.04 | 1.0 | 20 | 0 | 75.2 | 76 - 124 | 14.98 | 0.425 | 20 | S |
| 1,2-Dibromo-3-chloropropane | 13.49 | 1.0 | 20 | 0 | 67.4 | 62 - 128 | 12.99 | 3.79 | 20 | |
| 1,2-Dibromoethane | 15.54 | 1.0 | 20 | 0 | 77.7 | 77 - 121 | 15.56 | 0.0985 | 20 | |
| 1,2-Dichlorobenzene | 13.44 | 1.0 | 20 | 0 | 67.2 | 80 - 119 | 13.43 | 0.104 | 20 | S |
| 1,2-Dichloroethane | 17.11 | 1.0 | 20 | 0 | 85.6 | 73 - 128 | 17.4 | 1.64 | 20 | |
| 1,2-Dichloropropane | 15.46 | 1.0 | 20 | 0 | 77.3 | 78 - 122 | 15.8 | 2.14 | 20 | S |
| 1,3,5-Trimethylbenzene | 15.35 | 1.0 | 20 | 0 | 76.8 | 75 - 124 | 15.55 | 1.27 | 20 | |
| 1,3-Dichlorobenzene | 15.07 | 1.0 | 20 | 0 | 75.4 | 80 - 119 | 15.35 | 1.83 | 20 | S |
| 1,3-Dichloropropane | 15.95 | 1.0 | 20 | 0 | 79.8 | 80 - 119 | 16.35 | 2.45 | 20 | S |
| 1,4-Dichlorobenzene | 15.18 | 1.0 | 20 | 0 | 75.9 | 79 - 118 | 15.64 | 3 | 20 | S |
| 2,2-Dichloropropane | 13.31 | 1.0 | 20 | 0 | 66.6 | 60 - 139 | 13.91 | 4.37 | 20 | |
| 2-Butanone | 28.06 | 2.0 | 40 | 0 | 70.2 | 56 - 143 | 27.48 | 2.11 | 20 | |
| 2-Chlorotoluene | 15.83 | 1.0 | 20 | 0 | 79.1 | 79 - 122 | 16.1 | 1.72 | 20 | |
| 2-Hexanone | 30.05 | 2.0 | 40 | 0 | 75.1 | 57 - 139 | 28.64 | 4.81 | 20 | |
| 4-Chlorotoluene | 15.69 | 1.0 | 20 | 0 | 78.4 | 78 - 122 | 16.07 | 2.43 | 20 | |
| 4-Isopropyltoluene | 14.82 | 1.0 | 20 | 0 | 74.1 | 77 - 127 | 15.39 | 3.77 | 20 | S |
| 4-Methyl-2-pentanone | 30.61 | 2.0 | 40 | 0 | 76.5 | 67 - 130 | 29.31 | 4.33 | 20 | |
| Acetone | 26.97 | 2.0 | 40 | 0 | 67.4 | 39 - 160 | 27.15 | 0.651 | 20 | |
| Benzene | 15.48 | 1.0 | 20 | 0 | 77.4 | 79 - 120 | 16.16 | 4.28 | 20 | S |
| Bromobenzene | 15.45 | 1.0 | 20 | 0 | 77.2 | 80 - 120 | 15.94 | 3.13 | 20 | S |
| Bromochloromethane | 14.87 | 1.0 | 20 | 0 | 74.3 | 78 - 123 | 14.81 | 0.356 | 20 | S |
| Bromodichloromethane | 15.41 | 1.0 | 20 | 0 | 77.1 | 79 - 125 | 16.1 | 4.37 | 20 | S |
| Bromoform | 14.56 | 1.0 | 20 | 0 | 72.8 | 66 - 130 | 14.22 | 2.36 | 20 | |
| Bromomethane | 12.66 | 1.0 | 20 | 0 | 63.3 | 53 - 141 | 14.03 | 10.2 | 20 | |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID:** R403140 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS22020796-04MSD** Units: **ug/L** Analysis Date: **25-Feb-2022 19:10**
Client ID: Run ID: **VOA9_403140** SeqNo: **6523050** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 25.7 | 2.0 | 40 | 0 | 64.3 | 64 - 133 | 27.13 | 5.38 | 20 | |
| Carbon tetrachloride | 15.74 | 1.0 | 20 | 0 | 78.7 | 72 - 136 | 16.64 | 5.54 | 20 | |
| Chlorobenzene | 15.55 | 1.0 | 20 | 0 | 77.7 | 82 - 118 | 16.31 | 4.79 | 20 | S |
| Chloroethane | 14.61 | 1.0 | 20 | 0 | 73.0 | 60 - 138 | 19.24 | 27.4 | 20 | R |
| Chloroform | 14.84 | 1.0 | 20 | 0 | 74.2 | 79 - 124 | 15.61 | 5.05 | 20 | S |
| Chloromethane | 11.32 | 1.0 | 20 | 0 | 56.6 | 50 - 139 | 11.69 | 3.23 | 20 | |
| cis-1,2-Dichloroethene | 16.34 | 1.0 | 20 | 0.9351 | 77.0 | 78 - 123 | 16.83 | 2.95 | 20 | S |
| cis-1,3-Dichloropropene | 13.67 | 1.0 | 20 | 0 | 68.3 | 75 - 124 | 13.68 | 0.0792 | 20 | S |
| Dibromochloromethane | 14.85 | 1.0 | 20 | 0 | 74.2 | 74 - 126 | 15.08 | 1.54 | 20 | |
| Dibromomethane | 15.49 | 1.0 | 20 | 0 | 77.4 | 79 - 123 | 15.93 | 2.83 | 20 | S |
| Dichlorodifluoromethane | 6.753 | 1.0 | 20 | 0 | 33.8 | 32 - 152 | 6.791 | 0.565 | 20 | |
| Ethylbenzene | 15.44 | 1.0 | 20 | 0 | 77.2 | 79 - 121 | 16.27 | 5.22 | 20 | S |
| Hexachlorobutadiene | 16.22 | 1.0 | 20 | 0 | 81.1 | 66 - 134 | 16.31 | 0.539 | 20 | |
| Isopropylbenzene | 15.52 | 1.0 | 20 | 0 | 77.6 | 72 - 131 | 16.15 | 3.96 | 20 | |
| m,p-Xylene | 31.44 | 2.0 | 40 | 0 | 78.6 | 80 - 121 | 32.7 | 3.93 | 20 | S |
| Methylene chloride | 13.11 | 2.0 | 20 | 0 | 65.5 | 74 - 124 | 13.98 | 6.43 | 20 | S |
| Naphthalene | 14.55 | 1.0 | 20 | 0 | 72.7 | 61 - 128 | 13.7 | 6.02 | 20 | |
| n-Butylbenzene | 15.45 | 1.0 | 20 | 0 | 77.3 | 75 - 128 | 15.28 | 1.1 | 20 | |
| n-Propylbenzene | 15.51 | 1.0 | 20 | 0 | 77.5 | 76 - 126 | 16.04 | 3.39 | 20 | |
| o-Xylene | 15.48 | 1.0 | 20 | 0 | 77.4 | 78 - 122 | 15.69 | 1.38 | 20 | S |
| sec-Butylbenzene | 15.46 | 1.0 | 20 | 0 | 77.3 | 77 - 126 | 15.86 | 2.57 | 20 | |
| Styrene | 15.02 | 1.0 | 20 | 0 | 75.1 | 78 - 123 | 15.76 | 4.81 | 20 | S |
| tert-Butylbenzene | 15.8 | 1.0 | 20 | 0 | 79.0 | 78 - 124 | 16.02 | 1.39 | 20 | |
| Tetrachloroethene | 18.89 | 1.0 | 20 | 1.908 | 84.9 | 74 - 129 | 21.38 | 12.4 | 20 | |
| Toluene | 15.82 | 1.0 | 20 | 0 | 79.1 | 80 - 121 | 16.59 | 4.77 | 20 | S |
| trans-1,2-Dichloroethene | 14.16 | 1.0 | 20 | 0 | 70.8 | 75 - 124 | 14.81 | 4.46 | 20 | S |
| trans-1,3-Dichloropropene | 13.81 | 1.0 | 20 | 0 | 69.0 | 73 - 127 | 14.01 | 1.48 | 20 | S |
| Trichloroethene | 30.42 | 1.0 | 20 | 1.368 | 145 | 79 - 123 | 44.48 | 37.5 | 20 | SR |
| Trichlorofluoromethane | 13.77 | 1.0 | 20 | 0 | 68.9 | 65 - 141 | 15.11 | 9.27 | 20 | |
| Vinyl chloride | 11.3 | 1.0 | 20 | 0 | 56.5 | 58 - 137 | 12.03 | 6.28 | 20 | S |
| *Surr: 1,2-Dichloroethane-d4* | *48.81* | *1.0* | *50* | *0* | *97.6* | *81 - 118* | *48.43* | *0.782* | *20* | |
| *Surr: 4-Bromofluorobenzene* | *52.52* | *1.0* | *50* | *0* | *105* | *85 - 114* | *52.46* | *0.115* | *20* | |
| *Surr: Dibromofluoromethane* | *46.69* | *1.0* | *50* | *0* | *93.4* | *80 - 119* | *46.14* | *1.17* | *20* | |
| *Surr: Toluene-d8* | *53.41* | *1.0* | *50* | *0* | *107* | *89 - 112* | *53.91* | *0.923* | *20* | |

**ALS Houston, US** Date: 02-Mar-22

| | | |
|---|---|---|
| **Client:** | Bhate Environmental Associates, Inc. | **QC BATCH REPORT** |
| **Project:** | Groundwater Treatment Plant Quarterly Influent Samples | |
| **WorkOrder:** | HS22020823 | |

| | | | | | |
|---|---|---|---|---|---|
| **Batch ID:** | **R403140 ( 0 )** | **Instrument:** | **VOA9** | **Method:** | **VOLATILES ORGANICS BY METHOD 8260C** |

**The following samples were analyzed in this batch:** HS22020823-01

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID:** R402778 ( 0 ) **Instrument:** WetChem_HS **Method:** CHEMICAL OXYGEN DEMAND BY E410.4, REV 2.0, 1993

**MBLK** Sample ID: **MBLK-R402778** Units: **mg/L** Analysis Date: **22-Feb-2022 18:00**
Client ID: Run ID: **WetChem_HS_402778** SeqNo: **6514736** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | 7.50 | 15.0 | | | | | | | | U |

**LCS** Sample ID: **LCS-R402778** Units: **mg/L** Analysis Date: **22-Feb-2022 18:00**
Client ID: Run ID: **WetChem_HS_402778** SeqNo: **6514735** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | 99 | 15.0 | 100 | 0 | 99.0 | 85 - 115 | | | | |

**LCSD** Sample ID: **LCSD-R402778** Units: **mg/L** Analysis Date: **22-Feb-2022 18:00**
Client ID: Run ID: **WetChem_HS_402778** SeqNo: **6514734** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | 99 | 15.0 | 100 | 0 | 99.0 | 85 - 115 | 99 | 0 | 20 | |

**MS** Sample ID: **HS22020801-01MS** Units: **mg/L** Analysis Date: **22-Feb-2022 18:00**
Client ID: Run ID: **WetChem_HS_402778** SeqNo: **6514738** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | 80 | 15.0 | 50 | 31 | 98.0 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22020801-01MSD** Units: **mg/L** Analysis Date: **22-Feb-2022 18:00**
Client ID: Run ID: **WetChem_HS_402778** SeqNo: **6514737** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chemical Oxygen Demand | 79 | 15.0 | 50 | 31 | 96.0 | 80 - 120 | 80 | 1.26 | 20 | |

**The following samples were analyzed in this batch:** HS22020823-01

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID: R403145 ( 0 )** **Instrument: Balance1** **Method: OIL & GREASE (HEM) BY E1664A**

**MBLK** Sample ID: **WBLKW-022522** Units: **mg/L** Analysis Date: **25-Feb-2022 13:50**
Client ID: Run ID: **Balance1_403145** SeqNo: **6523128** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Oil and Grease | 1.00 | 2.00 | | | | | | | | U |

**LCS** Sample ID: **WLCSW-022522** Units: **mg/L** Analysis Date: **25-Feb-2022 13:50**
Client ID: Run ID: **Balance1_403145** SeqNo: **6523130** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Oil and Grease | 39.1 | 2.00 | 40 | 0 | 97.8 | 78 - 114 | | | | |

**LCSD** Sample ID: **WLCSDW-022522** Units: **mg/L** Analysis Date: **25-Feb-2022 13:50**
Client ID: Run ID: **Balance1_403145** SeqNo: **6523129** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Oil and Grease | 36.4 | 2.00 | 40 | 0 | 91.0 | 78 - 114 | 39.1 | 7.15 | 18 | |

**MS** Sample ID: **HS22021030-01MS** Units: **mg/L** Analysis Date: **25-Feb-2022 13:50**
Client ID: Run ID: **Balance1_403145** SeqNo: **6523115** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Oil and Grease | 38.1 | 2.00 | 40 | 1.22 | 92.2 | 78 - 114 | | | | |

**The following samples were analyzed in this batch:** HS22020823-01

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** HS22020823

**QC BATCH REPORT**

**Batch ID:** R403374 ( 0 ) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

**MBLK** Sample ID: **MBLK** Units: **mg/L** Analysis Date: **01-Mar-2022 18:46**
Client ID: Run ID: **ICS-Integrion_403374** SeqNo: **6528076** 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: **01-Mar-2022 18:52**
Client ID: Run ID: **ICS-Integrion_403374** SeqNo: **6528077** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 19.23 | 0.500 | 20 | 0 | 96.1 | 80 - 120 | | | | |
| Sulfate | 19.45 | 0.500 | 20 | 0 | 97.3 | 80 - 120 | | | | |

**MS** Sample ID: **HS22020823-01MS** Units: **mg/L** Analysis Date: **01-Mar-2022 17:43**
Client ID: **LH18/24-SP140_021522** Run ID: **ICS-Integrion_403374** SeqNo: **6528071** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 396.7 | 0.500 | 10 | 393.6 | 30.2 | 80 - 120 | | | | SEO |
| Sulfate | 49.8 | 0.500 | 10 | 40.3 | 95.0 | 80 - 120 | | | | O |

**MSD** Sample ID: **HS22020823-01MSD** Units: **mg/L** Analysis Date: **01-Mar-2022 17:48**
Client ID: **LH18/24-SP140_021522** Run ID: **ICS-Integrion_403374** SeqNo: **6528072** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 397.5 | 0.500 | 10 | 393.6 | 38.7 | 80 - 120 | 396.7 | 0.212 | 20 | SEO |
| Sulfate | 50.16 | 0.500 | 10 | 40.3 | 98.6 | 80 - 120 | 49.8 | 0.712 | 20 | O |

**The following samples were analyzed in this batch:** HS22020823-01

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Groundwater Treatment Plant Quarterly Influent Samples
**WorkOrder:** **HS22020823**

## QUALIFIERS, ACRONYMS, UNITS

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

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

| Unit Reported | Description |
|---|---|
| mg/L | Milligrams per Liter |

## CERTIFICATIONS,ACCREDITATIONS & LICENSES

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas | 21-022-0 | 26-Mar-2022 |
| Florida | E87611-34 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 02-Mar-22

## Sample Receipt Checklist

**Work Order ID:** HS22020823 **Date/Time Received:** **16-Feb-2022 10:00**

**Client Name:** Bhate Environmental **Received by:** **Paresh M. Giga**

**Completed By:** /S/ Paresh M. Giga (eSignature) 16-Feb-2022 16:06 (Date/Time) **Reviewed by:** /S/ Ragen Giga (eSignature) 17-Feb-2022 18:17 (Date/Time)

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

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

Temperature(s)/Thermometer(s): 0.2C/0.7C U/C IR31

Cooler(s)/Kit(s): 48337

Date/Time sample(s) sent to storage: 2/16/2022 16:15

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

pH adjusted by:

Login Notes: Trip Blank 1 x vial (2nd vial for Effluent)

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

# CHAIN OF CUSTODY

**HS22020823**

Bhate Environmental Associates, Inc.
Groundwater Treatment Plant Quarterly Influent Sample

Name Of Lab Shipping To: ALS 10450 Stancliff Rd., Suite 210 Houston, Tx. 77099 ATTN: RJ Modashia

**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:** GROUNDWATER TREATMENT PLANT QUARTERLY INFLUENT SAMPLES

**Prepared By:** Scott Beesinger

**P. O. Number**

Analysis

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | ROD Volatiles | Total Metals | Oil & Grease | Chemical Oxygen Demand | Chloride & Sulfate | 1, 4 - DIOXANE | Perchlorate | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP140_021522 | Water | 02/15/22 / 14:00 | | 4 | 3 | | 1 | | | | | | | | HCL | |
| LH18/24-SP140_021522 | Water | 02/15/22 / 14:00 | | 1 | | 1 | | | | | | | | | HNO3 | |
| LH18/24-SP140_021522 | Water | 02/15/22 / 14:00 | | 2 | | | | | 1 | 1 | | | | | NONE | |
| LH18/24-SP140_021522 | Water | 02/15/22 / 14:00 | | 1 | | | | 1 | | | | | | | H2SO4 | |
| LH18/24-SP140_021522 | Water | 02/15/22 / 14:00 | | 1 | | | | | | | 1 | | | | NONE | |
| Trip Blank | Water | 02/15/22 | | 2 | 2 | | | | | | | | | | HCL | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Additional Remarks: **STANDARD TURN AROUND TIME**

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 02/15/22 | 14:30 | [illegible] | 2/16/2022 | 10:00 | | | | | | |

**For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Remarks:

48337 0.2°
A31
CIF 0.5°

(Word) S:\1-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

48337

**CUSTODY SEAL**

Date: 2/15/22 Time: 1430
Name: Scott Beesinger
Company: BHATT

Seal Broken By: SMJ
Date: 02/16/22

48337 FEB 16 2022

Must Deliver Next Business Day
Time and Tempature Sensitive!

ALS

48337

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINGER
APTIM ENVIROMENTAL & INFASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 01NOV19
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 19x16x13 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP 37 - RJ

RMA:

FedEx Express

FedEx
TRK# 0221 1251 0291 2515

WED - 16 FEB 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

February 25, 2022

Service Request No:E2200142

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS22020823**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory February 16, 2022
For your reference, these analyses have been assigned our service request number **E2200142.**

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.:** | E2200142 |
| **Project:** | HS22020823 | **Date Received:** | 02/16/22 |
| **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 02/16/22.

The sample was received in good condition and is 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:**

EQ2200066: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS-DLCS recoveries met acceptance criteria.

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:**E2200142
**Project:** HS22020823

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2200142-001 | LH18/24-SP140_021522 | 2/15/2022 | 1400 |

# Service Request Summary

**Folder #:** **E2200142**
Client Name: ALS Environmental - US
Project Name: HS22020823
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 02/16/22
Internal Due Date: 3/2/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22020823
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON CIO4 DOD/6850 |
|---|---|---|---|---|
| E2200142-001 | LH18/24-SP140_021522 | Ground Water | 02/15/22 1400 | **IV** |

## Folder Comments:

Send DWELR confirmation to Middletown PM for PADEP samples.

# Service Request Summary

**Folder #:** **E2200142**
Client Name: ALS Environmental - US
Project Name: HS22020823
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 02/16/22
Internal Due Date: 3/2/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22020823
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 1 | Level IV due 3/9 |

# 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 | (Auto) The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result. |
| 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. |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| 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. |
| P | Indicates chlorodiphenyl ether interference present at the retention time of the target compound. |
| P | Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns |
| Q | Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria. |
| R | Duplicate Precision not met. |
| R1 | Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated. |
| S | Surrogate recovery not within specified limits. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| T | Analyte is a tentatively identified compound, result is estimated. |
| U | Compound was analyzed for, but was not detected (ND). |
| V1 | The continuing calibration verification standard was outside (biased high) the specified limits for this compound. |
| V2 | The continuing calibration verification standard was outside (biased low) the specified limits for this compound. |
| W | Result quantified, but the corresponding peak was detected outside the generated retention time window. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| X | See case narrative. |
| Y | Recovery outside limits |
| Y | The chromatogram resembles a petroleum product but does not match the calibration standard. |
| Z | The chromatogram does not resemble a petroleum product. |
| i | The MRL/MDL has been elevated due to a matrix interference. |

# ALS Laboratory Group

## Acronyms

| | |
|---|---|
| Cal | Calibration |
| Conc | CONCentration |
| Dioxin(s) | Polychlorinated dibenzo-p-dioxin(s) |
| EDL | Estimated Detection Limit |
| EMPC | Estimated Maximum Possible Concentration |
| Flags | Data qualifiers |
| Furan(s) | Polychlorinated dibenzofuran(s) |
| g | Grams |
| ICAL | Initial CALibration |
| ID | IDentifier |
| Ions | Masses monitored for the analyte during data acquisition |
| L | Liter (s) |
| LCS | Laboratory Control Sample |
| DLCS | Duplicate Laboratory Control Sample |
| MB | Method Blank |
| MCL | Method Calibration Limit |
| MDL | Method Detection Limit |
| mL | Milliliters |
| MS | Matrix Spiked sample |
| DMS | Duplicate Matrix Spiked sample |
| NO | Number of peaks meeting all identification criteria |
| PCDD(s) | Polychlorinated dibenzo-p-dioxin(s) |
| PCDF(s) | Polychlorinated dibenzofuran(s) |
| ppb | Parts per billion |
| ppm | Parts per million |
| ppq | Parts per quadrillion |
| ppt | Parts per trillion |
| QA | Quality Assurance |
| QC | Quality Control |
| Ratio | Ratio of areas from monitored ions for an analyte |
| % Rec. | Percent recovery |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| RT | Retention Time |
| SDG | Sample Delivery Group |
| S/N | Signal-to-noise ratio |
| TEF | Toxicity Equivalence Factor |
| TEQ | Toxicity Equivalence Quotient |

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ALS Environmental

## State Certifications, Accreditations, and Licenses

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas Department of Environmental Quality | 19-028-0 | 6/30/2022 |
| Arkansas Department of Environmental Quality | 21-022-0 | 3/26/2022 |
| Florida Department of Health | E87611-33 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 5/1/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
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Houston, TX 77099
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**F:** +1 281 530 5887
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# Subcontract Chain of Custody

**SAMPLING STATE:** **Colorado** **COC ID:** **18169**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

| | |
|---|---|
| **Company:** | ALS Houston |
| **Contact:** | Ragen Giga |
| **Address:** | 10450 Stancliff Rd, Ste 210 |
| **Phone:** | +1 281 530 5656 |
| **Email:** | RagenP.Giga@ALSGlobal.com |
| **Alternate Contact:** | 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:** | HS22020823 |
| **TSR:** | Sonia West |

| | LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | | | DUE DATE |
| **1.** | **HS22020823-01** | **LH18/24-SP140_021522** | **Water** | **15 Feb 2022 14:00** |
| | SUB_Perch-6850 | | | 02 Mar 2022 |

**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: ROBERT G Date/Time: 2-16-22 1561

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

# Cooler Receipt Form

Project Chemist: CH

Client/Project: ALS-H

Thermometer ID: IR31

Date/Time Received: 2-16-22 Initials: CH

Date/Time Logged in: 2-16-22 Initials: CH

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL (X) ALS Courier ○ Client
2. Samples received in: (X) Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes (X) No
   Were they intact? ○ Yes ○ No (X) N/A
   Were they signed and dated? ○ Yes ○ No (X) N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts (X) Baggies ○ Bubble Wrap ○ Gel Packs (X) 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 | | 2-16-22 | 1501 | CH | 4.1/4.6 | (X) |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? (X) Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? (X) Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? (X) Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? (X) Yes ○ No
10. Did sample labels and tags agree with custody documents? (X) Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

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# 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

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# *Preparation Information Benchsheet*

**Prep Run#:** 395659 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 2/23/22 08:59

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2200140-001 | LH18/24-SP650_021522_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 2 | E2200141-001 | LH18/24-SP650_021522_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 3 | E2200142-001 | LH18/24-SP140_021522 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 4 | EQ2200066-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 5 | EQ2200066-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 6 | EQ2200066-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |

## Spiking Solutions

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 221408 Logbook Ref: Perchlorate Internal Standard Expires On: 04/30/2022

E2200140-001 100.00µL E2200141-001 100.00µL E2200142-001 100.00µL EQ2200066-01 100.00µL EQ2200066-02 100.00µL EQ2200066-03 100.00µL

Name: Perchlorate Intermediate Stock1 Inventory ID 221456 Logbook Ref: Perchlorate Expires On: 04/30/2022

EQ2200066-02 1.00µL EQ2200066-03 1.00µL

## Preparation Materials

| | | | | | |
|---|---|---|---|---|---|
| Water HPLC Grade | 08/03/2021 Water (218532) | 6850 Amber Glass screw vial | 2mL Screw Top Vial (221308) | 537M Glass Culture Tubes | 537M Glass Tubes (218064) |
| 6850 Luer-Lok Syringes | Luer-Lok Syringes (221305) | 6850 Pipette Tips 50-1000 uL | 6850 Pipette Tips (221307) | 6850 0.45um syringe filters | 6850 Syringe Filters (219639) |

## Preparation Steps

Step: Preparation
Started: 2/23/22 08:59
Finished: 2/23/22 09:30
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 2/23/22

Chain of Custody

Relinquished By: _____ Date: _____ Extracts Examined

Received By: _____ Date: _____ Yes No

# Analytical Results

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**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200142 |
| **Project:** | HS22020823 | **Date Collected:** | 2/15/22 1400 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 2/16/22 |
| **Sample Name:** | LH18/24-SP140_021522 | **Units:** | µg/L |
| **Lab Code:** | E2200142-001 | **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 | **15300** | | 100 | 50.0 | 25.0 | 1000 | 2/23/22 | 2/23/22 16:57 | 395659 | 755514 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200142 |
| **Project:** | HS22020823 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2200066-01 | **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 | 2/23/22 | 2/23/22 14:58 | 395659 | 755514 | |

# Accuracy & Precision

**ALS Environmental - Houston HRMS**
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**ALS Group USA, Corp. dba ALS Environmental**

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200142 |
| **Project:** | HS22020823 | **Date Analyzed:** | 2/23/22 |
| **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:** | 395659 |

| | Lab Control Sample EQ2200066-02 | | | Duplicate Lab Control Sample EQ2200066-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.105 | 0.100 | 105 | 0.102 | 0.100 | 102 | 84 - 119 | 4 | 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:** | E2200142 |
| **Project:** | HS22020823 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200066-02 | **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 | **0.105** | | 0.100 | 0.0500 | 0.0250 | 1 | 2/23/22 | 2/23/22 15:22 | 395659 | 755514 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200142 |
| **Project:** | HS22020823 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200066-03 | **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 | **0.102** | | 0.100 | 0.0500 | 0.0250 | 1 | 2/23/22 | 2/23/22 14:42 | 395659 | 755514 | |

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March 02, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22021124**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia Olive,

ALS Environmental received 2 sample(s) on Feb 23, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: COREY.GRANDITS**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22021124

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22021124-01 | LH18/24-SP650_022222 | Water | | 22-Feb-2022 14:00 | 23-Feb-2022 10:00 | ☐ |
| HS22021124-02 | LH18/24-SP650_022222_AIX | Water | | 22-Feb-2022 14:00 | 23-Feb-2022 10:00 | ☐ |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22021124

**CASE NARRATIVE**

## Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached

## Subcontracted by Method NA

### Batch ID: R403232

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E350.3

### Batch ID: R403370

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E415.1

### Batch ID: R403023

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E365.3

### Batch ID: R402879

**Sample ID: LH18/24-SP650_022222 (HS22021124-01MS)**

- The recovery of the Matrix Spike (MS) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS may be due to sample matrix interference.

**Sample ID: LH18/24-SP650_022222 (HS22021124-01MSD)**

- The recovery of the Matrix Spike Duplicate (MSD) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The failed recovery of the MSD may be due to sample matrix interference.

**ALS Houston, US** Date: 02-Mar-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS22021124 |
| Sample ID: | LH18/24-SP650_022222 | Lab ID:HS22021124-01 |
| Collection Date: | 22-Feb-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **AMMONIA AS N BY E350.3(ISE)** | | **Method:E350.3** | | | | | | Analyst: MZD |
| **Nitrogen, Ammonia (As N)** | **13** | a | **0.10** | **0.20** | **0.20** | **mg/L** | 1 | 02-Mar-2022 14:15 |
| **ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978** | | **Method:E365.3** | | | | | | Analyst: MZD |
| **Phosphorus, Total Orthophosphate (As P)** | **21.5** | a | **0.500** | **1.25** | **1.25** | **mg/L** | 50 | 23-Feb-2022 15:48 |
| **TOTAL ORGANIC CARBON BY E415.1** | | **Method:E415.1** | | | | | | Analyst: JAC |
| **Organic Carbon, Total** | **36.1** | a | **0.500** | **1.00** | **1.00** | **mg/L** | 1 | 24-Feb-2022 18:51 |

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

**ALS Houston, US** Date: 02-Mar-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS22021124 |
| Sample ID: | LH18/24-SP650_022222_AIX | Lab ID:HS22021124-02 |
| Collection Date: | 22-Feb-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 28-Feb-2022 17:41 |

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

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22021124

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** R402879 ( 0 ) | **Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978 | | | | **Matrix:** Water | |
| HS22021124-01 | LH18/24-SP650_022222 | 22 Feb 2022 14:00 | | | 23 Feb 2022 15:48 | 50 |
| **Batch ID:** R403023 ( 0 ) | **Test Name :** TOTAL ORGANIC CARBON BY E415.1 | | | | **Matrix:** Water | |
| HS22021124-01 | LH18/24-SP650_022222 | 22 Feb 2022 14:00 | | | 24 Feb 2022 18:51 | 1 |
| **Batch ID:** R403232 ( 0 ) | **Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) | | | | **Matrix:** Water | |
| HS22021124-02 | LH18/24-SP650_022222_AIX | 22 Feb 2022 14:00 | | | 28 Feb 2022 17:41 | 1 |
| **Batch ID:** R403370 ( 0 ) | **Test Name :** AMMONIA AS N BY E350.3(ISE) | | | | **Matrix:** Water | |
| HS22021124-01 | LH18/24-SP650_022222 | 22 Feb 2022 14:00 | | | 02 Mar 2022 14:15 | 1 |

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22021124

**QC BATCH REPORT**

**Batch ID:** R402879 ( 0 ) **Instrument:** UV-2450 **Method:** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978

**MBLK** Sample ID: **MBLK-R402879** Units: **mg/L** Analysis Date: **23-Feb-2022 15:48**
Client ID: Run ID: **UV-2450_402879** SeqNo: **6517065** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.0250 | 0.0250 | | | | | | | | U |

**LCS** Sample ID: **LCS-R402879** Units: **mg/L** Analysis Date: **23-Feb-2022 15:48**
Client ID: Run ID: **UV-2450_402879** SeqNo: **6517064** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.224 | 0.0250 | 0.25 | 0 | 89.6 | 85 - 115 | | | | |

**MS** Sample ID: **HS22021124-01MS** Units: **mg/L** Analysis Date: **23-Feb-2022 15:48**
Client ID: Run ID: **UV-2450_402879** SeqNo: **6519586** PrepDate: DF: **50**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 33.65 | 1.25 | 12.5 | 0 | 269 | 80 - 120 | | | | S |

**MSD** Sample ID: **HS22021124-01MSD** Units: **mg/L** Analysis Date: **23-Feb-2022 15:48**
Client ID: Run ID: **UV-2450_402879** SeqNo: **6519585** PrepDate: DF: **50**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 33.6 | 1.25 | 12.5 | 0 | 269 | 80 - 120 | 33.65 | 0.149 | 20 | S |

**The following samples were analyzed in this batch:** HS22021124-01

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22021124

**QC BATCH REPORT**

**Batch ID: R403023 ( 0 )** **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON BY E415.1**

**MBLK** Sample ID: **MBLK-02242022** Units: **mg/L** Analysis Date: **24-Feb-2022 17:41**
Client ID: Run ID: **TOC_04_403023** SeqNo: **6520380** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 1.00 | 1.00 | | | | | | | | U |

**LCS** Sample ID: **LCS-02242022** Units: **mg/L** Analysis Date: **24-Feb-2022 17:55**
Client ID: Run ID: **TOC_04_403023** SeqNo: **6520381** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 9.486 | 1.00 | 10 | 0 | 94.9 | 85 - 115 | | | | |

**LCSD** Sample ID: **LCSD02242022** Units: **mg/L** Analysis Date: **24-Feb-2022 18:09**
Client ID: Run ID: **TOC_04_403023** SeqNo: **6520382** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 9.528 | 1.00 | 10 | 0 | 95.3 | 85 - 115 | 9.486 | 0.442 | 20 | |

**MS** Sample ID: **HS22021037-01MS** Units: **mg/L** Analysis Date: **24-Feb-2022 18:37**
Client ID: Run ID: **TOC_04_403023** SeqNo: **6520384** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 29.29 | 1.00 | 10 | 17.65 | 116 | 80 - 120 | | | | |

**The following samples were analyzed in this batch:** HS22021124-01

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22021124

**QC BATCH REPORT**

**Batch ID: R403370 ( 0 )** **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

**MBLK** Sample ID: **MBLK-R403370** Units: **mg/L** Analysis Date: **02-Mar-2022 14:15**
Client ID: Run ID: **WetChem_HS_403370** SeqNo: **6527953** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 0.20 | 0.20 | | | | | | | | U |

**LCS** Sample ID: **LCS-R403370** Units: **mg/L** Analysis Date: **02-Mar-2022 14:15**
Client ID: Run ID: **WetChem_HS_403370** SeqNo: **6527952** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 9.35 | 0.20 | 10 | 0 | 93.5 | 80 - 120 | | | | |

**MS** Sample ID: **HS22021256-01MS** Units: **mg/L** Analysis Date: **02-Mar-2022 14:15**
Client ID: Run ID: **WetChem_HS_403370** SeqNo: **6527956** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 17.1 | 0.20 | 10 | 7.383 | 97.2 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22021256-01MSD** Units: **mg/L** Analysis Date: **02-Mar-2022 14:15**
Client ID: Run ID: **WetChem_HS_403370** SeqNo: **6527955** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 17.09 | 0.20 | 10 | 7.383 | 97.1 | 80 - 120 | 17.1 | 0.0409 | 20 | |

**The following samples were analyzed in this batch:** HS22021124-01

**ALS Houston, US** Date: 02-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** **HS22021124**

## 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: 02-Mar-22

## CERTIFICATIONS,ACCREDITATIONS & LICENSES

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas | 21-022-0 | 26-Mar-2022 |
| Florida | E87611-34 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 02-Mar-22

## Sample Receipt Checklist

**Work Order ID:** HS22021124 **Date/Time Received:** **23-Feb-2022 10:00**

**Client Name:** Bhate Environmental **Received by:** **Paresh M. Giga**

**Completed By:** /S/ Paresh M. Giga (eSignature) 23-Feb-2022 11:19 (Date/Time) **Reviewed by:** /S/ Ragen Giga (eSignature) 23-Feb-2022 14:41 (Date/Time)

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

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

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 0.8C/1.3C U/C | IR31 |
| Cooler(s)/Kit(s): | 47942 | |
| Date/Time sample(s) sent to storage: | 2/23/2022 11:30 | |

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



**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:** GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

**Prepared By:** Scott Beesinger

**P.O. Number**

**HS22021124**

Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Weekly Samples

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | AMMONIA-N | TOTAL ORGANIC CARBON | ORTHO-PHOSPHATE | PERCHLORATE | | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_022222 | Water | 02/22/22 / 14:00 | | 3 | X | X | | | | | | | | | H2SO4 | |
| LH18/24-SP650_022222 | Water | 02/22/22 / 14:00 | | 1 | | | X | | | | | | | | NONE | |
| LH18/24–SP650_022222_AIX | Water | 02/22/22 / 14:00 | | 1 | | | | X | | | | | | | NONE | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Analyses

Additional Remarks: **Standard TAT on all parameters**

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 02/22/22 | 14:30 | [illegible] | 2/23/2022 | 10:00 | | | | | | |

**For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| | 4/C | | | | | | | | |

Remarks: 47942 0.8° #31 cir 0.3°

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

47942

C
Date: 2/22/
Name:
Company:

USTODY SEAL
22 Time: 1430
Seal Broken
Date: 2/23

FedEx
TRK# 0221 9473 0845 1379
WED – 23 FEB 10:30A
PRIORITY OVERNIGHT
AB SGRA 47942
77099
TX-US IAH
BILL #1 15237-435-DDB3
EXP 01/23

February 28, 2022

Service Request No:E2200155

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS22021124**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory February 23, 2022
For your reference, these analyses have been assigned our service request number **E2200155.**

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.:** | E2200155 |
| **Project:** | HS22021124 | **Date Received:** | 02/23/22 |
| **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 02/23/22.

The sample was received in good condition and is 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:**

EQ2200071: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS-DLCS recoveries met acceptance criteria.

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:**E2200155
**Project:** HS22021124

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2200155-001 | LH18/24-SP650_022222_AIX | 2/22/2022 | 1400 |

# Service Request Summary

**Folder #:** **E2200155**
Client Name: ALS Environmental - US
Project Name: HS22021124
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 02/23/22
Internal Due Date: 3/9/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22021124
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON CIO4 DOD/6850 |
|---|---|---|---|---|
| E2200155-001 | LH18/24-SP650_022222_AIX | Ground Water | 02/22/22 1400 | **IV** |

# Service Request Summary

| | | | |
|---|---|---|---|
| **Folder #:** | **E2200155** | Project Chemist: | Corey Grandits |
| Client Name: | ALS Environmental - US | Originating Lab: | HOUSTON |
| Project Name: | HS22021124 | Logged By: | CGRANDITS |
| Project Number: | | Date Received: | 02/23/22 |
| | | Internal Due Date: | 3/9/2022 |
| **Report To:** | Ragen Giga<br>ALS Environmental - US<br>10450 Stancliff Rd Suite 210<br>Houston, TX 77099<br>USA | QAP: | LAB QAP |
| | | Qualifier Set: | Lab Standard |
| | | Formset: | Lab Standard |
| | | Merged?: | Y |
| Phone Number: | | Report to MDL?: | Y |
| Cell Number: | | P.O. Number: | HS22021124 |
| Fax Number: | | EDD: | No EDD Specified |
| E-mail: | ragenp.giga@alsglobal.com | | |

1 120 mL-Plastic Bottle Natural WM Unpreserved

**Location:** EHRMS-AirArch 1

**Pressure Gas:**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 1 | Level IV due 3/16 |

# 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 | (Auto) The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result. |
| 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. |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| 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. |
| 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 |
|---|---|---|
| Arkansas Department of Environmental Quality | 19-028-0 | 6/30/2022 |
| Arkansas Department of Environmental Quality | 21-022-0 | 3/26/2022 |
| Florida Department of Health | E87611-33 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 5/1/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
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# Subcontract Chain of Custody

**SAMPLING STATE:** **Dept of Defense** **COC ID: 18195**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

| | |
|---|---|
| **Company:** | ALS Houston |
| **Contact:** | Ragen Giga |
| **Address:** | 10450 Stancliff Rd, Ste 210 |
| **Phone:** | +1 281 530 5656 |
| **Email:** | RagenP.Giga@ALSGlobal.com |
| **Alternate Contact:** | 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:** | HS22021124 |
| **TSR:** | Houston House Acct |

| | LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | | | DUE DATE |
| **1.** | **HS22021124-02** | **LH18/24-SP650_022222_AIX** | **Water** | **22 Feb 2022 14:00** |
| | 6850-Perch. DOD Level II & Level IV in separate pdf | | | 09 Mar 2022 |

**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: 2/23/2022

Received By: _____ Date/Time: 2/23/2022 1313

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

# Cooler Receipt Form

Project Chemist: CG

Client/Project: ALS-H

Thermometer ID: 11231

Date/Time Received: 2-23-22 Initials: CG

Date/Time Logged in: 2-23-22 Initials: CG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☒ Courier (ALS) ○ Client

2. Samples received in: ☒ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ☒ No

Were they intact? ○ Yes ○ No ☒ N/A

Were they signed and dated? ○ Yes ○ No ☒ N/A

If yes, how many and where?

4. Packing Material: ○ Inserts ☒ Baggies ○ Bubble Wrap ○ Gel Packs ☒ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

| Cooler Tracking Number | COC ID | Date Opened | Time Opened | Opened By | Temp. °C | Temp Blank? |
|---|---|---|---|---|---|---|
| NA | | 2-23-22 | 1713 | CG | 1.9/2.4 | ☒ |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☒ Yes ○ No

7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☒ Yes ○ No

8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☒ Yes ○ No

9. Were appropriate bottles/containers and volumes received for the requested tests? ☒ Yes ○ No

10. Did sample labels and tags agree with custody documents? ☒ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

Effective 10/04/2013

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#:** 395842 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 2/25/22 11:47

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2200155-001 | LH18/24-SP650_022222_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 2 | EQ2200071-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 3 | EQ2200071-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 4 | EQ2200071-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |

## Spiking Solutions

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 221408 Logbook Ref: Perchlorate Internal Standard Expires On: 04/30/2022

E2200155-001 100.00µL EQ2200071-01 100.00µL EQ2200071-02 100.00µL EQ2200071-03 100.00µL

Name: Perchlorate Intermediate Stock1 Inventory ID 221456 Logbook Ref: Perchlorate Expires On: 04/30/2022

EQ2200071-02 1.00µL EQ2200071-03 1.00µL

## Preparation Materials

| | | | | | |
|---|---|---|---|---|---|
| Water HPLC Grade | 08/03/2021 Water (218532) | 6850 Amber Glass screw vial | 2mL Screw Top Vial (221308) | 537M Glass Culture Tubes | 537M Glass Tubes (218064) |
| 6850 0.45um syringe filters | 6850 Syringe Filters (219639) | 6850 Luer-Lok Syringes | Luer-Lok Syringes (221305) | 6850 Pipette Tips 50-1000 uL | 6850 Pipette Tips (221307) |

## Preparation Steps

Step: Preparation
Started: 2/25/22 11:47
Finished: 2/25/22 13:00
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 2/25/22

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:** | E2200155 |
| **Project:** | HS22021124 | **Date Collected:** | 2/22/22 1400 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 2/23/22 |
| **Sample Name:** | LH18/24-SP650_022222_AIX | **Units:** | µg/L |
| **Lab Code:** | E2200155-001 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850
**Prep Method:** Method

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.626** | | 0.500 | 0.250 | 0.125 | 5 | 2/25/22 | 2/28/22 14:20 | 395842 | 755879 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200155 |
| **Project:** | HS22021124 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2200071-01 | **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 | 2/25/22 | 2/28/22 11:19 | 395842 | 755879 | |

# 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:** | E2200155 |
| **Project:** | HS22021124 | **Date Analyzed:** | 2/28/22 |
| **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:** | 395842 |

| | Lab Control Sample EQ2200071-02 | | | Duplicate Lab Control Sample EQ2200071-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.118 | 0.100 | 118 | 0.119 | 0.100 | 119 | 84 - 119 | 1 | 15 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200155 |
| **Project:** | HS22021124 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200071-02 | **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 | **0.118** | | 0.100 | 0.0500 | 0.0250 | 1 | 2/25/22 | 2/28/22 12:45 | 395842 | 755879 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200155 |
| **Project:** | HS22021124 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200071-03 | **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 | **0.119** | | 0.100 | 0.0500 | 0.0250 | 1 | 2/25/22 | 2/28/22 13:31 | 395842 | 755879 | |

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March 18, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22021133**

Laboratory Results for: **Longhorn GW Treatment Plant Bi-Weekly Samples**

Dear Marcia Olive,

ALS Environmental received 2 sample(s) on Feb 23, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: DAYNA.FISHER**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**Work Order:** HS22021133

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22021133-01 | LH18/24-SP650_022222 | Water | | 22-Feb-2022 14:00 | 23-Feb-2022 10:00 | ☐ |
| HS22021133-02 | Trip Blank | Water | CG-121321-572 | 22-Feb-2022 00:00 | 23-Feb-2022 10:00 | ☐ |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**Work Order:** HS22021133

**CASE NARRATIVE**

## GCMS Volatiles by Method SW8260

### Batch ID: R403302

**Sample ID: CCV050**

- Acetone exceeded %D limits for CCV .Samples are ND for this compound.

**Sample ID: HS22020815-04MS**

- MS and MSD are for an unrelated sample

## WetChemistry by Method SW9056

### Batch ID: R403694

**Sample ID: LH18/24-SP650_022222 (HS22021133-01MS)**

- 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)

**ALS Houston, US** Date: 18-Mar-22

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Sample ID: LH18/24-SP650_022222
Collection Date: 22-Feb-2022 14:00

**ANALYTICAL REPORT**
WorkOrder:HS22021133
Lab ID:HS22021133-01
Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| 1,1,1,2-Tetrachloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 1,1,1-Trichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 1,1-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 1,1-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 1,1-Dichloropropene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 1,2,3-Trichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 1,2,3-Trichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 1,2,4-Trichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 1,2,4-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 1,2-Dibromo-3-chloropropane | 1.0 | U | 0.20 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 1,2-Dibromoethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 1,2-Dichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 1,2-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 1,2-Dichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 1,3,5-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 1,3-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 1,3-Dichloropropane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 1,4-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 2,2-Dichloropropane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 2-Butanone | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 2-Chlorotoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 2-Hexanone | 2.0 | U | 1.0 | 2.0 | 2.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 4-Chlorotoluene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 4-Isopropyltoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| 4-Methyl-2-pentanone | 2.0 | U | 0.70 | 2.0 | 2.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Acetone | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Benzene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Bromobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Bromochloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Bromodichloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Bromoform | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Bromomethane | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Carbon disulfide | 2.0 | U | 0.60 | 2.0 | 2.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Carbon tetrachloride | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Chlorobenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Chloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Chloroform | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |

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

**ALS Houston, US** Date: 18-Mar-22

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Sample ID: LH18/24-SP650_022222
Collection Date: 22-Feb-2022 14:00

**ANALYTICAL REPORT**
WorkOrder:HS22021133
Lab ID:HS22021133-01
Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| Chloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| **cis-1,2-Dichloroethene** | **1.00** | J | **0.20** | **0.50** | **1.0** | **ug/L** | 1 | 01-Mar-2022 12:53 |
| cis-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Dibromochloromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Dibromomethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Dichlorodifluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Ethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Hexachlorobutadiene | 1.0 | U | 1.0 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Isopropylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| m,p-Xylene | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Methylene chloride | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| n-Butylbenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| n-Propylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Naphthalene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| o-Xylene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| sec-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Styrene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| tert-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Tetrachloroethene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Toluene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| trans-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| trans-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Trichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Trichlorofluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| Vinyl chloride | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:53 |
| *Surr: 1,2-Dichloroethane-d4* | *94.9* | | | **0** | *81-118* | *%REC* | *1* | *01-Mar-2022 12:53* |
| *Surr: 4-Bromofluorobenzene* | *101* | | | **0** | *85-114* | *%REC* | *1* | *01-Mar-2022 12:53* |
| *Surr: Dibromofluoromethane* | *91.7* | | | **0** | *80-119* | *%REC* | *1* | *01-Mar-2022 12:53* |
| *Surr: Toluene-d8* | *107* | | | **0** | *89-112* | *%REC* | *1* | *01-Mar-2022 12:53* |
| **ANIONS BY SW9056A** | | **Method:SW9056** | | | | | | Analyst: YP |
| **Chloride** | **863** | | **4.00** | **10.0** | **10.0** | **mg/L** | 20 | 07-Mar-2022 20:07 |
| **Sulfate** | **28.9** | | **0.200** | **0.500** | **0.500** | **mg/L** | 1 | 07-Mar-2022 19:51 |

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

**ALS Houston, US** Date: 18-Mar-22

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Sample ID: Trip Blank
Collection Date: 22-Feb-2022 00:00

**ANALYTICAL REPORT**
WorkOrder:HS22021133
Lab ID:HS22021133-02
Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| 1,1,1,2-Tetrachloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 1,1,1-Trichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 1,1-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 1,1-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 1,1-Dichloropropene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 1,2,3-Trichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 1,2,3-Trichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 1,2,4-Trichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 1,2,4-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 1,2-Dibromo-3-chloropropane | 1.0 | U | 0.20 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 1,2-Dibromoethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 1,2-Dichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 1,2-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 1,2-Dichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 1,3,5-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 1,3-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 1,3-Dichloropropane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 1,4-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 2,2-Dichloropropane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 2-Butanone | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 2-Chlorotoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 2-Hexanone | 2.0 | U | 1.0 | 2.0 | 2.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 4-Chlorotoluene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 4-Isopropyltoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| 4-Methyl-2-pentanone | 2.0 | U | 0.70 | 2.0 | 2.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Acetone | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Benzene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Bromobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Bromochloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Bromodichloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Bromoform | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Bromomethane | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Carbon disulfide | 2.0 | U | 0.60 | 2.0 | 2.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Carbon tetrachloride | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Chlorobenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Chloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Chloroform | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |

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

**ALS Houston, US** Date: 18-Mar-22

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Sample ID: Trip Blank
Collection Date: 22-Feb-2022 00:00

**ANALYTICAL REPORT**
WorkOrder:HS22021133
Lab ID:HS22021133-02
Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| Chloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| cis-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| cis-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Dibromochloromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Dibromomethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Dichlorodifluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Ethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Hexachlorobutadiene | 1.0 | U | 1.0 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Isopropylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| m,p-Xylene | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Methylene chloride | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| n-Butylbenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| n-Propylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Naphthalene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| o-Xylene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| sec-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Styrene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| tert-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Tetrachloroethene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Toluene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| trans-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| trans-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Trichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Trichlorofluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| Vinyl chloride | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Mar-2022 12:08 |
| *Surr: 1,2-Dichloroethane-d4* | *93.9* | | | **0** | *81-118* | *%REC* | *1* | *01-Mar-2022 12:08* |
| *Surr: 4-Bromofluorobenzene* | *101* | | | **0** | *85-114* | *%REC* | *1* | *01-Mar-2022 12:08* |
| *Surr: Dibromofluoromethane* | *92.9* | | | **0** | *80-119* | *%REC* | *1* | *01-Mar-2022 12:08* |
| *Surr: Toluene-d8* | *106* | | | **0** | *89-112* | *%REC* | *1* | *01-Mar-2022 12:08* |

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

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22021133

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** R403302 ( 0 ) | **Test Name :** VOLATILES ORGANICS BY METHOD 8260C | | | | **Matrix:** Water | |
| HS22021133-01 | LH18/24-SP650_022222 | 22 Feb 2022 14:00 | | | 01 Mar 2022 12:53 | 1 |
| HS22021133-02 | Trip Blank | 22 Feb 2022 00:00 | | | 01 Mar 2022 12:08 | 1 |
| **Batch ID:** R403694 ( 0 ) | **Test Name :** ANIONS BY SW9056A | | | | **Matrix:** Water | |
| HS22021133-01 | LH18/24-SP650_022222 | 22 Feb 2022 14:00 | | | 07 Mar 2022 20:07 | 20 |
| HS22021133-01 | LH18/24-SP650_022222 | 22 Feb 2022 14:00 | | | 07 Mar 2022 19:51 | 1 |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22021133

**QC BATCH REPORT**

**Batch ID:** R403302 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220228** Units: **ug/L** Analysis Date: **01-Mar-2022 11:44**
Client ID: Run ID: **VOA9_403302** SeqNo: **6526299** PrepDate: DF: **1**

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

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22021133

**QC BATCH REPORT**

**Batch ID:** R403302 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220228** Units: **ug/L** Analysis Date: **01-Mar-2022 11:44**
Client ID: Run ID: **VOA9_403302** SeqNo: **6526299** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 2.0 | 2.0 | | | | | | | | U |
| Carbon tetrachloride | 1.0 | 1.0 | | | | | | | | U |
| Chlorobenzene | 1.0 | 1.0 | | | | | | | | U |
| Chloroethane | 1.0 | 1.0 | | | | | | | | U |
| Chloroform | 0.50 | 1.0 | | | | | | | | U |
| Chloromethane | 0.50 | 1.0 | | | | | | | | U |
| cis-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| cis-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Dibromochloromethane | 1.0 | 1.0 | | | | | | | | U |
| Dibromomethane | 0.50 | 1.0 | | | | | | | | U |
| Dichlorodifluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Ethylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Hexachlorobutadiene | 1.0 | 1.0 | | | | | | | | U |
| Isopropylbenzene | 1.0 | 1.0 | | | | | | | | U |
| m,p-Xylene | 1.0 | 2.0 | | | | | | | | U |
| Methylene chloride | 2.0 | 2.0 | | | | | | | | U |
| Naphthalene | 1.0 | 1.0 | | | | | | | | U |
| n-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| n-Propylbenzene | 1.0 | 1.0 | | | | | | | | U |
| o-Xylene | 1.0 | 1.0 | | | | | | | | U |
| sec-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Styrene | 1.0 | 1.0 | | | | | | | | U |
| tert-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Tetrachloroethene | 1.0 | 1.0 | | | | | | | | U |
| Toluene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Trichloroethene | 0.50 | 1.0 | | | | | | | | U |
| Trichlorofluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Vinyl chloride | 0.50 | 1.0 | | | | | | | | U |
| *Surr: 1,2-Dichloroethane-d4* | *45.83* | *1.0* | *50* | *0* | *91.7* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *52.08* | *1.0* | *50* | *0* | *104* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *45.43* | *1.0* | *50* | *0* | *90.9* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *54.04* | *1.0* | *50* | *0* | *108* | *89 - 112* | | | | |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22021133

**QC BATCH REPORT**

**Batch ID:** R403302 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220228** Units: **ug/L** Analysis Date: **01-Mar-2022 11:00**
Client ID: Run ID: **VOA9_403302** SeqNo: **6526298** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 19.68 | 1.0 | 20 | 0 | 98.4 | 78 - 124 | | | | |
| 1,1,1-Trichloroethane | 19.88 | 1.0 | 20 | 0 | 99.4 | 74 - 131 | | | | |
| 1,1,2,2-Tetrachloroethane | 18.53 | 1.0 | 20 | 0 | 92.7 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 19.69 | 1.0 | 20 | 0 | 98.5 | 80 - 119 | | | | |
| 1,1-Dichloroethane | 19.97 | 1.0 | 20 | 0 | 99.8 | 77 - 125 | | | | |
| 1,1-Dichloroethene | 19.76 | 1.0 | 20 | 0 | 98.8 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 19.81 | 1.0 | 20 | 0 | 99.0 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 18.96 | 1.0 | 20 | 0 | 94.8 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 18.12 | 1.0 | 20 | 0 | 90.6 | 73 - 122 | | | | |
| 1,2,4-Trichlorobenzene | 18.71 | 1.0 | 20 | 0 | 93.6 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 19.92 | 1.0 | 20 | 0 | 99.6 | 76 - 124 | | | | |
| 1,2-Dibromo-3-chloropropane | 17.49 | 1.0 | 20 | 0 | 87.5 | 62 - 128 | | | | |
| 1,2-Dibromoethane | 19.89 | 1.0 | 20 | 0 | 99.4 | 77 - 121 | | | | |
| 1,2-Dichlorobenzene | 16.77 | 1.0 | 20 | 0 | 83.8 | 80 - 119 | | | | |
| 1,2-Dichloroethane | 20.67 | 1.0 | 20 | 0 | 103 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 19.63 | 1.0 | 20 | 0 | 98.2 | 78 - 122 | | | | |
| 1,3,5-Trimethylbenzene | 19.63 | 1.0 | 20 | 0 | 98.2 | 75 - 124 | | | | |
| 1,3-Dichlorobenzene | 19.41 | 1.0 | 20 | 0 | 97.0 | 80 - 119 | | | | |
| 1,3-Dichloropropane | 19.81 | 1.0 | 20 | 0 | 99.0 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 19.66 | 1.0 | 20 | 0 | 98.3 | 79 - 118 | | | | |
| 2,2-Dichloropropane | 18.6 | 1.0 | 20 | 0 | 93.0 | 60 - 139 | | | | |
| 2-Butanone | 41.73 | 2.0 | 40 | 0 | 104 | 56 - 143 | | | | |
| 2-Chlorotoluene | 19.67 | 1.0 | 20 | 0 | 98.3 | 79 - 122 | | | | |
| 2-Hexanone | 41.33 | 2.0 | 40 | 0 | 103 | 57 - 139 | | | | |
| 4-Chlorotoluene | 19.83 | 1.0 | 20 | 0 | 99.1 | 78 - 122 | | | | |
| 4-Isopropyltoluene | 19.5 | 1.0 | 20 | 0 | 97.5 | 77 - 127 | | | | |
| 4-Methyl-2-pentanone | 38.59 | 2.0 | 40 | 0 | 96.5 | 67 - 130 | | | | |
| Acetone | 61.79 | 2.0 | 40 | 0 | 154 | 39 - 160 | | | | |
| Benzene | 19.58 | 1.0 | 20 | 0 | 97.9 | 79 - 120 | | | | |
| Bromobenzene | 19.92 | 1.0 | 20 | 0 | 99.6 | 80 - 120 | | | | |
| Bromochloromethane | 20.27 | 1.0 | 20 | 0 | 101 | 78 - 123 | | | | |
| Bromodichloromethane | 20.23 | 1.0 | 20 | 0 | 101 | 79 - 125 | | | | |
| Bromoform | 19.54 | 1.0 | 20 | 0 | 97.7 | 66 - 130 | | | | |
| Bromomethane | 17.75 | 1.0 | 20 | 0 | 88.7 | 53 - 141 | | | | |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22021133

**QC BATCH REPORT**

**Batch ID:** R403302 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220228** Units: **ug/L** Analysis Date: **01-Mar-2022 11:00**
Client ID: Run ID: **VOA9_403302** SeqNo: **6526298** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 40.45 | 2.0 | 40 | 0 | 101 | 64 - 133 | | | | |
| Carbon tetrachloride | 19.69 | 1.0 | 20 | 0 | 98.4 | 72 - 136 | | | | |
| Chlorobenzene | 19.93 | 1.0 | 20 | 0 | 99.6 | 82 - 118 | | | | |
| Chloroethane | 18.05 | 1.0 | 20 | 0 | 90.3 | 60 - 138 | | | | |
| Chloroform | 19.83 | 1.0 | 20 | 0 | 99.1 | 79 - 124 | | | | |
| Chloromethane | 18.47 | 1.0 | 20 | 0 | 92.3 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 17.75 | 1.0 | 20 | 0 | 88.7 | 78 - 123 | | | | |
| cis-1,3-Dichloropropene | 18.61 | 1.0 | 20 | 0 | 93.0 | 75 - 124 | | | | |
| Dibromochloromethane | 19.99 | 1.0 | 20 | 0 | 100.0 | 74 - 126 | | | | |
| Dibromomethane | 19.86 | 1.0 | 20 | 0 | 99.3 | 79 - 123 | | | | |
| Dichlorodifluoromethane | 19.2 | 1.0 | 20 | 0 | 96.0 | 32 - 152 | | | | |
| Ethylbenzene | 19.77 | 1.0 | 20 | 0 | 98.9 | 79 - 121 | | | | |
| Hexachlorobutadiene | 18.96 | 1.0 | 20 | 0 | 94.8 | 66 - 134 | | | | |
| Isopropylbenzene | 19.66 | 1.0 | 20 | 0 | 98.3 | 72 - 131 | | | | |
| m,p-Xylene | 39.89 | 2.0 | 40 | 0 | 99.7 | 80 - 121 | | | | |
| Methylene chloride | 19.03 | 2.0 | 20 | 0 | 95.2 | 74 - 124 | | | | |
| Naphthalene | 18.27 | 1.0 | 20 | 0 | 91.4 | 61 - 128 | | | | |
| n-Butylbenzene | 19.3 | 1.0 | 20 | 0 | 96.5 | 75 - 128 | | | | |
| n-Propylbenzene | 19.37 | 1.0 | 20 | 0 | 96.9 | 76 - 126 | | | | |
| o-Xylene | 19.88 | 1.0 | 20 | 0 | 99.4 | 78 - 122 | | | | |
| sec-Butylbenzene | 19.64 | 1.0 | 20 | 0 | 98.2 | 77 - 126 | | | | |
| Styrene | 19.61 | 1.0 | 20 | 0 | 98.1 | 78 - 123 | | | | |
| tert-Butylbenzene | 19.67 | 1.0 | 20 | 0 | 98.4 | 78 - 124 | | | | |
| Tetrachloroethene | 20.36 | 1.0 | 20 | 0 | 102 | 74 - 129 | | | | |
| Toluene | 20.3 | 1.0 | 20 | 0 | 102 | 80 - 121 | | | | |
| trans-1,2-Dichloroethene | 20.41 | 1.0 | 20 | 0 | 102 | 75 - 124 | | | | |
| trans-1,3-Dichloropropene | 19.02 | 1.0 | 20 | 0 | 95.1 | 73 - 127 | | | | |
| Trichloroethene | 20.13 | 1.0 | 20 | 0 | 101 | 79 - 123 | | | | |
| Trichlorofluoromethane | 20.02 | 1.0 | 20 | 0 | 100 | 65 - 141 | | | | |
| Vinyl chloride | 18.55 | 1.0 | 20 | 0 | 92.8 | 58 - 137 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *50.7* | *1.0* | *50* | *0* | *101* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *51.56* | *1.0* | *50* | *0* | *103* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *49.45* | *1.0* | *50* | *0* | *98.9* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *51.3* | *1.0* | *50* | *0* | *103* | *89 - 112* | | | | |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22021133

**QC BATCH REPORT**

**Batch ID:** R403302 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS22020815-04MS** Units: **ug/L** Analysis Date: **01-Mar-2022 13:59**
Client ID: Run ID: **VOA9_403302** SeqNo: **6526305** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 14.5 | 1.0 | 20 | 0 | 72.5 | 78 - 124 | | | | S |
| 1,1,1-Trichloroethane | 13.96 | 1.0 | 20 | 0 | 69.8 | 74 - 131 | | | | S |
| 1,1,2,2-Tetrachloroethane | 14.17 | 1.0 | 20 | 0 | 70.8 | 71 - 121 | | | | S |
| 1,1,2-Trichloroethane | 14.06 | 1.0 | 20 | 0 | 70.3 | 80 - 119 | | | | S |
| 1,1-Dichloroethane | 13.45 | 1.0 | 20 | 0 | 67.3 | 77 - 125 | | | | S |
| 1,1-Dichloroethene | 13.65 | 1.0 | 20 | 0 | 68.3 | 71 - 131 | | | | S |
| 1,1-Dichloropropene | 14.77 | 1.0 | 20 | 0 | 73.9 | 78 - 125 | | | | S |
| 1,2,3-Trichlorobenzene | 13.56 | 1.0 | 20 | 0 | 67.8 | 69 - 129 | | | | S |
| 1,2,3-Trichloropropane | 13.31 | 1.0 | 20 | 0 | 66.5 | 73 - 122 | | | | S |
| 1,2,4-Trichlorobenzene | 13.7 | 1.0 | 20 | 0 | 68.5 | 69 - 130 | | | | S |
| 1,2,4-Trimethylbenzene | 14.01 | 1.0 | 20 | 0 | 70.1 | 76 - 124 | | | | S |
| 1,2-Dibromo-3-chloropropane | 12.73 | 1.0 | 20 | 0 | 63.6 | 62 - 128 | | | | |
| 1,2-Dibromoethane | 14.32 | 1.0 | 20 | 0 | 71.6 | 77 - 121 | | | | S |
| 1,2-Dichlorobenzene | 12.43 | 1.0 | 20 | 0 | 62.1 | 80 - 119 | | | | S |
| 1,2-Dichloroethane | 14.51 | 1.0 | 20 | 0 | 72.5 | 73 - 128 | | | | S |
| 1,2-Dichloropropane | 14.12 | 1.0 | 20 | 0 | 70.6 | 78 - 122 | | | | S |
| 1,3,5-Trimethylbenzene | 14.4 | 1.0 | 20 | 0 | 72.0 | 75 - 124 | | | | S |
| 1,3-Dichlorobenzene | 14.13 | 1.0 | 20 | 0 | 70.6 | 80 - 119 | | | | S |
| 1,3-Dichloropropane | 14.48 | 1.0 | 20 | 0 | 72.4 | 80 - 119 | | | | S |
| 1,4-Dichlorobenzene | 14.12 | 1.0 | 20 | 0 | 70.6 | 79 - 118 | | | | S |
| 2,2-Dichloropropane | 14.17 | 1.0 | 20 | 0 | 70.9 | 60 - 139 | | | | |
| 2-Butanone | 25.38 | 2.0 | 40 | 0 | 63.5 | 56 - 143 | | | | |
| 2-Chlorotoluene | 14.47 | 1.0 | 20 | 0 | 72.4 | 79 - 122 | | | | S |
| 2-Hexanone | 27.49 | 2.0 | 40 | 0 | 68.7 | 57 - 139 | | | | |
| 4-Chlorotoluene | 14.51 | 1.0 | 20 | 0 | 72.5 | 78 - 122 | | | | S |
| 4-Isopropyltoluene | 14.16 | 1.0 | 20 | 0 | 70.8 | 77 - 127 | | | | S |
| 4-Methyl-2-pentanone | 27.85 | 2.0 | 40 | 0 | 69.6 | 67 - 130 | | | | |
| Acetone | 24.27 | 2.0 | 40 | 0 | 60.7 | 39 - 160 | | | | |
| Benzene | 14.51 | 1.0 | 20 | 0 | 72.6 | 79 - 120 | | | | S |
| Bromobenzene | 14.52 | 1.0 | 20 | 0 | 72.6 | 80 - 120 | | | | S |
| Bromochloromethane | 13.15 | 1.0 | 20 | 0 | 65.7 | 78 - 123 | | | | S |
| Bromodichloromethane | 14.79 | 1.0 | 20 | 0 | 74.0 | 79 - 125 | | | | S |
| Bromoform | 14.36 | 1.0 | 20 | 0 | 71.8 | 66 - 130 | | | | |
| Bromomethane | 9.38 | 1.0 | 20 | 0 | 46.9 | 53 - 141 | | | | S |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22021133

**QC BATCH REPORT**

**Batch ID:** R403302 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS22020815-04MS** Units: **ug/L** Analysis Date: **01-Mar-2022 13:59**
Client ID: Run ID: **VOA9_403302** SeqNo: **6526305** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 24.97 | 2.0 | 40 | 0 | 62.4 | 64 - 133 | | | | S |
| Carbon tetrachloride | 15.53 | 1.0 | 20 | 0 | 77.6 | 72 - 136 | | | | |
| Chlorobenzene | 14.46 | 1.0 | 20 | 0 | 72.3 | 82 - 118 | | | | S |
| Chloroethane | 10.2 | 1.0 | 20 | 0 | 51.0 | 60 - 138 | | | | S |
| Chloroform | 13.73 | 1.0 | 20 | 0 | 68.7 | 79 - 124 | | | | S |
| Chloromethane | 8.121 | 1.0 | 20 | 0 | 40.6 | 50 - 139 | | | | S |
| cis-1,2-Dichloroethene | 189.5 | 1.0 | 20 | 181.5 | 39.9 | 78 - 123 | | | | SO |
| cis-1,3-Dichloropropene | 13.1 | 1.0 | 20 | 0 | 65.5 | 75 - 124 | | | | S |
| Dibromochloromethane | 14.09 | 1.0 | 20 | 0 | 70.5 | 74 - 126 | | | | S |
| Dibromomethane | 14.41 | 1.0 | 20 | 0 | 72.0 | 79 - 123 | | | | S |
| Dichlorodifluoromethane | 4.308 | 1.0 | 20 | 0 | 21.5 | 32 - 152 | | | | S |
| Ethylbenzene | 14.41 | 1.0 | 20 | 0 | 72.0 | 79 - 121 | | | | S |
| Hexachlorobutadiene | 14.22 | 1.0 | 20 | 0 | 71.1 | 66 - 134 | | | | |
| Isopropylbenzene | 14.79 | 1.0 | 20 | 0 | 74.0 | 72 - 131 | | | | |
| m,p-Xylene | 29.64 | 2.0 | 40 | 0 | 74.1 | 80 - 121 | | | | S |
| Methylene chloride | 12.1 | 2.0 | 20 | 0 | 60.5 | 74 - 124 | | | | S |
| Naphthalene | 13.15 | 1.0 | 20 | 0 | 65.8 | 61 - 128 | | | | |
| n-Butylbenzene | 13.96 | 1.0 | 20 | 0 | 69.8 | 75 - 128 | | | | S |
| n-Propylbenzene | 14.89 | 1.0 | 20 | 0 | 74.4 | 76 - 126 | | | | S |
| o-Xylene | 14.28 | 1.0 | 20 | 0 | 71.4 | 78 - 122 | | | | S |
| sec-Butylbenzene | 14.57 | 1.0 | 20 | 0 | 72.8 | 77 - 126 | | | | S |
| Styrene | 13.89 | 1.0 | 20 | 0 | 69.5 | 78 - 123 | | | | S |
| tert-Butylbenzene | 14.81 | 1.0 | 20 | 0 | 74.0 | 78 - 124 | | | | S |
| Tetrachloroethene | 15.4 | 1.0 | 20 | 0 | 77.0 | 74 - 129 | | | | |
| Toluene | 14.97 | 1.0 | 20 | 0 | 74.8 | 80 - 121 | | | | S |
| trans-1,2-Dichloroethene | 17.54 | 1.0 | 20 | 3.175 | 71.8 | 75 - 124 | | | | S |
| trans-1,3-Dichloropropene | 13.65 | 1.0 | 20 | 0 | 68.3 | 73 - 127 | | | | S |
| Trichloroethene | 62.41 | 1.0 | 20 | 48.92 | 67.5 | 79 - 123 | | | | S |
| Trichlorofluoromethane | 12.78 | 1.0 | 20 | 0 | 63.9 | 65 - 141 | | | | S |
| Vinyl chloride | 14.03 | 1.0 | 20 | 4.863 | 45.8 | 58 - 137 | | | | S |
| *Surr: 1,2-Dichloroethane-d4* | *46.77* | *1.0* | *50* | *0* | *93.5* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *51.74* | *1.0* | *50* | *0* | *103* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *45.58* | *1.0* | *50* | *0* | *91.2* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *53.62* | *1.0* | *50* | *0* | *107* | *89 - 112* | | | | |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22021133

**QC BATCH REPORT**

**Batch ID:** R403302 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS22020815-04MSD** Units: **ug/L** Analysis Date: **01-Mar-2022 14:21**
Client ID: Run ID: **VOA9_403302** SeqNo: **6526306** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 14.95 | 1.0 | 20 | 0 | 74.8 | 78 - 124 | 14.5 | 3.06 | 20 | S |
| 1,1,1-Trichloroethane | 14.25 | 1.0 | 20 | 0 | 71.2 | 74 - 131 | 13.96 | 2.03 | 20 | S |
| 1,1,2,2-Tetrachloroethane | 14.25 | 1.0 | 20 | 0 | 71.2 | 71 - 121 | 14.17 | 0.552 | 20 | |
| 1,1,2-Trichloroethane | 14.22 | 1.0 | 20 | 0 | 71.1 | 80 - 119 | 14.06 | 1.09 | 20 | S |
| 1,1-Dichloroethane | 13.56 | 1.0 | 20 | 0 | 67.8 | 77 - 125 | 13.45 | 0.79 | 20 | S |
| 1,1-Dichloroethene | 13.57 | 1.0 | 20 | 0 | 67.9 | 71 - 131 | 13.65 | 0.613 | 20 | S |
| 1,1-Dichloropropene | 15.36 | 1.0 | 20 | 0 | 76.8 | 78 - 125 | 14.77 | 3.89 | 20 | S |
| 1,2,3-Trichlorobenzene | 14.49 | 1.0 | 20 | 0 | 72.4 | 69 - 129 | 13.56 | 6.59 | 20 | |
| 1,2,3-Trichloropropane | 13.82 | 1.0 | 20 | 0 | 69.1 | 73 - 122 | 13.31 | 3.8 | 20 | S |
| 1,2,4-Trichlorobenzene | 14.59 | 1.0 | 20 | 0 | 73.0 | 69 - 130 | 13.7 | 6.27 | 20 | |
| 1,2,4-Trimethylbenzene | 14.45 | 1.0 | 20 | 0 | 72.3 | 76 - 124 | 14.01 | 3.11 | 20 | S |
| 1,2-Dibromo-3-chloropropane | 14.1 | 1.0 | 20 | 0 | 70.5 | 62 - 128 | 12.73 | 10.2 | 20 | |
| 1,2-Dibromoethane | 14.77 | 1.0 | 20 | 0 | 73.9 | 77 - 121 | 14.32 | 3.11 | 20 | S |
| 1,2-Dichlorobenzene | 12.87 | 1.0 | 20 | 0 | 64.3 | 80 - 119 | 12.43 | 3.46 | 20 | S |
| 1,2-Dichloroethane | 14.88 | 1.0 | 20 | 0 | 74.4 | 73 - 128 | 14.51 | 2.52 | 20 | |
| 1,2-Dichloropropane | 14.46 | 1.0 | 20 | 0 | 72.3 | 78 - 122 | 14.12 | 2.38 | 20 | S |
| 1,3,5-Trimethylbenzene | 14.61 | 1.0 | 20 | 0 | 73.0 | 75 - 124 | 14.4 | 1.39 | 20 | S |
| 1,3-Dichlorobenzene | 14.86 | 1.0 | 20 | 0 | 74.3 | 80 - 119 | 14.13 | 5.05 | 20 | S |
| 1,3-Dichloropropane | 14.75 | 1.0 | 20 | 0 | 73.8 | 80 - 119 | 14.48 | 1.86 | 20 | S |
| 1,4-Dichlorobenzene | 14.38 | 1.0 | 20 | 0 | 71.9 | 79 - 118 | 14.12 | 1.83 | 20 | S |
| 2,2-Dichloropropane | 13.85 | 1.0 | 20 | 0 | 69.2 | 60 - 139 | 14.17 | 2.31 | 20 | |
| 2-Butanone | 27.26 | 2.0 | 40 | 0 | 68.1 | 56 - 143 | 25.38 | 7.13 | 20 | |
| 2-Chlorotoluene | 14.7 | 1.0 | 20 | 0 | 73.5 | 79 - 122 | 14.47 | 1.55 | 20 | S |
| 2-Hexanone | 29.09 | 2.0 | 40 | 0 | 72.7 | 57 - 139 | 27.49 | 5.63 | 20 | |
| 4-Chlorotoluene | 14.58 | 1.0 | 20 | 0 | 72.9 | 78 - 122 | 14.51 | 0.514 | 20 | S |
| 4-Isopropyltoluene | 14.53 | 1.0 | 20 | 0 | 72.7 | 77 - 127 | 14.16 | 2.59 | 20 | S |
| 4-Methyl-2-pentanone | 28.68 | 2.0 | 40 | 0 | 71.7 | 67 - 130 | 27.85 | 2.95 | 20 | |
| Acetone | 25.87 | 2.0 | 40 | 0 | 64.7 | 39 - 160 | 24.27 | 6.38 | 20 | |
| Benzene | 14.52 | 1.0 | 20 | 0 | 72.6 | 79 - 120 | 14.51 | 0.0543 | 20 | S |
| Bromobenzene | 14.69 | 1.0 | 20 | 0 | 73.4 | 80 - 120 | 14.52 | 1.13 | 20 | S |
| Bromochloromethane | 13.58 | 1.0 | 20 | 0 | 67.9 | 78 - 123 | 13.15 | 3.28 | 20 | S |
| Bromodichloromethane | 14.91 | 1.0 | 20 | 0 | 74.5 | 79 - 125 | 14.79 | 0.801 | 20 | S |
| Bromoform | 14.31 | 1.0 | 20 | 0 | 71.5 | 66 - 130 | 14.36 | 0.381 | 20 | |
| Bromomethane | 9.716 | 1.0 | 20 | 0 | 48.6 | 53 - 141 | 9.38 | 3.51 | 20 | S |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22021133

**QC BATCH REPORT**

**Batch ID:** R403302 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS22020815-04MSD** Units: **ug/L** Analysis Date: **01-Mar-2022 14:21**
Client ID: Run ID: **VOA9_403302** SeqNo: **6526306** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 25.25 | 2.0 | 40 | 0 | 63.1 | 64 - 133 | 24.97 | 1.13 | 20 | S |
| Carbon tetrachloride | 15.46 | 1.0 | 20 | 0 | 77.3 | 72 - 136 | 15.53 | 0.459 | 20 | |
| Chlorobenzene | 14.87 | 1.0 | 20 | 0 | 74.4 | 82 - 118 | 14.46 | 2.84 | 20 | S |
| Chloroethane | 11.4 | 1.0 | 20 | 0 | 57.0 | 60 - 138 | 10.2 | 11.1 | 20 | S |
| Chloroform | 13.69 | 1.0 | 20 | 0 | 68.4 | 79 - 124 | 13.73 | 0.306 | 20 | S |
| Chloromethane | 8.199 | 1.0 | 20 | 0 | 41.0 | 50 - 139 | 8.121 | 0.952 | 20 | S |
| cis-1,2-Dichloroethene | 188.6 | 1.0 | 20 | 181.5 | 35.5 | 78 - 123 | 189.5 | 0.463 | 20 | SO |
| cis-1,3-Dichloropropene | 13.52 | 1.0 | 20 | 0 | 67.6 | 75 - 124 | 13.1 | 3.12 | 20 | S |
| Dibromochloromethane | 14.58 | 1.0 | 20 | 0 | 72.9 | 74 - 126 | 14.09 | 3.42 | 20 | S |
| Dibromomethane | 14.4 | 1.0 | 20 | 0 | 72.0 | 79 - 123 | 14.41 | 0.0721 | 20 | S |
| Dichlorodifluoromethane | 4.274 | 1.0 | 20 | 0 | 21.4 | 32 - 152 | 4.308 | 0.783 | 20 | S |
| Ethylbenzene | 14.75 | 1.0 | 20 | 0 | 73.8 | 79 - 121 | 14.41 | 2.36 | 20 | S |
| Hexachlorobutadiene | 15.25 | 1.0 | 20 | 0 | 76.2 | 66 - 134 | 14.22 | 6.97 | 20 | |
| Isopropylbenzene | 14.94 | 1.0 | 20 | 0 | 74.7 | 72 - 131 | 14.79 | 1.02 | 20 | |
| m,p-Xylene | 29.01 | 2.0 | 40 | 0 | 72.5 | 80 - 121 | 29.64 | 2.16 | 20 | S |
| Methylene chloride | 12.57 | 2.0 | 20 | 0 | 62.8 | 74 - 124 | 12.1 | 3.76 | 20 | S |
| Naphthalene | 14.21 | 1.0 | 20 | 0 | 71.0 | 61 - 128 | 13.15 | 7.71 | 20 | |
| n-Butylbenzene | 14.45 | 1.0 | 20 | 0 | 72.3 | 75 - 128 | 13.96 | 3.42 | 20 | S |
| n-Propylbenzene | 14.9 | 1.0 | 20 | 0 | 74.5 | 76 - 126 | 14.89 | 0.128 | 20 | S |
| o-Xylene | 14.59 | 1.0 | 20 | 0 | 73.0 | 78 - 122 | 14.28 | 2.2 | 20 | S |
| sec-Butylbenzene | 14.64 | 1.0 | 20 | 0 | 73.2 | 77 - 126 | 14.57 | 0.537 | 20 | S |
| Styrene | 14.14 | 1.0 | 20 | 0 | 70.7 | 78 - 123 | 13.89 | 1.74 | 20 | S |
| tert-Butylbenzene | 14.89 | 1.0 | 20 | 0 | 74.4 | 78 - 124 | 14.81 | 0.544 | 20 | S |
| Tetrachloroethene | 15.28 | 1.0 | 20 | 0 | 76.4 | 74 - 129 | 15.4 | 0.788 | 20 | |
| Toluene | 14.86 | 1.0 | 20 | 0 | 74.3 | 80 - 121 | 14.97 | 0.725 | 20 | S |
| trans-1,2-Dichloroethene | 17.28 | 1.0 | 20 | 3.175 | 70.5 | 75 - 124 | 17.54 | 1.53 | 20 | S |
| trans-1,3-Dichloropropene | 14.19 | 1.0 | 20 | 0 | 71.0 | 73 - 127 | 13.65 | 3.85 | 20 | S |
| Trichloroethene | 61.2 | 1.0 | 20 | 48.92 | 61.4 | 79 - 123 | 62.41 | 1.97 | 20 | S |
| Trichlorofluoromethane | 13.28 | 1.0 | 20 | 0 | 66.4 | 65 - 141 | 12.78 | 3.83 | 20 | |
| Vinyl chloride | 14.48 | 1.0 | 20 | 4.863 | 48.1 | 58 - 137 | 14.03 | 3.22 | 20 | S |
| *Surr: 1,2-Dichloroethane-d4* | *46.61* | *1.0* | *50* | *0* | *93.2* | *81 - 118* | *46.77* | *0.342* | *20* | |
| *Surr: 4-Bromofluorobenzene* | *52.1* | *1.0* | *50* | *0* | *104* | *85 - 114* | *51.74* | *0.703* | *20* | |
| *Surr: Dibromofluoromethane* | *44.87* | *1.0* | *50* | *0* | *89.7* | *80 - 119* | *45.58* | *1.55* | *20* | |
| *Surr: Toluene-d8* | *52.36* | *1.0* | *50* | *0* | *105* | *89 - 112* | *53.62* | *2.39* | *20* | |

**ALS Houston, US**

Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22021133

**QC BATCH REPORT**

| Batch ID: | R403302 ( 0 ) | Instrument: | VOA9 | Method: | VOLATILES ORGANICS BY METHOD 8260C |
|---|---|---|---|---|---|

**The following samples were analyzed in this batch:** HS22021133-01 HS22021133-02

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22021133

**QC BATCH REPORT**

**Batch ID:** R403694 ( 0 ) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

**MBLK** Sample ID: **MBLK** Units: **mg/L** Analysis Date: **07-Mar-2022 19:24**
Client ID: Run ID: **ICS-Integrion_403694** SeqNo: **6535252** 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: **07-Mar-2022 19:30**
Client ID: Run ID: **ICS-Integrion_403694** SeqNo: **6535253** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 19.88 | 0.500 | 20 | 0 | 99.4 | 80 - 120 | | | | |
| Sulfate | 20 | 0.500 | 20 | 0 | 100.0 | 80 - 120 | | | | |

**MS** Sample ID: **HS22021133-01MS** Units: **mg/L** Analysis Date: **07-Mar-2022 19:56**
Client ID: **LH18/24-SP650_022222** Run ID: **ICS-Integrion_403694** SeqNo: **6535255** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 852.6 | 0.500 | 10 | 865.2 | -126 | 80 - 120 | | | | SEO |
| Sulfate | 39.15 | 0.500 | 10 | 28.88 | 103 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22021133-01MSD** Units: **mg/L** Analysis Date: **07-Mar-2022 20:01**
Client ID: **LH18/24-SP650_022222** Run ID: **ICS-Integrion_403694** SeqNo: **6535256** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 853.6 | 0.500 | 10 | 865.2 | -116 | 80 - 120 | 852.6 | 0.119 | 20 | SEO |
| Sulfate | 39.19 | 0.500 | 10 | 28.88 | 103 | 80 - 120 | 39.15 | 0.103 | 20 | |

**The following samples were analyzed in this batch:** HS22021133-01

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** **HS22021133**

## QUALIFIERS, ACRONYMS, UNITS

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

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

| Unit Reported | Description |
|---|---|
| mg/L | Milligrams per Liter |

**ALS Houston, US** Date: 18-Mar-22

## CERTIFICATIONS,ACCREDITATIONS & LICENSES

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas | 21-022-0 | 26-Mar-2022 |
| Florida | E87611-34 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 18-Mar-22

## Sample Receipt Checklist

**Work Order ID:** HS22021133 **Date/Time Received:** **23-Feb-2022 10:00**

**Client Name:** Bhate Environmental **Received by:** **Paresh M. Giga**

**Completed By:** /S/ Paresh M. Giga (eSignature) 23-Feb-2022 12:10 (Date/Time) **Reviewed by:** /S/ Ragen Giga (eSignature) 23-Feb-2022 14:45 (Date/Time)

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

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

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 0.8C/1.3C U/c | IR31 |
| Cooler(s)/Kit(s): | 47942 | |
| Date/Time sample(s) sent to storage: | 2/23/2022 12:20 | |

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



**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:**
**GROUNDWATER TREATMENT PLANT BI-WEEKLY SAMPLES**

**Prepared By:** Scott Beesinger

**P.O Number**

**HS22021133**

Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Bi-Weekly Samples

Analyses

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | VOC | CHLORIDE, SULFATE | | | | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_022222 | Water | 02/22/22 / 14:00 | | 3 | 3 | | | | | | | | | | HCL | |
| LH18/24-SP650_022222 | Water | 02/22/22 / 14:00 | | 1 | | 1 | | | | | | | | | NONE | |
| Trip Blank | Water | 02/22/22 | | 2 | 2 | | | | | | | | | | HCL | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Additional Remarks: **Standard TAT on all parameters**

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 02/22/22 | 14:30 | 2/23/2022 | | 10:00 | | | | | | |

**9For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| UC | | | | | | | | | |

Remarks
47942 0.80
#31 Cl 0.50

01117696

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

47942

C
Date: 2/22/
Name: Steve
Company: T

USTODY SEAL
Time: 1430

Seal Broken By:
Date: 2/23/22.

FedEx
TRK# 0221 9473 0845 1379

WED - 23 FEB 10:30A
PRIORITY OVERNIGHT

AB SGRA 47942

77099
TX-US IAH

Rev#: 15297-435 BRDB2 EXP 01/23

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

March 18, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22030081**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia Olive,

ALS Environmental received 2 sample(s) on Mar 02, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: DAYNA.FISHER**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22030081

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22030081-01 | LH18/24-SP650_030122 | Water | | 01-Mar-2022 14:00 | 02-Mar-2022 10:20 | ☐ |
| HS22030081-02 | LH18/24-SP650_030122_AIX | Water | | 01-Mar-2022 14:00 | 02-Mar-2022 10:20 | ☐ |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22030081

**CASE NARRATIVE**

## Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached

## WetChemistry by Method E415.1

### Batch ID: R403851

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E350.3

### Batch ID: R403533

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E365.3

### Batch ID: R403525

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

**ALS Houston, US**

Date: 18-Mar-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS22030081 |
| Sample ID: | LH18/24-SP650_030122 | Lab ID:HS22030081-01 |
| Collection Date: | 01-Mar-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **AMMONIA AS N BY E350.3(ISE)** | | **Method:E350.3** | | | | | | Analyst: MZD |
| **Nitrogen, Ammonia (As N)** | **13** | a | **0.10** | **0.20** | **0.20** | **mg/L** | 1 | 03-Mar-2022 14:20 |
| **ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978** | | **Method:E365.3** | | | | | | Analyst: AP |
| **Phosphorus, Total Orthophosphate (As P)** | **12.6** | a | **0.500** | **1.25** | **1.25** | **mg/L** | 50 | 03-Mar-2022 12:25 |
| **TOTAL ORGANIC CARBON BY E415.1** | | **Method:E415.1** | | | | | | Analyst: JAC |
| **Organic Carbon, Total** | **30.3** | a | **0.500** | **1.00** | **1.00** | **mg/L** | 1 | 09-Mar-2022 19:31 |

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

**ALS Houston, US**

Date: 18-Mar-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS22030081 |
| Sample ID: | LH18/24-SP650_030122_AIX | Lab ID:HS22030081-02 |
| Collection Date: | 01-Mar-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 04-Mar-2022 13:53 |

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

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22030081

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** R403518 ( 0 ) | **Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) | | | | **Matrix:** Water | |
| HS22030081-02 | LH18/24-SP650_030122_AIX | 01 Mar 2022 14:00 | | | 04 Mar 2022 13:53 | 1 |
| **Batch ID:** R403525 ( 0 ) | **Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978 | | | | **Matrix:** Water | |
| HS22030081-01 | LH18/24-SP650_030122 | 01 Mar 2022 14:00 | | | 03 Mar 2022 12:25 | 50 |
| **Batch ID:** R403533 ( 0 ) | **Test Name :** AMMONIA AS N BY E350.3(ISE) | | | | **Matrix:** Water | |
| HS22030081-01 | LH18/24-SP650_030122 | 01 Mar 2022 14:00 | | | 03 Mar 2022 14:20 | 1 |
| **Batch ID:** R403851 ( 0 ) | **Test Name :** TOTAL ORGANIC CARBON BY E415.1 | | | | **Matrix:** Water | |
| HS22030081-01 | LH18/24-SP650_030122 | 01 Mar 2022 14:00 | | | 09 Mar 2022 19:31 | 1 |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22030081

**QC BATCH REPORT**

**Batch ID:** R403525 ( 0 ) **Instrument:** UV-2450 **Method:** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978

**MBLK** Sample ID: **MBLK-R403525** Units: **mg/L** Analysis Date: **03-Mar-2022 12:25**
Client ID: Run ID: **UV-2450_403525** SeqNo: **6531700** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.0250 | 0.0250 | | | | | | | | U |

**LCS** Sample ID: **LCS-R403525** Units: **mg/L** Analysis Date: **03-Mar-2022 12:25**
Client ID: Run ID: **UV-2450_403525** SeqNo: **6531699** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.245 | 0.0250 | 0.25 | 0 | 98.0 | 85 - 115 | | | | |

**MS** Sample ID: **HS22030081-01MS** Units: **mg/L** Analysis Date: **03-Mar-2022 12:25**
Client ID: **LH18/24-SP650_030122** Run ID: **UV-2450_403525** SeqNo: **6531696** PrepDate: DF: **50**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 24.65 | 1.25 | 12.5 | 12.55 | 96.8 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22030081-01MSD** Units: **mg/L** Analysis Date: **03-Mar-2022 12:25**
Client ID: **LH18/24-SP650_030122** Run ID: **UV-2450_403525** SeqNo: **6531695** PrepDate: DF: **50**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 24.5 | 1.25 | 12.5 | 12.55 | 95.6 | 80 - 120 | 24.65 | 0.61 | 20 | |

**The following samples were analyzed in this batch:** HS22030081-01

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22030081

**QC BATCH REPORT**

**Batch ID:** R403533 ( 0 ) **Instrument:** WetChem_HS **Method:** AMMONIA AS N BY E350.3(ISE)

**MBLK** Sample ID: **MBLK-R403533** Units: **mg/L** Analysis Date: **03-Mar-2022 14:20**
Client ID: Run ID: **WetChem_HS_403533** SeqNo: **6531928** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 0.20 | 0.20 | | | | | | | | U |

**LCS** Sample ID: **LCS-R403533** Units: **mg/L** Analysis Date: **03-Mar-2022 14:20**
Client ID: Run ID: **WetChem_HS_403533** SeqNo: **6531927** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 10.78 | 0.20 | 10 | 0 | 108 | 80 - 120 | | | | |

**MS** Sample ID: **HS22030081-01MS** Units: **mg/L** Analysis Date: **03-Mar-2022 14:20**
Client ID: **LH18/24-SP650_030122** Run ID: **WetChem_HS_403533** SeqNo: **6531930** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 21.65 | 0.20 | 10 | 12.77 | 88.8 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22030081-01MSD** Units: **mg/L** Analysis Date: **03-Mar-2022 14:20**
Client ID: **LH18/24-SP650_030122** Run ID: **WetChem_HS_403533** SeqNo: **6531929** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 21.75 | 0.20 | 10 | 12.77 | 89.8 | 80 - 120 | 21.65 | 0.47 | 20 | |

**The following samples were analyzed in this batch:** HS22030081-01

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22030081

**QC BATCH REPORT**

**Batch ID:** R403851 ( 0 ) **Instrument:** TOC_04 **Method:** TOTAL ORGANIC CARBON BY E415.1

**MBLK** Sample ID: **MBLK-03092022** Units: **mg/L** Analysis Date: **09-Mar-2022 16:23**
Client ID: Run ID: **TOC_04_403851** SeqNo: **6538482** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 1.00 | 1.00 | | | | | | | | U |

**LCS** Sample ID: **LCS-03092022** Units: **mg/L** Analysis Date: **09-Mar-2022 16:36**
Client ID: Run ID: **TOC_04_403851** SeqNo: **6538483** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 9.319 | 1.00 | 10 | 0 | 93.2 | 85 - 115 | | | | |

**LCSD** Sample ID: **LCSD-03092022** Units: **mg/L** Analysis Date: **09-Mar-2022 16:50**
Client ID: Run ID: **TOC_04_403851** SeqNo: **6538484** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 9.477 | 1.00 | 10 | 0 | 94.8 | 85 - 115 | 9.319 | 1.68 | 20 | |

**MS** Sample ID: **HS22030443-01MS** Units: **mg/L** Analysis Date: **09-Mar-2022 17:18**
Client ID: Run ID: **TOC_04_403851** SeqNo: **6538486** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 21.61 | 1.00 | 10 | 10.7 | 109 | 80 - 120 | | | | |

**The following samples were analyzed in this batch:** HS22030081-01

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** **HS22030081**

## 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: 18-Mar-22

## CERTIFICATIONS,ACCREDITATIONS & LICENSES

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas | 21-022-0 | 26-Mar-2022 |
| Florida | E87611-34 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 18-Mar-22

## Sample Receipt Checklist

**Work Order ID:** HS22030081 **Date/Time Received:** **02-Mar-2022 10:20**

**Client Name:** Bhate Environmental **Received by:** **Pablo Marinez**

**Completed By:** /S/ Pablo Marinez (eSignature) 02-Mar-2022 12:08 (Date/Time) **Reviewed by:** /S/ Corey Grandits (eSignature) 02-Mar-2022 18:31 (Date/Time)

Matrices: **WATER** Carrier name: **FedEx Priority Overnight**

| | Yes | No | |
|---|---|---|---|
| Shipping container/cooler in good condition? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on shipping container/cooler? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on sample bottles? | ☐ | ☐ | Not Present ☑ |
| VOA/TX1005/TX1006 Solids in hermetically sealed vials? | ☐ | ☐ | Not Present ☑ |
| Chain of custody present? | ☑ | ☐ | 1 Page(s) |
| Chain of custody signed when relinquished and received? | ☑ | ☐ | COC IDs:CLIENT |
| Samplers name present on COC? | ☑ | ☐ | |
| Chain of custody agrees with sample labels? | ☑ | ☐ | |
| Samples in proper container/bottle? | ☑ | ☐ | |
| Sample containers intact? | ☑ | ☐ | |
| Sufficient sample volume for indicated test? | ☑ | ☐ | |
| All samples received within holding time? | ☑ | ☐ | |
| Container/Temp Blank temperature in compliance? | ☑ | ☐ | |

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 0.1°C/0.6°C UC/C | IR 31 |
| Cooler(s)/Kit(s): | BLUE | |
| Date/Time sample(s) sent to storage: | 3/2/22 12:15 | |

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

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

01117709

# CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: Ragen Gigi



**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:** GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

**Prepared By:** Scott Beesinger

**P.O. Number**

HS22030081

Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Weekly Samples

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | AMMONIA-N | TOTAL ORGANIC CARBON | ORTHO-PHOSPHATE | PERCHLORATE | | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_030122 | Water | 03/01/22 / 14:00 | | 3 | X | X | | | | | | | | | H2SO4 | |
| LH18/24-SP650_030122 | Water | 03/01/22 / 14:00 | | 1 | | | X | | | | | | | | NONE | |
| LH18/24–SP650_030122_AIX | Water | 03/01/22 / 14:00 | | 1 | | | | X | | | | | | | NONE | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Analyses

**Additional Remarks:** Standard TAT on all parameters

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 03/01/22 | 14:30 | [illegible] | 3/2/22 | 10:20 | | | | | | |

**For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

**Remarks:**

Blue c.lc
IK31 CPTUS

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

01117710

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

CU

Date: 3/1/22
Name:
Company:

STODY SEAL
Time: 430

Seal Broken By:
Date:

FedEx
TRK# 0221 1891 8880 4576

WED - 02 MAR 10:30A
PRIORITY OVERNIGHT

AB SGRA Blue

77099
TX-US IAH

#475872 03/01 56DJ3/9088/FE4A

March 04, 2022

Service Request No:E2200166

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS22030081**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory March 02, 2022
For your reference, these analyses have been assigned our service request number **E2200166.**

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**
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Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

**ALS Environmental**

| | | | |
|---|---|---|---|
| **Client:** | ALS-H | **Service Request No.:** | E2200166 |
| **Project:** | HS22030081 | **Date Received:** | 03/02/22 |
| **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

One sample was received for analysis at ALS Environmental in Houston on 03/02/22.

The sample was received in good condition and is 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:**

EQ2200082: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS-DLCS recoveries are within QC limits.

Lab is DoD accredited for 6850 Perchlorate waters.

*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:**E2200166
**Project:** HS22030081

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2200166-001 | LH18/24-SP650_030122_AIX | 3/1/2022 | 1400 |

# Service Request Summary

**Folder #:** **E2200166**
Client Name: ALS Environmental - US
Project Name: HS22030081
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 03/02/22
Internal Due Date: 3/16/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22030081
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON CIO4 DOD/6850 |
|---|---|---|---|---|
| E2200166-001 | LH18/24-SP650_030122_AIX | Ground Water | 03/01/22 1400 | **IV** |

# Service Request Summary

| | | | |
|---|---|---|---|
| **Folder #:** | **E2200166** | Project Chemist: | Corey Grandits |
| Client Name: | ALS Environmental - US | Originating Lab: | HOUSTON |
| Project Name: | HS22030081 | Logged By: | CGRANDITS |
| Project Number: | | Date Received: | 03/02/22 |
| | | Internal Due Date: | 3/16/2022 |
| **Report To:** | Ragen Giga<br>ALS Environmental - US<br>10450 Stancliff Rd Suite 210<br>Houston, TX 77099<br>USA | QAP: | LAB QAP |
| | | Qualifier Set: | Lab Standard |
| | | Formset: | Lab Standard |
| | | Merged?: | Y |
| Phone Number: | | Report to MDL?: | Y |
| Cell Number: | | P.O. Number: | HS22030081 |
| Fax Number: | | EDD: | No EDD Specified |
| E-mail: | ragenp.giga@alsglobal.com | | |

1 120 mL-Plastic Bottle Natural WM Unpreserved

**Location:** EHRMS-AirArch 1

**Pressure Gas:**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 1 | Level IV due 3/23 |

# 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 | (Auto) The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result. |
| 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. |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| 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. |
| P | Indicates chlorodiphenyl ether interference present at the retention time of the target compound. |
| P | Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns |
| Q | Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria. |
| R | Duplicate Precision not met. |
| R1 | Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated. |
| S | Surrogate recovery not within specified limits. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| T | Analyte is a tentatively identified compound, result is estimated. |
| U | Compound was analyzed for, but was not detected (ND). |
| V1 | The continuing calibration verification standard was outside (biased high) the specified limits for this compound. |
| V2 | The continuing calibration verification standard was outside (biased low) the specified limits for this compound. |
| W | Result quantified, but the corresponding peak was detected outside the generated retention time window. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| X | See case narrative. |
| Y | Recovery outside limits |
| Y | The chromatogram resembles a petroleum product but does not match the calibration standard. |
| Z | The chromatogram does not resemble a petroleum product. |
| i | The MRL/MDL has been elevated due to a matrix interference. |

# ALS Laboratory Group

## Acronyms

| | |
|---|---|
| Cal | Calibration |
| Conc | CONCentration |
| Dioxin(s) | Polychlorinated dibenzo-p-dioxin(s) |
| EDL | Estimated Detection Limit |
| EMPC | Estimated Maximum Possible Concentration |
| Flags | Data qualifiers |
| Furan(s) | Polychlorinated dibenzofuran(s) |
| g | Grams |
| ICAL | Initial CALibration |
| ID | IDentifier |
| Ions | Masses monitored for the analyte during data acquisition |
| L | Liter (s) |
| LCS | Laboratory Control Sample |
| DLCS | Duplicate Laboratory Control Sample |
| MB | Method Blank |
| MCL | Method Calibration Limit |
| MDL | Method Detection Limit |
| mL | Milliliters |
| MS | Matrix Spiked sample |
| DMS | Duplicate Matrix Spiked sample |
| NO | Number of peaks meeting all identification criteria |
| PCDD(s) | Polychlorinated dibenzo-p-dioxin(s) |
| PCDF(s) | Polychlorinated dibenzofuran(s) |
| ppb | Parts per billion |
| ppm | Parts per million |
| ppq | Parts per quadrillion |
| ppt | Parts per trillion |
| QA | Quality Assurance |
| QC | Quality Control |
| Ratio | Ratio of areas from monitored ions for an analyte |
| % Rec. | Percent recovery |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| RT | Retention Time |
| SDG | Sample Delivery Group |
| S/N | Signal-to-noise ratio |
| TEF | Toxicity Equivalence Factor |
| TEQ | Toxicity Equivalence Quotient |

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ALS Environmental

## State Certifications, Accreditations, and Licenses

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas Department of Environmental Quality | 19-028-0 | 6/30/2022 |
| Arkansas Department of Environmental Quality | 21-022-0 | 3/26/2022 |
| Florida Department of Health | E87611-33 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 5/1/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

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Houston, TX 77099
**T:** +1 281 530 5656
**F:** +1 281 530 5887
**www.alsglobal.com**

# Subcontract Chain of Custody

**SAMPLING STATE:** **Dept of Defense** **COC ID: 18222**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

**Company:** ALS Houston
**Contact:** Ragen Giga
**Address:** 10450 Stancliff Rd, Ste 210
**Phone:** +1 281 530 5656
**Email:** RagenP.Giga@ALSGlobal.com
**Alternate Contact:**
**Email:**

**INVOICE INFORMATION:**

**Company:** ALS Houston
**Contact:** Accounts Payable
**Address:** 10450 Stancliff Rd, Ste 210
**Phone:** +1 281 530 5656
**Reference:** HS22030081
**TSR:** Houston House Acct

| | LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | | | DUE DATE |
| **1.** | **HS22030081-02** | **LH18/24-SP650_030122_AIX** | **Water** | **01 Mar 2022 14:00** |
| | 6850-Perch. DOD Level II & Level IV in separate pdf | | | 16 Mar 2022 |

**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: 3-2-22 12:30

Received By: _____ Date/Time: 3-2-22 12:

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

# Cooler Receipt Form

Project Chemist: LG

Client/Project: ALS-H

Thermometer ID: 1231

Date/Time Received: 3-2-22 Initials: LG Date/Time Logged in: 3-2-22 Initials: LG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☒ Courier (ALS) ○ Client
2. Samples received in: ☒ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ☒ No
   Were they intact? ○ Yes ○ No ☒ N/A
   Were they signed and dated? ○ Yes ○ No ☒ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ☒ Baggies ○ Bubble Wrap ○ Gel Packs ☒ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

| Cooler Tracking Number | COC ID | Date Opened | Time Opened | Opened By | Temp. °C | Temp Blank? |
|---|---|---|---|---|---|---|
| NA | | 3-2-22 | 1230 | LG | 0.5/1.0 | ☒ |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☒ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☒ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☒ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☒ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☒ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

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**
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Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

# *Preparation Information Benchsheet*

**Prep Run#:** 396095 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 3/3/22 08:29

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2200166-001 | LH18/24-SP650_030122_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 2 | E2200167-001 | LH18/24-SP140_030122 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 3 | E2200168-001 | LH18/24-SP650_030122_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 4 | EQ2200082-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 5 | EQ2200082-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 6 | EQ2200082-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 7 | R2201678-004 | 2202240920A ST-5-481 | .01 | 6850/ClO4 | | | Water | 10mL | |

## Spiking Solutions

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 221408 Logbook Ref: Perchlorate Internal Standard Expires On: 04/30/2022

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E2200166-001 | 100.00µL | E2200167-001 | 100.00µL | E2200168-001 | 100.00µL | EQ2200082-01 | 100.00µL | EQ2200082-01 | 100.00µL | EQ2200082-02 | 100.00µL |
| EQ2200082-02 | 100.00µL | EQ2200082-03 | 100.00µL | EQ2200082-03 | 100.00µL | R2201678-004 | 100.00µL | | | | |

Name: Perchlorate Intermediate Stock1 Inventory ID 221456 Logbook Ref: Perchlorate Expires On: 04/30/2022

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| EQ2200082-02 | 1.00µL | EQ2200082-02 | 1.00µL | EQ2200082-03 | 1.00µL | EQ2200082-03 | 1.00µL |

## Preparation Materials

| | | | | | |
|---|---|---|---|---|---|
| Water HPLC Grade | 08/03/2021 Water (218532) | 6850 Amber Glass screw vial | 2mL Screw Top Vial (221308) | 537M Glass Culture Tubes | 537M Glass Tubes (218064) |
| 6850 0.45um syringe filters | 6850 Syringe Filters (219639) | 6850 Luer-Lok Syringes | Luer-Lok Syringes (221305) | 6850 Pipette Tips 50-1000 uL | 6850 Pipette Tips (221307) |

## Preparation Steps

Step: Preparation
Started: 3/3/22 08:29
Finished: 3/3/22 09:12
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 3/3/22

Chain of Custody

Relinquished By: _____ Date: _____ Extracts Examined

Received By: _____ Date: _____ Yes No

# Analytical Results

**ALS Environmental - Houston HRMS**
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Phone (713)266-1599 Fax (713)266-0130
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**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200166 |
| **Project:** | HS22030081 | **Date Collected:** | 3/ 1/22 1400 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 3/ 2/22 |
| **Sample Name:** | LH18/24-SP650_030122_AIX | **Units:** | µg/L |
| **Lab Code:** | E2200166-001 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850
**Prep Method:** Method

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | ND | U | 0.100 | 0.0500 | 0.0250 | 1 | 3/ 3/22 | 3/3/22 14:05 | 396095 | 756210 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200166 |
| **Project:** | HS22030081 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2200082-01 | **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 | 3/ 3/22 | 3/3/22 16:01 | 396095 | 756210 | |

# 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:** | E2200166 |
| **Project:** | HS22030081 | **Date Analyzed:** | 3/ 3/22 |
| **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:** | 396095 |

| | Lab Control Sample EQ2200082-02 | | | Duplicate Lab Control Sample EQ2200082-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.114 | 0.100 | 114 | 0.119 | 0.100 | 119 | 84 - 119 | 5 | 15 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200166 |
| **Project:** | HS22030081 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200082-02 | **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 | **0.114** | | 0.100 | 0.0500 | 0.0250 | 1 | 3/ 3/22 | 3/3/22 15:30 | 396095 | 756210 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200166 |
| **Project:** | HS22030081 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200082-03 | **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 | **0.119** | | 0.100 | 0.0500 | 0.0250 | 1 | 3/ 3/22 | 3/3/22 15:38 | 396095 | 756210 | |

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

March 18, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22030082**

Laboratory Results for: **Longhorn GW Treatment Plant Monthly Influent Samples**

Dear Marcia Olive,

ALS Environmental received 1 sample(s) on Mar 02, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: DAYNA.FISHER**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent Samples
**Work Order:** HS22030082

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22030082-01 | LH18/24-SP140_030122 | Water | | 01-Mar-2022 14:00 | 02-Mar-2022 10:20 | ☐ |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent Samples
**Work Order:** HS22030082

**CASE NARRATIVE**

## Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached

## Metals by Method SW6020A

### Batch ID: 176355

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method SW7196

### Batch ID: R403754

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

**ALS Houston, US**

Date: 18-Mar-22

**ANALYTICAL REPORT**

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder:HS22030082
Sample ID: LH18/24-SP140_030122
Lab ID:HS22030082-01
Collection Date: 01-Mar-2022 14:00
Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **METALS BY ICPMS BY SW6020A** | | **Method:SW6020A** | | | | Prep:SW3010A / 15-Mar-2022 | | Analyst: JHD |
| Selenium | 0.00250 | U | 0.00110 | 0.00250 | 0.00500 | mg/L | 1 | 16-Mar-2022 13:07 |
| Silver | 0.000500 | U | 0.000200 | 0.000500 | 0.00500 | mg/L | 1 | 16-Mar-2022 13:07 |
| **HEXAVALENT CHROMIUM BY SW7196A** | | **Method:SW7196** | | | | | | Analyst: MZD |
| Chromium, Hexavalent | 0.0100 | U | 0.00600 | 0.0100 | 0.0100 | mg/L | 1 | 02-Mar-2022 13:47 |
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 04-Mar-2022 13:53 |

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

**ALS Houston, US** Date: 18-Mar-22

**Weight / Prep Log**

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent Samples
**WorkOrder:** HS22030082

**Batch ID:** 176355 **Start Date:** 15 Mar 2022 09:00 **End Date:** 15 Mar 2022 13:00
**Method:** WATER - SW3010A **Prep Code:** 3010A

| Sample ID | Container | Sample Wt/Vol | Final Volume | Prep Factor | |
|---|---|---|---|---|---|
| HS22030082-01 | | 10 (mL) | 10 (mL) | 1 | 120 plastic HNO3 |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent Samples
**WorkOrder:** HS22030082

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** 176355 ( 0 ) | **Test Name :** METALS BY ICPMS BY SW6020A | | | | **Matrix:** Water | |
| HS22030082-01 | LH18/24-SP140_030122 | 01 Mar 2022 14:00 | | 15 Mar 2022 09:00 | 16 Mar 2022 13:07 | 1 |
| **Batch ID:** R403518 ( 0 ) | **Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) | | | | **Matrix:** Water | |
| HS22030082-01 | LH18/24-SP140_030122 | 01 Mar 2022 14:00 | | | 04 Mar 2022 13:53 | 1 |
| **Batch ID:** R403754 ( 0 ) | **Test Name :** HEXAVALENT CHROMIUM BY SW7196A | | | | **Matrix:** Water | |
| HS22030082-01 | LH18/24-SP140_030122 | 01 Mar 2022 14:00 | | | 02 Mar 2022 13:47 | 1 |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent Samples
**WorkOrder:** HS22030082

**QC BATCH REPORT**

**Batch ID:** 176355 ( 0 ) **Instrument:** ICPMS06 **Method:** METALS BY ICPMS BY SW6020A

**MBLK** Sample ID: **MBLK-176355** Units: **mg/L** Analysis Date: **16-Mar-2022 13:03**
Client ID: Run ID: **ICPMS06_404248** SeqNo: **6547004** PrepDate: **15-Mar-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Selenium | 0.00250 | 0.00500 | | | | | | | | U |
| Silver | 0.000500 | 0.00500 | | | | | | | | U |

**LCS** Sample ID: **LCS-176355** Units: **mg/L** Analysis Date: **16-Mar-2022 13:05**
Client ID: Run ID: **ICPMS06_404248** SeqNo: **6547005** PrepDate: **15-Mar-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Selenium | 0.05187 | 0.00500 | 0.05 | 0 | 104 | 80 - 120 | | | | |
| Silver | 0.0499 | 0.00500 | 0.05 | 0 | 99.8 | 85 - 116 | | | | |

**MS** Sample ID: **HS22030082-01MS** Units: **mg/L** Analysis Date: **16-Mar-2022 13:11**
Client ID: **LH18/24-SP140_030122** Run ID: **ICPMS06_404248** SeqNo: **6547008** PrepDate: **15-Mar-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Selenium | 0.05326 | 0.00500 | 0.05 | 0.00033 | 106 | 80 - 120 | | | | |
| Silver | 0.04952 | 0.00500 | 0.05 | 0.000006 | 99.0 | 85 - 116 | | | | |

**MSD** Sample ID: **HS22030082-01MSD** Units: **mg/L** Analysis Date: **16-Mar-2022 13:13**
Client ID: **LH18/24-SP140_030122** Run ID: **ICPMS06_404248** SeqNo: **6547009** PrepDate: **15-Mar-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Selenium | 0.05236 | 0.00500 | 0.05 | 0.00033 | 104 | 80 - 120 | 0.05326 | 1.72 | 20 | |
| Silver | 0.04751 | 0.00500 | 0.05 | 0.000006 | 95.0 | 85 - 116 | 0.04952 | 4.15 | 20 | |

**PDS** Sample ID: **HS22030082-01PDS** Units: **mg/L** Analysis Date: **16-Mar-2022 13:15**
Client ID: **LH18/24-SP140_030122** Run ID: **ICPMS06_404248** SeqNo: **6547010** PrepDate: **15-Mar-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Selenium | 0.1188 | 0.00500 | 0.1 | 0.00033 | 119 | 80 - 120 | | | | |
| Silver | 0.1059 | 0.00500 | 0.1 | 0.000006 | 106 | 80 - 120 | | | | |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent Samples
**WorkOrder:** HS22030082

**QC BATCH REPORT**

**Batch ID:** **176355 ( 0 )** **Instrument:** **ICPMS06** **Method:** **METALS BY ICPMS BY SW6020A**

**SD** Sample ID: **HS22030082-01SD** Units: **mg/L** Analysis Date: **16-Mar-2022 13:09**
Client ID: **LH18/24-SP140_030122** Run ID: **ICPMS06_404248** SeqNo: **6547007** PrepDate: **15-Mar-2022** DF: **5**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %D | %D Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Selenium | 0.0125 | 0.0250 | | | | | 0.00033 | 0 | 10 | U |
| Silver | 0.00250 | 0.0250 | | | | | 0.000006 | 0 | 10 | U |

**The following samples were analyzed in this batch:** HS22030082-01

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent Samples
**WorkOrder:** HS22030082

**QC BATCH REPORT**

**Batch ID:** R403754 ( 0 ) **Instrument:** UV-2450 **Method:** HEXAVALENT CHROMIUM BY SW7196A

**MBLK** Sample ID: **MBLK-R403754** Units: **mg/L** Analysis Date: **02-Mar-2022 13:47**
Client ID: Run ID: **UV-2450_403754** SeqNo: **6536624** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 0.0100 | 0.0100 | | | | | | | | U |

**LCS** Sample ID: **LCS-R403754** Units: **mg/L** Analysis Date: **02-Mar-2022 13:47**
Client ID: Run ID: **UV-2450_403754** SeqNo: **6536623** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 0.267 | 0.0100 | 0.25 | 0 | 107 | 90 - 111 | | | | |

**MS** Sample ID: **HS22030082-01MS** Units: **mg/L** Analysis Date: **02-Mar-2022 13:47**
Client ID: **LH18/24-SP140_030122** Run ID: **UV-2450_403754** SeqNo: **6536626** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 0.271 | 0.0100 | 0.25 | 0 | 108 | 90 - 111 | | | | |

**MSD** Sample ID: **HS22030082-01MSD** Units: **mg/L** Analysis Date: **02-Mar-2022 13:47**
Client ID: **LH18/24-SP140_030122** Run ID: **UV-2450_403754** SeqNo: **6536625** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 0.27 | 0.0100 | 0.25 | 0 | 108 | 90 - 111 | 0.271 | 0.37 | 20 | |

**The following samples were analyzed in this batch:** HS22030082-01

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Influent Samples
**WorkOrder:** **HS22030082**

## 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: 18-Mar-22

## CERTIFICATIONS,ACCREDITATIONS & LICENSES

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas | 21-022-0 | 26-Mar-2022 |
| Florida | E87611-34 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 18-Mar-22

## Sample Receipt Checklist

**Work Order ID:** HS22030082 **Date/Time Received:** **02-Mar-2022 10:20**

**Client Name:** Bhate Environmental **Received by:** **Pablo Marinez**

**Completed By:** /S/ Pablo Marinez (eSignature) 02-Mar-2022 12:12 (Date/Time) **Reviewed by:** /S/ Corey Grandits (eSignature) 02-Mar-2022 18:30 (Date/Time)

Matrices: **WATER** Carrier name: **FedEx Priority Overnight**

| | Yes | No | |
|---|---|---|---|
| Shipping container/cooler in good condition? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on shipping container/cooler? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on sample bottles? | ☐ | ☐ | Not Present ☑ |
| VOA/TX1005/TX1006 Solids in hermetically sealed vials? | ☐ | ☐ | Not Present ☑ |
| Chain of custody present? | ☑ | ☐ | 1 Page(s) |
| Chain of custody signed when relinquished and received? | ☑ | ☐ | COC IDs:CLIENT |
| Samplers name present on COC? | ☑ | ☐ | |
| Chain of custody agrees with sample labels? | ☑ | ☐ | |
| Samples in proper container/bottle? | ☑ | ☐ | |
| Sample containers intact? | ☑ | ☐ | |
| Sufficient sample volume for indicated test? | ☑ | ☐ | |
| All samples received within holding time? | ☑ | ☐ | |
| Container/Temp Blank temperature in compliance? | ☑ | ☐ | |

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 0.1°C/0.6°C UC/C | IR 31 |
| Cooler(s)/Kit(s): | BLUE | |
| Date/Time sample(s) sent to storage: | 3/2/22 12:15 | |

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

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

01117746

# CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd., Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: Ragen Gigi



**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:**
## GROUNDWATER TREATMENT PLANT MONTHLY INFLUENT SAMPLES

**Prepared By:** Scott Beesinger

**P.O. Number**

HS22030082
Bhate Environmental Associates, Inc.
nghorn GW Treatment Plant Monthly Influent Sample

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | SILVER & SELENIUM | HEXAVALENT CHROMIUM | PERCHLORATE | | | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP140_030122 | Water | 03/01/22 / 14:00 | | 1 | X | | | | | | | | | | HNO3 | |
| LH18/24-SP140_030122 | Water | 03/01/22 / 14:00 | | 2 | | X | X | | | | | | | | NONE | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Analyses

**Additional Remarks:** **STANDARD TURN AROUND TIME**

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 03/01/22 | 14:30 | [illegible] | 3.2.22 | 10:00 | | | | | | |

**For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Remarks:

Blue O.K
(KSI CP705

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

01117747

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

Blue

CU
Date: 3/1/22
Name: Scott
Company:

STODY SEAL
Time: 1430

Seal Broken By:
Date: 3-2-22

FedEx
TRK# 0221 1891 8880 4576

WED - 02 MAR 10:30A
PRIORITY OVERNIGHT

AB SGRA

Blue

77099
TX - US IAH

#475872 03/01 56DJ3/9088/FE4A

March 04, 2022

Service Request No:E2200167

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS22030082**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory March 02, 2022
For your reference, these analyses have been assigned our service request number **E2200167.**

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-H | **Service Request No.:** | E2200167 |
| **Project:** | HS22030082 | **Date Received:** | 03/02/22 |
| **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

One sample was received for analysis at ALS Environmental in Houston on 03/02/22.

The sample was received in good condition and is 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:**

EQ2200082: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS-DLCS recoveries are within QC limits.

Lab is DoD accredited for 6850 Perchlorate waters.

*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:**E2200167
**Project:** HS22030082

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2200167-001 | LH18/24-SP140_030122 | 3/1/2022 | 1400 |

# Service Request Summary

**Folder #:** **E2200167**
Client Name: ALS Environmental - US
Project Name: HS22030082
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 03/02/22
Internal Due Date: 3/16/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22030082
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON ClO4 DOD/6850 |
|---|---|---|---|---|
| E2200167-001 | LH18/24-SP140_030122 | Ground Water | 03/01/22 1400 | **IV** |

# Service Request Summary

| | |
|---|---|
| **Folder #:** | **E2200167** |
| Client Name: | ALS Environmental - US |
| Project Name: | HS22030082 |
| Project Number: | |
| **Report To:** | Ragen Giga<br>ALS Environmental - US<br>10450 Stancliff Rd Suite 210<br>Houston, TX 77099<br>USA |
| Phone Number: | |
| Cell Number: | |
| Fax Number: | |
| E-mail: | ragenp.giga@alsglobal.com |

| | |
|---|---|
| Project Chemist: | Corey Grandits |
| Originating Lab: | HOUSTON |
| Logged By: | CGRANDITS |
| Date Received: | 03/02/22 |
| Internal Due Date: | 3/16/2022 |
| QAP: | LAB QAP |
| Qualifier Set: | Lab Standard |
| Formset: | Lab Standard |
| Merged?: | Y |
| Report to MDL?: | Y |
| P.O. Number: | HS22030082 |
| EDD: | No EDD Specified |

1 120 mL-Plastic Bottle Natural WM Unpreserved

**Location:** EHRMS-AirArch 1

**Pressure Gas:**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 1 | Level IV due 3/23 |

# 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 | (Auto) The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result. |
| 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. |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| 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. |
| P | Indicates chlorodiphenyl ether interference present at the retention time of the target compound. |
| P | Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns |
| Q | Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria. |
| R | Duplicate Precision not met. |
| R1 | Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated. |
| S | Surrogate recovery not within specified limits. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| T | Analyte is a tentatively identified compound, result is estimated. |
| U | Compound was analyzed for, but was not detected (ND). |
| V1 | The continuing calibration verification standard was outside (biased high) the specified limits for this compound. |
| V2 | The continuing calibration verification standard was outside (biased low) the specified limits for this compound. |
| W | Result quantified, but the corresponding peak was detected outside the generated retention time window. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| X | See case narrative. |
| Y | Recovery outside limits |
| Y | The chromatogram resembles a petroleum product but does not match the calibration standard. |
| Z | The chromatogram does not resemble a petroleum product. |
| i | The MRL/MDL has been elevated due to a matrix interference. |

# ALS Laboratory Group

## Acronyms

| | |
|---|---|
| Cal | Calibration |
| Conc | CONCentration |
| Dioxin(s) | Polychlorinated dibenzo-p-dioxin(s) |
| EDL | Estimated Detection Limit |
| EMPC | Estimated Maximum Possible Concentration |
| Flags | Data qualifiers |
| Furan(s) | Polychlorinated dibenzofuran(s) |
| g | Grams |
| ICAL | Initial CALibration |
| ID | IDentifier |
| Ions | Masses monitored for the analyte during data acquisition |
| L | Liter (s) |
| LCS | Laboratory Control Sample |
| DLCS | Duplicate Laboratory Control Sample |
| MB | Method Blank |
| MCL | Method Calibration Limit |
| MDL | Method Detection Limit |
| mL | Milliliters |
| MS | Matrix Spiked sample |
| DMS | Duplicate Matrix Spiked sample |
| NO | Number of peaks meeting all identification criteria |
| PCDD(s) | Polychlorinated dibenzo-p-dioxin(s) |
| PCDF(s) | Polychlorinated dibenzofuran(s) |
| ppb | Parts per billion |
| ppm | Parts per million |
| ppq | Parts per quadrillion |
| ppt | Parts per trillion |
| QA | Quality Assurance |
| QC | Quality Control |
| Ratio | Ratio of areas from monitored ions for an analyte |
| % Rec. | Percent recovery |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| RT | Retention Time |
| SDG | Sample Delivery Group |
| S/N | Signal-to-noise ratio |
| TEF | Toxicity Equivalence Factor |
| TEQ | Toxicity Equivalence Quotient |

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ALS Environmental

## State Certifications, Accreditations, and Licenses

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas Department of Environmental Quality | 19-028-0 | 6/30/2022 |
| Arkansas Department of Environmental Quality | 21-022-0 | 3/26/2022 |
| Florida Department of Health | E87611-33 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 5/1/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

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Houston, TX 77099
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**F:** +1 281 530 5887
**www.alsglobal.com**

# Subcontract Chain of Custody

**SAMPLING STATE:** **Dept of Defense** **COC ID: 18223**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

**Company:** ALS Houston
**Contact:** Ragen Giga
**Address:** 10450 Stancliff Rd, Ste 210
**Phone:** +1 281 530 5656
**Email:** RagenP.Giga@ALSGlobal.com
**Alternate Contact:**
**Email:**

**INVOICE INFORMATION:**

**Company:** ALS Houston
**Contact:** Accounts Payable
**Address:** 10450 Stancliff Rd, Ste 210
**Phone:** +1 281 530 5656
**Reference:** HS22030082
**TSR:** Sonia West

| | LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | | | DUE DATE |
| **1.** | **HS22030082-01** | **LH18/24-SP140_030122** | **Water** | **01 Mar 2022 14:00** |
| | 6850-Perch. DOD Level II & Level IV in separate pdf | | | 16 Mar 2022 |

**Comments:** Please analyze for the analysis listed above.
Send report to the emails shown above.

**QC Level:** DOD IV (DoD Data Package)

Relinquished By: Pal [illegible] Date/Time: 3.2.22 12:30

Received By: [illegible] Date/Time: 3-2-22 12:30

Cooler ID(s): Temperature(s):

ALS Environmental

# Cooler Receipt Form

Project Chemist: LG

Client/Project: ALS-H

Thermometer ID: 1231

Date/Time Received: 3-2-22 Initials: LG

Date/Time Logged in: 3-2-22 Initials: LG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☒ Courier (ALS) ○ Client
2. Samples received in: ☒ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ☒ No
   Were they intact? ○ Yes ○ No ☒ N/A
   Were they signed and dated? ○ Yes ○ No ☒ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ☒ Baggies ○ Bubble Wrap ○ Gel Packs ☒ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

| Cooler Tracking Number | COC ID | Date Opened | Time Opened | Opened By | Temp. °C | Temp Blank? |
|---|---|---|---|---|---|---|
| NA | | 3-2-22 | 1230 | LG | 0.5/1.0 | ☒ |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☒ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☒ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☒ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☒ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☒ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

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

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Phone (713)266-1599 Fax (713)266-0130
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# *Preparation Information Benchsheet*

**Prep Run#:** 396095 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 3/3/22 08:29

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2200166-001 | LH18/24-SP650_030122_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 2 | E2200167-001 | LH18/24-SP140_030122 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 3 | E2200168-001 | LH18/24-SP650_030122_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 4 | EQ2200082-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 5 | EQ2200082-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 6 | EQ2200082-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 7 | R2201678-004 | 2202240920A ST-5-481 | .01 | 6850/ClO4 | | | Water | 10mL | |

## Spiking Solutions

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 221408 Logbook Ref: Perchlorate Internal Standard Expires On: 04/30/2022

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E2200166-001 | 100.00µL | E2200167-001 | 100.00µL | E2200168-001 | 100.00µL | EQ2200082-01 | 100.00µL | EQ2200082-01 | 100.00µL | EQ2200082-02 | 100.00µL |
| EQ2200082-02 | 100.00µL | EQ2200082-03 | 100.00µL | EQ2200082-03 | 100.00µL | R2201678-004 | 100.00µL | | | | |

Name: Perchlorate Intermediate Stock1 Inventory ID 221456 Logbook Ref: Perchlorate Expires On: 04/30/2022

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| EQ2200082-02 | 1.00µL | EQ2200082-02 | 1.00µL | EQ2200082-03 | 1.00µL | EQ2200082-03 | 1.00µL |

## Preparation Materials

| | | | | | |
|---|---|---|---|---|---|
| Water HPLC Grade | 08/03/2021 Water (218532) | 6850 Amber Glass screw vial | 2mL Screw Top Vial (221308) | 537M Glass Culture Tubes | 537M Glass Tubes (218064) |
| 6850 0.45um syringe filters | 6850 Syringe Filters (219639) | 6850 Luer-Lok Syringes | Luer-Lok Syringes (221305) | 6850 Pipette Tips 50-1000 uL | 6850 Pipette Tips (221307) |

## Preparation Steps

Step: Preparation
Started: 3/3/22 08:29
Finished: 3/3/22 09:12
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 3/3/22

Chain of Custody

Relinquished By: _____ Date: _____ Extracts Examined

Received By: _____ Date: _____ Yes No

# Analytical Results

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**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200167 |
| **Project:** | HS22030082 | **Date Collected:** | 3/ 1/22 1400 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 3/ 2/22 |
| **Sample Name:** | LH18/24-SP140_030122 | **Units:** | µg/L |
| **Lab Code:** | E2200167-001 | **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 | **16800** | | 100 | 50.0 | 25.0 | 1000 | 3/ 3/22 | 3/3/22 14:50 | 396095 | 756210 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200167 |
| **Project:** | HS22030082 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2200082-01 | **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 | 3/ 3/22 | 3/3/22 16:01 | 396095 | 756210 | |

# Accuracy & Precision

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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:** | E2200167 |
| **Project:** | HS22030082 | **Date Analyzed:** | 3/ 3/22 |
| **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:** | 396095 |

| | Lab Control Sample EQ2200082-02 | | | Duplicate Lab Control Sample EQ2200082-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.114 | 0.100 | 114 | 0.119 | 0.100 | 119 | 84 - 119 | 5 | 15 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200167 |
| **Project:** | HS22030082 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200082-02 | **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 | **0.114** | | 0.100 | 0.0500 | 0.0250 | 1 | 3/ 3/22 | 3/3/22 15:30 | 396095 | 756210 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200167 |
| **Project:** | HS22030082 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200082-03 | **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 | **0.119** | | 0.100 | 0.0500 | 0.0250 | 1 | 3/ 3/22 | 3/3/22 15:38 | 396095 | 756210 | |

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Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

March 18, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22030083**

Laboratory Results for: **Longhorn GW Treatment Plant Monthly Effluent Samples**

Dear Marcia Olive,

ALS Environmental received 3 sample(s) on Mar 02, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: DAYNA.FISHER**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**Work Order:** HS22030083

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22030083-01 | LH18/24-SP650_030122 | Water | | 01-Mar-2022 14:00 | 02-Mar-2022 10:20 | ☐ |
| HS22030083-02 | LH18/24-SP650_030122_AIX | Water | | 01-Mar-2022 14:00 | 02-Mar-2022 10:20 | ☐ |
| HS22030083-03 | Trip Blank | Water | | 01-Mar-2022 14:00 | 02-Mar-2022 10:20 | ☐ |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**Work Order:** HS22030083

**CASE NARRATIVE**

## Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached

## GCMS Semivolatiles by Method SW8270SIM

### Batch ID: 176063

**Sample ID: LH18/24-SP650_030122 (HS22030083-01)**

- The surrogate recoveries could not be determined due to dilution below the calibration range.

## GCMS Volatiles by Method SW8260

### Batch ID: R403515

**Sample ID: HS22021286-02MS**

- MS and MSD are for an unrelated sample

## Metals by Method SW6020A

### Batch ID: 176355

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method SW7196

### Batch ID: R403754

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

**ALS Houston, US** Date: 18-Mar-22

Client: Bhate Environmental Associates, Inc.

**ANALYTICAL REPORT**

Project: Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS22030083

Sample ID: LH18/24-SP650_030122 Lab ID:HS22030083-01

Collection Date: 01-Mar-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: ZQM |
| 1,1,1,2-Tetrachloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 1,1,1-Trichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 1,1-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 1,1-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 1,1-Dichloropropene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 1,2,3-Trichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 1,2,3-Trichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 1,2,4-Trichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 1,2,4-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 1,2-Dibromo-3-chloropropane | 1.0 | U | 0.20 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 1,2-Dibromoethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 1,2-Dichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 1,2-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 1,2-Dichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 1,3,5-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 1,3-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 1,3-Dichloropropane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 1,4-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 2,2-Dichloropropane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 2-Butanone | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 2-Chlorotoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 2-Hexanone | 2.0 | U | 1.0 | 2.0 | 2.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 4-Chlorotoluene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 4-Isopropyltoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| 4-Methyl-2-pentanone | 2.0 | U | 0.70 | 2.0 | 2.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Acetone | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Benzene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Bromobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Bromochloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Bromodichloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Bromoform | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Bromomethane | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Carbon disulfide | 2.0 | U | 0.60 | 2.0 | 2.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Carbon tetrachloride | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Chlorobenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Chloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Chloroform | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |

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

**ALS Houston, US** Date: 18-Mar-22

Client: Bhate Environmental Associates, Inc.

**ANALYTICAL REPORT**

Project: Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS22030083

Sample ID: LH18/24-SP650_030122 Lab ID:HS22030083-01

Collection Date: 01-Mar-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: ZQM |
| Chloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| **cis-1,2-Dichloroethene** | **0.62** | J | **0.20** | **0.50** | **1.0** | **ug/L** | 1 | 03-Mar-2022 17:23 |
| cis-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Dibromochloromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Dibromomethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Dichlorodifluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Ethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Hexachlorobutadiene | 1.0 | U | 1.0 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Isopropylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| m,p-Xylene | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Methylene chloride | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| n-Butylbenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| n-Propylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Naphthalene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| o-Xylene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| sec-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Styrene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| tert-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Tetrachloroethene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Toluene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| trans-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| trans-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Trichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Trichlorofluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| Vinyl chloride | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:23 |
| *Surr: 1,2-Dichloroethane-d4* | *89.4* | | | **0** | *81-118* | *%REC* | *1* | *03-Mar-2022 17:23* |
| *Surr: 4-Bromofluorobenzene* | *100* | | | **0** | *85-114* | *%REC* | *1* | *03-Mar-2022 17:23* |
| *Surr: Dibromofluoromethane* | *87.0* | | | **0** | *80-119* | *%REC* | *1* | *03-Mar-2022 17:23* |
| *Surr: Toluene-d8* | *106* | | | **0** | *89-112* | *%REC* | *1* | *03-Mar-2022 17:23* |
| **SEMIVOLATILES SIM** | | **Method:SW8270SIM** | | | | Prep:SW3510 / 07-Mar-2022 | | Analyst: JLJ |
| **1,4-Dioxane** | **14** | a | **1.0** | **1.0** | **1.0** | **ug/L** | 100 | 11-Mar-2022 14:09 |
| *Surr: 2-Fluorobiphenyl* | *0* | *S* | | 0 | *40-140* | *%REC* | *100* | *11-Mar-2022 14:09* |
| *Surr: 4-Terphenyl-d14* | *0* | *S* | | 0 | *40-140* | *%REC* | *100* | *11-Mar-2022 14:09* |
| *Surr: Nitrobenzene-d5* | *0* | *S* | | 0 | *40-140* | *%REC* | *100* | *11-Mar-2022 14:09* |
| **METALS BY ICPMS BY SW6020A** | | **Method:SW6020A** | | | | Prep:SW3010A / 15-Mar-2022 | | Analyst: JHD |
| **Barium** | **0.785** | | **0.00190** | **0.00250** | **0.00500** | **mg/L** | 1 | 16-Mar-2022 13:17 |
| Lead | 0.00100 | U | 0.000600 | 0.00100 | 0.00500 | mg/L | 1 | 16-Mar-2022 13:17 |
| Selenium | 0.00250 | U | 0.00110 | 0.00250 | 0.00500 | mg/L | 1 | 16-Mar-2022 13:17 |
| Silver | 0.000500 | U | 0.000200 | 0.000500 | 0.00500 | mg/L | 1 | 16-Mar-2022 13:17 |

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

**ALS Houston, US**

Date: 18-Mar-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Monthly Effluent Samples | WorkOrder:HS22030083 |
| Sample ID: | LH18/24-SP650_030122 | Lab ID:HS22030083-01 |
| Collection Date: | 01-Mar-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **HEXAVALENT CHROMIUM BY SW7196A** | | **Method:SW7196** | | | | | | Analyst: MZD |
| Chromium, Hexavalent | 0.0100 | U | 0.00600 | 0.0100 | 0.0100 | mg/L | 1 | 02-Mar-2022 13:47 |

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

**ALS Houston, US**

Date: 18-Mar-22

**ANALYTICAL REPORT**

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder:HS22030083
Sample ID: LH18/24-SP650_030122_AIX
Lab ID:HS22030083-02
Collection Date: 01-Mar-2022 14:00
Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 04-Mar-2022 13:53 |

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

**ALS Houston, US** Date: 18-Mar-22

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS22030083
Sample ID: Trip Blank Lab ID:HS22030083-03
Collection Date: 01-Mar-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: ZQM |
| 1,1,1,2-Tetrachloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 1,1,1-Trichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 1,1-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 1,1-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 1,1-Dichloropropene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 1,2,3-Trichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 1,2,3-Trichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 1,2,4-Trichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 1,2,4-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 1,2-Dibromo-3-chloropropane | 1.0 | U | 0.20 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 1,2-Dibromoethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 1,2-Dichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 1,2-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 1,2-Dichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 1,3,5-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 1,3-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 1,3-Dichloropropane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 1,4-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 2,2-Dichloropropane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 2-Butanone | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 2-Chlorotoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 2-Hexanone | 2.0 | U | 1.0 | 2.0 | 2.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 4-Chlorotoluene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 4-Isopropyltoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| 4-Methyl-2-pentanone | 2.0 | U | 0.70 | 2.0 | 2.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Acetone | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Benzene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Bromobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Bromochloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Bromodichloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Bromoform | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Bromomethane | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Carbon disulfide | 2.0 | U | 0.60 | 2.0 | 2.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Carbon tetrachloride | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Chlorobenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Chloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Chloroform | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |

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

**ALS Houston, US** Date: 18-Mar-22

Client: Bhate Environmental Associates, Inc.

**ANALYTICAL REPORT**

Project: Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS22030083

Sample ID: Trip Blank Lab ID:HS22030083-03

Collection Date: 01-Mar-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: ZQM |
| Chloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| cis-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| cis-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Dibromochloromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Dibromomethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Dichlorodifluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Ethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Hexachlorobutadiene | 1.0 | U | 1.0 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Isopropylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| m,p-Xylene | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Methylene chloride | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| n-Butylbenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| n-Propylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Naphthalene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| o-Xylene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| sec-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Styrene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| tert-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Tetrachloroethene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Toluene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| trans-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| trans-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Trichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Trichlorofluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| Vinyl chloride | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 03-Mar-2022 17:00 |
| *Surr: 1,2-Dichloroethane-d4* | *88.1* | | | **0** | *81-118* | *%REC* | *1* | *03-Mar-2022 17:00* |
| *Surr: 4-Bromofluorobenzene* | *100* | | | **0** | *85-114* | *%REC* | *1* | *03-Mar-2022 17:00* |
| *Surr: Dibromofluoromethane* | *85.7* | | | **0** | *80-119* | *%REC* | *1* | *03-Mar-2022 17:00* |
| *Surr: Toluene-d8* | *106* | | | **0** | *89-112* | *%REC* | *1* | *03-Mar-2022 17:00* |

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

**ALS Houston, US** Date: 18-Mar-22

## Weight / Prep Log

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22030083

**Batch ID:** 176063 **Start Date:** 07 Mar 2022 09:43 **End Date:** 07 Mar 2022 13:30
**Method:** SV AQ SEP FUN EXTRACT-LOWLEV - 3510C **Prep Code:** 3510_B_SIM

| Sample ID | Container | Sample Wt/Vol | Final Volume | Prep Factor | |
|---|---|---|---|---|---|
| HS22030083-01 | 1 | 1000 (mL) | 1 (mL) | 0.001 | 1-liter amber glass, Neat |

**Batch ID:** 176355 **Start Date:** 15 Mar 2022 09:00 **End Date:** 15 Mar 2022 13:00
**Method:** WATER - SW3010A **Prep Code:** 3010A

| Sample ID | Container | Sample Wt/Vol | Final Volume | Prep Factor | |
|---|---|---|---|---|---|
| HS22030083-01 | | 10 (mL) | 10 (mL) | 1 | 120 plastic HNO3 |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22030083

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** 176063 ( 0 ) | **Test Name :** SEMIVOLATILES SIM | | | | **Matrix:** Water | |
| HS22030083-01 | LH18/24-SP650_030122 | 01 Mar 2022 14:00 | | 07 Mar 2022 09:43 | 11 Mar 2022 14:09 | 100 |
| **Batch ID:** 176355 ( 0 ) | **Test Name :** METALS BY ICPMS BY SW6020A | | | | **Matrix:** Water | |
| HS22030083-01 | LH18/24-SP650_030122 | 01 Mar 2022 14:00 | | 15 Mar 2022 09:00 | 16 Mar 2022 13:17 | 1 |
| **Batch ID:** R403515 ( 0 ) | **Test Name :** VOLATILES ORGANICS BY METHOD 8260C | | | | **Matrix:** Water | |
| HS22030083-01 | LH18/24-SP650_030122 | 01 Mar 2022 14:00 | | | 03 Mar 2022 17:23 | 1 |
| HS22030083-03 | Trip Blank | 01 Mar 2022 14:00 | | | 03 Mar 2022 17:00 | 1 |
| **Batch ID:** R403518 ( 0 ) | **Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) | | | | **Matrix:** Water | |
| HS22030083-02 | LH18/24-SP650_030122_AIX | 01 Mar 2022 14:00 | | | 04 Mar 2022 13:53 | 1 |
| **Batch ID:** R403754 ( 0 ) | **Test Name :** HEXAVALENT CHROMIUM BY SW7196A | | | | **Matrix:** Water | |
| HS22030083-01 | LH18/24-SP650_030122 | 01 Mar 2022 14:00 | | | 02 Mar 2022 13:47 | 1 |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22030083

**QC BATCH REPORT**

**Batch ID: 176355 ( 0 )** **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

**MBLK** Sample ID: **MBLK-176355** Units: **mg/L** Analysis Date: **16-Mar-2022 13:03**
Client ID: Run ID: **ICPMS06_404248** SeqNo: **6547004** PrepDate: **15-Mar-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 0.00250 | 0.00500 | | | | | | | | U |
| Lead | 0.00100 | 0.00500 | | | | | | | | U |
| Selenium | 0.00250 | 0.00500 | | | | | | | | U |
| Silver | 0.000500 | 0.00500 | | | | | | | | U |

**LCS** Sample ID: **LCS-176355** Units: **mg/L** Analysis Date: **16-Mar-2022 13:05**
Client ID: Run ID: **ICPMS06_404248** SeqNo: **6547005** PrepDate: **15-Mar-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 0.0522 | 0.00500 | 0.05 | 0 | 104 | 86 - 114 | | | | |
| Lead | 0.05111 | 0.00500 | 0.05 | 0 | 102 | 88 - 115 | | | | |
| Selenium | 0.05187 | 0.00500 | 0.05 | 0 | 104 | 80 - 120 | | | | |
| Silver | 0.0499 | 0.00500 | 0.05 | 0 | 99.8 | 85 - 116 | | | | |

**MS** Sample ID: **HS22030082-01MS** Units: **mg/L** Analysis Date: **16-Mar-2022 13:11**
Client ID: Run ID: **ICPMS06_404248** SeqNo: **6547008** PrepDate: **15-Mar-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 0.556 | 0.00500 | 0.05 | 0.5109 | 90.3 | 86 - 114 | | | | O |
| Lead | 0.05098 | 0.00500 | 0.05 | 0.000287 | 101 | 88 - 115 | | | | |
| Selenium | 0.05326 | 0.00500 | 0.05 | 0.00033 | 106 | 80 - 120 | | | | |
| Silver | 0.04952 | 0.00500 | 0.05 | 0.000006 | 99.0 | 85 - 116 | | | | |

**MSD** Sample ID: **HS22030082-01MSD** Units: **mg/L** Analysis Date: **16-Mar-2022 13:13**
Client ID: Run ID: **ICPMS06_404248** SeqNo: **6547009** PrepDate: **15-Mar-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 0.557 | 0.00500 | 0.05 | 0.5109 | 92.2 | 86 - 114 | 0.556 | 0.165 | 20 | O |
| Lead | 0.05219 | 0.00500 | 0.05 | 0.000287 | 104 | 88 - 115 | 0.05098 | 2.35 | 20 | |
| Selenium | 0.05236 | 0.00500 | 0.05 | 0.00033 | 104 | 80 - 120 | 0.05326 | 1.72 | 20 | |
| Silver | 0.04751 | 0.00500 | 0.05 | 0.000006 | 95.0 | 85 - 116 | 0.04952 | 4.15 | 20 | |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22030083

**QC BATCH REPORT**

**Batch ID: 176355 ( 0 )** **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

**PDS** Sample ID: **HS22030082-01PDS** Units: **mg/L** Analysis Date: **16-Mar-2022 13:15**
Client ID: Run ID: **ICPMS06_404248** SeqNo: **6547010** PrepDate: **15-Mar-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 0.6236 | 0.00500 | 0.1 | 0.5109 | 113 | 80 - 120 | | | | O |
| Lead | 0.1173 | 0.00500 | 0.1 | 0.000287 | 117 | 80 - 120 | | | | |
| Selenium | 0.1188 | 0.00500 | 0.1 | 0.00033 | 119 | 80 - 120 | | | | |
| Silver | 0.1059 | 0.00500 | 0.1 | 0.000006 | 106 | 80 - 120 | | | | |

**SD** Sample ID: **HS22030082-01SD** Units: **mg/L** Analysis Date: **16-Mar-2022 13:09**
Client ID: Run ID: **ICPMS06_404248** SeqNo: **6547007** PrepDate: **15-Mar-2022** DF: **5**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %D | %D Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 0.4743 | 0.0250 | | | | | 0.5109 | 7.16 | 10 | |
| Lead | 0.00500 | 0.0250 | | | | | 0.000287 | 0 | 10 | U |
| Selenium | 0.0125 | 0.0250 | | | | | 0.00033 | 0 | 10 | U |
| Silver | 0.00250 | 0.0250 | | | | | 0.000006 | 0 | 10 | U |

**The following samples were analyzed in this batch:** HS22030083-01

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22030083

**QC BATCH REPORT**

**Batch ID: 176063 ( 0 )** **Instrument: SV-6** **Method: SEMIVOLATILES SIM**

**MBLK** Sample ID: **MBLK-176063** Units: **ug/L** Analysis Date: **11-Mar-2022 12:43**
Client ID: Run ID: **SV-6_404000** SeqNo: **6541433** PrepDate: **07-Mar-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,4-Dioxane | 0.010 | 0.010 | | | | | | | | U |
| *Surr: 2-Fluorobiphenyl* | *0.08288* | *0* | *0.08* | *0* | *104* | *40 - 140* | | | | |
| *Surr: 4-Terphenyl-d14* | *0.07772* | *0* | *0.08* | *0* | *97.2* | *40 - 140* | | | | |
| *Surr: Nitrobenzene-d5* | *0.0825* | *0* | *0.08* | *0* | *103* | *40 - 140* | | | | |

**LCS** Sample ID: **LCS-176063** Units: **ug/L** Analysis Date: **11-Mar-2022 13:01**
Client ID: Run ID: **SV-6_404000** SeqNo: **6541434** PrepDate: **07-Mar-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,4-Dioxane | 0.07644 | 0.010 | 0.08 | 0 | 95.5 | 40 - 140 | | | | |
| *Surr: 2-Fluorobiphenyl* | *0.08167* | *0* | *0.08* | *0* | *102* | *40 - 140* | | | | |
| *Surr: 4-Terphenyl-d14* | *0.07043* | *0* | *0.08* | *0* | *88.0* | *40 - 140* | | | | |
| *Surr: Nitrobenzene-d5* | *0.07299* | *0* | *0.08* | *0* | *91.2* | *40 - 140* | | | | |

**LCSD** Sample ID: **LCSD-176063** Units: **ug/L** Analysis Date: **11-Mar-2022 13:19**
Client ID: Run ID: **SV-6_404000** SeqNo: **6541435** PrepDate: **07-Mar-2022** DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,4-Dioxane | 0.08085 | 0.010 | 0.08 | 0 | 101 | 40 - 140 | 0.07644 | 5.62 | 20 | |
| *Surr: 2-Fluorobiphenyl* | *0.07869* | *0* | *0.08* | *0* | *98.4* | *40 - 140* | *0.08167* | *3.71* | *20* | |
| *Surr: 4-Terphenyl-d14* | *0.07278* | *0* | *0.08* | *0* | *91.0* | *40 - 140* | *0.07043* | *3.28* | *20* | |
| *Surr: Nitrobenzene-d5* | *0.07845* | *0* | *0.08* | *0* | *98.1* | *40 - 140* | *0.07299* | *7.22* | *20* | |

**The following samples were analyzed in this batch:** HS22030083-01

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22030083

**QC BATCH REPORT**

**Batch ID:** R403515 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220303** Units: **ug/L** Analysis Date: **03-Mar-2022 12:06**
Client ID: Run ID: **VOA9_403515** SeqNo: **6531451** PrepDate: DF: **1**

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

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22030083

**QC BATCH REPORT**

**Batch ID:** R403515 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220303** Units: **ug/L** Analysis Date: **03-Mar-2022 12:06**
Client ID: Run ID: **VOA9_403515** SeqNo: **6531451** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 2.0 | 2.0 | | | | | | | | U |
| Carbon tetrachloride | 1.0 | 1.0 | | | | | | | | U |
| Chlorobenzene | 1.0 | 1.0 | | | | | | | | U |
| Chloroethane | 1.0 | 1.0 | | | | | | | | U |
| Chloroform | 0.50 | 1.0 | | | | | | | | U |
| Chloromethane | 0.50 | 1.0 | | | | | | | | U |
| cis-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| cis-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Dibromochloromethane | 1.0 | 1.0 | | | | | | | | U |
| Dibromomethane | 0.50 | 1.0 | | | | | | | | U |
| Dichlorodifluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Ethylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Hexachlorobutadiene | 1.0 | 1.0 | | | | | | | | U |
| Isopropylbenzene | 1.0 | 1.0 | | | | | | | | U |
| m,p-Xylene | 1.0 | 2.0 | | | | | | | | U |
| Methylene chloride | 2.0 | 2.0 | | | | | | | | U |
| Naphthalene | 1.0 | 1.0 | | | | | | | | U |
| n-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| n-Propylbenzene | 1.0 | 1.0 | | | | | | | | U |
| o-Xylene | 1.0 | 1.0 | | | | | | | | U |
| sec-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Styrene | 1.0 | 1.0 | | | | | | | | U |
| tert-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Tetrachloroethene | 1.0 | 1.0 | | | | | | | | U |
| Toluene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Trichloroethene | 0.50 | 1.0 | | | | | | | | U |
| Trichlorofluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Vinyl chloride | 0.50 | 1.0 | | | | | | | | U |
| *Surr: 1,2-Dichloroethane-d4* | *43.96* | *1.0* | *50* | *0* | *87.9* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *51.12* | *1.0* | *50* | *0* | *102* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *44.16* | *1.0* | *50* | *0* | *88.3* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *53.09* | *1.0* | *50* | *0* | *106* | *89 - 112* | | | | |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22030083

**QC BATCH REPORT**

**Batch ID:** R403515 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220303** Units: **ug/L** Analysis Date: **03-Mar-2022 11:21**
Client ID: Run ID: **VOA9_403515** SeqNo: **6531450** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 20.08 | 1.0 | 20 | 0 | 100 | 78 - 124 | | | | |
| 1,1,1-Trichloroethane | 19.12 | 1.0 | 20 | 0 | 95.6 | 74 - 131 | | | | |
| 1,1,2,2-Tetrachloroethane | 18.9 | 1.0 | 20 | 0 | 94.5 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 19.29 | 1.0 | 20 | 0 | 96.4 | 80 - 119 | | | | |
| 1,1-Dichloroethane | 20.17 | 1.0 | 20 | 0 | 101 | 77 - 125 | | | | |
| 1,1-Dichloroethene | 20.13 | 1.0 | 20 | 0 | 101 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 19.45 | 1.0 | 20 | 0 | 97.2 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 18.95 | 1.0 | 20 | 0 | 94.8 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 17.97 | 1.0 | 20 | 0 | 89.8 | 73 - 122 | | | | |
| 1,2,4-Trichlorobenzene | 19.25 | 1.0 | 20 | 0 | 96.2 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 19.47 | 1.0 | 20 | 0 | 97.3 | 76 - 124 | | | | |
| 1,2-Dibromo-3-chloropropane | 18.49 | 1.0 | 20 | 0 | 92.5 | 62 - 128 | | | | |
| 1,2-Dibromoethane | 19.86 | 1.0 | 20 | 0 | 99.3 | 77 - 121 | | | | |
| 1,2-Dichlorobenzene | 16.45 | 1.0 | 20 | 0 | 82.2 | 80 - 119 | | | | |
| 1,2-Dichloroethane | 20.29 | 1.0 | 20 | 0 | 101 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 19.41 | 1.0 | 20 | 0 | 97.1 | 78 - 122 | | | | |
| 1,3,5-Trimethylbenzene | 19.66 | 1.0 | 20 | 0 | 98.3 | 75 - 124 | | | | |
| 1,3-Dichlorobenzene | 19.39 | 1.0 | 20 | 0 | 97.0 | 80 - 119 | | | | |
| 1,3-Dichloropropane | 19.72 | 1.0 | 20 | 0 | 98.6 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 19.39 | 1.0 | 20 | 0 | 97.0 | 79 - 118 | | | | |
| 2,2-Dichloropropane | 18.46 | 1.0 | 20 | 0 | 92.3 | 60 - 139 | | | | |
| 2-Butanone | 37.36 | 2.0 | 40 | 0 | 93.4 | 56 - 143 | | | | |
| 2-Chlorotoluene | 19.33 | 1.0 | 20 | 0 | 96.7 | 79 - 122 | | | | |
| 2-Hexanone | 37.4 | 2.0 | 40 | 0 | 93.5 | 57 - 139 | | | | |
| 4-Chlorotoluene | 19.43 | 1.0 | 20 | 0 | 97.2 | 78 - 122 | | | | |
| 4-Isopropyltoluene | 19.13 | 1.0 | 20 | 0 | 95.6 | 77 - 127 | | | | |
| 4-Methyl-2-pentanone | 38.28 | 2.0 | 40 | 0 | 95.7 | 67 - 130 | | | | |
| Acetone | 39.02 | 2.0 | 40 | 0 | 97.5 | 39 - 160 | | | | |
| Benzene | 19.69 | 1.0 | 20 | 0 | 98.4 | 79 - 120 | | | | |
| Bromobenzene | 20.29 | 1.0 | 20 | 0 | 101 | 80 - 120 | | | | |
| Bromochloromethane | 20.4 | 1.0 | 20 | 0 | 102 | 78 - 123 | | | | |
| Bromodichloromethane | 19.67 | 1.0 | 20 | 0 | 98.4 | 79 - 125 | | | | |
| Bromoform | 19.59 | 1.0 | 20 | 0 | 97.9 | 66 - 130 | | | | |
| Bromomethane | 18.49 | 1.0 | 20 | 0 | 92.5 | 53 - 141 | | | | |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22030083

**QC BATCH REPORT**

**Batch ID:** R403515 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220303** Units: **ug/L** Analysis Date: **03-Mar-2022 11:21**
Client ID: Run ID: **VOA9_403515** SeqNo: **6531450** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 39.75 | 2.0 | 40 | 0 | 99.4 | 64 - 133 | | | | |
| Carbon tetrachloride | 19.12 | 1.0 | 20 | 0 | 95.6 | 72 - 136 | | | | |
| Chlorobenzene | 19.9 | 1.0 | 20 | 0 | 99.5 | 82 - 118 | | | | |
| Chloroethane | 20.18 | 1.0 | 20 | 0 | 101 | 60 - 138 | | | | |
| Chloroform | 19.28 | 1.0 | 20 | 0 | 96.4 | 79 - 124 | | | | |
| Chloromethane | 18.58 | 1.0 | 20 | 0 | 92.9 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 17.92 | 1.0 | 20 | 0 | 89.6 | 78 - 123 | | | | |
| cis-1,3-Dichloropropene | 18.53 | 1.0 | 20 | 0 | 92.6 | 75 - 124 | | | | |
| Dibromochloromethane | 19.07 | 1.0 | 20 | 0 | 95.4 | 74 - 126 | | | | |
| Dibromomethane | 19.27 | 1.0 | 20 | 0 | 96.3 | 79 - 123 | | | | |
| Dichlorodifluoromethane | 18.15 | 1.0 | 20 | 0 | 90.7 | 32 - 152 | | | | |
| Ethylbenzene | 19.72 | 1.0 | 20 | 0 | 98.6 | 79 - 121 | | | | |
| Hexachlorobutadiene | 19.24 | 1.0 | 20 | 0 | 96.2 | 66 - 134 | | | | |
| Isopropylbenzene | 19.45 | 1.0 | 20 | 0 | 97.2 | 72 - 131 | | | | |
| m,p-Xylene | 39.62 | 2.0 | 40 | 0 | 99.1 | 80 - 121 | | | | |
| Methylene chloride | 20.1 | 2.0 | 20 | 0 | 101 | 74 - 124 | | | | |
| Naphthalene | 18.08 | 1.0 | 20 | 0 | 90.4 | 61 - 128 | | | | |
| n-Butylbenzene | 18.65 | 1.0 | 20 | 0 | 93.2 | 75 - 128 | | | | |
| n-Propylbenzene | 19.66 | 1.0 | 20 | 0 | 98.3 | 76 - 126 | | | | |
| o-Xylene | 19.23 | 1.0 | 20 | 0 | 96.2 | 78 - 122 | | | | |
| sec-Butylbenzene | 19.02 | 1.0 | 20 | 0 | 95.1 | 77 - 126 | | | | |
| Styrene | 19.77 | 1.0 | 20 | 0 | 98.9 | 78 - 123 | | | | |
| tert-Butylbenzene | 19.13 | 1.0 | 20 | 0 | 95.7 | 78 - 124 | | | | |
| Tetrachloroethene | 20.23 | 1.0 | 20 | 0 | 101 | 74 - 129 | | | | |
| Toluene | 20.2 | 1.0 | 20 | 0 | 101 | 80 - 121 | | | | |
| trans-1,2-Dichloroethene | 20.57 | 1.0 | 20 | 0 | 103 | 75 - 124 | | | | |
| trans-1,3-Dichloropropene | 18.99 | 1.0 | 20 | 0 | 94.9 | 73 - 127 | | | | |
| Trichloroethene | 19.83 | 1.0 | 20 | 0 | 99.2 | 79 - 123 | | | | |
| Trichlorofluoromethane | 19.39 | 1.0 | 20 | 0 | 97.0 | 65 - 141 | | | | |
| Vinyl chloride | 18.36 | 1.0 | 20 | 0 | 91.8 | 58 - 137 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *49.34* | *1.0* | *50* | *0* | *98.7* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *50.82* | *1.0* | *50* | *0* | *102* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *47.87* | *1.0* | *50* | *0* | *95.7* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *50.81* | *1.0* | *50* | *0* | *102* | *89 - 112* | | | | |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22030083

**QC BATCH REPORT**

**Batch ID:** R403515 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS22021286-02MS** Units: **ug/L** Analysis Date: **03-Mar-2022 13:18**
Client ID: Run ID: **VOA9_403515** SeqNo: **6531453** PrepDate: DF: **50**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 799.3 | 50 | 1000 | 0 | 79.9 | 78 - 124 | | | | |
| 1,1,1-Trichloroethane | 777.7 | 50 | 1000 | 0 | 77.8 | 74 - 131 | | | | |
| 1,1,2,2-Tetrachloroethane | 761.8 | 50 | 1000 | 0 | 76.2 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 1027 | 50 | 1000 | 0 | 103 | 80 - 119 | | | | |
| 1,1-Dichloroethane | 786.8 | 50 | 1000 | 0 | 78.7 | 77 - 125 | | | | |
| 1,1-Dichloroethene | 782.6 | 50 | 1000 | 0 | 78.3 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 873.3 | 50 | 1000 | 0 | 87.3 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 803.6 | 50 | 1000 | 0 | 80.4 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 714.7 | 50 | 1000 | 133.9 | 58.1 | 73 - 122 | | | | S |
| 1,2,4-Trichlorobenzene | 825.9 | 50 | 1000 | 0 | 82.6 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 1514 | 50 | 1000 | 629.2 | 88.5 | 76 - 124 | | | | |
| 1,2-Dibromo-3-chloropropane | 972.1 | 50 | 1000 | 0 | 97.2 | 62 - 128 | | | | |
| 1,2-Dibromoethane | 819.9 | 50 | 1000 | 0 | 82.0 | 77 - 121 | | | | |
| 1,2-Dichlorobenzene | 703 | 50 | 1000 | 0 | 70.3 | 80 - 119 | | | | S |
| 1,2-Dichloroethane | 858 | 50 | 1000 | 0 | 85.8 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 845.8 | 50 | 1000 | 0 | 84.6 | 78 - 122 | | | | |
| 1,3,5-Trimethylbenzene | 884.4 | 50 | 1000 | 0 | 88.4 | 75 - 124 | | | | |
| 1,3-Dichlorobenzene | 835.3 | 50 | 1000 | 0 | 83.5 | 80 - 119 | | | | |
| 1,3-Dichloropropane | 829 | 50 | 1000 | 0 | 82.9 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 833.3 | 50 | 1000 | 0 | 83.3 | 79 - 118 | | | | |
| 2,2-Dichloropropane | 793.7 | 50 | 1000 | 0 | 79.4 | 60 - 139 | | | | |
| 2-Butanone | 1557 | 100 | 2000 | 0 | 77.8 | 56 - 143 | | | | |
| 2-Chlorotoluene | 892 | 50 | 1000 | 0 | 89.2 | 79 - 122 | | | | |
| 2-Hexanone | 5067 | 100 | 2000 | 0 | 253 | 57 - 139 | | | | S |
| 4-Chlorotoluene | 840.7 | 50 | 1000 | 0 | 84.1 | 78 - 122 | | | | |
| 4-Isopropyltoluene | 1015 | 50 | 1000 | 87.88 | 92.7 | 77 - 127 | | | | |
| 4-Methyl-2-pentanone | 3935 | 100 | 2000 | 0 | 197 | 67 - 130 | | | | S |
| Acetone | 1872 | 100 | 2000 | 0 | 93.6 | 39 - 160 | | | | |
| Benzene | 856.8 | 50 | 1000 | 0 | 85.7 | 79 - 120 | | | | |
| Bromobenzene | 832.3 | 50 | 1000 | 0 | 83.2 | 80 - 120 | | | | |
| Bromochloromethane | 715.7 | 50 | 1000 | 0 | 71.6 | 78 - 123 | | | | S |
| Bromodichloromethane | 984.6 | 50 | 1000 | 0 | 98.5 | 79 - 125 | | | | |
| Bromoform | 715.5 | 50 | 1000 | 0 | 71.5 | 66 - 130 | | | | |
| Bromomethane | 552.3 | 50 | 1000 | 0 | 55.2 | 53 - 141 | | | | |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22030083

**QC BATCH REPORT**

**Batch ID:** R403515 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS22021286-02MS** Units: **ug/L** Analysis Date: **03-Mar-2022 13:18**
Client ID: Run ID: **VOA9_403515** SeqNo: **6531453** PrepDate: DF: **50**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 1478 | 100 | 2000 | 0 | 73.9 | 64 - 133 | | | | |
| Carbon tetrachloride | 836.5 | 50 | 1000 | 0 | 83.7 | 72 - 136 | | | | |
| Chlorobenzene | 875.5 | 50 | 1000 | 0 | 87.5 | 82 - 118 | | | | |
| Chloroethane | 624 | 50 | 1000 | 0 | 62.4 | 60 - 138 | | | | |
| Chloroform | 808.8 | 50 | 1000 | 0 | 80.9 | 79 - 124 | | | | |
| Chloromethane | 766.7 | 50 | 1000 | 0 | 76.7 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 762.5 | 50 | 1000 | 0 | 76.2 | 78 - 123 | | | | S |
| cis-1,3-Dichloropropene | 716.5 | 50 | 1000 | 0 | 71.7 | 75 - 124 | | | | S |
| Dibromochloromethane | 736.9 | 50 | 1000 | 0 | 73.7 | 74 - 126 | | | | S |
| Dibromomethane | 785.3 | 50 | 1000 | 0 | 78.5 | 79 - 123 | | | | S |
| Dichlorodifluoromethane | 694.7 | 50 | 1000 | 0 | 69.5 | 32 - 152 | | | | |
| Ethylbenzene | 1377 | 50 | 1000 | 466.6 | 91.0 | 79 - 121 | | | | |
| Hexachlorobutadiene | 1146 | 50 | 1000 | 0 | 115 | 66 - 134 | | | | |
| Isopropylbenzene | 2518 | 50 | 1000 | 1559 | 95.9 | 72 - 131 | | | | |
| m,p-Xylene | 1817 | 100 | 2000 | 308.3 | 75.4 | 80 - 121 | | | | S |
| Methylene chloride | 746.9 | 100 | 1000 | 0 | 74.7 | 74 - 124 | | | | |
| Naphthalene | 2987 | 50 | 1000 | 2041 | 94.6 | 61 - 128 | | | | |
| n-Butylbenzene | 5578 | 50 | 1000 | 4705 | 87.3 | 75 - 128 | | | | O |
| n-Propylbenzene | 6417 | 50 | 1000 | 5707 | 71.0 | 76 - 126 | | | | SO |
| o-Xylene | 881.6 | 50 | 1000 | 0 | 88.2 | 78 - 122 | | | | |
| sec-Butylbenzene | 2481 | 50 | 1000 | 1591 | 89.0 | 77 - 126 | | | | |
| Styrene | 910.4 | 50 | 1000 | 0 | 91.0 | 78 - 123 | | | | |
| tert-Butylbenzene | 992.8 | 50 | 1000 | 117.8 | 87.5 | 78 - 124 | | | | |
| Tetrachloroethene | 873.7 | 50 | 1000 | 0 | 87.4 | 74 - 129 | | | | |
| Toluene | 860.8 | 50 | 1000 | 0 | 86.1 | 80 - 121 | | | | |
| trans-1,2-Dichloroethene | 792.7 | 50 | 1000 | 0 | 79.3 | 75 - 124 | | | | |
| trans-1,3-Dichloropropene | 720.8 | 50 | 1000 | 0 | 72.1 | 73 - 127 | | | | S |
| Trichloroethene | 871.1 | 50 | 1000 | 0 | 87.1 | 79 - 123 | | | | |
| Trichlorofluoromethane | 733.7 | 50 | 1000 | 0 | 73.4 | 65 - 141 | | | | |
| Vinyl chloride | 822 | 50 | 1000 | 0 | 82.2 | 58 - 137 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *2177* | *50* | *2500* | *0* | *87.1* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *2883* | *50* | *2500* | *0* | *115* | *85 - 114* | | | | S |
| *Surr: Dibromofluoromethane* | *2190* | *50* | *2500* | *0* | *87.6* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *2615* | *50* | *2500* | *0* | *105* | *89 - 112* | | | | |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22030083

**QC BATCH REPORT**

**Batch ID:** R403515 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS22021286-02MSD** Units: **ug/L** Analysis Date: **03-Mar-2022 13:40**
Client ID: Run ID: **VOA9_403515** SeqNo: **6531454** PrepDate: DF: **50**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 804.9 | 50 | 1000 | 0 | 80.5 | 78 - 124 | 799.3 | 0.704 | 20 | |
| 1,1,1-Trichloroethane | 749.6 | 50 | 1000 | 0 | 75.0 | 74 - 131 | 777.7 | 3.67 | 20 | |
| 1,1,2,2-Tetrachloroethane | 772.9 | 50 | 1000 | 0 | 77.3 | 71 - 121 | 761.8 | 1.44 | 20 | |
| 1,1,2-Trichloroethane | 1010 | 50 | 1000 | 0 | 101 | 80 - 119 | 1027 | 1.67 | 20 | |
| 1,1-Dichloroethane | 746.1 | 50 | 1000 | 0 | 74.6 | 77 - 125 | 786.8 | 5.32 | 20 | S |
| 1,1-Dichloroethene | 742.1 | 50 | 1000 | 0 | 74.2 | 71 - 131 | 782.6 | 5.3 | 20 | |
| 1,1-Dichloropropene | 849.2 | 50 | 1000 | 0 | 84.9 | 78 - 125 | 873.3 | 2.8 | 20 | |
| 1,2,3-Trichlorobenzene | 815.9 | 50 | 1000 | 0 | 81.6 | 69 - 129 | 803.6 | 1.53 | 20 | |
| 1,2,3-Trichloropropane | 678.8 | 50 | 1000 | 133.9 | 54.5 | 73 - 122 | 714.7 | 5.15 | 20 | S |
| 1,2,4-Trichlorobenzene | 831.3 | 50 | 1000 | 0 | 83.1 | 69 - 130 | 825.9 | 0.654 | 20 | |
| 1,2,4-Trimethylbenzene | 1512 | 50 | 1000 | 629.2 | 88.2 | 76 - 124 | 1514 | 0.185 | 20 | |
| 1,2-Dibromo-3-chloropropane | 831.3 | 50 | 1000 | 0 | 83.1 | 62 - 128 | 972.1 | 15.6 | 20 | |
| 1,2-Dibromoethane | 798.5 | 50 | 1000 | 0 | 79.9 | 77 - 121 | 819.9 | 2.65 | 20 | |
| 1,2-Dichlorobenzene | 684.5 | 50 | 1000 | 0 | 68.5 | 80 - 119 | 703 | 2.66 | 20 | S |
| 1,2-Dichloroethane | 862.5 | 50 | 1000 | 0 | 86.2 | 73 - 128 | 858 | 0.515 | 20 | |
| 1,2-Dichloropropane | 830.8 | 50 | 1000 | 0 | 83.1 | 78 - 122 | 845.8 | 1.79 | 20 | |
| 1,3,5-Trimethylbenzene | 868.2 | 50 | 1000 | 0 | 86.8 | 75 - 124 | 884.4 | 1.84 | 20 | |
| 1,3-Dichlorobenzene | 839.4 | 50 | 1000 | 0 | 83.9 | 80 - 119 | 835.3 | 0.492 | 20 | |
| 1,3-Dichloropropane | 790.6 | 50 | 1000 | 0 | 79.1 | 80 - 119 | 829 | 4.73 | 20 | S |
| 1,4-Dichlorobenzene | 831.3 | 50 | 1000 | 0 | 83.1 | 79 - 118 | 833.3 | 0.235 | 20 | |
| 2,2-Dichloropropane | 752.9 | 50 | 1000 | 0 | 75.3 | 60 - 139 | 793.7 | 5.28 | 20 | |
| 2-Butanone | 1549 | 100 | 2000 | 0 | 77.5 | 56 - 143 | 1557 | 0.477 | 20 | |
| 2-Chlorotoluene | 853.1 | 50 | 1000 | 0 | 85.3 | 79 - 122 | 892 | 4.46 | 20 | |
| 2-Hexanone | 5132 | 100 | 2000 | 0 | 257 | 57 - 139 | 5067 | 1.29 | 20 | S |
| 4-Chlorotoluene | 817.6 | 50 | 1000 | 0 | 81.8 | 78 - 122 | 840.7 | 2.78 | 20 | |
| 4-Isopropyltoluene | 999.6 | 50 | 1000 | 87.88 | 91.2 | 77 - 127 | 1015 | 1.56 | 20 | |
| 4-Methyl-2-pentanone | 3990 | 100 | 2000 | 0 | 200 | 67 - 130 | 3935 | 1.4 | 20 | S |
| Acetone | 1896 | 100 | 2000 | 0 | 94.8 | 39 - 160 | 1872 | 1.27 | 20 | |
| Benzene | 827.2 | 50 | 1000 | 0 | 82.7 | 79 - 120 | 856.8 | 3.51 | 20 | |
| Bromobenzene | 792.3 | 50 | 1000 | 0 | 79.2 | 80 - 120 | 832.3 | 4.93 | 20 | S |
| Bromochloromethane | 686.7 | 50 | 1000 | 0 | 68.7 | 78 - 123 | 715.7 | 4.13 | 20 | S |
| Bromodichloromethane | 964.8 | 50 | 1000 | 0 | 96.5 | 79 - 125 | 984.6 | 2.03 | 20 | |
| Bromoform | 726.7 | 50 | 1000 | 0 | 72.7 | 66 - 130 | 715.5 | 1.56 | 20 | |
| Bromomethane | 568.5 | 50 | 1000 | 0 | 56.8 | 53 - 141 | 552.3 | 2.89 | 20 | |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22030083

**QC BATCH REPORT**

**Batch ID:** R403515 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS22021286-02MSD** Units: **ug/L** Analysis Date: **03-Mar-2022 13:40**
Client ID: Run ID: **VOA9_403515** SeqNo: **6531454** PrepDate: DF: **50**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 1432 | 100 | 2000 | 0 | 71.6 | 64 - 133 | 1478 | 3.14 | 20 | |
| Carbon tetrachloride | 802.9 | 50 | 1000 | 0 | 80.3 | 72 - 136 | 836.5 | 4.11 | 20 | |
| Chlorobenzene | 847.2 | 50 | 1000 | 0 | 84.7 | 82 - 118 | 875.5 | 3.28 | 20 | |
| Chloroethane | 553.8 | 50 | 1000 | 0 | 55.4 | 60 - 138 | 624 | 11.9 | 20 | S |
| Chloroform | 773.4 | 50 | 1000 | 0 | 77.3 | 79 - 124 | 808.8 | 4.48 | 20 | S |
| Chloromethane | 741 | 50 | 1000 | 0 | 74.1 | 50 - 139 | 766.7 | 3.4 | 20 | |
| cis-1,2-Dichloroethene | 733.4 | 50 | 1000 | 0 | 73.3 | 78 - 123 | 762.5 | 3.89 | 20 | S |
| cis-1,3-Dichloropropene | 710.3 | 50 | 1000 | 0 | 71.0 | 75 - 124 | 716.5 | 0.878 | 20 | S |
| Dibromochloromethane | 738 | 50 | 1000 | 0 | 73.8 | 74 - 126 | 736.9 | 0.148 | 20 | S |
| Dibromomethane | 759.5 | 50 | 1000 | 0 | 76.0 | 79 - 123 | 785.3 | 3.33 | 20 | S |
| Dichlorodifluoromethane | 639.5 | 50 | 1000 | 0 | 63.9 | 32 - 152 | 694.7 | 8.28 | 20 | |
| Ethylbenzene | 1357 | 50 | 1000 | 466.6 | 89.0 | 79 - 121 | 1377 | 1.45 | 20 | |
| Hexachlorobutadiene | 1179 | 50 | 1000 | 0 | 118 | 66 - 134 | 1146 | 2.81 | 20 | |
| Isopropylbenzene | 2463 | 50 | 1000 | 1559 | 90.4 | 72 - 131 | 2518 | 2.22 | 20 | |
| m,p-Xylene | 1738 | 100 | 2000 | 308.3 | 71.5 | 80 - 121 | 1817 | 4.45 | 20 | S |
| Methylene chloride | 700.2 | 100 | 1000 | 0 | 70.0 | 74 - 124 | 746.9 | 6.44 | 20 | S |
| Naphthalene | 3032 | 50 | 1000 | 2041 | 99.1 | 61 - 128 | 2987 | 1.51 | 20 | |
| n-Butylbenzene | 5523 | 50 | 1000 | 4705 | 81.8 | 75 - 128 | 5578 | 0.984 | 20 | O |
| n-Propylbenzene | 6303 | 50 | 1000 | 5707 | 59.6 | 76 - 126 | 6417 | 1.79 | 20 | SO |
| o-Xylene | 858.9 | 50 | 1000 | 0 | 85.9 | 78 - 122 | 881.6 | 2.61 | 20 | |
| sec-Butylbenzene | 2458 | 50 | 1000 | 1591 | 86.7 | 77 - 126 | 2481 | 0.938 | 20 | |
| Styrene | 891.5 | 50 | 1000 | 0 | 89.1 | 78 - 123 | 910.4 | 2.11 | 20 | |
| tert-Butylbenzene | 981.9 | 50 | 1000 | 117.8 | 86.4 | 78 - 124 | 992.8 | 1.1 | 20 | |
| Tetrachloroethene | 896.8 | 50 | 1000 | 0 | 89.7 | 74 - 129 | 873.7 | 2.61 | 20 | |
| Toluene | 848.6 | 50 | 1000 | 0 | 84.9 | 80 - 121 | 860.8 | 1.42 | 20 | |
| trans-1,2-Dichloroethene | 766.7 | 50 | 1000 | 0 | 76.7 | 75 - 124 | 792.7 | 3.33 | 20 | |
| trans-1,3-Dichloropropene | 725.5 | 50 | 1000 | 0 | 72.6 | 73 - 127 | 720.8 | 0.661 | 20 | S |
| Trichloroethene | 831.3 | 50 | 1000 | 0 | 83.1 | 79 - 123 | 871.1 | 4.67 | 20 | |
| Trichlorofluoromethane | 713.3 | 50 | 1000 | 0 | 71.3 | 65 - 141 | 733.7 | 2.82 | 20 | |
| Vinyl chloride | 788.5 | 50 | 1000 | 0 | 78.8 | 58 - 137 | 822 | 4.16 | 20 | |
| *Surr: 1,2-Dichloroethane-d4* | *2147* | *50* | *2500* | *0* | *85.9* | *81 - 118* | *2177* | *1.43* | *20* | |
| *Surr: 4-Bromofluorobenzene* | *2750* | *50* | *2500* | *0* | *110* | *85 - 114* | *2883* | *4.71* | *20* | |
| *Surr: Dibromofluoromethane* | *2178* | *50* | *2500* | *0* | *87.1* | *80 - 119* | *2190* | *0.569* | *20* | |
| *Surr: Toluene-d8* | *2643* | *50* | *2500* | *0* | *106* | *89 - 112* | *2615* | *1.06* | *20* | |

**ALS Houston, US**

Date: 18-Mar-22

| | | |
|---|---|---|
| **Client:** | Bhate Environmental Associates, Inc. | **QC BATCH REPORT** |
| **Project:** | Longhorn GW Treatment Plant Monthly Effluent Samples | |
| **WorkOrder:** | HS22030083 | |

| | | | | | |
|---|---|---|---|---|---|
| **Batch ID:** | **R403515 ( 0 )** | **Instrument:** | **VOA9** | **Method:** | **VOLATILES ORGANICS BY METHOD 8260C** |

**The following samples were analyzed in this batch:** HS22030083-01 HS22030083-03

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** HS22030083

**QC BATCH REPORT**

**Batch ID:** R403754 ( 0 ) **Instrument:** UV-2450 **Method:** HEXAVALENT CHROMIUM BY SW7196A

**MBLK** Sample ID: **MBLK-R403754** Units: **mg/L** Analysis Date: **02-Mar-2022 13:47**
Client ID: Run ID: **UV-2450_403754** SeqNo: **6536624** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 0.0100 | 0.0100 | | | | | | | | U |

**LCS** Sample ID: **LCS-R403754** Units: **mg/L** Analysis Date: **02-Mar-2022 13:47**
Client ID: Run ID: **UV-2450_403754** SeqNo: **6536623** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 0.267 | 0.0100 | 0.25 | 0 | 107 | 90 - 111 | | | | |

**MS** Sample ID: **HS22030082-01MS** Units: **mg/L** Analysis Date: **02-Mar-2022 13:47**
Client ID: Run ID: **UV-2450_403754** SeqNo: **6536626** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 0.271 | 0.0100 | 0.25 | 0 | 108 | 90 - 111 | | | | |

**MSD** Sample ID: **HS22030082-01MSD** Units: **mg/L** Analysis Date: **02-Mar-2022 13:47**
Client ID: Run ID: **UV-2450_403754** SeqNo: **6536625** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chromium, Hexavalent | 0.27 | 0.0100 | 0.25 | 0 | 108 | 90 - 111 | 0.271 | 0.37 | 20 | |

**The following samples were analyzed in this batch:** HS22030083-01

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Monthly Effluent Samples
**WorkOrder:** **HS22030083**

## 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: 18-Mar-22

## CERTIFICATIONS,ACCREDITATIONS & LICENSES

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas | 21-022-0 | 26-Mar-2022 |
| Florida | E87611-34 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 18-Mar-22

## Sample Receipt Checklist

**Work Order ID:** HS22030083 **Date/Time Received:** **02-Mar-2022 10:20**

**Client Name:** Bhate Environmental **Received by:** **Pablo Marinez**

**Completed By:** /S/ Pablo Marinez (eSignature) 02-Mar-2022 12:17 (Date/Time) **Reviewed by:** /S/ Corey Grandits (eSignature) 02-Mar-2022 18:27 (Date/Time)

Matrices: **WATER** Carrier name: **FedEx Priority Overnight**

| | Yes | No | |
|---|---|---|---|
| Shipping container/cooler in good condition? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on shipping container/cooler? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on sample bottles? | ☐ | ☐ | Not Present ☑ |
| VOA/TX1005/TX1006 Solids in hermetically sealed vials? | ☐ | ☐ | Not Present ☑ |
| Chain of custody present? | ☑ | ☐ | 1 Page(s) |
| Chain of custody signed when relinquished and received? | ☑ | ☐ | COC IDs:CLIENT |
| Samplers name present on COC? | ☑ | ☐ | |
| Chain of custody agrees with sample labels? | ☑ | ☐ | |
| Samples in proper container/bottle? | ☑ | ☐ | |
| Sample containers intact? | ☑ | ☐ | |
| Sufficient sample volume for indicated test? | ☑ | ☐ | |
| All samples received within holding time? | ☑ | ☐ | |
| Container/Temp Blank temperature in compliance? | ☑ | ☐ | |

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 0.1°C/0.6°C UC/C | IR 31 |
| Cooler(s)/Kit(s): | BLUE | |
| Date/Time sample(s) sent to storage: | 3/2/22 12:20 | |

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

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

01117798

# CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd., Suite 210 Houston, TX 77099 (281) 530 – 5656 ATTN: Ragen Gigi



**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:** GROUNDWATER TREATMENT PLANT MONTHLY EFFLUENT SAMPLES

**Prepared By:** Scott Beesinger

**P.O. Number**

HS22030083
Bhate Environmental Associates, Inc.
ıghorn GW Treatment Plant Monthly Effluent Sample

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | VOLATILES | SILVER, SELENIUM, LEAD, BARIUM | HEXAVALENT CHROMIUM | 1, 4 - DIOXANE | PERCHLORATE | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_030122 | Water | 03/01/22 / 14:00 | | 3 | X | | | | | | | | | | HCL | |
| LH18/24-SP650_030122 | Water | 03/01/22 / 14:00 | | 2 | | | X | X | | | | | | | NONE | |
| LH18/24-SP650_030122_AIX | Water | 03/01/22 / 14:00 | | 1 | | | | | X | | | | | | NONE | |
| LH18/24-SP650_030122 | Water | 03/01/22 / 14:00 | | 1 | | X | | | | | | | | | HNO3 | |
| Trip Blank | Water | 03/01/22 | | 2 | X | | | | | | | | | | HCL | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Analyses

**Additional Remarks:** **Standard TAT on all parameters**

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 03/01/22 | 14:30 | [illegible] | 3-3-22 | 10:20 | | | | | | |

**For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Remarks:

Blue 0.1C
IR31 CF+03

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

01117799

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

CU

Date: 3/1/22
Name: Scott
Company:

STODY SEAL
Time: 1430

Seal Broken By:
Date:

FedEx
TRK# 0221 1891 8880 4576

WED - 02 MAR 10:30A
PRIORITY OVERNIGHT

AB SGRA

Blue

77099
TX-US IAH

8475872 03/01 56DJ3/9088/FE4R

March 04, 2022

Service Request No:E2200168

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS22030083**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory March 02, 2022
For your reference, these analyses have been assigned our service request number **E2200168.**

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**
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Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

**ALS Environmental**

| | | | |
|---|---|---|---|
| **Client:** | ALS-H | **Service Request No.:** | E2200168 |
| **Project:** | HS22030083 | **Date Received:** | 03/02/22 |
| **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

One sample was received for analysis at ALS Environmental in Houston on 03/02/22.

The sample was received in good condition and is 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:**

EQ2200082: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS-DLCS recoveries are within QC limits.

Lab is DoD accredited for 6850 Perchlorate waters.

*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:**E2200168
**Project:** HS22030083

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2200168-001 | LH18/24-SP650_030122_AIX | 3/1/2022 | 1400 |

# Service Request Summary

**Folder #:** **E2200168**
Client Name: ALS Environmental - US
Project Name: HS22030083
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 03/02/22
Internal Due Date: 3/16/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22030083
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON CIO4 DOD/6850 |
|---|---|---|---|---|
| E2200168-001 | LH18/24-SP650_030122_AIX | Ground Water | 03/01/22 1400 | **IV** |

# Service Request Summary

| | |
|---|---|
| **Folder #:** | **E2200168** |
| Client Name: | ALS Environmental - US |
| Project Name: | HS22030083 |
| Project Number: | |

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA

| | |
|---|---|
| Phone Number: | |
| Cell Number: | |
| Fax Number: | |
| E-mail: | ragenp.giga@alsglobal.com |

| | |
|---|---|
| Project Chemist: | Corey Grandits |
| Originating Lab: | HOUSTON |
| Logged By: | CGRANDITS |
| Date Received: | 03/02/22 |
| Internal Due Date: | 3/16/2022 |
| QAP: | LAB QAP |
| Qualifier Set: | Lab Standard |
| Formset: | Lab Standard |
| Merged?: | Y |
| Report to MDL?: | Y |
| P.O. Number: | HS22030083 |
| EDD: | No EDD Specified |

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 1 | Level IV due 3/23 |

# 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 | (Auto) The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result. |
| 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. |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| 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. |
| P | Indicates chlorodiphenyl ether interference present at the retention time of the target compound. |
| P | Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns |
| Q | Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria. |
| R | Duplicate Precision not met. |
| R1 | Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated. |
| S | Surrogate recovery not within specified limits. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| T | Analyte is a tentatively identified compound, result is estimated. |
| U | Compound was analyzed for, but was not detected (ND). |
| V1 | The continuing calibration verification standard was outside (biased high) the specified limits for this compound. |
| V2 | The continuing calibration verification standard was outside (biased low) the specified limits for this compound. |
| W | Result quantified, but the corresponding peak was detected outside the generated retention time window. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| X | See case narrative. |
| Y | Recovery outside limits |
| Y | The chromatogram resembles a petroleum product but does not match the calibration standard. |
| Z | The chromatogram does not resemble a petroleum product. |
| i | The MRL/MDL has been elevated due to a matrix interference. |

# ALS Laboratory Group

## Acronyms

| | |
|---|---|
| Cal | Calibration |
| Conc | CONCentration |
| Dioxin(s) | Polychlorinated dibenzo-p-dioxin(s) |
| EDL | Estimated Detection Limit |
| EMPC | Estimated Maximum Possible Concentration |
| Flags | Data qualifiers |
| Furan(s) | Polychlorinated dibenzofuran(s) |
| g | Grams |
| ICAL | Initial CALibration |
| ID | IDentifier |
| Ions | Masses monitored for the analyte during data acquisition |
| L | Liter (s) |
| LCS | Laboratory Control Sample |
| DLCS | Duplicate Laboratory Control Sample |
| MB | Method Blank |
| MCL | Method Calibration Limit |
| MDL | Method Detection Limit |
| mL | Milliliters |
| MS | Matrix Spiked sample |
| DMS | Duplicate Matrix Spiked sample |
| NO | Number of peaks meeting all identification criteria |
| PCDD(s) | Polychlorinated dibenzo-p-dioxin(s) |
| PCDF(s) | Polychlorinated dibenzofuran(s) |
| ppb | Parts per billion |
| ppm | Parts per million |
| ppq | Parts per quadrillion |
| ppt | Parts per trillion |
| QA | Quality Assurance |
| QC | Quality Control |
| Ratio | Ratio of areas from monitored ions for an analyte |
| % Rec. | Percent recovery |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| RT | Retention Time |
| SDG | Sample Delivery Group |
| S/N | Signal-to-noise ratio |
| TEF | Toxicity Equivalence Factor |
| TEQ | Toxicity Equivalence Quotient |

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ALS Environmental

## State Certifications, Accreditations, and Licenses

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas Department of Environmental Quality | 19-028-0 | 6/30/2022 |
| Arkansas Department of Environmental Quality | 21-022-0 | 3/26/2022 |
| Florida Department of Health | E87611-33 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 5/1/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

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Houston, TX 77099
**T:** +1 281 530 5656
**F:** +1 281 530 5887
**www.alsglobal.com**

# Subcontract Chain of Custody

**SAMPLING STATE:** **Dept of Defense** **COC ID: 18224**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

**Company:** ALS Houston
**Contact:** Ragen Giga
**Address:** 10450 Stancliff Rd, Ste 210
**Phone:** +1 281 530 5656
**Email:** RagenP.Giga@ALSGlobal.com
**Alternate Contact:**
**Email:**

**INVOICE INFORMATION:**

**Company:** ALS Houston
**Contact:** Accounts Payable
**Address:** 10450 Stancliff Rd, Ste 210
**Phone:** +1 281 530 5656
**Reference:** HS22030083
**TSR:** Sonia West

| | LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | | | DUE DATE |
| **1.** | **HS22030083-02** | **LH18/24-SP650_030122_AIX** | **Water** | **01 Mar 2022 14:00** |
| | Provide Level II and Level IV reports in separate pdf | | | 16 Mar 2022 |

**Comments:** Please analyze for the analysis listed above.
Send report to the emails shown above.

**QC Level:** DOD IV (DoD Data Package)

Relinquished By: Paul [illegible] Date/Time: 3-2-22 12:30

Received By: Corey G Date/Time: 3-2-22 1230

Cooler ID(s): Temperature(s):

ALS Environmental

# Cooler Receipt Form

Project Chemist: LG

Client/Project: ALS-H

Thermometer ID: 1231

Date/Time Received: 3-2-22 Initials: LG

Date/Time Logged in: 3-2-22 Initials: LG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☒ Courier (ALS) ○ Client
2. Samples received in: ☒ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ☒ No
   Were they intact? ○ Yes ○ No ☒ N/A
   Were they signed and dated? ○ Yes ○ No ☒ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ☒ Baggies ○ Bubble Wrap ○ Gel Packs ☒ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

| Cooler Tracking Number | COC ID | Date Opened | Time Opened | Opened By | Temp. °C | Temp Blank? |
|---|---|---|---|---|---|---|
| NA | | 3-2-22 | 1230 | LG | 0.5/1.0 | ☒ |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☒ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☒ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☒ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☒ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☒ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

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#:** 396095 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 3/3/22 08:29

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2200166-001 | LH18/24-SP650_030122_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 2 | E2200167-001 | LH18/24-SP140_030122 | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 3 | E2200168-001 | LH18/24-SP650_030122_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 4 | EQ2200082-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 5 | EQ2200082-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 6 | EQ2200082-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 7 | R2201678-004 | 2202240920A ST-5-481 | .01 | 6850/ClO4 | | | Water | 10mL | |

## Spiking Solutions

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 221408 Logbook Ref: Perchlorate Internal Standard Expires On: 04/30/2022

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E2200166-001 | 100.00µL | E2200167-001 | 100.00µL | E2200168-001 | 100.00µL | EQ2200082-01 | 100.00µL | EQ2200082-01 | 100.00µL | EQ2200082-02 | 100.00µL |
| EQ2200082-02 | 100.00µL | EQ2200082-03 | 100.00µL | EQ2200082-03 | 100.00µL | R2201678-004 | 100.00µL | | | | |

Name: Perchlorate Intermediate Stock1 Inventory ID 221456 Logbook Ref: Perchlorate Expires On: 04/30/2022

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| EQ2200082-02 | 1.00µL | EQ2200082-02 | 1.00µL | EQ2200082-03 | 1.00µL | EQ2200082-03 | 1.00µL |

## Preparation Materials

| | | | | | |
|---|---|---|---|---|---|
| Water HPLC Grade | 08/03/2021 Water (218532) | 6850 Amber Glass screw vial | 2mL Screw Top Vial (221308) | 537M Glass Culture Tubes | 537M Glass Tubes (218064) |
| 6850 0.45um syringe filters | 6850 Syringe Filters (219639) | 6850 Luer-Lok Syringes | Luer-Lok Syringes (221305) | 6850 Pipette Tips 50-1000 uL | 6850 Pipette Tips (221307) |

## Preparation Steps

Step: Preparation
Started: 3/3/22 08:29
Finished: 3/3/22 09:12
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 3/3/22

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:** | E2200168 |
| **Project:** | HS22030083 | **Date Collected:** | 3/ 1/22 1400 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 3/ 2/22 |
| **Sample Name:** | LH18/24-SP650_030122_AIX | **Units:** | µg/L |
| **Lab Code:** | E2200168-001 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850
**Prep Method:** Method

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | ND | U | 0.100 | 0.0500 | 0.0250 | 1 | 3/ 3/22 | 3/3/22 15:14 | 396095 | 756210 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200168 |
| **Project:** | HS22030083 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2200082-01 | **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 | 3/ 3/22 | 3/3/22 16:01 | 396095 | 756210 | |

# 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:** | E2200168 |
| **Project:** | HS22030083 | **Date Analyzed:** | 3/ 3/22 |
| **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:** | 396095 |

| | Lab Control Sample EQ2200082-02 | | | Duplicate Lab Control Sample EQ2200082-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.114 | 0.100 | 114 | 0.119 | 0.100 | 119 | 84 - 119 | 5 | 15 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200168 |
| **Project:** | HS22030083 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200082-02 | **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 | **0.114** | | 0.100 | 0.0500 | 0.0250 | 1 | 3/ 3/22 | 3/3/22 15:30 | 396095 | 756210 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200168 |
| **Project:** | HS22030083 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200082-03 | **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 | **0.119** | | 0.100 | 0.0500 | 0.0250 | 1 | 3/ 3/22 | 3/3/22 15:38 | 396095 | 756210 | |

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

March 18, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22030443**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia Olive,

ALS Environmental received 3 sample(s) on Mar 09, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: DAYNA.FISHER**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22030443

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22030443-01 | LH18/24-SP650_030822 | Water | | 08-Mar-2022 14:00 | 09-Mar-2022 10:30 | ☐ |
| HS22030443-02 | LH18/24-SP650_030822_AIX | Water | | 08-Mar-2022 14:00 | 09-Mar-2022 10:30 | ☐ |
| HS22030443-03 | LH18/24-SP650_030822_BIX | Water | | 08-Mar-2022 14:00 | 09-Mar-2022 10:30 | ☐ |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22030443

**CASE NARRATIVE**

## Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached

## WetChemistry by Method E350.3

### Batch ID: R403891

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E415.1

### Batch ID: R403851

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E365.3

### Batch ID: R403819

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

**ALS Houston, US**

Date: 18-Mar-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS22030443 |
| Sample ID: | LH18/24-SP650_030822 | Lab ID:HS22030443-01 |
| Collection Date: | 08-Mar-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **AMMONIA AS N BY E350.3(ISE)** | | **Method:E350.3** | | | | | | Analyst: MZD |
| **Nitrogen, Ammonia (As N)** | **22** | a | **0.10** | **0.20** | **0.20** | **mg/L** | 1 | 10-Mar-2022 13:20 |
| **ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978** | | **Method:E365.3** | | | | | | Analyst: MZD |
| **Phosphorus, Total Orthophosphate (As P)** | **9.45** | a | **0.500** | **1.25** | **1.25** | **mg/L** | 50 | 09-Mar-2022 14:39 |
| **TOTAL ORGANIC CARBON BY E415.1** | | **Method:E415.1** | | | | | | Analyst: JAC |
| **Organic Carbon, Total** | **10.7** | a | **0.500** | **1.00** | **1.00** | **mg/L** | 1 | 09-Mar-2022 17:04 |

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

**ALS Houston, US**

Date: 18-Mar-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS22030443 |
| Sample ID: | LH18/24-SP650_030822_AIX | Lab ID:HS22030443-02 |
| Collection Date: | 08-Mar-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 10-Mar-2022 14:21 |

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

**ALS Houston, US**

Date: 18-Mar-22

| | | | |
|---|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder: | HS22030443 |
| Sample ID: | LH18/24-SP650_030822_BIX | Lab ID: | HS22030443-03 |
| Collection Date: | 08-Mar-2022 14:00 | Matrix: | Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 16-Mar-2022 12:00 |

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

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22030443

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** R403819 ( 0 ) | **Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978 | | | | **Matrix:** Water | |
| HS22030443-01 | LH18/24-SP650_030822 | 08 Mar 2022 14:00 | | | 09 Mar 2022 14:39 | 50 |
| **Batch ID:** R403851 ( 0 ) | **Test Name :** TOTAL ORGANIC CARBON BY E415.1 | | | | **Matrix:** Water | |
| HS22030443-01 | LH18/24-SP650_030822 | 08 Mar 2022 14:00 | | | 09 Mar 2022 17:04 | 1 |
| **Batch ID:** R403891 ( 0 ) | **Test Name :** AMMONIA AS N BY E350.3(ISE) | | | | **Matrix:** Water | |
| HS22030443-01 | LH18/24-SP650_030822 | 08 Mar 2022 14:00 | | | 10 Mar 2022 13:20 | 1 |
| **Batch ID:** R403895 ( 0 ) | **Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) | | | | **Matrix:** Water | |
| HS22030443-02 | LH18/24-SP650_030822_AIX | 08 Mar 2022 14:00 | | | 10 Mar 2022 14:21 | 1 |
| **Batch ID:** R404235 ( 0 ) | **Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) | | | | **Matrix:** Water | |
| HS22030443-03 | LH18/24-SP650_030822_BIX | 08 Mar 2022 14:00 | | | 16 Mar 2022 12:00 | 1 |

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22030443

**QC BATCH REPORT**

**Batch ID:** R403819 ( 0 ) **Instrument:** UV-2450 **Method:** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978

**MBLK** Sample ID: **MBLK-R403819** Units: **mg/L** Analysis Date: **09-Mar-2022 14:39**
Client ID: Run ID: **UV-2450_403819** SeqNo: **6537695** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.0250 | 0.0250 | | | | | | | | U |

**LCS** Sample ID: **LCS-R403819** Units: **mg/L** Analysis Date: **09-Mar-2022 14:39**
Client ID: Run ID: **UV-2450_403819** SeqNo: **6537694** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.255 | 0.0250 | 0.25 | 0 | 102 | 85 - 115 | | | | |

**MS** Sample ID: **HS22030443-01MS** Units: **mg/L** Analysis Date: **09-Mar-2022 14:39**
Client ID: **LH18/24-SP650_030822** Run ID: **UV-2450_403819** SeqNo: **6537697** PrepDate: DF: **50**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 21.9 | 1.25 | 12.5 | 9.45 | 99.6 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22030443-01MSD** Units: **mg/L** Analysis Date: **09-Mar-2022 14:39**
Client ID: **LH18/24-SP650_030822** Run ID: **UV-2450_403819** SeqNo: **6537696** PrepDate: DF: **50**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 21.9 | 1.25 | 12.5 | 9.45 | 99.6 | 80 - 120 | 21.9 | 0 | 20 | |

**The following samples were analyzed in this batch:** HS22030443-01

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22030443

**QC BATCH REPORT**

**Batch ID:** R403851 ( 0 ) **Instrument:** TOC_04 **Method:** TOTAL ORGANIC CARBON BY E415.1

**MBLK** Sample ID: **MBLK-03092022** Units: **mg/L** Analysis Date: **09-Mar-2022 16:23**
Client ID: Run ID: **TOC_04_403851** SeqNo: **6538482** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 1.00 | 1.00 | | | | | | | | U |

**LCS** Sample ID: **LCS-03092022** Units: **mg/L** Analysis Date: **09-Mar-2022 16:36**
Client ID: Run ID: **TOC_04_403851** SeqNo: **6538483** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 9.319 | 1.00 | 10 | 0 | 93.2 | 85 - 115 | | | | |

**LCSD** Sample ID: **LCSD-03092022** Units: **mg/L** Analysis Date: **09-Mar-2022 16:50**
Client ID: Run ID: **TOC_04_403851** SeqNo: **6538484** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 9.477 | 1.00 | 10 | 0 | 94.8 | 85 - 115 | 9.319 | 1.68 | 20 | |

**MS** Sample ID: **HS22030443-01MS** Units: **mg/L** Analysis Date: **09-Mar-2022 17:18**
Client ID: **LH18/24-SP650_030822** Run ID: **TOC_04_403851** SeqNo: **6538486** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 21.61 | 1.00 | 10 | 10.7 | 109 | 80 - 120 | | | | |

**The following samples were analyzed in this batch:** HS22030443-01

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22030443

**QC BATCH REPORT**

**Batch ID: R403891 ( 0 )** **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

**MBLK** Sample ID: **MBLK-R403891** Units: **mg/L** Analysis Date: **10-Mar-2022 13:20**
Client ID: Run ID: **WetChem_HS_403891** SeqNo: **6539354** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 0.20 | 0.20 | | | | | | | | U |

**LCS** Sample ID: **LCS-R403891** Units: **mg/L** Analysis Date: **10-Mar-2022 13:20**
Client ID: Run ID: **WetChem_HS_403891** SeqNo: **6539353** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 9.511 | 0.20 | 10 | 0 | 95.1 | 80 - 120 | | | | |

**MS** Sample ID: **HS22030443-01MS** Units: **mg/L** Analysis Date: **10-Mar-2022 13:20**
Client ID: **LH18/24-SP650_030822** Run ID: **WetChem_HS_403891** SeqNo: **6539356** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 32.39 | 0.20 | 10 | 22.03 | 104 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22030443-01MSD** Units: **mg/L** Analysis Date: **10-Mar-2022 13:20**
Client ID: **LH18/24-SP650_030822** Run ID: **WetChem_HS_403891** SeqNo: **6539355** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 32.39 | 0.20 | 10 | 22.03 | 104 | 80 - 120 | 32.39 | 0.0154 | 20 | |

**The following samples were analyzed in this batch:** HS22030443-01

**ALS Houston, US** Date: 18-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** **HS22030443**

## 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: 18-Mar-22

## CERTIFICATIONS,ACCREDITATIONS & LICENSES

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas | 21-022-0 | 26-Mar-2022 |
| Florida | E87611-34 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 18-Mar-22

## Sample Receipt Checklist

**Work Order ID:** HS22030443 **Date/Time Received:** **09-Mar-2022 10:30**

**Client Name:** Bhate Environmental **Received by:** **Pablo Marinez**

**Completed By:** /S/ Pablo Marinez (eSignature) 09-Mar-2022 12:03 (Date/Time) **Reviewed by:** /S/ Corey Grandits (eSignature) 11-Mar-2022 11:10 (Date/Time)

Matrices: **WATER** Carrier name: **FedEx Priority Overnight**

| | Yes | No | |
|---|---|---|---|
| Shipping container/cooler in good condition? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on shipping container/cooler? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on sample bottles? | ☐ | ☐ | Not Present ☑ |
| VOA/TX1005/TX1006 Solids in hermetically sealed vials? | ☐ | ☐ | Not Present ☑ |
| Chain of custody present? | ☑ | ☐ | 1 Page(s) |
| Chain of custody signed when relinquished and received? | ☑ | ☐ | COC IDs:CLIENT |
| Samplers name present on COC? | ☑ | ☐ | |
| Chain of custody agrees with sample labels? | ☑ | ☐ | |
| Samples in proper container/bottle? | ☑ | ☐ | |
| Sample containers intact? | ☑ | ☐ | |
| Sufficient sample volume for indicated test? | ☑ | ☐ | |
| All samples received within holding time? | ☑ | ☐ | |
| Container/Temp Blank temperature in compliance? | ☑ | ☐ | |

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 0.4°C/0.9°C UC/C | IR 31 |
| Cooler(s)/Kit(s): | 48436 | |
| Date/Time sample(s) sent to storage: | 3/9/22 12:05 | |

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

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

01117836

# CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: Ragen Gigi



**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:** GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

**Prepared By:** Scott Beesinger

**P.O. Number**

HS22030443

Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Weekly Samples

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | AMMONIA-N | TOTAL ORGANIC CARBON | ORTHO-PHOSPHATE | PERCHLORATE | | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_030822 | Water | 03/08/22 / 14:00 | | 3 | X | X | | | | | | | | | H2SO4 | |
| LH18/24-SP650_030822 | Water | 03/08/22 / 14:00 | | 1 | | | X | | | | | | | | NONE | |
| LH18/24–SP650_030822_AIX | Water | 03/08/22 / 14:00 | | 1 | | | | X | | | | | | | NONE | |
| LH18/24-SP650_030822_BIX | Water | 03/08/22 / 14:00 | | 1 | | | | X | | | | | | | NONE | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Analyses

**Additional Remarks:** 24 HOUR TAT on PERCHLORATE. Standard TAT on all other parameters

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 03/08/22 | 14:30 | Paul Rose | 3-9-22 | 1023 | | | | | | |

**For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Remarks:

4E4-36 0.4C
IR3 GT0.5

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

01117837

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

4E436

CUSTO
Date: 3/8/22
Name: Jesus Ber
Company: 3H2473

DY SEAL
ime:

Seal Broken By:
PM
Date:
3922

TRK# 5300 5228 3900
PRIORITY OVERNIGHT
RETURNS MON-SAT

AB SGRA 4E436

77099
TX-US
IAH

3923207 08Mar2022 GGGA 56DG1/29A0/1B23

March 10, 2022

Service Request No:E2200189

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS22030443**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory March 09, 2022
For your reference, these analyses have been assigned our service request number **E2200189.**

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**
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Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

**ALS Environmental**

| | | | |
|---|---|---|---|
| **Client:** | ALS-H | **Service Request No.:** | E2200189 |
| **Project:** | HS22030443 | | |
| **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 03/09/22.

The sample was received in good condition and is 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:**

EQ2200092: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS-DLCS recoveries are within QC limits.

Lab is DoD accredited for 6850 Perchlorate waters.

*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:**E2200189
**Project:** HS22030443

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2200189-001 | LH18/24-SP650_030822_BIX | 3/8/2022 | 1400 |

# Service Request Summary

**Folder #:** **E2200189**
Client Name: ALS Environmental - US
Project Name: HS22030443
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 03/09/22
Internal Due Date: 3/10/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22030443
EDD: No EDD Specified

2 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**
**Rush**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON CIO4 DOD/6850 |
|---|---|---|---|---|
| E2200189-001 | LH18/24-SP650_030822_BIX | Ground Water | 03/08/22 1400 | **IV** |

# Service Request Summary

| | | | |
|---|---|---|---|
| **Folder #:** | **E2200189** | Project Chemist: | Corey Grandits |
| Client Name: | ALS Environmental - US | Originating Lab: | HOUSTON |
| Project Name: | HS22030443 | Logged By: | CGRANDITS |
| Project Number: | | Date Received: | 03/09/22 |
| | | Internal Due Date: | 3/10/2022 |
| **Report To:** | Ragen Giga<br>ALS Environmental - US<br>10450 Stancliff Rd Suite 210<br>Houston, TX 77099<br>USA | QAP: | LAB QAP |
| | | Qualifier Set: | Lab Standard |
| | | Formset: | Lab Standard |
| | | Merged?: | Y |
| Phone Number: | | Report to MDL?: | Y |
| Cell Number: | | P.O. Number: | HS22030443 |
| Fax Number: | | EDD: | No EDD Specified |
| E-mail: | ragenp.giga@alsglobal.com | | |

2 120 mL-Plastic Bottle Natural WM Unpreserved

**Location:** EHRMS-AirArch 1

**Pressure Gas:**

**Rush**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 1 | Level IV due 3/30 |

# 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 | (Auto) The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result. |
| 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. |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| 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. |
| P | Indicates chlorodiphenyl ether interference present at the retention time of the target compound. |
| P | Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns |
| Q | Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria. |
| R | Duplicate Precision not met. |
| R1 | Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated. |
| S | Surrogate recovery not within specified limits. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| T | Analyte is a tentatively identified compound, result is estimated. |
| U | Compound was analyzed for, but was not detected (ND). |
| V1 | The continuing calibration verification standard was outside (biased high) the specified limits for this compound. |
| V2 | The continuing calibration verification standard was outside (biased low) the specified limits for this compound. |
| W | Result quantified, but the corresponding peak was detected outside the generated retention time window. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| X | See case narrative. |
| Y | Recovery outside limits |
| Y | The chromatogram resembles a petroleum product but does not match the calibration standard. |
| Z | The chromatogram does not resemble a petroleum product. |
| i | The MRL/MDL has been elevated due to a matrix interference. |

# ALS Laboratory Group

## Acronyms

| | |
|---|---|
| Cal | Calibration |
| Conc | CONCentration |
| Dioxin(s) | Polychlorinated dibenzo-p-dioxin(s) |
| EDL | Estimated Detection Limit |
| EMPC | Estimated Maximum Possible Concentration |
| Flags | Data qualifiers |
| Furan(s) | Polychlorinated dibenzofuran(s) |
| g | Grams |
| ICAL | Initial CALibration |
| ID | IDentifier |
| Ions | Masses monitored for the analyte during data acquisition |
| L | Liter (s) |
| LCS | Laboratory Control Sample |
| DLCS | Duplicate Laboratory Control Sample |
| MB | Method Blank |
| MCL | Method Calibration Limit |
| MDL | Method Detection Limit |
| mL | Milliliters |
| MS | Matrix Spiked sample |
| DMS | Duplicate Matrix Spiked sample |
| NO | Number of peaks meeting all identification criteria |
| PCDD(s) | Polychlorinated dibenzo-p-dioxin(s) |
| PCDF(s) | Polychlorinated dibenzofuran(s) |
| ppb | Parts per billion |
| ppm | Parts per million |
| ppq | Parts per quadrillion |
| ppt | Parts per trillion |
| QA | Quality Assurance |
| QC | Quality Control |
| Ratio | Ratio of areas from monitored ions for an analyte |
| % Rec. | Percent recovery |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| RT | Retention Time |
| SDG | Sample Delivery Group |
| S/N | Signal-to-noise ratio |
| TEF | Toxicity Equivalence Factor |
| TEQ | Toxicity Equivalence Quotient |

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ALS Environmental

## State Certifications, Accreditations, and Licenses

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas Department of Environmental Quality | 19-028-0 | 6/30/2022 |
| Arkansas Department of Environmental Quality | 21-022-0 | 3/26/2022 |
| Florida Department of Health | E87611-33 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 5/1/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
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Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

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Houston, TX 77099
**T:** +1 281 530 5656
**F:** +1 281 530 5887
**www.alsglobal.com**

# Subcontract Chain of Custody

**SAMPLING STATE:** **Dept of Defense** **COC ID: 18275**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

**Company:** ALS Houston
**Contact:** Ragen Giga
**Address:** 10450 Stancliff Rd, Ste 210
**Phone:** +1 281 530 5656
**Email:** RagenP.Giga@ALSGlobal.com
**Alternate Contact:**
**Email:**

**INVOICE INFORMATION:**

**Company:** ALS Houston
**Contact:** Accounts Payable
**Address:** 10450 Stancliff Rd, Ste 210
**Phone:** +1 281 530 5656
**Reference:** HS22030443
**TSR:** Houston House Acct

| | LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | xxx BIX | | DUE DATE |
| 1. | **HS22030443-02** | **LH18/24-SP650_030822_AIX** | **Water** | **08 Mar 2022 14:00** |
| | 6850-Perch. DOD Level II & Level IV in separate pdf | | | 10 Mar 2022 |

**Comments:** Please analyze for the analysis listed above.
Send report to the emails shown above.

**QC Level:** DOD IV (DoD Data Package)

Relinquished By: Paul [illegible] Date/Time: 3-9-22 12:05
Received By: [illegible] Date/Time: 3/9/22 1215
Cooler ID(s): Temperature(s):

ALS Environmental

# Cooler Receipt Form

Project Chemist: CH

Client/Project: ALH-H

Thermometer ID: 1231

Date/Time Received: 3-9-22 Initials: CH Date/Time Logged in: 3-9-22 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? |
|---|---|---|---|---|---|---|
| NA | | 3-9-22 | 1205 | CH | 1.8/2.3 | ☒ |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☒ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☒ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☒ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☒ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☒ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

ALS Environmental - Houston HRMS

10450 Stancliff Rd., Suite 210
Houston, TX 77099
**T:** +1 713 266 1599
**F:** +1 713 266 1599
**www.alsglobal.com**

# SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

**Cooler Custody Seals (desirable, mandatory if specified in SAP):**

- ✓ Intact on outside of cooler, signed and dated

**Chain-of-Custody (COC) documentation (mandatory):**

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

**Sample Integrity (mandatory):**

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

**Temperature Requirement (varies by sample matrix):**

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

# Preparation Information Benchsheets

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Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

# *Preparation Information Benchsheet*

**Prep Run#:** 396435 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** **Prep Date/Time:** 3/10/22 08:11

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2200189-001 | LH18/24-SP650_030822_BIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 2 | EQ2200092-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 3 | EQ2200092-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 4 | EQ2200092-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 5 | R2201851-006 | 2203011100Y WW-3-569 | .01 | 6850/ClO4 | | | Water | 10mL | |
| 6 | R2201904-009 | 2203021009A WW-1-452 | .01 | 6850/ClO4 | | | Water | 10mL | |
| 7 | R2201904-015 | 2203021452A BLM-21-400 | .01 | 6850/ClO4 | | | Water | 10mL | |

## Spiking Solutions

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 221408 Logbook Ref: Perchlorate Internal Standard Expires On: 04/30/2022

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E2200189-001 | 100.00µL | EQ2200092-01 | 100.00µL | EQ2200092-01 | 100.00µL | EQ2200092-02 | 100.00µL | EQ2200092-02 | 100.00µL | EQ2200092-03 | 100.00µL |
| EQ2200092-03 | 100.00µL | R2201851-006 | 100.00µL | R2201904-009 | 100.00µL | R2201904-015 | 100.00µL | | | | |

Name: Perchlorate Intermediate Stock1 Inventory ID 221456 Logbook Ref: Perchlorate Expires On: 04/30/2022

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| EQ2200092-02 | 1.00µL | EQ2200092-02 | 1.00µL | EQ2200092-03 | 1.00µL | EQ2200092-03 | 1.00µL |

## Preparation Materials

| | | | | | |
|---|---|---|---|---|---|
| Water HPLC Grade | 08/03/2021 Water (218532) | 6850 Amber Glass screw vial | 2mL Screw Top Vial (221308) | 537M Glass Culture Tubes | 537M Glass Tubes (218064) |
| 6850 Luer-Lok Syringes | Luer-Lok Syringes (221305) | 6850 Pipette Tips 50-1000 uL | 6850 Pipette Tips (221307) | 6850 0.45um syringe filters | 6850 Syringe Filters (219639) |

## Preparation Steps

Step: Preparation
Started: 3/10/22 08:11
Finished: 3/10/22 09:00
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 3/10/22

Chain of Custody

Relinquished By: _____ Date: _____ Extracts Examined

Received By: _____ Date: _____ Yes No

# Analytical Results

**ALS Environmental - Houston HRMS**
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Phone (713)266-1599 Fax (713)266-0130
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**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200189 |
| **Project:** | HS22030443 | **Date Collected:** | 3/ 8/22 1400 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 3/ 9/22 |
| **Sample Name:** | LH18/24-SP650_030822_BIX | **Units:** | µg/L |
| **Lab Code:** | E2200189-001 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **1630** | | 10.0 | 5.00 | 2.50 | 100 | 3/10/22 | 3/10/22 11:51 | 396435 | 756955 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200189 |
| **Project:** | HS22030443 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2200092-01 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | ND | U | 0.100 | 0.0500 | 0.0250 | 1 | 3/10/22 | 3/10/22 10:25 | 396435 | 756955 | |

# Accuracy & Precision

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Phone (713)266-1599 Fax (713)266-0130
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**ALS Group USA, Corp. dba ALS Environmental**

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200189 |
| **Project:** | HS22030443 | **Date Analyzed:** | 3/10/22 |
| **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:** | | **Basis:** | NA |
| | | **Extraction Lot:** | 396435 |

| | Lab Control Sample EQ2200092-02 | | | Duplicate Lab Control Sample EQ2200092-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.0920 | 0.100 | 92 | 0.0908 | 0.100 | 91 | 84 - 119 | 1 | 15 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200189 |
| **Project:** | HS22030443 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200092-02 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.0920** | J | 0.100 | 0.0500 | 0.0250 | 1 | 3/10/22 | 3/10/22 10:33 | 396435 | 756955 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200189 |
| **Project:** | HS22030443 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200092-03 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.0908** | J | 0.100 | 0.0500 | 0.0250 | 1 | 3/10/22 | 3/10/22 11:12 | 396435 | 756955 | |

March 16, 2022

Service Request No:E2200191

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS22030443**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory March 09, 2022
For your reference, these analyses have been assigned our service request number **E2200191.**

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

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**ALS Environmental**

| | | | |
|---|---|---|---|
| **Client:** | ALS Houston | **Service Request No.:** | E2200191 |
| **Project:** | HS22030443 | **Date Received:** | 03/11/22 |
| **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

One sample was received for analysis at ALS Environmental in Houston on 03/11/22.

The sample was received in good condition and is 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:**

EQ2200095: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS-DLCS recoveries are within QC limits.

Sample E2200191-001 had to be analyzed at a 2X dilution due to sample 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:**E2200191
**Project:** HS22030443

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2200191-001 | LH18/24-SP650_030822_AIX | 3/8/2022 | 1400 |

# Service Request Summary

**Folder #:** **E2200191**
Client Name: ALS Environmental - US
Project Name: HS22030443
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 03/09/22
Internal Due Date: 3/16/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22030443
EDD: No EDD Specified

1 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**
**Rush**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON CIO4 DOD/6850 |
|---|---|---|---|---|
| E2200191-001 | LH18/24-SP650_030822_AIX | Ground Water | 03/08/22 1400 | **IV** |

# Service Request Summary

| | | | |
|---|---|---|---|
| **Folder #:** | **E2200191** | Project Chemist: | Corey Grandits |
| Client Name: | ALS Environmental - US | Originating Lab: | HOUSTON |
| Project Name: | HS22030443 | Logged By: | CGRANDITS |
| Project Number: | | Date Received: | 03/09/22 |
| **Report To:** | Ragen Giga<br>ALS Environmental - US<br>10450 Stancliff Rd Suite 210<br>Houston, TX 77099<br>USA | Internal Due Date: | 3/16/2022 |
| | | QAP: | LAB QAP |
| | | Qualifier Set: | Lab Standard |
| | | Formset: | Lab Standard |
| | | Merged?: | Y |
| Phone Number: | | Report to MDL?: | Y |
| Cell Number: | | P.O. Number: | HS22030443 |
| Fax Number: | | EDD: | No EDD Specified |
| E-mail: | ragenp.giga@alsglobal.com | | |

1 120 mL-Plastic Bottle Natural WM Unpreserved

**Location:** EHRMS-AirArch 1

**Pressure Gas:**

**Rush**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 1 | Level IV due 3/30 |

# 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 | (Auto) The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result. |
| 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. |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| 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. |
| P | Indicates chlorodiphenyl ether interference present at the retention time of the target compound. |
| P | Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns |
| Q | Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria. |
| R | Duplicate Precision not met. |
| R1 | Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated. |
| S | Surrogate recovery not within specified limits. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| T | Analyte is a tentatively identified compound, result is estimated. |
| U | Compound was analyzed for, but was not detected (ND). |
| V1 | The continuing calibration verification standard was outside (biased high) the specified limits for this compound. |
| V2 | The continuing calibration verification standard was outside (biased low) the specified limits for this compound. |
| W | Result quantified, but the corresponding peak was detected outside the generated retention time window. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| X | See case narrative. |
| Y | Recovery outside limits |
| Y | The chromatogram resembles a petroleum product but does not match the calibration standard. |
| Z | The chromatogram does not resemble a petroleum product. |
| i | The MRL/MDL has been elevated due to a matrix interference. |

# ALS Laboratory Group

## Acronyms

| | |
|---|---|
| Cal | Calibration |
| Conc | CONCentration |
| Dioxin(s) | Polychlorinated dibenzo-p-dioxin(s) |
| EDL | Estimated Detection Limit |
| EMPC | Estimated Maximum Possible Concentration |
| Flags | Data qualifiers |
| Furan(s) | Polychlorinated dibenzofuran(s) |
| g | Grams |
| ICAL | Initial CALibration |
| ID | IDentifier |
| Ions | Masses monitored for the analyte during data acquisition |
| L | Liter (s) |
| LCS | Laboratory Control Sample |
| DLCS | Duplicate Laboratory Control Sample |
| MB | Method Blank |
| MCL | Method Calibration Limit |
| MDL | Method Detection Limit |
| mL | Milliliters |
| MS | Matrix Spiked sample |
| DMS | Duplicate Matrix Spiked sample |
| NO | Number of peaks meeting all identification criteria |
| PCDD(s) | Polychlorinated dibenzo-p-dioxin(s) |
| PCDF(s) | Polychlorinated dibenzofuran(s) |
| ppb | Parts per billion |
| ppm | Parts per million |
| ppq | Parts per quadrillion |
| ppt | Parts per trillion |
| QA | Quality Assurance |
| QC | Quality Control |
| Ratio | Ratio of areas from monitored ions for an analyte |
| % Rec. | Percent recovery |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| RT | Retention Time |
| SDG | Sample Delivery Group |
| S/N | Signal-to-noise ratio |
| TEF | Toxicity Equivalence Factor |
| TEQ | Toxicity Equivalence Quotient |

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ALS Environmental

## State Certifications, Accreditations, and Licenses

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas Department of Environmental Quality | 19-028-0 | 6/30/2022 |
| Arkansas Department of Environmental Quality | 21-022-0 | 3/26/2022 |
| Florida Department of Health | E87611-33 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 5/1/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
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# Subcontract Chain of Custody

**SAMPLING STATE:** **Dept of Defense** **COC ID: 18297**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

| | |
|---|---|
| **Company:** | ALS Houston |
| **Contact:** | Ragen Giga |
| **Address:** | 10450 Stancliff Rd, Ste 210 |
| **Phone:** | +1 281 530 5656 |
| **Email:** | RagenP.Giga@ALSGlobal.com |
| **Alternate Contact:** | 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:** | HS22030443 |
| **TSR:** | Houston House Acct |

| | LAB SAMPLE ID | CLIENT SAMPLE ID | AIX XXX MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | | | DUE DATE |
| **1.** | **HS22030443-03** | **LH18/24-SP650_030822_BIX** | **Water** | **08 Mar 2022 14:00** |
| | 6850-Perch. DOD Level II & Level IV in separate pdf | | | 16 Mar 2022 |

**Comments:** Please analyze for the analysis listed above.
Send report to the emails shown above.

**QC Level:** DOD IV (DoD Data Package)

Relinquished By: NR Date/Time:

Received By: Corey Giannotta Date/Time: 3-11-22 1400

Cooler ID(s): Temperature(s):

ALS Environmental

# Cooler Receipt Form

Project Chemist: CG

Client/Project: ALS-H

Thermometer ID: IR31

Date/Time Received: 3-11-22 Initials: CG Date/Time Logged in: 3-11-22 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 | | 3-11-22 | 1900 | CG | 4.4 | ☒ |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☒ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☒ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☒ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☒ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☒ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

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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**
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Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

# *Preparation Information Benchsheet*

**Prep Run#:** 396575 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 3/14/22 09:45

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2200191-001 | LH18/24-SP650_030822_AIX | .01 | 6850/ClO4 DOD | | | Ground Water | 10mL | |
| 2 | EQ2200095-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 3 | EQ2200095-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 4 | EQ2200095-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |

## Spiking Solutions

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 221408 Logbook Ref: Perchlorate Internal Standard Expires On: 04/30/2022

E2200191-001 100.00µL EQ2200095-01 100.00µL EQ2200095-02 100.00µL EQ2200095-03 100.00µL

Name: Perchlorate Intermediate Stock1 Inventory ID 221456 Logbook Ref: Perchlorate Expires On: 04/30/2022

EQ2200095-02 1.00µL EQ2200095-03 1.00µL

## Preparation Materials

| | | | | | |
|---|---|---|---|---|---|
| Water HPLC Grade | 08/03/2021 Water (218532) | 6850 Amber Glass screw vial | 2mL Screw Top Vial (221308) | 537M Glass Culture Tubes | 537M Glass Tubes (218064) |
| 6850 0.45um syringe filters | 6850 Syringe Filters (219639) | 6850 Luer-Lok Syringes | Luer-Lok Syringes (221305) | 6850 Pipette Tips 50-1000 uL | 6850 Pipette Tips (221307) |

## Preparation Steps

Step: Preparation
Started: 3/14/22 09:45
Finished: 3/14/22 10:15
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 3/14/22

Chain of Custody

Relinquished By: _____ Date: _____ Extracts Examined

Received By: _____ Date: _____ Yes No

# Analytical Results

**ALS Environmental - Houston HRMS**
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Phone (713)266-1599 Fax (713)266-0130
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**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200191 |
| **Project:** | HS22030443 | **Date Collected:** | 3/ 8/22 1400 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 3/ 9/22 |
| **Sample Name:** | LH18/24-SP650_030822_AIX | **Units:** | µg/L |
| **Lab Code:** | E2200191-001 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850
**Prep Method:** Method

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.221** | | 0.200 | 0.100 | 0.0500 | 2 | 3/14/22 | 3/14/22 15:21 | 396575 | 757277 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200191 |
| **Project:** | HS22030443 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2200095-01 | **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 | 3/14/22 | 3/14/22 12:59 | 396575 | 757277 | |

# 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:** | E2200191 |
| **Project:** | HS22030443 | **Date Analyzed:** | 3/14/22 |
| **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:** | 396575 |

| | Lab Control Sample EQ2200095-02 | | | Duplicate Lab Control Sample EQ2200095-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.101 | 0.100 | 101 | 0.104 | 0.100 | 104 | 84 - 119 | 2 | 15 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200191 |
| **Project:** | HS22030443 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200095-02 | **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 | **0.101** | | 0.100 | 0.0500 | 0.0250 | 1 | 3/14/22 | 3/14/22 13:06 | 396575 | 757277 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200191 |
| **Project:** | HS22030443 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200095-03 | **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 | **0.104** | | 0.100 | 0.0500 | 0.0250 | 1 | 3/14/22 | 3/14/22 13:14 | 396575 | 757277 | |

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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March 23, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22030465**

Laboratory Results for: **Longhorn GW Treatment Plant Bi-Weekly Samples**

Dear Marcia Olive,

ALS Environmental received 2 sample(s) on Mar 09, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: JUMOKE.LAWAL**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 23-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**Work Order:** HS22030465

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22030465-01 | LH18/24-SP650_030822 | Water | | 08-Mar-2022 14:00 | 09-Mar-2022 10:30 | ☐ |
| HS22030465-02 | Trip Blank | Water | CG-082521-491 | 08-Mar-2022 14:00 | 09-Mar-2022 10:30 | ☐ |

**ALS Houston, US** Date: 23-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**Work Order:** HS22030465

**CASE NARRATIVE**

## GCMS Volatiles by Method SW8260

### Batch ID: R403926

#### Sample ID: VSTD050

- Carbon Disulfide exceeded %D limits for CCV. Samples are ND for this compound.

## WetChemistry by Method SW9056

### Batch ID: R404703

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

**ALS Houston, US** Date: 23-Mar-22

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS22030465
Sample ID: LH18/24-SP650_030822 Lab ID:HS22030465-01
Collection Date: 08-Mar-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| 1,1,1,2-Tetrachloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 1,1,1-Trichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 1,1-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 1,1-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 1,1-Dichloropropene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 1,2,3-Trichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 1,2,3-Trichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 1,2,4-Trichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 1,2,4-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 1,2-Dibromo-3-chloropropane | 1.0 | U | 0.20 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 1,2-Dibromoethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 1,2-Dichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 1,2-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 1,2-Dichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 1,3,5-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 1,3-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 1,3-Dichloropropane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 1,4-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 2,2-Dichloropropane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 2-Butanone | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 2-Chlorotoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 2-Hexanone | 2.0 | U | 1.0 | 2.0 | 2.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 4-Chlorotoluene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 4-Isopropyltoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| 4-Methyl-2-pentanone | 2.0 | U | 0.70 | 2.0 | 2.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Acetone | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Benzene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Bromobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Bromochloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Bromodichloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Bromoform | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Bromomethane | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Carbon disulfide | 2.0 | U | 0.60 | 2.0 | 2.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Carbon tetrachloride | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Chlorobenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Chloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Chloroform | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |

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

**ALS Houston, US** Date: 23-Mar-22

Client: Bhate Environmental Associates, Inc.

**ANALYTICAL REPORT**

Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS22030465

Sample ID: LH18/24-SP650_030822 Lab ID:HS22030465-01

Collection Date: 08-Mar-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| Chloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| **cis-1,2-Dichloroethene** | **1.5** | | **0.20** | **0.50** | **1.0** | **ug/L** | 1 | 10-Mar-2022 13:46 |
| cis-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Dibromochloromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Dibromomethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Dichlorodifluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Ethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Hexachlorobutadiene | 1.0 | U | 1.0 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Isopropylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| m,p-Xylene | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Methylene chloride | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| n-Butylbenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| n-Propylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Naphthalene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| o-Xylene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| sec-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Styrene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| tert-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Tetrachloroethene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Toluene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| trans-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| trans-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Trichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Trichlorofluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| Vinyl chloride | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:46 |
| *Surr: 1,2-Dichloroethane-d4* | *93.8* | | | **0** | *81-118* | *%REC* | *1* | *10-Mar-2022 13:46* |
| *Surr: 4-Bromofluorobenzene* | *104* | | | **0** | *85-114* | *%REC* | *1* | *10-Mar-2022 13:46* |
| *Surr: Dibromofluoromethane* | *91.5* | | | **0** | *80-119* | *%REC* | *1* | *10-Mar-2022 13:46* |
| *Surr: Toluene-d8* | *103* | | | **0** | *89-112* | *%REC* | *1* | *10-Mar-2022 13:46* |
| **ANIONS BY SW9056A** | | **Method:SW9056** | | | | | | Analyst: YP |
| **Chloride** | **853** | | **10.0** | **25.0** | **25.0** | **mg/L** | 50 | 23-Mar-2022 01:14 |
| **Sulfate** | **32.6** | | **0.400** | **1.00** | **1.00** | **mg/L** | 2 | 23-Mar-2022 01:08 |

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

**ALS Houston, US** Date: 23-Mar-22

Client: Bhate Environmental Associates, Inc.

**ANALYTICAL REPORT**

Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS22030465

Sample ID: Trip Blank Lab ID:HS22030465-02

Collection Date: 08-Mar-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| 1,1,1,2-Tetrachloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 1,1,1-Trichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 1,1-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 1,1-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 1,1-Dichloropropene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 1,2,3-Trichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 1,2,3-Trichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 1,2,4-Trichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 1,2,4-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 1,2-Dibromo-3-chloropropane | 1.0 | U | 0.20 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 1,2-Dibromoethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 1,2-Dichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 1,2-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 1,2-Dichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 1,3,5-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 1,3-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 1,3-Dichloropropane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 1,4-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 2,2-Dichloropropane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 2-Butanone | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 2-Chlorotoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 2-Hexanone | 2.0 | U | 1.0 | 2.0 | 2.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 4-Chlorotoluene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 4-Isopropyltoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| 4-Methyl-2-pentanone | 2.0 | U | 0.70 | 2.0 | 2.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| Acetone | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| Benzene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| Bromobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| Bromochloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| Bromodichloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| Bromoform | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| Bromomethane | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| Carbon disulfide | 2.0 | U | 0.60 | 2.0 | 2.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| Carbon tetrachloride | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| Chlorobenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| Chloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| Chloroform | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |

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

**ALS Houston, US** Date: 23-Mar-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Bi-Weekly Samples | WorkOrder:HS22030465 |
| Sample ID: | Trip Blank | Lab ID:HS22030465-02 |
| Collection Date: | 08-Mar-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: PC |
| Chloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| cis-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| cis-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| Dibromochloromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| Dibromomethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| Dichlorodifluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| Ethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| Hexachlorobutadiene | 1.0 | U | 1.0 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| Isopropylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| m,p-Xylene | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| Methylene chloride | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| n-Butylbenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| n-Propylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| Naphthalene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| o-Xylene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| sec-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| Styrene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| tert-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| Tetrachloroethene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| Toluene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| trans-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| trans-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| Trichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| **Trichlorofluoromethane** | **1.4** | | **0.30** | **1.0** | **1.0** | **ug/L** | 1 | 10-Mar-2022 13:24 |
| Vinyl chloride | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 10-Mar-2022 13:24 |
| *Surr: 1,2-Dichloroethane-d4* | *94.6* | | | **0** | *81-118* | *%REC* | *1* | *10-Mar-2022 13:24* |
| *Surr: 4-Bromofluorobenzene* | *103* | | | **0** | *85-114* | *%REC* | *1* | *10-Mar-2022 13:24* |
| *Surr: Dibromofluoromethane* | *92.0* | | | **0** | *80-119* | *%REC* | *1* | *10-Mar-2022 13:24* |
| *Surr: Toluene-d8* | *104* | | | **0** | *89-112* | *%REC* | *1* | *10-Mar-2022 13:24* |

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

**ALS Houston, US** Date: 23-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22030465

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** R403926 ( 0 ) | **Test Name :** VOLATILES ORGANICS BY METHOD 8260C | | | | **Matrix:** Water | |
| HS22030465-01 | LH18/24-SP650_030822 | 08 Mar 2022 14:00 | | | 10 Mar 2022 13:46 | 1 |
| HS22030465-02 | Trip Blank | 08 Mar 2022 14:00 | | | 10 Mar 2022 13:24 | 1 |
| **Batch ID:** R404703 ( 0 ) | **Test Name :** ANIONS BY SW9056A | | | | **Matrix:** Water | |
| HS22030465-01 | LH18/24-SP650_030822 | 08 Mar 2022 14:00 | | | 23 Mar 2022 01:14 | 50 |
| HS22030465-01 | LH18/24-SP650_030822 | 08 Mar 2022 14:00 | | | 23 Mar 2022 01:08 | 2 |

**ALS Houston, US** Date: 23-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22030465

**QC BATCH REPORT**

**Batch ID:** R403926 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220310** Units: **ug/L** Analysis Date: **10-Mar-2022 13:02**
Client ID: Run ID: **VOA9_403926** SeqNo: **6540147** PrepDate: DF: **1**

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

**ALS Houston, US** Date: 23-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22030465

**QC BATCH REPORT**

**Batch ID:** R403926 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220310** Units: **ug/L** Analysis Date: **10-Mar-2022 13:02**
Client ID: Run ID: **VOA9_403926** SeqNo: **6540147** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 2.0 | 2.0 | | | | | | | | U |
| Carbon tetrachloride | 1.0 | 1.0 | | | | | | | | U |
| Chlorobenzene | 1.0 | 1.0 | | | | | | | | U |
| Chloroethane | 1.0 | 1.0 | | | | | | | | U |
| Chloroform | 0.50 | 1.0 | | | | | | | | U |
| Chloromethane | 0.50 | 1.0 | | | | | | | | U |
| cis-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| cis-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Dibromochloromethane | 1.0 | 1.0 | | | | | | | | U |
| Dibromomethane | 0.50 | 1.0 | | | | | | | | U |
| Dichlorodifluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Ethylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Hexachlorobutadiene | 1.0 | 1.0 | | | | | | | | U |
| Isopropylbenzene | 1.0 | 1.0 | | | | | | | | U |
| m,p-Xylene | 1.0 | 2.0 | | | | | | | | U |
| Methylene chloride | 2.0 | 2.0 | | | | | | | | U |
| Naphthalene | 1.0 | 1.0 | | | | | | | | U |
| n-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| n-Propylbenzene | 1.0 | 1.0 | | | | | | | | U |
| o-Xylene | 1.0 | 1.0 | | | | | | | | U |
| sec-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Styrene | 1.0 | 1.0 | | | | | | | | U |
| tert-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Tetrachloroethene | 1.0 | 1.0 | | | | | | | | U |
| Toluene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Trichloroethene | 0.50 | 1.0 | | | | | | | | U |
| Trichlorofluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Vinyl chloride | 0.50 | 1.0 | | | | | | | | U |
| *Surr: 1,2-Dichloroethane-d4* | *46.3* | *1.0* | *50* | *0* | *92.6* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *51.76* | *1.0* | *50* | *0* | *104* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *45.84* | *1.0* | *50* | *0* | *91.7* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *52.3* | *1.0* | *50* | *0* | *105* | *89 - 112* | | | | |

**ALS Houston, US** Date: 23-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22030465

**QC BATCH REPORT**

**Batch ID:** R403926 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220310** Units: **ug/L** Analysis Date: **10-Mar-2022 12:17**
Client ID: Run ID: **VOA9_403926** SeqNo: **6540146** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 21.22 | 1.0 | 20 | 0 | 106 | 78 - 124 | | | | |
| 1,1,1-Trichloroethane | 19.86 | 1.0 | 20 | 0 | 99.3 | 74 - 131 | | | | |
| 1,1,2,2-Tetrachloroethane | 19.84 | 1.0 | 20 | 0 | 99.2 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 20.42 | 1.0 | 20 | 0 | 102 | 80 - 119 | | | | |
| 1,1-Dichloroethane | 19.2 | 1.0 | 20 | 0 | 96.0 | 77 - 125 | | | | |
| 1,1-Dichloroethene | 23.35 | 1.0 | 20 | 0 | 117 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 19.96 | 1.0 | 20 | 0 | 99.8 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 20.32 | 1.0 | 20 | 0 | 102 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 19.93 | 1.0 | 20 | 0 | 99.6 | 73 - 122 | | | | |
| 1,2,4-Trichlorobenzene | 20.88 | 1.0 | 20 | 0 | 104 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 20.8 | 1.0 | 20 | 0 | 104 | 76 - 124 | | | | |
| 1,2-Dibromo-3-chloropropane | 18.35 | 1.0 | 20 | 0 | 91.7 | 62 - 128 | | | | |
| 1,2-Dibromoethane | 20.86 | 1.0 | 20 | 0 | 104 | 77 - 121 | | | | |
| 1,2-Dichlorobenzene | 19.87 | 1.0 | 20 | 0 | 99.4 | 80 - 119 | | | | |
| 1,2-Dichloroethane | 21.21 | 1.0 | 20 | 0 | 106 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 20.06 | 1.0 | 20 | 0 | 100 | 78 - 122 | | | | |
| 1,3,5-Trimethylbenzene | 20.52 | 1.0 | 20 | 0 | 103 | 75 - 124 | | | | |
| 1,3-Dichlorobenzene | 20.1 | 1.0 | 20 | 0 | 101 | 80 - 119 | | | | |
| 1,3-Dichloropropane | 20.89 | 1.0 | 20 | 0 | 104 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 19.74 | 1.0 | 20 | 0 | 98.7 | 79 - 118 | | | | |
| 2,2-Dichloropropane | 19.34 | 1.0 | 20 | 0 | 96.7 | 60 - 139 | | | | |
| 2-Butanone | 37.09 | 2.0 | 40 | 0 | 92.7 | 56 - 143 | | | | |
| 2-Chlorotoluene | 20.31 | 1.0 | 20 | 0 | 102 | 79 - 122 | | | | |
| 2-Hexanone | 41.93 | 2.0 | 40 | 0 | 105 | 57 - 139 | | | | |
| 4-Chlorotoluene | 20.61 | 1.0 | 20 | 0 | 103 | 78 - 122 | | | | |
| 4-Isopropyltoluene | 21.5 | 1.0 | 20 | 0 | 108 | 77 - 127 | | | | |
| 4-Methyl-2-pentanone | 42.5 | 2.0 | 40 | 0 | 106 | 67 - 130 | | | | |
| Acetone | 44.01 | 2.0 | 40 | 0 | 110 | 39 - 160 | | | | |
| Benzene | 20.14 | 1.0 | 20 | 0 | 101 | 79 - 120 | | | | |
| Bromobenzene | 20.2 | 1.0 | 20 | 0 | 101 | 80 - 120 | | | | |
| Bromochloromethane | 20.62 | 1.0 | 20 | 0 | 103 | 78 - 123 | | | | |
| Bromodichloromethane | 20.45 | 1.0 | 20 | 0 | 102 | 79 - 125 | | | | |
| Bromoform | 18.16 | 1.0 | 20 | 0 | 90.8 | 66 - 130 | | | | |
| Bromomethane | 20.03 | 1.0 | 20 | 0 | 100 | 53 - 141 | | | | |

**ALS Houston, US** Date: 23-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22030465

**QC BATCH REPORT**

**Batch ID:** R403926 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220310** Units: **ug/L** Analysis Date: **10-Mar-2022 12:17**
Client ID: Run ID: **VOA9_403926** SeqNo: **6540146** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 46.23 | 2.0 | 40 | 0 | 116 | 64 - 133 | | | | |
| Carbon tetrachloride | 20.45 | 1.0 | 20 | 0 | 102 | 72 - 136 | | | | |
| Chlorobenzene | 20.14 | 1.0 | 20 | 0 | 101 | 82 - 118 | | | | |
| Chloroethane | 18.7 | 1.0 | 20 | 0 | 93.5 | 60 - 138 | | | | |
| Chloroform | 20.22 | 1.0 | 20 | 0 | 101 | 79 - 124 | | | | |
| Chloromethane | 19.16 | 1.0 | 20 | 0 | 95.8 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 19.21 | 1.0 | 20 | 0 | 96.0 | 78 - 123 | | | | |
| cis-1,3-Dichloropropene | 18.54 | 1.0 | 20 | 0 | 92.7 | 75 - 124 | | | | |
| Dibromochloromethane | 18.78 | 1.0 | 20 | 0 | 93.9 | 74 - 126 | | | | |
| Dibromomethane | 20.16 | 1.0 | 20 | 0 | 101 | 79 - 123 | | | | |
| Dichlorodifluoromethane | 19.8 | 1.0 | 20 | 0 | 99.0 | 32 - 152 | | | | |
| Ethylbenzene | 20.44 | 1.0 | 20 | 0 | 102 | 79 - 121 | | | | |
| Hexachlorobutadiene | 22.93 | 1.0 | 20 | 0 | 115 | 66 - 134 | | | | |
| Isopropylbenzene | 21.1 | 1.0 | 20 | 0 | 106 | 72 - 131 | | | | |
| m,p-Xylene | 41.28 | 2.0 | 40 | 0 | 103 | 80 - 121 | | | | |
| Methylene chloride | 20.88 | 2.0 | 20 | 0 | 104 | 74 - 124 | | | | |
| Naphthalene | 20.34 | 1.0 | 20 | 0 | 102 | 61 - 128 | | | | |
| n-Butylbenzene | 21.23 | 1.0 | 20 | 0 | 106 | 75 - 128 | | | | |
| n-Propylbenzene | 20.85 | 1.0 | 20 | 0 | 104 | 76 - 126 | | | | |
| o-Xylene | 20.89 | 1.0 | 20 | 0 | 104 | 78 - 122 | | | | |
| sec-Butylbenzene | 20.87 | 1.0 | 20 | 0 | 104 | 77 - 126 | | | | |
| Styrene | 21.43 | 1.0 | 20 | 0 | 107 | 78 - 123 | | | | |
| tert-Butylbenzene | 20.4 | 1.0 | 20 | 0 | 102 | 78 - 124 | | | | |
| Tetrachloroethene | 20.93 | 1.0 | 20 | 0 | 105 | 74 - 129 | | | | |
| Toluene | 20.89 | 1.0 | 20 | 0 | 104 | 80 - 121 | | | | |
| trans-1,2-Dichloroethene | 21.88 | 1.0 | 20 | 0 | 109 | 75 - 124 | | | | |
| trans-1,3-Dichloropropene | 18.67 | 1.0 | 20 | 0 | 93.3 | 73 - 127 | | | | |
| Trichloroethene | 19.19 | 1.0 | 20 | 0 | 96.0 | 79 - 123 | | | | |
| Trichlorofluoromethane | 21.63 | 1.0 | 20 | 0 | 108 | 65 - 141 | | | | |
| Vinyl chloride | 19.56 | 1.0 | 20 | 0 | 97.8 | 58 - 137 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *51.62* | *1.0* | *50* | *0* | *103* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *52.51* | *1.0* | *50* | *0* | *105* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *50.62* | *1.0* | *50* | *0* | *101* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *49.39* | *1.0* | *50* | *0* | *98.8* | *89 - 112* | | | | |

**ALS Houston, US** Date: 23-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22030465

**QC BATCH REPORT**

**Batch ID:** R403926 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS22030465-01MS** Units: **ug/L** Analysis Date: **10-Mar-2022 14:31**
Client ID: **LH18/24-SP650_030822** Run ID: **VOA9_403926** SeqNo: **6540150** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 23.55 | 1.0 | 20 | 0 | 118 | 78 - 124 | | | | |
| 1,1,1-Trichloroethane | 21.88 | 1.0 | 20 | 0 | 109 | 74 - 131 | | | | |
| 1,1,2,2-Tetrachloroethane | 21.52 | 1.0 | 20 | 0 | 108 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 22.16 | 1.0 | 20 | 0 | 111 | 80 - 119 | | | | |
| 1,1-Dichloroethane | 22.37 | 1.0 | 20 | 0 | 112 | 77 - 125 | | | | |
| 1,1-Dichloroethene | 20.88 | 1.0 | 20 | 0 | 104 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 23.06 | 1.0 | 20 | 0 | 115 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 21.63 | 1.0 | 20 | 0 | 108 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 21.6 | 1.0 | 20 | 0 | 108 | 73 - 122 | | | | |
| 1,2,4-Trichlorobenzene | 22.1 | 1.0 | 20 | 0 | 111 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 23.65 | 1.0 | 20 | 0 | 118 | 76 - 124 | | | | |
| 1,2-Dibromo-3-chloropropane | 20.01 | 1.0 | 20 | 0 | 100 | 62 - 128 | | | | |
| 1,2-Dibromoethane | 22.91 | 1.0 | 20 | 0 | 115 | 77 - 121 | | | | |
| 1,2-Dichlorobenzene | 21.74 | 1.0 | 20 | 0 | 109 | 80 - 119 | | | | |
| 1,2-Dichloroethane | 22.73 | 1.0 | 20 | 0 | 114 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 22.01 | 1.0 | 20 | 0 | 110 | 78 - 122 | | | | |
| 1,3,5-Trimethylbenzene | 23.58 | 1.0 | 20 | 0 | 118 | 75 - 124 | | | | |
| 1,3-Dichlorobenzene | 22.28 | 1.0 | 20 | 0 | 111 | 80 - 119 | | | | |
| 1,3-Dichloropropane | 22.75 | 1.0 | 20 | 0 | 114 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 21.61 | 1.0 | 20 | 0 | 108 | 79 - 118 | | | | |
| 2,2-Dichloropropane | 20.69 | 1.0 | 20 | 0 | 103 | 60 - 139 | | | | |
| 2-Butanone | 38.01 | 2.0 | 40 | 0 | 95.0 | 56 - 143 | | | | |
| 2-Chlorotoluene | 22.79 | 1.0 | 20 | 0 | 114 | 79 - 122 | | | | |
| 2-Hexanone | 47.2 | 2.0 | 40 | 0 | 118 | 57 - 139 | | | | |
| 4-Chlorotoluene | 23.08 | 1.0 | 20 | 0 | 115 | 78 - 122 | | | | |
| 4-Isopropyltoluene | 24.54 | 1.0 | 20 | 0 | 123 | 77 - 127 | | | | |
| 4-Methyl-2-pentanone | 47.85 | 2.0 | 40 | 0 | 120 | 67 - 130 | | | | |
| Acetone | 37.54 | 2.0 | 40 | 0 | 93.9 | 39 - 160 | | | | |
| Benzene | 22.19 | 1.0 | 20 | 0 | 111 | 79 - 120 | | | | |
| Bromobenzene | 22.01 | 1.0 | 20 | 0 | 110 | 80 - 120 | | | | |
| Bromochloromethane | 21.62 | 1.0 | 20 | 0 | 108 | 78 - 123 | | | | |
| Bromodichloromethane | 22.68 | 1.0 | 20 | 0 | 113 | 79 - 125 | | | | |
| Bromoform | 19.53 | 1.0 | 20 | 0 | 97.7 | 66 - 130 | | | | |
| Bromomethane | 11.64 | 1.0 | 20 | 0 | 58.2 | 53 - 141 | | | | |

**ALS Houston, US** Date: 23-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22030465

**QC BATCH REPORT**

**Batch ID:** R403926 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS22030465-01MS** Units: **ug/L** Analysis Date: **10-Mar-2022 14:31**
Client ID: **LH18/24-SP650_030822** Run ID: **VOA9_403926** SeqNo: **6540150** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 43.48 | 2.0 | 40 | 0 | 109 | 64 - 133 | | | | |
| Carbon tetrachloride | 25 | 1.0 | 20 | 0 | 125 | 72 - 136 | | | | |
| Chlorobenzene | 21.92 | 1.0 | 20 | 0 | 110 | 82 - 118 | | | | |
| Chloroethane | 15.91 | 1.0 | 20 | 0 | 79.5 | 60 - 138 | | | | |
| Chloroform | 20.86 | 1.0 | 20 | 0 | 104 | 79 - 124 | | | | |
| Chloromethane | 18.63 | 1.0 | 20 | 0 | 93.1 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 21.68 | 1.0 | 20 | 1.481 | 101 | 78 - 123 | | | | |
| cis-1,3-Dichloropropene | 20.32 | 1.0 | 20 | 0 | 102 | 75 - 124 | | | | |
| Dibromochloromethane | 20.83 | 1.0 | 20 | 0 | 104 | 74 - 126 | | | | |
| Dibromomethane | 21.85 | 1.0 | 20 | 0 | 109 | 79 - 123 | | | | |
| Dichlorodifluoromethane | 14.35 | 1.0 | 20 | 0 | 71.8 | 32 - 152 | | | | |
| Ethylbenzene | 22.98 | 1.0 | 20 | 0 | 115 | 79 - 121 | | | | |
| Hexachlorobutadiene | 24.2 | 1.0 | 20 | 0 | 121 | 66 - 134 | | | | |
| Isopropylbenzene | 24.29 | 1.0 | 20 | 0 | 121 | 72 - 131 | | | | |
| m,p-Xylene | 46.42 | 2.0 | 40 | 0 | 116 | 80 - 121 | | | | |
| Methylene chloride | 20.15 | 2.0 | 20 | 0 | 101 | 74 - 124 | | | | |
| Naphthalene | 22.11 | 1.0 | 20 | 0 | 111 | 61 - 128 | | | | |
| n-Butylbenzene | 24.13 | 1.0 | 20 | 0 | 121 | 75 - 128 | | | | |
| n-Propylbenzene | 24.15 | 1.0 | 20 | 0 | 121 | 76 - 126 | | | | |
| o-Xylene | 22.91 | 1.0 | 20 | 0 | 115 | 78 - 122 | | | | |
| sec-Butylbenzene | 24.21 | 1.0 | 20 | 0 | 121 | 77 - 126 | | | | |
| Styrene | 23.84 | 1.0 | 20 | 0 | 119 | 78 - 123 | | | | |
| tert-Butylbenzene | 23.71 | 1.0 | 20 | 0 | 119 | 78 - 124 | | | | |
| Tetrachloroethene | 23.16 | 1.0 | 20 | 0 | 116 | 74 - 129 | | | | |
| Toluene | 23.25 | 1.0 | 20 | 0 | 116 | 80 - 121 | | | | |
| trans-1,2-Dichloroethene | 21.25 | 1.0 | 20 | 0 | 106 | 75 - 124 | | | | |
| trans-1,3-Dichloropropene | 20 | 1.0 | 20 | 0 | 100 | 73 - 127 | | | | |
| Trichloroethene | 22.59 | 1.0 | 20 | 0 | 113 | 79 - 123 | | | | |
| Trichlorofluoromethane | 21.34 | 1.0 | 20 | 0 | 107 | 65 - 141 | | | | |
| Vinyl chloride | 18.65 | 1.0 | 20 | 0 | 93.3 | 58 - 137 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *47.1* | *1.0* | *50* | *0* | *94.2* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *52.78* | *1.0* | *50* | *0* | *106* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *46.68* | *1.0* | *50* | *0* | *93.4* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *51.33* | *1.0* | *50* | *0* | *103* | *89 - 112* | | | | |

**ALS Houston, US** Date: 23-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22030465

**QC BATCH REPORT**

**Batch ID:** R403926 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS22030465-01MSD** Units: **ug/L** Analysis Date: **10-Mar-2022 14:53**
Client ID: **LH18/24-SP650_030822** Run ID: **VOA9_403926** SeqNo: **6540151** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 24.57 | 1.0 | 20 | 0 | 123 | 78 - 124 | 23.55 | 4.21 | 20 | |
| 1,1,1-Trichloroethane | 22.72 | 1.0 | 20 | 0 | 114 | 74 - 131 | 21.88 | 3.75 | 20 | |
| 1,1,2,2-Tetrachloroethane | 22.2 | 1.0 | 20 | 0 | 111 | 71 - 121 | 21.52 | 3.11 | 20 | |
| 1,1,2-Trichloroethane | 23.29 | 1.0 | 20 | 0 | 116 | 80 - 119 | 22.16 | 4.95 | 20 | |
| 1,1-Dichloroethane | 23.38 | 1.0 | 20 | 0 | 117 | 77 - 125 | 22.37 | 4.45 | 20 | |
| 1,1-Dichloroethene | 21.16 | 1.0 | 20 | 0 | 106 | 71 - 131 | 20.88 | 1.35 | 20 | |
| 1,1-Dichloropropene | 23.33 | 1.0 | 20 | 0 | 117 | 78 - 125 | 23.06 | 1.16 | 20 | |
| 1,2,3-Trichlorobenzene | 22.67 | 1.0 | 20 | 0 | 113 | 69 - 129 | 21.63 | 4.66 | 20 | |
| 1,2,3-Trichloropropane | 22.72 | 1.0 | 20 | 0 | 114 | 73 - 122 | 21.6 | 5.06 | 20 | |
| 1,2,4-Trichlorobenzene | 23.21 | 1.0 | 20 | 0 | 116 | 69 - 130 | 22.1 | 4.91 | 20 | |
| 1,2,4-Trimethylbenzene | 24.7 | 1.0 | 20 | 0 | 123 | 76 - 124 | 23.65 | 4.31 | 20 | |
| 1,2-Dibromo-3-chloropropane | 20.36 | 1.0 | 20 | 0 | 102 | 62 - 128 | 20.01 | 1.74 | 20 | |
| 1,2-Dibromoethane | 23.72 | 1.0 | 20 | 0 | 119 | 77 - 121 | 22.91 | 3.44 | 20 | |
| 1,2-Dichlorobenzene | 22.24 | 1.0 | 20 | 0 | 111 | 80 - 119 | 21.74 | 2.25 | 20 | |
| 1,2-Dichloroethane | 23.52 | 1.0 | 20 | 0 | 118 | 73 - 128 | 22.73 | 3.38 | 20 | |
| 1,2-Dichloropropane | 22.46 | 1.0 | 20 | 0 | 112 | 78 - 122 | 22.01 | 2.05 | 20 | |
| 1,3,5-Trimethylbenzene | 24.16 | 1.0 | 20 | 0 | 121 | 75 - 124 | 23.58 | 2.44 | 20 | |
| 1,3-Dichlorobenzene | 22.66 | 1.0 | 20 | 0 | 113 | 80 - 119 | 22.28 | 1.69 | 20 | |
| 1,3-Dichloropropane | 23.36 | 1.0 | 20 | 0 | 117 | 80 - 119 | 22.75 | 2.63 | 20 | |
| 1,4-Dichlorobenzene | 22.31 | 1.0 | 20 | 0 | 112 | 79 - 118 | 21.61 | 3.21 | 20 | |
| 2,2-Dichloropropane | 20.89 | 1.0 | 20 | 0 | 104 | 60 - 139 | 20.69 | 0.982 | 20 | |
| 2-Butanone | 38.68 | 2.0 | 40 | 0 | 96.7 | 56 - 143 | 38.01 | 1.77 | 20 | |
| 2-Chlorotoluene | 23.1 | 1.0 | 20 | 0 | 115 | 79 - 122 | 22.79 | 1.36 | 20 | |
| 2-Hexanone | 48.8 | 2.0 | 40 | 0 | 122 | 57 - 139 | 47.2 | 3.33 | 20 | |
| 4-Chlorotoluene | 23.61 | 1.0 | 20 | 0 | 118 | 78 - 122 | 23.08 | 2.29 | 20 | |
| 4-Isopropyltoluene | 24.67 | 1.0 | 20 | 0 | 123 | 77 - 127 | 24.54 | 0.548 | 20 | |
| 4-Methyl-2-pentanone | 49.62 | 2.0 | 40 | 0 | 124 | 67 - 130 | 47.85 | 3.62 | 20 | |
| Acetone | 37.76 | 2.0 | 40 | 0 | 94.4 | 39 - 160 | 37.54 | 0.567 | 20 | |
| Benzene | 22.96 | 1.0 | 20 | 0 | 115 | 79 - 120 | 22.19 | 3.41 | 20 | |
| Bromobenzene | 22.72 | 1.0 | 20 | 0 | 114 | 80 - 120 | 22.01 | 3.17 | 20 | |
| Bromochloromethane | 21.77 | 1.0 | 20 | 0 | 109 | 78 - 123 | 21.62 | 0.691 | 20 | |
| Bromodichloromethane | 23.64 | 1.0 | 20 | 0 | 118 | 79 - 125 | 22.68 | 4.18 | 20 | |
| Bromoform | 20.74 | 1.0 | 20 | 0 | 104 | 66 - 130 | 19.53 | 5.99 | 20 | |
| Bromomethane | 11.29 | 1.0 | 20 | 0 | 56.5 | 53 - 141 | 11.64 | 3.01 | 20 | |

**ALS Houston, US** Date: 23-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22030465

**QC BATCH REPORT**

**Batch ID:** R403926 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS22030465-01MSD** Units: **ug/L** Analysis Date: **10-Mar-2022 14:53**
Client ID: **LH18/24-SP650_030822** Run ID: **VOA9_403926** SeqNo: **6540151** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 43.88 | 2.0 | 40 | 0 | 110 | 64 - 133 | 43.48 | 0.915 | 20 | |
| Carbon tetrachloride | 25.4 | 1.0 | 20 | 0 | 127 | 72 - 136 | 25 | 1.59 | 20 | |
| Chlorobenzene | 22.58 | 1.0 | 20 | 0 | 113 | 82 - 118 | 21.92 | 2.98 | 20 | |
| Chloroethane | 18.15 | 1.0 | 20 | 0 | 90.7 | 60 - 138 | 15.91 | 13.2 | 20 | |
| Chloroform | 21.17 | 1.0 | 20 | 0 | 106 | 79 - 124 | 20.86 | 1.5 | 20 | |
| Chloromethane | 17.36 | 1.0 | 20 | 0 | 86.8 | 50 - 139 | 18.63 | 7.05 | 20 | |
| cis-1,2-Dichloroethene | 22.1 | 1.0 | 20 | 1.481 | 103 | 78 - 123 | 21.68 | 1.89 | 20 | |
| cis-1,3-Dichloropropene | 20.85 | 1.0 | 20 | 0 | 104 | 75 - 124 | 20.32 | 2.56 | 20 | |
| Dibromochloromethane | 21.22 | 1.0 | 20 | 0 | 106 | 74 - 126 | 20.83 | 1.89 | 20 | |
| Dibromomethane | 22.35 | 1.0 | 20 | 0 | 112 | 79 - 123 | 21.85 | 2.25 | 20 | |
| Dichlorodifluoromethane | 14.64 | 1.0 | 20 | 0 | 73.2 | 32 - 152 | 14.35 | 2 | 20 | |
| Ethylbenzene | 23.9 | 1.0 | 20 | 0 | 119 | 79 - 121 | 22.98 | 3.92 | 20 | |
| Hexachlorobutadiene | 24.88 | 1.0 | 20 | 0 | 124 | 66 - 134 | 24.2 | 2.8 | 20 | |
| Isopropylbenzene | 24.99 | 1.0 | 20 | 0 | 125 | 72 - 131 | 24.29 | 2.86 | 20 | |
| m,p-Xylene | 47.77 | 2.0 | 40 | 0 | 119 | 80 - 121 | 46.42 | 2.87 | 20 | |
| Methylene chloride | 18.7 | 2.0 | 20 | 0 | 93.5 | 74 - 124 | 20.15 | 7.49 | 20 | |
| Naphthalene | 23.96 | 1.0 | 20 | 0 | 120 | 61 - 128 | 22.11 | 8.03 | 20 | |
| n-Butylbenzene | 24.67 | 1.0 | 20 | 0 | 123 | 75 - 128 | 24.13 | 2.22 | 20 | |
| n-Propylbenzene | 24.09 | 1.0 | 20 | 0 | 120 | 76 - 126 | 24.15 | 0.216 | 20 | |
| o-Xylene | 23.76 | 1.0 | 20 | 0 | 119 | 78 - 122 | 22.91 | 3.65 | 20 | |
| sec-Butylbenzene | 24.49 | 1.0 | 20 | 0 | 122 | 77 - 126 | 24.21 | 1.14 | 20 | |
| Styrene | 24.22 | 1.0 | 20 | 0 | 121 | 78 - 123 | 23.84 | 1.59 | 20 | |
| tert-Butylbenzene | 24.14 | 1.0 | 20 | 0 | 121 | 78 - 124 | 23.71 | 1.8 | 20 | |
| Tetrachloroethene | 23.49 | 1.0 | 20 | 0 | 117 | 74 - 129 | 23.16 | 1.41 | 20 | |
| Toluene | 23.56 | 1.0 | 20 | 0 | 118 | 80 - 121 | 23.25 | 1.34 | 20 | |
| trans-1,2-Dichloroethene | 22.64 | 1.0 | 20 | 0 | 113 | 75 - 124 | 21.25 | 6.32 | 20 | |
| trans-1,3-Dichloropropene | 20.46 | 1.0 | 20 | 0 | 102 | 73 - 127 | 20 | 2.28 | 20 | |
| Trichloroethene | 23.02 | 1.0 | 20 | 0 | 115 | 79 - 123 | 22.59 | 1.9 | 20 | |
| Trichlorofluoromethane | 21.44 | 1.0 | 20 | 0 | 107 | 65 - 141 | 21.34 | 0.445 | 20 | |
| Vinyl chloride | 18.61 | 1.0 | 20 | 0 | 93.1 | 58 - 137 | 18.65 | 0.213 | 20 | |
| *Surr: 1,2-Dichloroethane-d4* | *46.79* | *1.0* | *50* | *0* | *93.6* | *81 - 118* | *47.1* | *0.658* | *20* | |
| *Surr: 4-Bromofluorobenzene* | *53.12* | *1.0* | *50* | *0* | *106* | *85 - 114* | *52.78* | *0.633* | *20* | |
| *Surr: Dibromofluoromethane* | *47.04* | *1.0* | *50* | *0* | *94.1* | *80 - 119* | *46.68* | *0.756* | *20* | |
| *Surr: Toluene-d8* | *51.19* | *1.0* | *50* | *0* | *102* | *89 - 112* | *51.33* | *0.266* | *20* | |

**ALS Houston, US** Date: 23-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22030465

**QC BATCH REPORT**

| Batch ID: | R403926 ( 0 ) | Instrument: | VOA9 | Method: | VOLATILES ORGANICS BY METHOD 8260C |
|---|---|---|---|---|---|

**The following samples were analyzed in this batch:** HS22030465-01 HS22030465-02

**ALS Houston, US** Date: 23-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22030465

**QC BATCH REPORT**

**Batch ID:** R404703 ( 0 ) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

**MBLK** Sample ID: **MBLK** Units: **mg/L** Analysis Date: **23-Mar-2022 00:58**
Client ID: Run ID: **ICS-Integrion_404703** SeqNo: **6556818** 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: **23-Mar-2022 01:03**
Client ID: Run ID: **ICS-Integrion_404703** SeqNo: **6556819** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 19.81 | 0.500 | 20 | 0 | 99.0 | 80 - 120 | | | | |
| Sulfate | 19.94 | 0.500 | 20 | 0 | 99.7 | 80 - 120 | | | | |

**MS** Sample ID: **HS22031004-09MS** Units: **mg/L** Analysis Date: **23-Mar-2022 01:35**
Client ID: Run ID: **ICS-Integrion_404703** SeqNo: **6556825** PrepDate: DF: **5**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 230.1 | 2.50 | 50 | 189.6 | 81.1 | 80 - 120 | | | | |
| Sulfate | 97.67 | 2.50 | 50 | 49.35 | 96.6 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22031004-09MSD** Units: **mg/L** Analysis Date: **23-Mar-2022 01:40**
Client ID: Run ID: **ICS-Integrion_404703** SeqNo: **6556826** PrepDate: DF: **5**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 229.7 | 2.50 | 50 | 189.6 | 80.3 | 80 - 120 | 230.1 | 0.18 | 20 | |
| Sulfate | 97.72 | 2.50 | 50 | 49.35 | 96.8 | 80 - 120 | 97.67 | 0.0558 | 20 | |

**The following samples were analyzed in this batch:** HS22030465-01

**ALS Houston, US** Date: 23-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** **HS22030465**

## QUALIFIERS, ACRONYMS, UNITS

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

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

| Unit Reported | Description |
|---|---|
| mg/L | Milligrams per Liter |

## CERTIFICATIONS,ACCREDITATIONS & LICENSES

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas | 21-022-0 | 26-Mar-2022 |
| Florida | E87611-34 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 23-Mar-22

## Sample Receipt Checklist

**Work Order ID:** HS22030465 **Date/Time Received:** **09-Mar-2022 10:30**

**Client Name:** Bhate Environmental **Received by:** **Pablo Marinez**

**Completed By:** /S/ Pablo Marinez (eSignature) 09-Mar-2022 14:07 (Date/Time) **Reviewed by:** /S/ Corey Grandits (eSignature) 11-Mar-2022 11:44 (Date/Time)

Matrices: **WATER** Carrier name: **ALS.HS**

| | Yes | No | |
|---|---|---|---|
| Shipping container/cooler in good condition? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on shipping container/cooler? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on sample bottles? | ☐ | ☐ | Not Present ☑ |
| VOA/TX1005/TX1006 Solids in hermetically sealed vials? | ☐ | ☐ | Not Present ☑ |
| Chain of custody present? | ☑ | ☐ | 1 Page(s) |
| Chain of custody signed when relinquished and received? | ☑ | ☐ | COC IDs:CLIENT |
| Samplers name present on COC? | ☑ | ☐ | |
| Chain of custody agrees with sample labels? | ☑ | ☐ | |
| Samples in proper container/bottle? | ☑ | ☐ | |
| Sample containers intact? | ☑ | ☐ | |
| Sufficient sample volume for indicated test? | ☑ | ☐ | |
| All samples received within holding time? | ☑ | ☐ | |
| Container/Temp Blank temperature in compliance? | ☑ | ☐ | |

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 0.4°C/0.9°C UC/C | IR 31 |
| Cooler(s)/Kit(s): | 48436 | |
| Date/Time sample(s) sent to storage: | 3/9/22 14:10 | |

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

Page 1 of 1

**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:** GROUNDWATER TREATMENT PLANT BI-WEEKLY SAMPLES

**Prepared By:** Scott Beesinger

**P.O Number**

HS22030465
Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Bi-Weekly Samples

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | VOC | CHLORIDE, SULFATE | | | | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_030822 | Water | 03/08/22 / 14:00 | | 3 | 3 | | | | | | | | | | HCL | |
| LH18/24-SP650_030822 | Water | 03/08/22 / 14:00 | | 1 | | 1 | | | | | | | | | NONE | |
| Trip Blank | Water | 03/08/22 | | 2 | 2 | | | | | | | | | | HCL | |

Additional Remarks: **Standard TAT on all parameters**

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 03/08/22 | 14:30 | [illegible] | 3/8/22 | 10:30 | | | | | | |

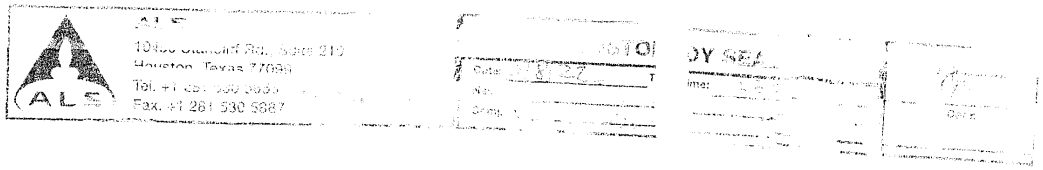
**9For Lab Use Only**

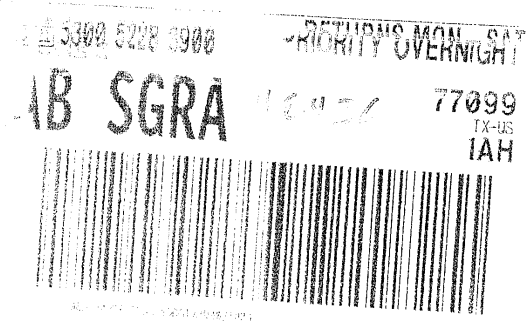
| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Remarks

4E436 0.4c
1R31 UP+0.5

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly


ALS
Fax. +1 281 530 5887


PRIORITY OVERNIGHT
AB SGRA
77099
TX-US
IAH

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

March 21, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22030820**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia Olive,

ALS Environmental received 3 sample(s) on Mar 16, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: DAYNA.FISHER**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 21-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22030820

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22030820-01 | LH18/24-SP650_031522 | Water | | 15-Mar-2022 14:00 | 16-Mar-2022 09:55 | ☐ |
| HS22030820-02 | LH18/24-SP650_031522_AIX | Water | | 15-Mar-2022 14:00 | 16-Mar-2022 09:55 | ☐ |
| HS22030820-03 | LH18/24-SP650_031522_BIX | Water | | 15-Mar-2022 14:00 | 16-Mar-2022 09:55 | ☐ |

**ALS Houston, US** Date: 21-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22030820

**CASE NARRATIVE**

## Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached

## WetChemistry by Method E415.1

### Batch ID: R404518

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E350.3

### Batch ID: R404432

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E365.3

### Batch ID: R404347

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

**ALS Houston, US**

Date: 21-Mar-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS22030820 |
| Sample ID: | LH18/24-SP650_031522 | Lab ID:HS22030820-01 |
| Collection Date: | 15-Mar-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **AMMONIA AS N BY E350.3(ISE)** | | **Method:E350.3** | | | | | | Analyst: MZD |
| **Nitrogen, Ammonia (As N)** | **31** | a | **0.10** | **0.20** | **0.20** | **mg/L** | 1 | 18-Mar-2022 10:30 |
| **ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978** | | **Method:E365.3** | | | | | | Analyst: MZD |
| **Phosphorus, Total Orthophosphate (As P)** | **5.56** | a | **0.200** | **0.500** | **0.500** | **mg/L** | 20 | 16-Mar-2022 17:12 |
| **TOTAL ORGANIC CARBON BY E415.1** | | **Method:E415.1** | | | | | | Analyst: JAC |
| **Organic Carbon, Total** | **2.32** | a | **0.500** | **1.00** | **1.00** | **mg/L** | 1 | 19-Mar-2022 07:01 |

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

**ALS Houston, US**

Date: 21-Mar-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS22030820 |
| Sample ID: | LH18/24-SP650_031522_AIX | Lab ID:HS22030820-02 |
| Collection Date: | 15-Mar-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 21-Mar-2022 10:56 |

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

**ALS Houston, US**

Date: 21-Mar-22

| | | | |
|---|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder: | HS22030820 |
| Sample ID: | LH18/24-SP650_031522_BIX | Lab ID: | HS22030820-03 |
| Collection Date: | 15-Mar-2022 14:00 | Matrix: | Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 21-Mar-2022 10:56 |

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

**ALS Houston, US** Date: 21-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22030820

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** R404347 ( 0 ) | **Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978 | | | | **Matrix:** Water | |
| HS22030820-01 | LH18/24-SP650_031522 | 15 Mar 2022 14:00 | | | 16 Mar 2022 17:12 | 20 |
| **Batch ID:** R404432 ( 0 ) | **Test Name :** AMMONIA AS N BY E350.3(ISE) | | | | **Matrix:** Water | |
| HS22030820-01 | LH18/24-SP650_031522 | 15 Mar 2022 14:00 | | | 18 Mar 2022 10:30 | 1 |
| **Batch ID:** R404518 ( 0 ) | **Test Name :** TOTAL ORGANIC CARBON BY E415.1 | | | | **Matrix:** Water | |
| HS22030820-01 | LH18/24-SP650_031522 | 15 Mar 2022 14:00 | | | 19 Mar 2022 07:01 | 1 |
| **Batch ID:** R404522 ( 0 ) | **Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) | | | | **Matrix:** Water | |
| HS22030820-02 | LH18/24-SP650_031522_AIX | 15 Mar 2022 14:00 | | | 21 Mar 2022 10:56 | 1 |
| HS22030820-03 | LH18/24-SP650_031522_BIX | 15 Mar 2022 14:00 | | | 21 Mar 2022 10:56 | 1 |

**ALS Houston, US** Date: 21-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22030820

**QC BATCH REPORT**

**Batch ID:** R404347 ( 0 ) **Instrument:** UV-2450 **Method:** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978

**MBLK** Sample ID: **MBLK-R404347** Units: **mg/L** Analysis Date: **16-Mar-2022 17:12**
Client ID: Run ID: **UV-2450_404347** SeqNo: **6548864** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.0250 | 0.0250 | | | | | | | | U |

**LCS** Sample ID: **LCS-R404347** Units: **mg/L** Analysis Date: **16-Mar-2022 17:12**
Client ID: Run ID: **UV-2450_404347** SeqNo: **6548863** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.244 | 0.0250 | 0.25 | 0 | 97.6 | 85 - 115 | | | | |

**MS** Sample ID: **HS22030820-01MS** Units: **mg/L** Analysis Date: **16-Mar-2022 17:12**
Client ID: **LH18/24-SP650_031522** Run ID: **UV-2450_404347** SeqNo: **6548866** PrepDate: DF: **20**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 9.78 | 0.500 | 5 | 5.56 | 84.4 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22030820-01MSD** Units: **mg/L** Analysis Date: **16-Mar-2022 17:12**
Client ID: **LH18/24-SP650_031522** Run ID: **UV-2450_404347** SeqNo: **6548865** PrepDate: DF: **20**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 9.7 | 0.500 | 5 | 5.56 | 82.8 | 80 - 120 | 9.78 | 0.821 | 20 | |

**The following samples were analyzed in this batch:** HS22030820-01

**ALS Houston, US** Date: 21-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22030820

**QC BATCH REPORT**

**Batch ID: R404432 ( 0 )** **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

**MBLK** Sample ID: **MBLK-R404432** Units: **mg/L** Analysis Date: **18-Mar-2022 10:30**
Client ID: Run ID: **WetChem_HS_404432** SeqNo: **6550689** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 0.20 | 0.20 | | | | | | | | U |

**LCS** Sample ID: **LCS-R404432** Units: **mg/L** Analysis Date: **18-Mar-2022 10:30**
Client ID: Run ID: **WetChem_HS_404432** SeqNo: **6550688** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 10.32 | 0.20 | 10 | 0 | 103 | 80 - 120 | | | | |

**MS** Sample ID: **HS22030772-01MS** Units: **mg/L** Analysis Date: **18-Mar-2022 10:30**
Client ID: Run ID: **WetChem_HS_404432** SeqNo: **6550694** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 21.95 | 0.20 | 10 | 10.16 | 118 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22030772-01MSD** Units: **mg/L** Analysis Date: **18-Mar-2022 10:30**
Client ID: Run ID: **WetChem_HS_404432** SeqNo: **6550693** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 21.85 | 0.20 | 10 | 10.16 | 117 | 80 - 120 | 21.95 | 0.452 | 20 | |

**The following samples were analyzed in this batch:** HS22030820-01

**ALS Houston, US** Date: 21-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22030820

**QC BATCH REPORT**

**Batch ID:** R404518 ( 0 ) **Instrument:** TOC_04 **Method:** TOTAL ORGANIC CARBON BY E415.1

**MBLK** Sample ID: **MBLK-03182022** Units: **mg/L** Analysis Date: **19-Mar-2022 05:56**
Client ID: Run ID: **TOC_04_404518** SeqNo: **6552483** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 1.00 | 1.00 | | | | | | | | U |

**LCS** Sample ID: **LCS-03182022** Units: **mg/L** Analysis Date: **19-Mar-2022 06:10**
Client ID: Run ID: **TOC_04_404518** SeqNo: **6552484** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 9.625 | 1.00 | 10 | 0 | 96.2 | 85 - 115 | | | | |

**LCSD** Sample ID: **LCSD-03182022** Units: **mg/L** Analysis Date: **19-Mar-2022 06:23**
Client ID: Run ID: **TOC_04_404518** SeqNo: **6552485** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 9.644 | 1.00 | 10 | 0 | 96.4 | 85 - 115 | 9.625 | 0.197 | 20 | |

**MS** Sample ID: **HS22030820-01MS** Units: **mg/L** Analysis Date: **19-Mar-2022 07:15**
Client ID: **LH18/24-SP650_031522** Run ID: **TOC_04_404518** SeqNo: **6552489** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 12.75 | 1.00 | 10 | 2.32 | 104 | 80 - 120 | | | | |

**The following samples were analyzed in this batch:** HS22030820-01

**ALS Houston, US** Date: 21-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** **HS22030820**

## QUALIFIERS, ACRONYMS, UNITS

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

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

**ALS Houston, US** Date: 21-Mar-22

## CERTIFICATIONS,ACCREDITATIONS & LICENSES

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas | 21-022-0 | 26-Mar-2022 |
| Florida | E87611-34 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 21-Mar-22

## Sample Receipt Checklist

**Work Order ID:** HS22030820 **Date/Time Received:** **16-Mar-2022 09:55**

**Client Name:** Bhate Environmental **Received by:** **Paresh M. Giga**

**Completed By:** /S/ Paresh M. Giga (eSignature) 16-Mar-2022 12:51 (Date/Time) **Reviewed by:** /S/ Ragen Giga (eSignature) 17-Mar-2022 10:11 (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 ☐ | 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): | 0.7c/1.2C U/C | IR31 |
| Cooler(s)/Kit(s): | 48180 | |
| Date/Time sample(s) sent to storage: | 3/16/2022 13:00 | |

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

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

01117920

# CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: Ragen Gigi



**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:** GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

**Prepared By:** Scott Beesinger

**P.O. Number**

HS22030820
Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Weekly Samples

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | AMMONIA-N | TOTAL ORGANIC CARBON | ORTHO-PHOSPHATE | PERCHLORATE | | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_031522 | Water | 03/15/22 / 14:00 | | 3 | X | X | | | | | | | | | H2SO4 | |
| LH18/24-SP650_031522 | Water | 03/15/22 / 14:00 | | 1 | | | X | | | | | | | | NONE | |
| LH18/24–SP650_031522_AIX | Water | 03/15/22 / 14:00 | | 1 | | | | X | | | | | | | NONE | |
| LH18/24-SP650_031522_BIX | Water | 03/15/22 / 14:00 | | 1 | | | | X | | | | | | | NONE | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Analyses

**Additional Remarks:** 24 HOUR TAT on PERCHLORATE. Standard TAT on all other parameters

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 03/15/22 | 14:30 | [illegible] | 3/16/22 | 09:55 | | | | | | |

**For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| 48180 OK 6.70 #31 Cl-0.5 | | | | | | | | | |

Remarks:

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly

01117921

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

48180

CUSTODY SEAL
Date: 3/15/22 Time: 1430
Name: Scott Beesiner
Company: BHATE

Seal Broken By: SM
Date: 03/16/22

48180 MAR 16 2022

SHORT HOLDING TIME

48180

Part # 159469-434 MTW EXP 09/22

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 28FEB22
ACTWGT: 1.00 LB MAN
CAD: 0221247/CAFE3509
DIMS: 26x14x14 IN

TO SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: GWTP-BO 83872-RG

RMA:

FedEx Express

FedEx
TRK# 0221 5300 5228 3911

WED - 16 MAR AA
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

3923207 15Mar2022 GGGA 560C5/E002/C008

March 21, 2022

Service Request No:E2200210

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS22030820**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory March 16, 2022
For your reference, these analyses have been assigned our service request number **E2200210.**

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.:** | E2200210 |
| **Project:** | HS22030820 | **Date Received:** | 03/16/22 |
| **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 03/16/22.

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:**

EQ2200102: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS-DLCS recoveries are within QC limits.

DoD Certification is held for the method/matrix/analytes provided in this report.

*The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*

**Client:** ALS Environmental - US **Service Request:**E2200210
**Project:** HS22030820

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2200210-001 | LH18/24-SP650_031522_AIX | 3/15/2022 | 1400 |
| E2200210-002 | LH18/24-SP650_031522_BIX | 3/15/2022 | 1400 |

# Service Request Summary

**Folder #:** **E2200210**
Client Name: ALS Environmental - US
Project Name: HS22030820
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 03/16/22
Internal Due Date: 3/23/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22030820
EDD: No EDD Specified

2 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON CIO4 DOD/6850 |
|---|---|---|---|---|
| E2200210-001 | LH18/24-SP650_031522_AIX | Water | 03/15/22 1400 | **IV** |
| E2200210-002 | LH18/24-SP650_031522_BIX | Water | 03/15/22 1400 | **IV** |

# Service Request Summary

**Folder #:** **E2200210**
Client Name: ALS Environmental - US
Project Name: HS22030820
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 03/16/22
Internal Due Date: 3/23/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22030820
EDD: No EDD Specified

2 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 2 | IV DUE 4/6 |

# 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 | (Auto) The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result. |
| 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. |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| 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. |
| P | Indicates chlorodiphenyl ether interference present at the retention time of the target compound. |
| P | Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns |
| Q | Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria. |
| R | Duplicate Precision not met. |
| R1 | Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated. |
| S | Surrogate recovery not within specified limits. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| T | Analyte is a tentatively identified compound, result is estimated. |
| U | Compound was analyzed for, but was not detected (ND). |
| V1 | The continuing calibration verification standard was outside (biased high) the specified limits for this compound. |
| V2 | The continuing calibration verification standard was outside (biased low) the specified limits for this compound. |
| W | Result quantified, but the corresponding peak was detected outside the generated retention time window. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| X | See case narrative. |
| Y | Recovery outside limits |
| Y | The chromatogram resembles a petroleum product but does not match the calibration standard. |
| Z | The chromatogram does not resemble a petroleum product. |
| i | The MRL/MDL has been elevated due to a matrix interference. |

# ALS Laboratory Group

## Acronyms

| | |
|---|---|
| Cal | Calibration |
| Conc | CONCentration |
| Dioxin(s) | Polychlorinated dibenzo-p-dioxin(s) |
| EDL | Estimated Detection Limit |
| EMPC | Estimated Maximum Possible Concentration |
| Flags | Data qualifiers |
| Furan(s) | Polychlorinated dibenzofuran(s) |
| g | Grams |
| ICAL | Initial CALibration |
| ID | IDentifier |
| Ions | Masses monitored for the analyte during data acquisition |
| L | Liter (s) |
| LCS | Laboratory Control Sample |
| DLCS | Duplicate Laboratory Control Sample |
| MB | Method Blank |
| MCL | Method Calibration Limit |
| MDL | Method Detection Limit |
| mL | Milliliters |
| MS | Matrix Spiked sample |
| DMS | Duplicate Matrix Spiked sample |
| NO | Number of peaks meeting all identification criteria |
| PCDD(s) | Polychlorinated dibenzo-p-dioxin(s) |
| PCDF(s) | Polychlorinated dibenzofuran(s) |
| ppb | Parts per billion |
| ppm | Parts per million |
| ppq | Parts per quadrillion |
| ppt | Parts per trillion |
| QA | Quality Assurance |
| QC | Quality Control |
| Ratio | Ratio of areas from monitored ions for an analyte |
| % Rec. | Percent recovery |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| RT | Retention Time |
| SDG | Sample Delivery Group |
| S/N | Signal-to-noise ratio |
| TEF | Toxicity Equivalence Factor |
| TEQ | Toxicity Equivalence Quotient |

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ALS Environmental

## State Certifications, Accreditations, and Licenses

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas Department of Environmental Quality | 19-028-0 | 6/30/2022 |
| Arkansas Department of Environmental Quality | 21-022-0 | 3/26/2022 |
| Florida Department of Health | E87611-33 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 5/1/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

10450 Stancliff Rd, Ste 210
Houston, TX 77099
**T:** +1 281 530 5656
**F:** +1 281 530 5887
**www.alsglobal.com**

# Subcontract Chain of Custody

**SAMPLING STATE:** **Dept of Defense** **COC ID: 18336**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

| | |
|---|---|
| **Company:** | ALS Houston |
| **Contact:** | Ragen Giga |
| **Address:** | 10450 Stancliff Rd, Ste 210 |
| **Phone:** | +1 281 530 5656 |
| **Email:** | RagenP.Giga@ALSGlobal.com |
| **Alternate Contact:** | 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:** | HS22030820 |
| **TSR:** | Houston House Acct |

| | LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | | | DUE DATE |
| 1. | **HS22030820-02** | **LH18/24-SP650_031522_AIX** | **Water** | **15 Mar 2022 14:00** |
| | 6850-Perch. DOD Level II & Level IV in separate pdf | | | 17 Mar 2022 |
| 2. | **HS22030820-03** | **LH18/24-SP650_031522_BIX** | **Water** | **15 Mar 2022 14:00** |
| | 6850-Perch. DOD Level II & Level IV in separate pdf | | | 17 Mar 2022 |

**Comments:** Please analyze for the analysis listed above.
Send report to the emails shown above.
24Hr.TAT

**QC Level:** DOD IV (DoD Data Package)

Relinquished By: Paul Ky Date/Time:

Received By: Corey G Date/Time: 3-16-22 1457

Cooler ID(s): Temperature(s):

ALS Environmental

# Cooler Receipt Form

Project Chemist: CH

Client/Project: ALS-H

Thermometer ID: 1231

Date/Time Received: 3-16-22 Initials: CH Date/Time Logged in: 3-16-22 Initials: CH

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☒ Courier (ALS) ○ Client
2. Samples received in: ☒ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ☒ No
   Were they intact? ○ Yes ○ No ☒ N/A
   Were they signed and dated? ○ Yes ○ No ☒ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ☒ Baggies ○ Bubble Wrap ○ Gel Packs ☒ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

| Cooler Tracking Number | COC ID | Date Opened | Time Opened | Opened By | Temp. °C | Temp Blank? |
|---|---|---|---|---|---|---|
| NA | | 3-16-22 | 1445 | CH | 3.0 | ☒ |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☒ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☒ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☒ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☒ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☒ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

ALS Environmental - Houston HRMS

10450 Stancliff Rd., Suite 210
Houston, TX 77099
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**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**
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Phone (713)266-1599 Fax (713)266-0130
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# *Preparation Information Benchsheet*

**Prep Run#:** 396779 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** Method **Prep Date/Time:** 3/17/22 09:11

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2200203-001 | HBW7_031522 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 2 | E2200203-002 | HBW10_031522 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 3 | E2200203-003 | HBW1_031522 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 4 | E2200203-004 | HBW1_031522_a | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 5 | E2200203-005 | GPW1_031522 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 6 | E2200203-006 | GPW3_031522 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 7 | E2200210-001 | LH18/24-SP650_031522_AIX | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 8 | E2200210-002 | LH18/24-SP650_031522_BIX | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 9 | EQ2200102-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 10 | EQ2200102-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 11 | EQ2200102-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |

## Spiking Solutions

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 221408 Logbook Ref: Perchlorate Internal Standard Expires On: 04/30/2022

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E2200203-001 | 100.00µL | E2200203-002 | 100.00µL | E2200203-003 | 100.00µL | E2200203-004 | 100.00µL | E2200203-005 | 100.00µL | E2200203-006 | 100.00µL |
| E2200210-001 | 100.00µL | E2200210-002 | 100.00µL | EQ2200102-01 | 100.00µL | EQ2200102-02 | 100.00µL | EQ2200102-03 | 100.00µL | | |

Name: Perchlorate Intermediate Stock1 Inventory ID 221456 Logbook Ref: Perchlorate Expires On: 04/30/2022

| | | | |
|---|---|---|---|
| EQ2200102-02 | 1.00µL | EQ2200102-03 | 1.00µL |

## Preparation Materials

| | | | | | |
|---|---|---|---|---|---|
| Water HPLC Grade | 08/03/2021 Water (218532) | 6850 Amber Glass screw vial | 2mL Screw Top Vial (221308) | 537M Glass Culture Tubes | 537M Glass Tubes (218064) |
| 6850 0.45um syringe filters | 6850 Syringe Filters (219639) | 6850 Luer-Lok Syringes | Luer-Lok Syringes (221305) | 6850 Pipette Tips 50-1000 uL | 6850 Pipette Tips (221307) |

## Preparation Steps

Step: Preparation
Started: 3/17/22 09:11
Finished: 3/17/22 10:00
By: GRIVERA
Comments

Comments: _____

Reviewed By: GR Date: 3/17/22

# Analytical Results

**ALS Environmental - Houston HRMS**
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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:** | E2200210 |
| **Project:** | HS22030820 | **Date Collected:** | 3/15/22 1400 |
| **Sample Matrix:** | Water | **Date Received:** | 3/16/22 |
| **Sample Name:** | LH18/24-SP650_031522_AIX | **Units:** | µg/L |
| **Lab Code:** | E2200210-001 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850
**Prep Method:** Method

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | ND | U | 0.100 | 0.0500 | 0.0250 | 1 | 3/17/22 | 3/17/22 15:18 | 396779 | 757810 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200210 |
| **Project:** | HS22030820 | **Date Collected:** | 3/15/22 1400 |
| **Sample Matrix:** | Water | **Date Received:** | 3/16/22 |
| **Sample Name:** | LH18/24-SP650_031522_BIX | **Units:** | µg/L |
| **Lab Code:** | E2200210-002 | **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 | **903** | | 5.00 | 2.50 | 1.25 | 50 | 3/17/22 | 3/17/22 16:13 | 396779 | 757810 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200210 |
| **Project:** | HS22030820 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2200102-01 | **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 | 3/17/22 | 3/17/22 13:27 | 396779 | 757810 | |

# Accuracy & Precision

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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:** | E2200210 |
| **Project:** | HS22030820 | **Date Analyzed:** | 3/17/22 |
| **Sample Matrix:** | Water | | |

**Lab Control Sample Summary**
**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

| | | | |
|---|---|---|---|
| **Analytical Method:** | 6850 | **Units:** | µg/L |
| **Prep Method:** | Method | **Basis:** | NA |
| | | **Extraction Lot:** | 396779 |

| | Lab Control Sample EQ2200102-02 | | | Duplicate Lab Control Sample EQ2200102-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.0959 | 0.100 | 96 | 0.102 | 0.100 | 102 | 84 - 119 | 6 | 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:** | E2200210 |
| **Project:** | HS22030820 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200102-02 | **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 | **0.0959** | J | 0.100 | 0.0500 | 0.0250 | 1 | 3/17/22 | 3/17/22 13:35 | 396779 | 757810 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200210 |
| **Project:** | HS22030820 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200102-03 | **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 | **0.102** | | 0.100 | 0.0500 | 0.0250 | 1 | 3/17/22 | 3/17/22 13:43 | 396779 | 757810 | |

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F: +1 281 530 5887

March 29, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22031203**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia Olive,

ALS Environmental received 3 sample(s) on Mar 23, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: JUMOKE.LAWAL**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 29-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22031203

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22031203-01 | LH18/24-SP650_032222 | Water | | 22-Mar-2022 14:00 | 23-Mar-2022 09:25 | ☐ |
| HS22031203-02 | LH18/24-SP650_032222_AIX | Water | | 22-Mar-2022 14:00 | 23-Mar-2022 09:25 | ☐ |
| HS22031203-03 | LH18/24-SP650_032222_BIX | Water | | 22-Mar-2022 14:00 | 23-Mar-2022 09:25 | ☐ |

**ALS Houston, US** Date: 29-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22031203

**CASE NARRATIVE**

## Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached

## WetChemistry by Method E350.3

### Batch ID: R405124

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E415.1

### Batch ID: R404858

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E365.3

### Batch ID: R404805

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

**ALS Houston, US** Date: 29-Mar-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS22031203 |
| Sample ID: | LH18/24-SP650_032222 | Lab ID:HS22031203-01 |
| Collection Date: | 22-Mar-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **AMMONIA AS N BY E350.3(ISE)** | | **Method:E350.3** | | | | | | Analyst: MZD |
| **Nitrogen, Ammonia (As N)** | **38** | a | **0.10** | **0.20** | **0.20** | **mg/L** | 1 | 29-Mar-2022 10:15 |
| **ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978** | | **Method:E365.3** | | | | | | Analyst: MZD |
| **Phosphorus, Total Orthophosphate (As P)** | **5.94** | a | **0.200** | **0.500** | **0.500** | **mg/L** | 20 | 24-Mar-2022 10:01 |
| **TOTAL ORGANIC CARBON BY E415.1** | | **Method:E415.1** | | | | | | Analyst: JAC |
| **Organic Carbon, Total** | **4.18** | a | **0.500** | **1.00** | **1.00** | **mg/L** | 1 | 24-Mar-2022 16:41 |

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

**ALS Houston, US** Date: 29-Mar-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS22031203 |
| Sample ID: | LH18/24-SP650_032222_AIX | Lab ID:HS22031203-02 |
| Collection Date: | 22-Mar-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 24-Mar-2022 14:21 |

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

**ALS Houston, US** Date: 29-Mar-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS22031203 |
| Sample ID: | LH18/24-SP650_032222_BIX | Lab ID:HS22031203-03 |
| Collection Date: | 22-Mar-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: GR |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 24-Mar-2022 14:21 |

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

**ALS Houston, US** Date: 29-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22031203

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** R404805 ( 0 ) | **Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978 | | | | **Matrix:** Water | |
| HS22031203-01 | LH18/24-SP650_032222 | 22 Mar 2022 14:00 | | | 24 Mar 2022 10:01 | 20 |
| **Batch ID:** R404810 ( 0 ) | **Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) | | | | **Matrix:** Water | |
| HS22031203-02 | LH18/24-SP650_032222_AIX | 22 Mar 2022 14:00 | | | 24 Mar 2022 14:21 | 1 |
| HS22031203-03 | LH18/24-SP650_032222_BIX | 22 Mar 2022 14:00 | | | 24 Mar 2022 14:21 | 1 |
| **Batch ID:** R404858 ( 0 ) | **Test Name :** TOTAL ORGANIC CARBON BY E415.1 | | | | **Matrix:** Water | |
| HS22031203-01 | LH18/24-SP650_032222 | 22 Mar 2022 14:00 | | | 24 Mar 2022 16:41 | 1 |
| **Batch ID:** R405124 ( 0 ) | **Test Name :** AMMONIA AS N BY E350.3(ISE) | | | | **Matrix:** Water | |
| HS22031203-01 | LH18/24-SP650_032222 | 22 Mar 2022 14:00 | | | 29 Mar 2022 10:15 | 1 |

**ALS Houston, US** Date: 29-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22031203

**QC BATCH REPORT**

**Batch ID:** R404805 ( 0 ) **Instrument:** UV-2450 **Method:** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978

**MBLK** Sample ID: **MBLK-R404805** Units: **mg/L** Analysis Date: **24-Mar-2022 10:01**
Client ID: Run ID: **UV-2450_404805** SeqNo: **6559348** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.0250 | 0.0250 | | | | | | | | U |

**LCS** Sample ID: **LCS-R404805** Units: **mg/L** Analysis Date: **24-Mar-2022 10:01**
Client ID: Run ID: **UV-2450_404805** SeqNo: **6559347** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.226 | 0.0250 | 0.25 | 0 | 90.4 | 85 - 115 | | | | |

**MS** Sample ID: **HS22031203-01MS** Units: **mg/L** Analysis Date: **24-Mar-2022 10:01**
Client ID: **LH18/24-SP650_032222** Run ID: **UV-2450_404805** SeqNo: **6559350** PrepDate: DF: **20**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 10.68 | 0.500 | 5 | 5.94 | 94.8 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22031203-01MSD** Units: **mg/L** Analysis Date: **24-Mar-2022 10:01**
Client ID: **LH18/24-SP650_032222** Run ID: **UV-2450_404805** SeqNo: **6559349** PrepDate: DF: **20**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 10.7 | 0.500 | 5 | 5.94 | 95.2 | 80 - 120 | 10.68 | 0.187 | 20 | |

**The following samples were analyzed in this batch:** HS22031203-01

**ALS Houston, US** Date: 29-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22031203

**QC BATCH REPORT**

**Batch ID: R404858 ( 0 )** **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON BY E415.1**

**MBLK** Sample ID: **MBLK-03242022** Units: **mg/L** Analysis Date: **24-Mar-2022 15:23**
Client ID: Run ID: **TOC_04_404858** SeqNo: **6560830** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 1.00 | 1.00 | | | | | | | | U |

**LCS** Sample ID: **LCS-03242022** Units: **mg/L** Analysis Date: **24-Mar-2022 15:36**
Client ID: Run ID: **TOC_04_404858** SeqNo: **6560831** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 8.904 | 1.00 | 10 | 0 | 89.0 | 85 - 115 | | | | |

**LCSD** Sample ID: **LCSD-03242022** Units: **mg/L** Analysis Date: **24-Mar-2022 15:50**
Client ID: Run ID: **TOC_04_404858** SeqNo: **6560832** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 8.962 | 1.00 | 10 | 0 | 89.6 | 85 - 115 | 8.904 | 0.649 | 20 | |

**MS** Sample ID: **HS22030973-03MS** Units: **mg/L** Analysis Date: **24-Mar-2022 17:21**
Client ID: Run ID: **TOC_04_404858** SeqNo: **6560839** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 10.84 | 1.00 | 10 | 0.04785 | 108 | 80 - 120 | | | | |

**The following samples were analyzed in this batch:** HS22031203-01

**ALS Houston, US** Date: 29-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22031203

**QC BATCH REPORT**

**Batch ID: R405124 ( 0 )** **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

**MBLK** Sample ID: **MBLK-R405124** Units: **mg/L** Analysis Date: **29-Mar-2022 10:15**
Client ID: Run ID: **WetChem_HS_405124** SeqNo: **6566794** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 0.20 | 0.20 | | | | | | | | U |

**LCS** Sample ID: **LCS-R405124** Units: **mg/L** Analysis Date: **29-Mar-2022 10:15**
Client ID: Run ID: **WetChem_HS_405124** SeqNo: **6566793** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 10.24 | 0.20 | 10 | 0 | 102 | 80 - 120 | | | | |

**MS** Sample ID: **HS22031275-01MS** Units: **mg/L** Analysis Date: **29-Mar-2022 10:15**
Client ID: Run ID: **WetChem_HS_405124** SeqNo: **6566796** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 10.45 | 0.20 | 10 | 0.112 | 103 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22031275-01MSD** Units: **mg/L** Analysis Date: **29-Mar-2022 10:15**
Client ID: Run ID: **WetChem_HS_405124** SeqNo: **6566795** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 10.26 | 0.20 | 10 | 0.112 | 101 | 80 - 120 | 10.45 | 1.83 | 20 | |

**The following samples were analyzed in this batch:** HS22031203-01

**ALS Houston, US** Date: 29-Mar-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** **HS22031203**

## 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 |
|---|---|---|
| Florida | E87611-34 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 29-Mar-22

## Sample Receipt Checklist

**Work Order ID:** HS22031203 **Date/Time Received:** **23-Mar-2022 09:25**

**Client Name:** Bhate Environmental **Received by:** **Pablo Marinez**

**Completed By:** /S/ Pablo Marinez (eSignature) 23-Mar-2022 10:55 (Date/Time) **Reviewed by:** /S/ Ragen Giga (eSignature) 24-Mar-2022 18:38 (Date/Time)

Matrices: **WATER** Carrier name: **FedEx Priority Overnight**

| | Yes | No | |
|---|---|---|---|
| Shipping container/cooler in good condition? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on shipping container/cooler? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on sample bottles? | ☐ | ☐ | Not Present ☑ |
| VOA/TX1005/TX1006 Solids in hermetically sealed vials? | ☐ | ☐ | Not Present ☑ |
| Chain of custody present? | ☑ | ☐ | 1 Page(s) |
| Chain of custody signed when relinquished and received? | ☑ | ☐ | COC IDs:CLIENT |
| Samplers name present on COC? | ☑ | ☐ | |
| Chain of custody agrees with sample labels? | ☑ | ☐ | |
| Samples in proper container/bottle? | ☑ | ☐ | |
| Sample containers intact? | ☑ | ☐ | |
| Sufficient sample volume for indicated test? | ☑ | ☐ | |
| All samples received within holding time? | ☑ | ☐ | |
| Container/Temp Blank temperature in compliance? | ☑ | ☐ | |

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 0.4°C/0.9°C UC/C | IR 31 |
| Cooler(s)/Kit(s): | BLUE | |
| Date/Time sample(s) sent to storage: | 3/23/22 11:00 | |

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

Page 1 of 1

**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:**
## GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

**Prepared By:** Scott Beesinger

**P.O. Number**

HS22031203
Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Weekly Samples

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | AMMONIA-N | TOTAL ORGANIC CARBON | ORTHO-PHOSPHATE | PERCHLORATE | | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_032222 | Water | 03/22/22 / 14:00 | | 3 | X | X | | | | | | | | | H2SO4 | |
| LH18/24-SP650_032222 | Water | 03/22/22 / 14:00 | | 1 | | | X | | | | | | | | NONE | |
| LH18/24–SP650_032222_AIX | Water | 03/22/22 / 14:00 | | 1 | | | | X | | | | | | | NONE | |
| LH18/24-SP650_032222_BIX | Water | 03/22/22 / 14:00 | | 1 | | | | X | | | | | | | NONE | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Analyses

Additional Remarks: **24 HOUR TAT on PERCHLORATE. Standard TAT on all other parameters**

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 03/22/22 | 14:30 | Paul Re | 3/23/22 | 9:25 | | | | | | |

**For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Remarks:

Blue 0.4C
1R3L CP40.5

(Word) S:\1-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

Blue

CUSTODY SEAL
Date: 3/22/22 Time: 1430
Name: Sean Beccuzzo
Company: BBTC
Seal Broken
Date: 3/23

LRN# 1251 0294 3970
FedEx
PRIORITY OVERNIGHT
AB SGRA
Blue
77099
TX-US
IAH
3923207 22Mar2022 GGGA 56DG5/EB02/C0B8

March 24, 2022

Service Request No:E2200229

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS22031203**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory March 23, 2022
For your reference, these analyses have been assigned our service request number **E2200229.**

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-H | **Service Request No.:** | E2200229 |
| **Project:** | HS22031203 | **Date Received:** | 03/23/22 |
| **Sample Matrix:** | W | | |

## CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

### Sample Receipt

Two samples were received for analysis at ALS Environmental in Houston on 03/23/22.

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:**

EQ2200112: 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 RPD exceed QC limits; the individual recoveries met acceptance criteria. 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 **Service Request:**E2200229
**Project:** HS22031203

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2200229-001 | LH18/24-SP650_032222_AIX | 3/22/2022 | 1400 |
| E2200229-002 | LH18/24-SP650_032222_BIX | 3/22/2022 | 1400 |

# Service Request Summary

**Folder #:** **E2200229**
Client Name: ALS Environmental - US
Project Name: HS22031203
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 03/23/22
Internal Due Date: 3/24/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22031203
EDD: No EDD Specified

2 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**
**Rush**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON CIO4 DOD/6850 |
|---|---|---|---|---|
| E2200229-001 | LH18/24-SP650_032222_AIX | Water | 03/22/22 1400 | **IV** |
| E2200229-002 | LH18/24-SP650_032222_BIX | Water | 03/22/22 1400 | **IV** |

# Service Request Summary

**Folder #:** **E2200229**
Client Name: ALS Environmental - US
Project Name: HS22031203
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 03/23/22
Internal Due Date: 3/24/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22031203
EDD: No EDD Specified

2 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**
**Rush**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 2 | IV DUE 4/13 |

# 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 | (Auto) The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result. |
| 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. |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| 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. |
| P | Indicates chlorodiphenyl ether interference present at the retention time of the target compound. |
| P | Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns |
| Q | Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria. |
| R | Duplicate Precision not met. |
| R1 | Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated. |
| S | Surrogate recovery not within specified limits. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| T | Analyte is a tentatively identified compound, result is estimated. |
| U | Compound was analyzed for, but was not detected (ND). |
| V1 | The continuing calibration verification standard was outside (biased high) the specified limits for this compound. |
| V2 | The continuing calibration verification standard was outside (biased low) the specified limits for this compound. |
| W | Result quantified, but the corresponding peak was detected outside the generated retention time window. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| X | See case narrative. |
| Y | Recovery outside limits |
| Y | The chromatogram resembles a petroleum product but does not match the calibration standard. |
| Z | The chromatogram does not resemble a petroleum product. |
| i | The MRL/MDL has been elevated due to a matrix interference. |

# ALS Laboratory Group

## Acronyms

| | |
|---|---|
| Cal | Calibration |
| Conc | CONCentration |
| Dioxin(s) | Polychlorinated dibenzo-p-dioxin(s) |
| EDL | Estimated Detection Limit |
| EMPC | Estimated Maximum Possible Concentration |
| Flags | Data qualifiers |
| Furan(s) | Polychlorinated dibenzofuran(s) |
| g | Grams |
| ICAL | Initial CALibration |
| ID | IDentifier |
| Ions | Masses monitored for the analyte during data acquisition |
| L | Liter (s) |
| LCS | Laboratory Control Sample |
| DLCS | Duplicate Laboratory Control Sample |
| MB | Method Blank |
| MCL | Method Calibration Limit |
| MDL | Method Detection Limit |
| mL | Milliliters |
| MS | Matrix Spiked sample |
| DMS | Duplicate Matrix Spiked sample |
| NO | Number of peaks meeting all identification criteria |
| PCDD(s) | Polychlorinated dibenzo-p-dioxin(s) |
| PCDF(s) | Polychlorinated dibenzofuran(s) |
| ppb | Parts per billion |
| ppm | Parts per million |
| ppq | Parts per quadrillion |
| ppt | Parts per trillion |
| QA | Quality Assurance |
| QC | Quality Control |
| Ratio | Ratio of areas from monitored ions for an analyte |
| % Rec. | Percent recovery |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| RT | Retention Time |
| SDG | Sample Delivery Group |
| S/N | Signal-to-noise ratio |
| TEF | Toxicity Equivalence Factor |
| TEQ | Toxicity Equivalence Quotient |

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ALS Environmental

## State Certifications, Accreditations, and Licenses

| Agency | Number | Expire Date |
|---|---|---|
| Arkansas Department of Environmental Quality | 19-028-0 | 6/30/2022 |
| Arkansas Department of Environmental Quality | 21-022-0 | 3/26/2022 |
| Florida Department of Health | E87611-33 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 5/1/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
10450 Stancliff Rd, Suite 210, Houston TX 77099
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Houston, TX 77099
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**F:** +1 281 530 5887
**www.alsglobal.com**

# Subcontract Chain of Custody

224

**SAMPLING STATE:** **Dept of Defense** **COC ID:** **18380**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

**Company:** ALS Houston
**Contact:** Ragen Giga
**Address:** 10450 Stancliff Rd, Ste 210
**Phone:** +1 281 530 5656
**Email:** RagenP.Giga@ALSGlobal.com
**Alternate Contact:**
**Email:**

**INVOICE INFORMATION:**

**Company:** ALS Houston
**Contact:** Accounts Payable
**Address:** 10450 Stancliff Rd, Ste 210
**Phone:** +1 281 530 5656
**Reference:** HS22031203
**TSR:** Houston House Acct

| | LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | | | DUE DATE |
| **1.** | **HS22031203-02** | **LH18/24-SP650_032222_AIX** | **Water** | **22 Mar 2022 14:00** |
| | 6850-Perch. DOD Level II & Level IV in separate pdf | | | 24 Mar 2022 |
| **2.** | **HS22031203-03** | **LH18/24-SP650_032222_BIX** | **Water** | **22 Mar 2022 14:00** |
| | 6850-Perch. DOD Level II & Level IV in separate pdf | | | 24 Mar 2022 |

**Comments:** Please analyze for the analysis listed above.
Send report to the emails shown above.

**QC Level:** DOD IV (DoD Data Package)

Relinquished By: Paul [illegible] Date/Time: 3-23-22 11:00

Received By: CORET G Date/Time: 3/23/22 11:00

Cooler ID(s): Temperature(s): 5.6°C

ALS Environmental

# Cooler Receipt Form

Project Chemist: CG

Client/Project: ALS-H

Thermometer ID: IR31

Date/Time Received: 3-23-22 Initials: PM

Date/Time Logged in: 3-23-22 Initials: CG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☒ Courier (ALS) ○ Client

2. Samples received in: ☒ Cooler ○ Box ○ Envelope ○ Other

3. Were custody seals on coolers? ○ Yes ☒ No
   Were they intact? ○ Yes ○ No ☒ N/A
   Were they signed and dated? ○ Yes ○ No ☒ N/A
   If yes, how many and where?

4. Packing Material: ○ Inserts ☒ Baggies ○ Bubble Wrap ○ Gel Packs ☒ Wet Ice ○ Sleeves ○ Other

5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

| Cooler Tracking Number | COC ID | Date Opened | Time Opened | Opened By | Temp. °C | Temp Blank? |
|---|---|---|---|---|---|---|
| NA | | 3-23-22 | 1106 | CG | 5.6 | ☒ |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

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

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**www.alsglobal.com**

# SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

**Cooler Custody Seals (desirable, mandatory if specified in SAP):**

- ✓ Intact on outside of cooler, signed and dated

**Chain-of-Custody (COC) documentation (mandatory):**

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sampleThe COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

**Sample Integrity (mandatory):**

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

**Temperature Requirement (varies by sample matrix):**

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6ºC.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10ºC.
- ✓ Air samples are shipped and stored cold, at 0 to 6ºC
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report

# Preparation Information Benchsheets

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Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

# Preparation Information Benchsheet

**Prep Run#:** 397109 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** **Prep Date/Time:** 3/24/22 09:04

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2200229-001 | LH18/24-SP650_032222_AIX | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 2 | E2200229-002 | LH18/24-SP650_032222_BIX | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 3 | E2200231-001 | HTA-HTA03-A-2203 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 4 | E2200231-002 | HTA-HTA03-B-2203 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 5 | E2200231-003 | HTA-HTA17-A-2203 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 6 | E2200231-004 | HTA-HTA12-A-2203 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 7 | EQ2200112-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 8 | EQ2200112-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 9 | EQ2200112-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 10 | EQ2200112-04 | HTA-HTA03-B-2203 MS | .02 | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 11 | EQ2200112-05 | HTA-HTA03-B-2203 DMS | .03 | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 12 | R2202224-007 | 2203101437Y PL-8-455 | .01 | 6850/ClO4 | | | Water | 10mL | |
| 13 | R2202336-003 | 2203150935C PL-2-504 | .01 | 6850/ClO4 | | | Water | 10mL | |
| 14 | R2202336-008 | 2203150958A PL-4-464 | .01 | 6850/ClO4 | | | Water | 10mL | |

## Spiking Solutions

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 221408 Logbook Ref: Perchlorate Internal Standard Expires On: 04/30/2022

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E2200229-001 | 100.00µL | E2200229-002 | 100.00µL | E2200231-001 | 100.00µL | E2200231-002 | 100.00µL | E2200231-003 | 100.00µL | E2200231-004 | 100.00µL |
| EQ2200112-01 | 100.00µL | EQ2200112-01 | 100.00µL | EQ2200112-02 | 100.00µL | EQ2200112-02 | 100.00µL | EQ2200112-03 | 100.00µL | EQ2200112-03 | 100.00µL |
| EQ2200112-04 | 100.00µL | EQ2200112-05 | 100.00µL | R2202224-007 | 100.00µL | R2202336-003 | 100.00µL | R2202336-008 | 100.00µL | | |

Name: Perchlorate Intermediate Stock1 Inventory ID 221456 Logbook Ref: Perchlorate Expires On: 04/30/2022

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EQ2200112-02 | 1.00µL | EQ2200112-02 | 1.00µL | EQ2200112-03 | 1.00µL | EQ2200112-03 | 1.00µL | EQ2200112-04 | 1.00µL | EQ2200112-05 | 1.00µL |

## Preparation Materials

| | | | | | |
|---|---|---|---|---|---|
| Water HPLC Grade | 08/03/2021 Water (218532) | 6850 Amber Glass screw vial | 2mL Screw Top Vial (221308) | 537M Glass Culture Tubes | 537M Glass Tubes (218064) |
| 6850 Luer-Lok Syringes | Luer-Lok Syringes (221305) | 6850 Pipette Tips 50-1000 uL | 6850 Pipette Tips (221929) | 6850 0.45um syringe filters | 6850 Syringe Filters (219639) |

## Preparation Steps

Step: Preparation
Started: 3/24/22 09:04
Finished: 3/24/22 10:00
By: GRIVERA
Comments

# *Preparation Information Benchsheet*

**Prep Run#:** 397109
**Team:** Semivoa GCMS/GRIVERA

**Prep WorkFlow:** GenExt28Day
**Prep Method:**

**Status:** Prepped
**Prep Date/Time:** 3/24/22 09:04

Comments:

Reviewed By: GR Date: 3/24/22

Chain of Custody

Relinquished By: Date:

Received By: Date:

Extracts Examined
Yes No

# Analytical Results

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**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200229 |
| **Project:** | HS22031203 | **Date Collected:** | 3/22/22 1400 |
| **Sample Matrix:** | Water | **Date Received:** | 3/23/22 |
| **Sample Name:** | LH18/24-SP650_032222_AIX | **Units:** | µg/L |
| **Lab Code:** | E2200229-001 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | ND | U | 0.100 | 0.0500 | 0.0250 | 1 | 3/24/22 | 3/24/22 12:38 | 397109 | 758533 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200229 |
| **Project:** | HS22031203 | **Date Collected:** | 3/22/22 1400 |
| **Sample Matrix:** | Water | **Date Received:** | 3/23/22 |
| **Sample Name:** | LH18/24-SP650_032222_BIX | **Units:** | µg/L |
| **Lab Code:** | E2200229-002 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **577** | | 5.00 | 2.50 | 1.25 | 50 | 3/24/22 | 3/24/22 13:10 | 397109 | 758533 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200229 |
| **Project:** | HS22031203 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2200112-01 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | ND | U | 0.100 | 0.0500 | 0.0250 | 1 | 3/24/22 | 3/24/22 12:15 | 397109 | 758533 | |

# Accuracy & Precision

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**ALS Group USA, Corp. dba ALS Environmental**

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200229 |
| **Project:** | HS22031203 | **Date Analyzed:** | 3/24/22 |
| **Sample Matrix:** | Water | | |

**Lab Control Sample Summary**
**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

| | | | |
|---|---|---|---|
| **Analytical Method:** | 6850 | **Units:** | µg/L |
| **Prep Method:** | | **Basis:** | NA |
| | | **Extraction Lot:** | 397109 |

| | Lab Control Sample EQ2200112-02 | | | Duplicate Lab Control Sample EQ2200112-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.0886 | 0.100 | 89 | 0.107 | 0.100 | 107 | 84 - 119 | 19 * | 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:** | E2200229 |
| **Project:** | HS22031203 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200112-02 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.0886** | J | 0.100 | 0.0500 | 0.0250 | 1 | 3/24/22 | 3/24/22 12:22 | 397109 | 758533 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200229 |
| **Project:** | HS22031203 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200112-03 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.107** | | 0.100 | 0.0500 | 0.0250 | 1 | 3/24/22 | 3/24/22 12:30 | 397109 | 758533 | |

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April 05, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22031243**

Laboratory Results for: **Longhorn GW Treatment Plant Bi-Weekly Samples**

Dear Marcia Olive,

ALS Environmental received 2 sample(s) on Mar 23, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: JUMOKE.LAWAL**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 05-Apr-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**Work Order:** HS22031243

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22031243-01 | LH18/24-SP650_032222 | Water | | 22-Mar-2022 14:00 | 23-Mar-2022 09:25 | ☐ |
| HS22031243-02 | Trip Blank | Water | CG-082521-500 | 22-Mar-2022 14:00 | 23-Mar-2022 09:25 | ☐ |

**ALS Houston, US** Date: 05-Apr-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**Work Order:** HS22031243

**CASE NARRATIVE**

## GCMS Volatiles by Method SW8260

### Batch ID: R405468

**Sample ID: CCV_END**

- Ending CCV out side control limits but samples are ND.

**Sample ID: Trip Blank (HS22031243-02)**

- In the 8260 analysis of batch 405468, the %D for Chloromethane was high in the ccv, however there were no hits for this compound in the associated samples so the data was not affected and no corrective action was taken.
  Several compounds were high in the closing ccv but there were no hits for these

**Sample ID: VSTD050**

- CCV High but sample ND.

**Sample ID: HS22031343-07MS**

- MS and MSD were performed on unrelated sample

## WetChemistry by Method SW9056

### Batch ID: R405710

**Sample ID: LH18/24-SP650_032222 (HS22031243-01MS)**

- 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)

**ALS Houston, US** Date: 05-Apr-22

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS22031243
Sample ID: LH18/24-SP650_032222 Lab ID:HS22031243-01
Collection Date: 22-Mar-2022 14:00 Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: ZQM |
| 1,1,1,2-Tetrachloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 1,1,1-Trichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 1,1-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 1,1-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 1,1-Dichloropropene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 1,2,3-Trichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 1,2,3-Trichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 1,2,4-Trichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 1,2,4-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 1,2-Dibromo-3-chloropropane | 1.0 | U | 0.20 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 1,2-Dibromoethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 1,2-Dichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 1,2-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 1,2-Dichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 1,3,5-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 1,3-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 1,3-Dichloropropane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 1,4-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 2,2-Dichloropropane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 2-Butanone | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 2-Chlorotoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 2-Hexanone | 2.0 | U | 1.0 | 2.0 | 2.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 4-Chlorotoluene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 4-Isopropyltoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| 4-Methyl-2-pentanone | 2.0 | U | 0.70 | 2.0 | 2.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Acetone | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Benzene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Bromobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Bromochloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Bromodichloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Bromoform | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Bromomethane | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Carbon disulfide | 2.0 | U | 0.60 | 2.0 | 2.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Carbon tetrachloride | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Chlorobenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Chloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Chloroform | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |

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

**ALS Houston, US** Date: 05-Apr-22

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Sample ID: LH18/24-SP650_032222
Collection Date: 22-Mar-2022 14:00

**ANALYTICAL REPORT**
WorkOrder:HS22031243
Lab ID:HS22031243-01
Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: ZQM |
| Chloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| **cis-1,2-Dichloroethene** | **1.2** | | **0.20** | **0.50** | **1.0** | **ug/L** | 1 | 01-Apr-2022 15:37 |
| cis-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Dibromochloromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Dibromomethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Dichlorodifluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Ethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Hexachlorobutadiene | 1.0 | U | 1.0 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Isopropylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| m,p-Xylene | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Methylene chloride | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| n-Butylbenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| n-Propylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Naphthalene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| o-Xylene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| sec-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Styrene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| tert-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Tetrachloroethene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Toluene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| trans-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| trans-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Trichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Trichlorofluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| Vinyl chloride | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 15:37 |
| *Surr: 1,2-Dichloroethane-d4* | *102* | | | **0** | *81-118* | *%REC* | *1* | *01-Apr-2022 15:37* |
| *Surr: 4-Bromofluorobenzene* | *98.6* | | | **0** | *85-114* | *%REC* | *1* | *01-Apr-2022 15:37* |
| *Surr: Dibromofluoromethane* | *96.5* | | | **0** | *80-119* | *%REC* | *1* | *01-Apr-2022 15:37* |
| *Surr: Toluene-d8* | *106* | | | **0** | *89-112* | *%REC* | *1* | *01-Apr-2022 15:37* |
| **ANIONS BY SW9056A** | | **Method:SW9056** | | | | | | Analyst: YP |
| **Chloride** | **834** | | **4.00** | **10.0** | **10.0** | **mg/L** | 20 | 05-Apr-2022 13:45 |
| **Sulfate** | **34.8** | | **0.200** | **0.500** | **0.500** | **mg/L** | 1 | 05-Apr-2022 13:40 |

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

**ALS Houston, US** Date: 05-Apr-22

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Sample ID: Trip Blank
Collection Date: 22-Mar-2022 14:00

**ANALYTICAL REPORT**
WorkOrder:HS22031243
Lab ID:HS22031243-02
Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: ZQM |
| 1,1,1,2-Tetrachloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 1,1,1-Trichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 1,1,2,2-Tetrachloroethane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 1,1,2-Trichloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 1,1-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 1,1-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 1,1-Dichloropropene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 1,2,3-Trichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 1,2,3-Trichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 1,2,4-Trichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 1,2,4-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 1,2-Dibromo-3-chloropropane | 1.0 | U | 0.20 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 1,2-Dibromoethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 1,2-Dichlorobenzene | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 1,2-Dichloroethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 1,2-Dichloropropane | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 1,3,5-Trimethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 1,3-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 1,3-Dichloropropane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 1,4-Dichlorobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 2,2-Dichloropropane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 2-Butanone | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 2-Chlorotoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 2-Hexanone | 2.0 | U | 1.0 | 2.0 | 2.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 4-Chlorotoluene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 4-Isopropyltoluene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| 4-Methyl-2-pentanone | 2.0 | U | 0.70 | 2.0 | 2.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| Acetone | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| Benzene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| Bromobenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| Bromochloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| Bromodichloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| Bromoform | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| Bromomethane | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| Carbon disulfide | 2.0 | U | 0.60 | 2.0 | 2.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| Carbon tetrachloride | 1.0 | U | 0.50 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| Chlorobenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| Chloroethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| Chloroform | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |

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

**ALS Houston, US** Date: 05-Apr-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Bi-Weekly Samples | WorkOrder:HS22031243 |
| Sample ID: | Trip Blank | Lab ID:HS22031243-02 |
| Collection Date: | 22-Mar-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **VOLATILES ORGANICS BY METHOD 8260C** | | **Method:SW8260** | | | | | | Analyst: ZQM |
| Chloromethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| cis-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| cis-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| Dibromochloromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| Dibromomethane | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| Dichlorodifluoromethane | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| Ethylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| Hexachlorobutadiene | 1.0 | U | 1.0 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| Isopropylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| m,p-Xylene | 1.0 | U | 0.50 | 1.0 | 2.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| Methylene chloride | 2.0 | U | 0.40 | 2.0 | 2.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| n-Butylbenzene | 1.0 | U | 0.40 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| n-Propylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| Naphthalene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| o-Xylene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| sec-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| Styrene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| tert-Butylbenzene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| Tetrachloroethene | 1.0 | U | 0.30 | 1.0 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| Toluene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| trans-1,2-Dichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| trans-1,3-Dichloropropene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| Trichloroethene | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| **Trichlorofluoromethane** | **1.3** | | **0.30** | **1.0** | **1.0** | **ug/L** | 1 | 01-Apr-2022 17:06 |
| Vinyl chloride | 0.50 | U | 0.20 | 0.50 | 1.0 | ug/L | 1 | 01-Apr-2022 17:06 |
| *Surr: 1,2-Dichloroethane-d4* | *101* | | | **0** | *81-118* | *%REC* | *1* | *01-Apr-2022 17:06* |
| *Surr: 4-Bromofluorobenzene* | *99.1* | | | **0** | *85-114* | *%REC* | *1* | *01-Apr-2022 17:06* |
| *Surr: Dibromofluoromethane* | *95.1* | | | **0** | *80-119* | *%REC* | *1* | *01-Apr-2022 17:06* |
| *Surr: Toluene-d8* | *108* | | | **0** | *89-112* | *%REC* | *1* | *01-Apr-2022 17:06* |

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

**ALS Houston, US** Date: 05-Apr-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22031243

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** R405468 ( 0 ) | **Test Name :** VOLATILES ORGANICS BY METHOD 8260C | | | | **Matrix:** Water | |
| HS22031243-01 | LH18/24-SP650_032222 | 22 Mar 2022 14:00 | | | 01 Apr 2022 15:37 | 1 |
| HS22031243-02 | Trip Blank | 22 Mar 2022 14:00 | | | 01 Apr 2022 17:06 | 1 |
| **Batch ID:** R405710 ( 0 ) | **Test Name :** ANIONS BY SW9056A | | | | **Matrix:** Water | |
| HS22031243-01 | LH18/24-SP650_032222 | 22 Mar 2022 14:00 | | | 05 Apr 2022 13:45 | 20 |
| HS22031243-01 | LH18/24-SP650_032222 | 22 Mar 2022 14:00 | | | 05 Apr 2022 13:40 | 1 |

**ALS Houston, US** Date: 05-Apr-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22031243

**QC BATCH REPORT**

**Batch ID:** R405468 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220331** Units: **ug/L** Analysis Date: **01-Apr-2022 13:20**
Client ID: Run ID: **VOA9_405468** SeqNo: **6574594** PrepDate: DF: **1**

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

**ALS Houston, US** Date: 05-Apr-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22031243

**QC BATCH REPORT**

**Batch ID:** R405468 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MBLK** Sample ID: **VBLKW-220331** Units: **ug/L** Analysis Date: **01-Apr-2022 13:20**
Client ID: Run ID: **VOA9_405468** SeqNo: **6574594** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 2.0 | 2.0 | | | | | | | | U |
| Carbon tetrachloride | 1.0 | 1.0 | | | | | | | | U |
| Chlorobenzene | 1.0 | 1.0 | | | | | | | | U |
| Chloroethane | 1.0 | 1.0 | | | | | | | | U |
| Chloroform | 0.50 | 1.0 | | | | | | | | U |
| Chloromethane | 0.50 | 1.0 | | | | | | | | U |
| cis-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| cis-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Dibromochloromethane | 1.0 | 1.0 | | | | | | | | U |
| Dibromomethane | 0.50 | 1.0 | | | | | | | | U |
| Dichlorodifluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Ethylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Hexachlorobutadiene | 1.0 | 1.0 | | | | | | | | U |
| Isopropylbenzene | 1.0 | 1.0 | | | | | | | | U |
| m,p-Xylene | 1.0 | 2.0 | | | | | | | | U |
| Methylene chloride | 2.0 | 2.0 | | | | | | | | U |
| Naphthalene | 1.0 | 1.0 | | | | | | | | U |
| n-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| n-Propylbenzene | 1.0 | 1.0 | | | | | | | | U |
| o-Xylene | 1.0 | 1.0 | | | | | | | | U |
| sec-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Styrene | 1.0 | 1.0 | | | | | | | | U |
| tert-Butylbenzene | 1.0 | 1.0 | | | | | | | | U |
| Tetrachloroethene | 1.0 | 1.0 | | | | | | | | U |
| Toluene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,2-Dichloroethene | 0.50 | 1.0 | | | | | | | | U |
| trans-1,3-Dichloropropene | 0.50 | 1.0 | | | | | | | | U |
| Trichloroethene | 0.50 | 1.0 | | | | | | | | U |
| Trichlorofluoromethane | 1.0 | 1.0 | | | | | | | | U |
| Vinyl chloride | 0.50 | 1.0 | | | | | | | | U |
| *Surr: 1,2-Dichloroethane-d4* | *49.53* | *1.0* | *50* | *0* | *99.1* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *49.13* | *1.0* | *50* | *0* | *98.3* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *46.74* | *1.0* | *50* | *0* | *93.5* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *52.44* | *1.0* | *50* | *0* | *105* | *89 - 112* | | | | |

**ALS Houston, US** Date: 05-Apr-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22031243

**QC BATCH REPORT**

**Batch ID:** **R405468 ( 0 )** **Instrument:** **VOA9** **Method:** **VOLATILES ORGANICS BY METHOD 8260C**

**LCS** Sample ID: **VLCSW-220331** Units: **ug/L** Analysis Date: **01-Apr-2022 12:36**
Client ID: Run ID: **VOA9_405468** SeqNo: **6574593** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 20.65 | 1.0 | 20 | 0 | 103 | 78 - 124 | | | | |
| 1,1,1-Trichloroethane | 20.8 | 1.0 | 20 | 0 | 104 | 74 - 131 | | | | |
| 1,1,2,2-Tetrachloroethane | 21.53 | 1.0 | 20 | 0 | 108 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 21.38 | 1.0 | 20 | 0 | 107 | 80 - 119 | | | | |
| 1,1-Dichloroethane | 21.88 | 1.0 | 20 | 0 | 109 | 77 - 125 | | | | |
| 1,1-Dichloroethene | 21.94 | 1.0 | 20 | 0 | 110 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 20.79 | 1.0 | 20 | 0 | 104 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 19.36 | 1.0 | 20 | 0 | 96.8 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 19.46 | 1.0 | 20 | 0 | 97.3 | 73 - 122 | | | | |
| 1,2,4-Trichlorobenzene | 19.31 | 1.0 | 20 | 0 | 96.6 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 20.97 | 1.0 | 20 | 0 | 105 | 76 - 124 | | | | |
| 1,2-Dibromo-3-chloropropane | 17.83 | 1.0 | 20 | 0 | 89.1 | 62 - 128 | | | | |
| 1,2-Dibromoethane | 20.6 | 1.0 | 20 | 0 | 103 | 77 - 121 | | | | |
| 1,2-Dichlorobenzene | 20.82 | 1.0 | 20 | 0 | 104 | 80 - 119 | | | | |
| 1,2-Dichloroethane | 21.47 | 1.0 | 20 | 0 | 107 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 21.22 | 1.0 | 20 | 0 | 106 | 78 - 122 | | | | |
| 1,3,5-Trimethylbenzene | 21.11 | 1.0 | 20 | 0 | 106 | 75 - 124 | | | | |
| 1,3-Dichlorobenzene | 19.79 | 1.0 | 20 | 0 | 98.9 | 80 - 119 | | | | |
| 1,3-Dichloropropane | 22.29 | 1.0 | 20 | 0 | 111 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 21.3 | 1.0 | 20 | 0 | 106 | 79 - 118 | | | | |
| 2,2-Dichloropropane | 20.9 | 1.0 | 20 | 0 | 104 | 60 - 139 | | | | |
| 2-Butanone | 43.59 | 2.0 | 40 | 0 | 109 | 56 - 143 | | | | |
| 2-Chlorotoluene | 20.17 | 1.0 | 20 | 0 | 101 | 79 - 122 | | | | |
| 2-Hexanone | 45.37 | 2.0 | 40 | 0 | 113 | 57 - 139 | | | | |
| 4-Chlorotoluene | 21.25 | 1.0 | 20 | 0 | 106 | 78 - 122 | | | | |
| 4-Isopropyltoluene | 21.42 | 1.0 | 20 | 0 | 107 | 77 - 127 | | | | |
| 4-Methyl-2-pentanone | 45.06 | 2.0 | 40 | 0 | 113 | 67 - 130 | | | | |
| Acetone | 49.04 | 2.0 | 40 | 0 | 123 | 39 - 160 | | | | |
| Benzene | 21.33 | 1.0 | 20 | 0 | 107 | 79 - 120 | | | | |
| Bromobenzene | 21.23 | 1.0 | 20 | 0 | 106 | 80 - 120 | | | | |
| Bromochloromethane | 22.29 | 1.0 | 20 | 0 | 111 | 78 - 123 | | | | |
| Bromodichloromethane | 20.02 | 1.0 | 20 | 0 | 100 | 79 - 125 | | | | |
| Bromoform | 19.31 | 1.0 | 20 | 0 | 96.5 | 66 - 130 | | | | |
| Bromomethane | 26.31 | 1.0 | 20 | 0 | 132 | 53 - 141 | | | | |

**ALS Houston, US** Date: 05-Apr-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22031243

**QC BATCH REPORT**

**Batch ID:** R405468 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**LCS** Sample ID: **VLCSW-220331** Units: **ug/L** Analysis Date: **01-Apr-2022 12:36**
Client ID: Run ID: **VOA9_405468** SeqNo: **6574593** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 42.23 | 2.0 | 40 | 0 | 106 | 64 - 133 | | | | |
| Carbon tetrachloride | 21.21 | 1.0 | 20 | 0 | 106 | 72 - 136 | | | | |
| Chlorobenzene | 20.22 | 1.0 | 20 | 0 | 101 | 82 - 118 | | | | |
| Chloroethane | 22.37 | 1.0 | 20 | 0 | 112 | 60 - 138 | | | | |
| Chloroform | 20.73 | 1.0 | 20 | 0 | 104 | 79 - 124 | | | | |
| Chloromethane | 25.68 | 1.0 | 20 | 0 | 128 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 21.24 | 1.0 | 20 | 0 | 106 | 78 - 123 | | | | |
| cis-1,3-Dichloropropene | 19.5 | 1.0 | 20 | 0 | 97.5 | 75 - 124 | | | | |
| Dibromochloromethane | 20 | 1.0 | 20 | 0 | 100 | 74 - 126 | | | | |
| Dibromomethane | 22.05 | 1.0 | 20 | 0 | 110 | 79 - 123 | | | | |
| Dichlorodifluoromethane | 28.4 | 1.0 | 20 | 0 | 142 | 32 - 152 | | | | |
| Ethylbenzene | 19.93 | 1.0 | 20 | 0 | 99.6 | 79 - 121 | | | | |
| Hexachlorobutadiene | 21.58 | 1.0 | 20 | 0 | 108 | 66 - 134 | | | | |
| Isopropylbenzene | 21.01 | 1.0 | 20 | 0 | 105 | 72 - 131 | | | | |
| m,p-Xylene | 41.24 | 2.0 | 40 | 0 | 103 | 80 - 121 | | | | |
| Methylene chloride | 22.57 | 2.0 | 20 | 0 | 113 | 74 - 124 | | | | |
| Naphthalene | 19.85 | 1.0 | 20 | 0 | 99.2 | 61 - 128 | | | | |
| n-Butylbenzene | 20.08 | 1.0 | 20 | 0 | 100 | 75 - 128 | | | | |
| n-Propylbenzene | 20.67 | 1.0 | 20 | 0 | 103 | 76 - 126 | | | | |
| o-Xylene | 20.5 | 1.0 | 20 | 0 | 102 | 78 - 122 | | | | |
| sec-Butylbenzene | 21.37 | 1.0 | 20 | 0 | 107 | 77 - 126 | | | | |
| Styrene | 20.71 | 1.0 | 20 | 0 | 104 | 78 - 123 | | | | |
| tert-Butylbenzene | 21.32 | 1.0 | 20 | 0 | 107 | 78 - 124 | | | | |
| Tetrachloroethene | 19.4 | 1.0 | 20 | 0 | 97.0 | 74 - 129 | | | | |
| Toluene | 20.69 | 1.0 | 20 | 0 | 103 | 80 - 121 | | | | |
| trans-1,2-Dichloroethene | 21.73 | 1.0 | 20 | 0 | 109 | 75 - 124 | | | | |
| trans-1,3-Dichloropropene | 18.75 | 1.0 | 20 | 0 | 93.8 | 73 - 127 | | | | |
| Trichloroethene | 21.17 | 1.0 | 20 | 0 | 106 | 79 - 123 | | | | |
| Trichlorofluoromethane | 22.08 | 1.0 | 20 | 0 | 110 | 65 - 141 | | | | |
| Vinyl chloride | 22.42 | 1.0 | 20 | 0 | 112 | 58 - 137 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *49.8* | *1.0* | *50* | *0* | *99.6* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *47.04* | *1.0* | *50* | *0* | *94.1* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *46.83* | *1.0* | *50* | *0* | *93.7* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *47.55* | *1.0* | *50* | *0* | *95.1* | *89 - 112* | | | | |

**ALS Houston, US** Date: 05-Apr-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22031243

**QC BATCH REPORT**

**Batch ID:** R405468 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS22031343-07MS** Units: **ug/L** Analysis Date: **01-Apr-2022 15:59**
Client ID: Run ID: **VOA9_405468** SeqNo: **6576387** PrepDate: DF: **5**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 83.05 | 5.0 | 100 | 0 | 83.1 | 78 - 124 | | | | |
| 1,1,1-Trichloroethane | 84.82 | 5.0 | 100 | 0 | 84.8 | 74 - 131 | | | | |
| 1,1,2,2-Tetrachloroethane | 84 | 5.0 | 100 | 0 | 84.0 | 71 - 121 | | | | |
| 1,1,2-Trichloroethane | 87.53 | 5.0 | 100 | 0 | 87.5 | 80 - 119 | | | | |
| 1,1-Dichloroethane | 132.9 | 5.0 | 100 | 46.17 | 86.8 | 77 - 125 | | | | |
| 1,1-Dichloroethene | 93.33 | 5.0 | 100 | 3.591 | 89.7 | 71 - 131 | | | | |
| 1,1-Dichloropropene | 88.72 | 5.0 | 100 | 0 | 88.7 | 78 - 125 | | | | |
| 1,2,3-Trichlorobenzene | 77.55 | 5.0 | 100 | 0 | 77.5 | 69 - 129 | | | | |
| 1,2,3-Trichloropropane | 74.17 | 5.0 | 100 | 0 | 74.2 | 73 - 122 | | | | |
| 1,2,4-Trichlorobenzene | 79.22 | 5.0 | 100 | 0 | 79.2 | 69 - 130 | | | | |
| 1,2,4-Trimethylbenzene | 87.92 | 5.0 | 100 | 0 | 87.9 | 76 - 124 | | | | |
| 1,2-Dibromo-3-chloropropane | 73.69 | 5.0 | 100 | 0 | 73.7 | 62 - 128 | | | | |
| 1,2-Dibromoethane | 82.21 | 5.0 | 100 | 0 | 82.2 | 77 - 121 | | | | |
| 1,2-Dichlorobenzene | 96.44 | 5.0 | 100 | 7.68 | 88.8 | 80 - 119 | | | | |
| 1,2-Dichloroethane | 88.07 | 5.0 | 100 | 0 | 88.1 | 73 - 128 | | | | |
| 1,2-Dichloropropane | 87.59 | 5.0 | 100 | 0 | 87.6 | 78 - 122 | | | | |
| 1,3,5-Trimethylbenzene | 90.44 | 5.0 | 100 | 0 | 90.4 | 75 - 124 | | | | |
| 1,3-Dichlorobenzene | 82.95 | 5.0 | 100 | 0 | 83.0 | 80 - 119 | | | | |
| 1,3-Dichloropropane | 89.16 | 5.0 | 100 | 0 | 89.2 | 80 - 119 | | | | |
| 1,4-Dichlorobenzene | 87.45 | 5.0 | 100 | 0 | 87.4 | 79 - 118 | | | | |
| 2,2-Dichloropropane | 84.1 | 5.0 | 100 | 0 | 84.1 | 60 - 139 | | | | |
| 2-Butanone | 155.2 | 10 | 200 | 0 | 77.6 | 56 - 143 | | | | |
| 2-Chlorotoluene | 84.65 | 5.0 | 100 | 0 | 84.7 | 79 - 122 | | | | |
| 2-Hexanone | 171.6 | 10 | 200 | 0 | 85.8 | 57 - 139 | | | | |
| 4-Chlorotoluene | 88.34 | 5.0 | 100 | 0 | 88.3 | 78 - 122 | | | | |
| 4-Isopropyltoluene | 91.75 | 5.0 | 100 | 0 | 91.8 | 77 - 127 | | | | |
| 4-Methyl-2-pentanone | 163.3 | 10 | 200 | 0 | 81.7 | 67 - 130 | | | | |
| Acetone | 167.8 | 10 | 200 | 0 | 83.9 | 39 - 160 | | | | |
| Benzene | 120.6 | 5.0 | 100 | 30.13 | 90.4 | 79 - 120 | | | | |
| Bromobenzene | 84.96 | 5.0 | 100 | 0 | 85.0 | 80 - 120 | | | | |
| Bromochloromethane | 82.58 | 5.0 | 100 | 0 | 82.6 | 78 - 123 | | | | |
| Bromodichloromethane | 82.07 | 5.0 | 100 | 0 | 82.1 | 79 - 125 | | | | |
| Bromoform | 78.74 | 5.0 | 100 | 0 | 78.7 | 66 - 130 | | | | |
| Bromomethane | 76.92 | 5.0 | 100 | 0 | 76.9 | 53 - 141 | | | | |

**ALS Houston, US** Date: 05-Apr-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22031243

**QC BATCH REPORT**

**Batch ID:** R405468 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MS** Sample ID: **HS22031343-07MS** Units: **ug/L** Analysis Date: **01-Apr-2022 15:59**
Client ID: Run ID: **VOA9_405468** SeqNo: **6576387** PrepDate: DF: **5**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 159.3 | 10 | 200 | 0 | 79.7 | 64 - 133 | | | | |
| Carbon tetrachloride | 91.42 | 5.0 | 100 | 0 | 91.4 | 72 - 136 | | | | |
| Chlorobenzene | 82.54 | 5.0 | 100 | 0 | 82.5 | 82 - 118 | | | | |
| Chloroethane | 183.8 | 5.0 | 100 | 73.43 | 110 | 60 - 138 | | | | |
| Chloroform | 82.27 | 5.0 | 100 | 0 | 82.3 | 79 - 124 | | | | |
| Chloromethane | 98.87 | 5.0 | 100 | 0 | 98.9 | 50 - 139 | | | | |
| cis-1,2-Dichloroethene | 359 | 5.0 | 100 | 290 | 69.0 | 78 - 123 | | | | S |
| cis-1,3-Dichloropropene | 79.08 | 5.0 | 100 | 0 | 79.1 | 75 - 124 | | | | |
| Dibromochloromethane | 82.81 | 5.0 | 100 | 0 | 82.8 | 74 - 126 | | | | |
| Dibromomethane | 86.1 | 5.0 | 100 | 0 | 86.1 | 79 - 123 | | | | |
| Dichlorodifluoromethane | 123 | 5.0 | 100 | 0 | 123 | 32 - 152 | | | | |
| Ethylbenzene | 84.33 | 5.0 | 100 | 0 | 84.3 | 79 - 121 | | | | |
| Hexachlorobutadiene | 93.48 | 5.0 | 100 | 0 | 93.5 | 66 - 134 | | | | |
| Isopropylbenzene | 90.08 | 5.0 | 100 | 0 | 90.1 | 72 - 131 | | | | |
| m,p-Xylene | 171.8 | 10 | 200 | 0 | 85.9 | 80 - 121 | | | | |
| Methylene chloride | 86.45 | 10 | 100 | 0 | 86.5 | 74 - 124 | | | | |
| Naphthalene | 79.33 | 5.0 | 100 | 0 | 79.3 | 61 - 128 | | | | |
| n-Butylbenzene | 87.61 | 5.0 | 100 | 0 | 87.6 | 75 - 128 | | | | |
| n-Propylbenzene | 91.74 | 5.0 | 100 | 0 | 91.7 | 76 - 126 | | | | |
| o-Xylene | 85.22 | 5.0 | 100 | 0 | 85.2 | 78 - 122 | | | | |
| sec-Butylbenzene | 92.28 | 5.0 | 100 | 0 | 92.3 | 77 - 126 | | | | |
| Styrene | 86.86 | 5.0 | 100 | 0 | 86.9 | 78 - 123 | | | | |
| tert-Butylbenzene | 92.31 | 5.0 | 100 | 0 | 92.3 | 78 - 124 | | | | |
| Tetrachloroethene | 111.2 | 5.0 | 100 | 25.38 | 85.8 | 74 - 129 | | | | |
| Toluene | 87.78 | 5.0 | 100 | 0 | 87.8 | 80 - 121 | | | | |
| trans-1,2-Dichloroethene | 90.25 | 5.0 | 100 | 0 | 90.3 | 75 - 124 | | | | |
| trans-1,3-Dichloropropene | 75.4 | 5.0 | 100 | 0 | 75.4 | 73 - 127 | | | | |
| Trichloroethene | 110.4 | 5.0 | 100 | 21.31 | 89.1 | 79 - 123 | | | | |
| Trichlorofluoromethane | 90.85 | 5.0 | 100 | 0 | 90.8 | 65 - 141 | | | | |
| Vinyl chloride | 156.4 | 5.0 | 100 | 69.96 | 86.4 | 58 - 137 | | | | |
| *Surr: 1,2-Dichloroethane-d4* | *252.7* | *5.0* | *250* | *0* | *101* | *81 - 118* | | | | |
| *Surr: 4-Bromofluorobenzene* | *257.6* | *5.0* | *250* | *0* | *103* | *85 - 114* | | | | |
| *Surr: Dibromofluoromethane* | *245.6* | *5.0* | *250* | *0* | *98.3* | *80 - 119* | | | | |
| *Surr: Toluene-d8* | *272.5* | *5.0* | *250* | *0* | *109* | *89 - 112* | | | | |

**ALS Houston, US** Date: 05-Apr-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22031243

**QC BATCH REPORT**

**Batch ID:** R405468 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS22031343-07MSD** Units: **ug/L** Analysis Date: **01-Apr-2022 16:21**
Client ID: Run ID: **VOA9_405468** SeqNo: **6576388** PrepDate: DF: **5**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1,2-Tetrachloroethane | 90.37 | 5.0 | 100 | 0 | 90.4 | 78 - 124 | 83.05 | 8.44 | 20 | |
| 1,1,1-Trichloroethane | 87.45 | 5.0 | 100 | 0 | 87.5 | 74 - 131 | 84.82 | 3.06 | 20 | |
| 1,1,2,2-Tetrachloroethane | 87.16 | 5.0 | 100 | 0 | 87.2 | 71 - 121 | 84 | 3.7 | 20 | |
| 1,1,2-Trichloroethane | 92.29 | 5.0 | 100 | 0 | 92.3 | 80 - 119 | 87.53 | 5.29 | 20 | |
| 1,1-Dichloroethane | 133.3 | 5.0 | 100 | 46.17 | 87.2 | 77 - 125 | 132.9 | 0.284 | 20 | |
| 1,1-Dichloroethene | 95.52 | 5.0 | 100 | 3.591 | 91.9 | 71 - 131 | 93.33 | 2.32 | 20 | |
| 1,1-Dichloropropene | 88.81 | 5.0 | 100 | 0 | 88.8 | 78 - 125 | 88.72 | 0.0989 | 20 | |
| 1,2,3-Trichlorobenzene | 79.62 | 5.0 | 100 | 0 | 79.6 | 69 - 129 | 77.55 | 2.64 | 20 | |
| 1,2,3-Trichloropropane | 79.44 | 5.0 | 100 | 0 | 79.4 | 73 - 122 | 74.17 | 6.86 | 20 | |
| 1,2,4-Trichlorobenzene | 80.84 | 5.0 | 100 | 0 | 80.8 | 69 - 130 | 79.22 | 2.02 | 20 | |
| 1,2,4-Trimethylbenzene | 90.23 | 5.0 | 100 | 0 | 90.2 | 76 - 124 | 87.92 | 2.6 | 20 | |
| 1,2-Dibromo-3-chloropropane | 79.6 | 5.0 | 100 | 0 | 79.6 | 62 - 128 | 73.69 | 7.72 | 20 | |
| 1,2-Dibromoethane | 85.24 | 5.0 | 100 | 0 | 85.2 | 77 - 121 | 82.21 | 3.62 | 20 | |
| 1,2-Dichlorobenzene | 95.07 | 5.0 | 100 | 7.68 | 87.4 | 80 - 119 | 96.44 | 1.43 | 20 | |
| 1,2-Dichloroethane | 88.46 | 5.0 | 100 | 0 | 88.5 | 73 - 128 | 88.07 | 0.434 | 20 | |
| 1,2-Dichloropropane | 88 | 5.0 | 100 | 0 | 88.0 | 78 - 122 | 87.59 | 0.465 | 20 | |
| 1,3,5-Trimethylbenzene | 90.27 | 5.0 | 100 | 0 | 90.3 | 75 - 124 | 90.44 | 0.189 | 20 | |
| 1,3-Dichlorobenzene | 82.83 | 5.0 | 100 | 0 | 82.8 | 80 - 119 | 82.95 | 0.145 | 20 | |
| 1,3-Dichloropropane | 92.12 | 5.0 | 100 | 0 | 92.1 | 80 - 119 | 89.16 | 3.26 | 20 | |
| 1,4-Dichlorobenzene | 90.58 | 5.0 | 100 | 0 | 90.6 | 79 - 118 | 87.45 | 3.51 | 20 | |
| 2,2-Dichloropropane | 86.38 | 5.0 | 100 | 0 | 86.4 | 60 - 139 | 84.1 | 2.68 | 20 | |
| 2-Butanone | 161.4 | 10 | 200 | 0 | 80.7 | 56 - 143 | 155.2 | 3.91 | 20 | |
| 2-Chlorotoluene | 85.3 | 5.0 | 100 | 0 | 85.3 | 79 - 122 | 84.65 | 0.756 | 20 | |
| 2-Hexanone | 181.4 | 10 | 200 | 0 | 90.7 | 57 - 139 | 171.6 | 5.58 | 20 | |
| 4-Chlorotoluene | 87.66 | 5.0 | 100 | 0 | 87.7 | 78 - 122 | 88.34 | 0.774 | 20 | |
| 4-Isopropyltoluene | 92.18 | 5.0 | 100 | 0 | 92.2 | 77 - 127 | 91.75 | 0.463 | 20 | |
| 4-Methyl-2-pentanone | 172.4 | 10 | 200 | 0 | 86.2 | 67 - 130 | 163.3 | 5.44 | 20 | |
| Acetone | 176.6 | 10 | 200 | 0 | 88.3 | 39 - 160 | 167.8 | 5.15 | 20 | |
| Benzene | 121.4 | 5.0 | 100 | 30.13 | 91.3 | 79 - 120 | 120.6 | 0.701 | 20 | |
| Bromobenzene | 88.48 | 5.0 | 100 | 0 | 88.5 | 80 - 120 | 84.96 | 4.05 | 20 | |
| Bromochloromethane | 83.66 | 5.0 | 100 | 0 | 83.7 | 78 - 123 | 82.58 | 1.29 | 20 | |
| Bromodichloromethane | 86.52 | 5.0 | 100 | 0 | 86.5 | 79 - 125 | 82.07 | 5.28 | 20 | |
| Bromoform | 79.21 | 5.0 | 100 | 0 | 79.2 | 66 - 130 | 78.74 | 0.592 | 20 | |
| Bromomethane | 89.16 | 5.0 | 100 | 0 | 89.2 | 53 - 141 | 76.92 | 14.7 | 20 | |

**ALS Houston, US** Date: 05-Apr-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22031243

**QC BATCH REPORT**

**Batch ID:** R405468 ( 0 ) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

**MSD** Sample ID: **HS22031343-07MSD** Units: **ug/L** Analysis Date: **01-Apr-2022 16:21**
Client ID: Run ID: **VOA9_405468** SeqNo: **6576388** PrepDate: DF: **5**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 168 | 10 | 200 | 0 | 84.0 | 64 - 133 | 159.3 | 5.28 | 20 | |
| Carbon tetrachloride | 91.81 | 5.0 | 100 | 0 | 91.8 | 72 - 136 | 91.42 | 0.425 | 20 | |
| Chlorobenzene | 86.53 | 5.0 | 100 | 0 | 86.5 | 82 - 118 | 82.54 | 4.72 | 20 | |
| Chloroethane | 168 | 5.0 | 100 | 73.43 | 94.6 | 60 - 138 | 183.8 | 9 | 20 | |
| Chloroform | 82.7 | 5.0 | 100 | 0 | 82.7 | 79 - 124 | 82.27 | 0.518 | 20 | |
| Chloromethane | 96.17 | 5.0 | 100 | 0 | 96.2 | 50 - 139 | 98.87 | 2.77 | 20 | |
| cis-1,2-Dichloroethene | 355.1 | 5.0 | 100 | 290 | 65.0 | 78 - 123 | 359 | 1.1 | 20 | S |
| cis-1,3-Dichloropropene | 82.81 | 5.0 | 100 | 0 | 82.8 | 75 - 124 | 79.08 | 4.6 | 20 | |
| Dibromochloromethane | 87.32 | 5.0 | 100 | 0 | 87.3 | 74 - 126 | 82.81 | 5.31 | 20 | |
| Dibromomethane | 89.8 | 5.0 | 100 | 0 | 89.8 | 79 - 123 | 86.1 | 4.21 | 20 | |
| Dichlorodifluoromethane | 122.9 | 5.0 | 100 | 0 | 123 | 32 - 152 | 123 | 0.0768 | 20 | |
| Ethylbenzene | 85.12 | 5.0 | 100 | 0 | 85.1 | 79 - 121 | 84.33 | 0.928 | 20 | |
| Hexachlorobutadiene | 91.65 | 5.0 | 100 | 0 | 91.6 | 66 - 134 | 93.48 | 1.99 | 20 | |
| Isopropylbenzene | 90.75 | 5.0 | 100 | 0 | 90.8 | 72 - 131 | 90.08 | 0.748 | 20 | |
| m,p-Xylene | 176.1 | 10 | 200 | 0 | 88.0 | 80 - 121 | 171.8 | 2.48 | 20 | |
| Methylene chloride | 86.47 | 10 | 100 | 0 | 86.5 | 74 - 124 | 86.45 | 0.0262 | 20 | |
| Naphthalene | 85.19 | 5.0 | 100 | 0 | 85.2 | 61 - 128 | 79.33 | 7.12 | 20 | |
| n-Butylbenzene | 88.1 | 5.0 | 100 | 0 | 88.1 | 75 - 128 | 87.61 | 0.554 | 20 | |
| n-Propylbenzene | 90.16 | 5.0 | 100 | 0 | 90.2 | 76 - 126 | 91.74 | 1.73 | 20 | |
| o-Xylene | 87.04 | 5.0 | 100 | 0 | 87.0 | 78 - 122 | 85.22 | 2.11 | 20 | |
| sec-Butylbenzene | 92.55 | 5.0 | 100 | 0 | 92.5 | 77 - 126 | 92.28 | 0.285 | 20 | |
| Styrene | 88.15 | 5.0 | 100 | 0 | 88.2 | 78 - 123 | 86.86 | 1.48 | 20 | |
| tert-Butylbenzene | 92.47 | 5.0 | 100 | 0 | 92.5 | 78 - 124 | 92.31 | 0.181 | 20 | |
| Tetrachloroethene | 109.1 | 5.0 | 100 | 25.38 | 83.7 | 74 - 129 | 111.2 | 1.88 | 20 | |
| Toluene | 88.09 | 5.0 | 100 | 0 | 88.1 | 80 - 121 | 87.78 | 0.349 | 20 | |
| trans-1,2-Dichloroethene | 88.05 | 5.0 | 100 | 0 | 88.0 | 75 - 124 | 90.25 | 2.47 | 20 | |
| trans-1,3-Dichloropropene | 79.7 | 5.0 | 100 | 0 | 79.7 | 73 - 127 | 75.4 | 5.55 | 20 | |
| Trichloroethene | 110.4 | 5.0 | 100 | 21.31 | 89.1 | 79 - 123 | 110.4 | 0.0756 | 20 | |
| Trichlorofluoromethane | 94.02 | 5.0 | 100 | 0 | 94.0 | 65 - 141 | 90.85 | 3.43 | 20 | |
| Vinyl chloride | 156.1 | 5.0 | 100 | 69.96 | 86.2 | 58 - 137 | 156.4 | 0.161 | 20 | |
| *Surr: 1,2-Dichloroethane-d4* | *248.6* | *5.0* | *250* | *0* | *99.4* | *81 - 118* | *252.7* | *1.66* | *20* | |
| *Surr: 4-Bromofluorobenzene* | *258.5* | *5.0* | *250* | *0* | *103* | *85 - 114* | *257.6* | *0.353* | *20* | |
| *Surr: Dibromofluoromethane* | *240.6* | *5.0* | *250* | *0* | *96.2* | *80 - 119* | *245.6* | *2.09* | *20* | |
| *Surr: Toluene-d8* | *270.7* | *5.0* | *250* | *0* | *108* | *89 - 112* | *272.5* | *0.653* | *20* | |

**ALS Houston, US** Date: 05-Apr-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22031243

**QC BATCH REPORT**

| Batch ID: | R405468 ( 0 ) | Instrument: | VOA9 | Method: | VOLATILES ORGANICS BY METHOD 8260C |
|---|---|---|---|---|---|

**The following samples were analyzed in this batch:** HS22031243-01 HS22031243-02

**ALS Houston, US** Date: 05-Apr-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** HS22031243

**QC BATCH REPORT**

**Batch ID:** R405710 ( 0 ) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

**MBLK** Sample ID: **MBLK** Units: **mg/L** Analysis Date: **05-Apr-2022 14:06**
Client ID: Run ID: **ICS-Integrion_405710** SeqNo: **6579963** 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: **05-Apr-2022 14:12**
Client ID: Run ID: **ICS-Integrion_405710** SeqNo: **6579964** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 18.76 | 0.500 | 20 | 0 | 93.8 | 80 - 120 | | | | |
| Sulfate | 20.58 | 0.500 | 20 | 0 | 103 | 80 - 120 | | | | |

**MS** Sample ID: **HS22031243-01MS** Units: **mg/L** Analysis Date: **05-Apr-2022 13:51**
Client ID: **LH18/24-SP650_032222** Run ID: **ICS-Integrion_405710** SeqNo: **6579960** PrepDate: DF: **20**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 981 | 10.0 | 200 | 834 | 73.5 | 80 - 120 | | | | SO |
| Sulfate | 264.3 | 10.0 | 200 | 49.48 | 107 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22031243-01MSD** Units: **mg/L** Analysis Date: **05-Apr-2022 13:56**
Client ID: **LH18/24-SP650_032222** Run ID: **ICS-Integrion_405710** SeqNo: **6579961** PrepDate: DF: **20**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 983.3 | 10.0 | 200 | 834 | 74.7 | 80 - 120 | 981 | 0.236 | 20 | SO |
| Sulfate | 263.1 | 10.0 | 200 | 49.48 | 107 | 80 - 120 | 264.3 | 0.431 | 20 | |

**The following samples were analyzed in this batch:** HS22031243-01

**ALS Houston, US** Date: 05-Apr-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Bi-Weekly Samples
**WorkOrder:** **HS22031243**

## QUALIFIERS, ACRONYMS, UNITS

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

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

| Unit Reported | Description |
|---|---|
| mg/L | Milligrams per Liter |

## CERTIFICATIONS,ACCREDITATIONS & LICENSES

| Agency | Number | Expire Date |
|---|---|---|
| Florida | E87611-34 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 05-Apr-22

## Sample Receipt Checklist

**Work Order ID:** HS22031243 **Date/Time Received:** **23-Mar-2022 09:25**

**Client Name:** Bhate Environmental **Received by:** **Pablo Marinez**

**Completed By:** /S/ Pablo Marinez (eSignature) 23-Mar-2022 18:30 (Date/Time) **Reviewed by:** /S/ Ragen Giga (eSignature) 24-Mar-2022 20:31 (Date/Time)

Matrices: **WATER** Carrier name: **FedEx Priority Overnight**

| | Yes | No | Not Present |
|---|---|---|---|
| Shipping container/cooler in good condition? | ☑ | ☐ | ☐ |
| Custody seals intact on shipping container/cooler? | ☑ | ☐ | ☐ |
| Custody seals intact on sample bottles? | ☐ | ☐ | ☑ |
| VOA/TX1005/TX1006 Solids in hermetically sealed vials? | ☐ | ☐ | ☑ |
| Chain of custody present? | ☑ | ☐ | 1 Page(s) |
| Chain of custody signed when relinquished and received? | ☑ | ☐ | COC IDs:CLIENT |
| Samplers name present on COC? | ☑ | ☐ | |
| Chain of custody agrees with sample labels? | ☑ | ☐ | |
| Samples in proper container/bottle? | ☑ | ☐ | |
| Sample containers intact? | ☑ | ☐ | |
| Sufficient sample volume for indicated test? | ☑ | ☐ | |
| All samples received within holding time? | ☑ | ☐ | |
| Container/Temp Blank temperature in compliance? | ☑ | ☐ | |

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 0.4°C/0.9°C UC/C | IR 31 |
| Cooler(s)/Kit(s): | BLUE | |
| Date/Time sample(s) sent to storage: | 3/23/22 18:35 | |

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



Project: BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. NWO1312.0150.0 16.0001

Job:
**GROUNDWATER TREATMENT PLANT BI-WEEKLY SAMPLES**

Prepared By: Scott Beesinger

P.O Number

**HS22031243**

Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Bi-Weekly Samples

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | VOC | CHLORIDE, SULFATE | | | | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_032222 | Water | 03/22/22 / 14:00 | | 3 | 3 | | | | | | | | | | HCL | |
| LH18/24-SP650_032222 | Water | 03/22/22 / 14:00 | | 1 | | 1 | | | | | | | | | NONE | |
| Trip Blank | Water | 03/22/22 | | 2 | 2 | | | | | | | | | | HCL | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Additional Remarks: **Standard TAT on all parameters**

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 03/22/22 | 14:30 | [illegible] | 3/22/22 | 9:25 | | | | | | |

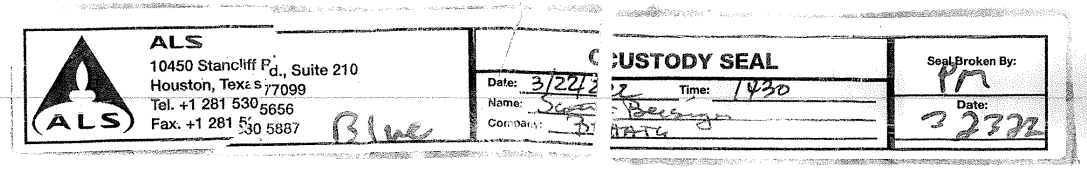
9For Lab Use Only

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Remarks

Blue 0.4c
1231 LPtos

(Word) S:\1-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
Blue
CUSTODY SEAL
Date: 3/22/22
Time: 1430
Name:
Company:
Seal Broken By:
Date: 3 23 22

1251 0294 3970
PRIORITY OVERNIGHT
AB SGRA
Blue
77099
TX-US
IAH
3923207 22Mar2022 GGGA 56DG5/ED02/C0B8

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April 07, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS22031664**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia Olive,

ALS Environmental received 3 sample(s) on Mar 31, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

**Generated By: DAYNA.FISHER**

Ragen Giga
Project Manager

**ALS Houston, US** Date: 07-Apr-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22031664

## SAMPLE SUMMARY

| Lab Samp ID | Client Sample ID | Matrix | TagNo | Collection Date | Date Received | Hold |
|---|---|---|---|---|---|---|
| HS22031664-01 | LH18/24-SP650_032922 | Water | | 29-Mar-2022 14:00 | 31-Mar-2022 10:15 | ☐ |
| HS22031664-02 | LH18/24-SP650_032922_AIX | Water | | 29-Mar-2022 14:00 | 31-Mar-2022 10:15 | ☐ |
| HS22031664-03 | LH18/24-SP650_032922_BIX | Water | | 29-Mar-2022 14:00 | 31-Mar-2022 10:15 | ☐ |

**ALS Houston, US** Date: 07-Apr-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**Work Order:** HS22031664

**CASE NARRATIVE**

## Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Houston High-Res Lab. Final report attached

## WetChemistry by Method E415.1

### Batch ID: R405898

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E350.3

### Batch ID: R405386

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

## WetChemistry by Method E365.3

### Batch ID: R405377

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

**ALS Houston, US**

Date: 07-Apr-22

**ANALYTICAL REPORT**

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Sample ID: LH18/24-SP650_032922
Collection Date: 29-Mar-2022 14:00

WorkOrder:HS22031664
Lab ID:HS22031664-01
Matrix:Water

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **AMMONIA AS N BY E350.3(ISE)** | | **Method:E350.3** | | | | | | Analyst: MZD |
| **Nitrogen, Ammonia (As N)** | **40** | a | **0.10** | **0.20** | **0.20** | **mg/L** | 1 | 31-Mar-2022 12:35 |
| **ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978** | | **Method:E365.3** | | | | | | Analyst: MZD |
| **Phosphorus, Total Orthophosphate (As P)** | **6.00** | a | **0.250** | **0.625** | **0.625** | **mg/L** | 25 | 31-Mar-2022 12:46 |
| **TOTAL ORGANIC CARBON BY E415.1** | | **Method:E415.1** | | | | | | Analyst: JAC |
| **Organic Carbon, Total** | **4.57** | a | **0.500** | **1.00** | **1.00** | **mg/L** | 1 | 06-Apr-2022 23:11 |

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

**ALS Houston, US**

Date: 07-Apr-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS22031664 |
| Sample ID: | LH18/24-SP650_032922_AIX | Lab ID:HS22031664-02 |
| Collection Date: | 29-Mar-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: SUB |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 04-Apr-2022 10:32 |

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

**ALS Houston, US**

Date: 07-Apr-22

| | | |
|---|---|---|
| Client: | Bhate Environmental Associates, Inc. | **ANALYTICAL REPORT** |
| Project: | Longhorn GW Treatment Plant Weekly Samples | WorkOrder:HS22031664 |
| Sample ID: | LH18/24-SP650_032922_BIX | Lab ID:HS22031664-03 |
| Collection Date: | 29-Mar-2022 14:00 | Matrix:Water |

| ANALYSES | RESULT | QUAL | DL | LOD | LOQ | UNITS | DILUTION FACTOR | DATE ANALYZED |
|---|---|---|---|---|---|---|---|---|
| **SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)** | | **Method:NA** | | | | | | Analyst: SUB |
| Subcontract Analysis | See Attached | | 0 | 0 | | NA | 1 | 04-Apr-2022 10:32 |

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

**ALS Houston, US** Date: 07-Apr-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22031664

## DATES REPORT

| Sample ID | Client Samp ID | Collection Date | Leachate Date | Prep Date | Analysis Date | DF |
|---|---|---|---|---|---|---|
| **Batch ID:** R405377 ( 0 ) | **Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978 | | | | **Matrix:** Water | |
| HS22031664-01 | LH18/24-SP650_032922 | 29 Mar 2022 14:00 | | | 31 Mar 2022 12:46 | 25 |
| **Batch ID:** R405386 ( 0 ) | **Test Name :** AMMONIA AS N BY E350.3(ISE) | | | | **Matrix:** Water | |
| HS22031664-01 | LH18/24-SP650_032922 | 29 Mar 2022 14:00 | | | 31 Mar 2022 12:35 | 1 |
| **Batch ID:** R405566 ( 0 ) | **Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) | | | | **Matrix:** Water | |
| HS22031664-02 | LH18/24-SP650_032922_AIX | 29 Mar 2022 14:00 | | | 04 Apr 2022 10:32 | 1 |
| HS22031664-03 | LH18/24-SP650_032922_BIX | 29 Mar 2022 14:00 | | | 04 Apr 2022 10:32 | 1 |
| **Batch ID:** R405898 ( 0 ) | **Test Name :** TOTAL ORGANIC CARBON BY E415.1 | | | | **Matrix:** Water | |
| HS22031664-01 | LH18/24-SP650_032922 | 29 Mar 2022 14:00 | | | 06 Apr 2022 23:11 | 1 |

**ALS Houston, US** Date: 07-Apr-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22031664

**QC BATCH REPORT**

**Batch ID:** R405377 ( 0 ) **Instrument:** UV-2450 **Method:** ORTHO PHOSPHATE (PO4) AS P BY E365.3-1978

**MBLK** Sample ID: **MBLK-R405377** Units: **mg/L** Analysis Date: **31-Mar-2022 12:46**
Client ID: Run ID: **UV-2450_405377** SeqNo: **6572574** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.0250 | 0.0250 | | | | | | | | U |

**LCS** Sample ID: **LCS-R405377** Units: **mg/L** Analysis Date: **31-Mar-2022 12:46**
Client ID: Run ID: **UV-2450_405377** SeqNo: **6572573** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 0.244 | 0.0250 | 0.25 | 0 | 97.6 | 85 - 115 | | | | |

**MS** Sample ID: **HS22031664-01MS** Units: **mg/L** Analysis Date: **31-Mar-2022 12:46**
Client ID: **LH18/24-SP650_032922** Run ID: **UV-2450_405377** SeqNo: **6572576** PrepDate: DF: **25**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 12.2 | 0.625 | 6.25 | 6 | 99.2 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22031664-01MSD** Units: **mg/L** Analysis Date: **31-Mar-2022 12:46**
Client ID: **LH18/24-SP650_032922** Run ID: **UV-2450_405377** SeqNo: **6572575** PrepDate: DF: **25**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Phosphorus, Total Orthophosphate (As P) | 12.22 | 0.625 | 6.25 | 6 | 99.6 | 80 - 120 | 12.2 | 0.205 | 20 | |

**The following samples were analyzed in this batch:** HS22031664-01

**ALS Houston, US** Date: 07-Apr-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22031664

**QC BATCH REPORT**

**Batch ID: R405386 ( 0 )** **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

**MBLK** Sample ID: **MBLK-R405386** Units: **mg/L** Analysis Date: **31-Mar-2022 12:35**
Client ID: Run ID: **WetChem_HS_405386** SeqNo: **6572714** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 0.20 | 0.20 | | | | | | | | U |

**LCS** Sample ID: **LCS-R405386** Units: **mg/L** Analysis Date: **31-Mar-2022 12:35**
Client ID: Run ID: **WetChem_HS_405386** SeqNo: **6572713** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 10.3 | 0.20 | 10 | 0 | 103 | 80 - 120 | | | | |

**MS** Sample ID: **HS22031543-01MS** Units: **mg/L** Analysis Date: **31-Mar-2022 12:35**
Client ID: Run ID: **WetChem_HS_405386** SeqNo: **6572722** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 49.75 | 0.20 | 10 | 38.32 | 114 | 80 - 120 | | | | |

**MSD** Sample ID: **HS22031543-01MSD** Units: **mg/L** Analysis Date: **31-Mar-2022 12:35**
Client ID: Run ID: **WetChem_HS_405386** SeqNo: **6572721** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen, Ammonia (As N) | 49.75 | 0.20 | 10 | 38.32 | 114 | 80 - 120 | 49.75 | 0.00201 | 20 | |

**The following samples were analyzed in this batch:** HS22031664-01

**ALS Houston, US** Date: 07-Apr-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** HS22031664

**QC BATCH REPORT**

**Batch ID:** R405898 ( 0 ) **Instrument:** TOC_04 **Method:** TOTAL ORGANIC CARBON BY E415.1

**MBLK** Sample ID: **MBLK-04052022** Units: **mg/L** Analysis Date: **06-Apr-2022 21:59**
Client ID: Run ID: **TOC_04_405898** SeqNo: **6584762** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 1.00 | 1.00 | | | | | | | | U |

**LCS** Sample ID: **LCS-04052022** Units: **mg/L** Analysis Date: **06-Apr-2022 22:14**
Client ID: Run ID: **TOC_04_405898** SeqNo: **6584763** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 9.288 | 1.00 | 10 | 0 | 92.9 | 85 - 115 | | | | |

**LCSD** Sample ID: **LCSD-04052022** Units: **mg/L** Analysis Date: **06-Apr-2022 22:29**
Client ID: Run ID: **TOC_04_405898** SeqNo: **6584764** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 9.341 | 1.00 | 10 | 0 | 93.4 | 85 - 115 | 9.288 | 0.569 | 20 | |

**MS** Sample ID: **HS22031286-01MS** Units: **mg/L** Analysis Date: **06-Apr-2022 22:58**
Client ID: Run ID: **TOC_04_405898** SeqNo: **6584766** PrepDate: DF: **1**

| Analyte | Result | PQL | SPK Val | SPK Ref Value | %REC | Control Limit | RPD Ref Value | %RPD | RPD Limit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|
| Organic Carbon, Total | 24.57 | 1.00 | 10 | 12.87 | 117 | 80 - 120 | | | | |

**The following samples were analyzed in this batch:** HS22031664-01

**ALS Houston, US** Date: 07-Apr-22

**Client:** Bhate Environmental Associates, Inc.
**Project:** Longhorn GW Treatment Plant Weekly Samples
**WorkOrder:** **HS22031664**

## 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: 07-Apr-22

## CERTIFICATIONS,ACCREDITATIONS & LICENSES

| Agency | Number | Expire Date |
|---|---|---|
| Florida | E87611-34 | 30-Jun-2022 |
| Illinois | 2000322021-7 | 09-May-2022 |
| Kansas | E-10352 2021-2022 | 31-Jul-2022 |
| Kentucky | 123043, 2021-2022 | 30-Apr-2022 |
| Louisiana | 03087, 2021-2022 | 30-Jun-2022 |
| Texas | T104704231-21-28 | 30-Apr-2022 |

**ALS Houston, US** Date: 07-Apr-22

## Sample Receipt Checklist

**Work Order ID:** HS22031664 **Date/Time Received:** **31-Mar-2022 10:15**

**Client Name:** Bhate Environmental **Received by:** **Pablo Marinez**

**Completed By:** /S/ Pablo Marinez (eSignature) 31-Mar-2022 12:11 (Date/Time) **Reviewed by:** /S/ Ragen Giga (eSignature) 01-Apr-2022 13:22 (Date/Time)

Matrices: **WATER** Carrier name: **FedEx Priority Overnight**

| | Yes | No | |
|---|---|---|---|
| Shipping container/cooler in good condition? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on shipping container/cooler? | ☑ | ☐ | Not Present ☐ |
| Custody seals intact on sample bottles? | ☐ | ☐ | Not Present ☑ |
| VOA/TX1005/TX1006 Solids in hermetically sealed vials? | ☐ | ☐ | Not Present ☑ |
| Chain of custody present? | ☑ | ☐ | 1 Page(s) |
| Chain of custody signed when relinquished and received? | ☑ | ☐ | COC IDs:CLIENT |
| Samplers name present on COC? | ☑ | ☐ | |
| Chain of custody agrees with sample labels? | ☑ | ☐ | |
| Samples in proper container/bottle? | ☑ | ☐ | |
| Sample containers intact? | ☑ | ☐ | |
| Sufficient sample volume for indicated test? | ☑ | ☐ | |
| All samples received within holding time? | ☑ | ☐ | |
| Container/Temp Blank temperature in compliance? | ☑ | ☐ | |

| | | |
|---|---|---|
| Temperature(s)/Thermometer(s): | 0.9°C/1.4°C UC/C | IR 31 |
| Cooler(s)/Kit(s): | BLUE | |
| Date/Time sample(s) sent to storage: | 3/31/22 12:20 | |

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



**Project:** BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

**Project No.** NWO1312.0150.0 16.0001

**Job:** GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

**Prepared By:** Scott Beesinger

**P.O. Number**

**HS22031664**
Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Weekly Samples

| Field Sample I.D. | Sample Matrix | Date / Time | MS / MSD | No. OF CONTAINERS | AMMONIA-N | TOTAL ORGANIC CARBON | ORTHO-PHOSPHATE | PERCHLORATE | | | | | | | Remarks (Preservatives, etc.) | Lab I.D.# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP650_032922 | Water | 03/29/22 / 14:00 | | 3 | X | X | | | | | | | | | H2SO4 | |
| LH18/24-SP650_032922 | Water | 03/29/22 / 14:00 | | 1 | | | X | | | | | | | | NONE | |
| LH18/24–SP650_032922_AIX | Water | 03/29/22 / 14:00 | | 1 | | | | X | | | | | | | NONE | |
| LH18/24-SP650_032922_BIX | Water | 03/29/22 / 14:00 | | 1 | | | | X | | | | | | | NONE | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

Analyses

**Additional Remarks:** 24 HOUR TAT on PERCHLORATE. Standard TAT on all other parameters

| Relinquished By: | Date | Time | Received By: | Date | Time | Relinquished By: | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Beesinger | 03/29/22 | 14:30 | [illegible] | 3/31/22 | 10:15 | | | | | | |

**For Lab Use Only**

| Received At Lab By: | Date | Time | Airbill No. | Opened By: | Date | Time | Temp of Container | Seal No. | Condition |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Remarks:

Blue 0.4c
IR31 LFHOS

01118023

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

Blue

Date: 3/29/22 Time: 1430
Name:
Company:

CUSTODY SEAL

Seal Broken By:
Date: 3 31 22

TRK# 1251 0294 3959

PRIORITY OVERNIGHT

AB SGRA Blue

77099
TX-US
IAH

3923207 29Mar2022 GGGA 56DG1/1E38/C0B8

April 04, 2022

Service Request No:E2200260

Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099

**Laboratory Results for: HS22031664**

Dear Ragen,

Enclosed are the results of the sample(s) submitted to our laboratory March 31, 2022
For your reference, these analyses have been assigned our service request number **E2200260.**

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.:** | E2200260 |
| **Project:** | HS22031664 | **Date Received:** | 03/31/22 |
| **Sample Matrix:** | W | | |

## CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

### Sample Receipt

Two samples were received for analysis at ALS Environmental in Houston on 03/31/22.

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:**

EQ2200127: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of a MS/MSD for this extraction batch. The LCS-DLCS RPD exceeded QC limits, the individual recoveries met acceptance criteria.

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:**E2200260
**Project:** HS22031664

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| E2200260-001 | LH18/24-SP650_032922_AIX | 3/29/2022 | 1400 |
| E2200260-002 | LH18/24-SP650_032922_BIX | 3/29/2022 | 1400 |

# Service Request Summary

**Folder #:** **E2200260**
Client Name: ALS Environmental - US
Project Name: HS22031664
Project Number:

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA
Phone Number:
Cell Number:
Fax Number:
E-mail: ragenp.giga@alsglobal.com

Project Chemist: Corey Grandits
Originating Lab: HOUSTON
Logged By: CGRANDITS
Date Received: 03/31/22
Internal Due Date: 4/1/2022
QAP: LAB QAP
Qualifier Set: Lab Standard
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS22031664
EDD: No EDD Specified

2 120 mL-Plastic Bottle Natural WM Unpreserved
**Location:** EHRMS-AirArch 1
**Pressure Gas:**
**Rush**

| Lab Samp No. | Client Samp No | Matrix | Collected | HOUSTON CIO4 DOD/6850 |
|---|---|---|---|---|
| E2200260-001 | LH18/24-SP650_032922_AIX | Water | 03/29/22 1400 | **IV** |
| E2200260-002 | LH18/24-SP650_032922_BIX | Water | 03/29/22 1400 | **IV** |

# Service Request Summary

| | |
|---|---|
| **Folder #:** | **E2200260** |
| Client Name: | ALS Environmental - US |
| Project Name: | HS22031664 |
| Project Number: | |

**Report To:** Ragen Giga
ALS Environmental - US
10450 Stancliff Rd Suite 210
Houston, TX 77099
USA

| | |
|---|---|
| Phone Number: | |
| Cell Number: | |
| Fax Number: | |
| E-mail: | ragenp.giga@alsglobal.com |

| | |
|---|---|
| Project Chemist: | Corey Grandits |
| Originating Lab: | HOUSTON |
| Logged By: | CGRANDITS |
| Date Received: | 03/31/22 |
| Internal Due Date: | 4/1/2022 |
| QAP: | LAB QAP |
| Qualifier Set: | Lab Standard |
| Formset: | Lab Standard |
| Merged?: | Y |
| Report to MDL?: | Y |
| P.O. Number: | HS22031664 |
| EDD: | No EDD Specified |

2 120 mL-Plastic Bottle Natural WM Unpreserved

**Location:** EHRMS-AirArch 1

**Pressure Gas:**

**Rush**

## Test Comments:

| Group | Test/Method | Samples | Comments |
|---|---|---|---|
| Semivoa GCMS | ClO4 DOD/6850 | 2 | IV DUE 4/21 |

# 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 | (Auto) The reference ion ratio was outside acceptance criteria, which may indicate a potential bias to this result. |
| 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. |

# Data Qualifiers

## Lab Standard

| | |
|---|---|
| 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. |
| P | Indicates chlorodiphenyl ether interference present at the retention time of the target compound. |
| P | Pesticide/Aroclor target analyte > 40% difference for detected concentrations between GC columns |
| Q | Indicates as estimated value because the P and P + 2 theoretical abundance ratio does not meet method criteria. |
| R | Duplicate Precision not met. |
| R1 | Duplicate precision not within the specified limits; however, the results are below the MRL and considered estimated. |
| S | Surrogate recovery not within specified limits. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| T | Analyte is a tentatively identified compound, result is estimated. |
| U | Compound was analyzed for, but was not detected (ND). |
| V1 | The continuing calibration verification standard was outside (biased high) the specified limits for this compound. |
| V2 | The continuing calibration verification standard was outside (biased low) the specified limits for this compound. |
| W | Result quantified, but the corresponding peak was detected outside the generated retention time window. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| X | See case narrative. |
| Y | Recovery outside limits |
| Y | The chromatogram resembles a petroleum product but does not match the calibration standard. |
| Z | The chromatogram does not resemble a petroleum product. |
| i | The MRL/MDL has been elevated due to a matrix interference. |

# ALS Laboratory Group

## Acronyms

| | |
|---|---|
| Cal | Calibration |
| Conc | CONCentration |
| Dioxin(s) | Polychlorinated dibenzo-p-dioxin(s) |
| EDL | Estimated Detection Limit |
| EMPC | Estimated Maximum Possible Concentration |
| Flags | Data qualifiers |
| Furan(s) | Polychlorinated dibenzofuran(s) |
| g | Grams |
| ICAL | Initial CALibration |
| ID | IDentifier |
| Ions | Masses monitored for the analyte during data acquisition |
| L | Liter (s) |
| LCS | Laboratory Control Sample |
| DLCS | Duplicate Laboratory Control Sample |
| MB | Method Blank |
| MCL | Method Calibration Limit |
| MDL | Method Detection Limit |
| mL | Milliliters |
| MS | Matrix Spiked sample |
| DMS | Duplicate Matrix Spiked sample |
| NO | Number of peaks meeting all identification criteria |
| PCDD(s) | Polychlorinated dibenzo-p-dioxin(s) |
| PCDF(s) | Polychlorinated dibenzofuran(s) |
| ppb | Parts per billion |
| ppm | Parts per million |
| ppq | Parts per quadrillion |
| ppt | Parts per trillion |
| QA | Quality Assurance |
| QC | Quality Control |
| Ratio | Ratio of areas from monitored ions for an analyte |
| % Rec. | Percent recovery |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| RT | Retention Time |
| SDG | Sample Delivery Group |
| S/N | Signal-to-noise ratio |
| TEF | Toxicity Equivalence Factor |
| TEQ | Toxicity Equivalence Quotient |

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ALS Environmental

## State Certifications, Accreditations, and Licenses

| Agency | Number | Expire Date |
|---|---|---|
| Arizona Department of Health Services | AZ0793-2022 | 5/27/2022 |
| California Department of Health Services | 2919 | 4/30/2022 |
| California Department of Health Services | 2919-2022 | 4/30/2022 |
| Florida Department of Health | E87611-34 | 6/30/2022 |
| Hawaii Department of Health | 2021-2022 | 4/30/2022 |
| Illinois Environmental Protection Agency | 2000322021-7 | 5/9/2022 |
| Kansas Department of Health and Environment | E-10352 2022 | 7/31/2022 |
| Louisiana Department of Environmental Quality | 03087-2021 | 6/30/2022 |
| Louisiana Department of Environmental Quality | 03087-2020 | 6/30/2022 |
| Louisiana Department of Health and Hospitals | LA028 | 12/31/2022 |
| Maine Department of Health and Human Services | 2020016 | 6/5/2022 |
| Maryland Department of the Environment | 343 | 6/30/2022 |
| Michigan Depratment of Environmental Quality | 9971 | 4/30/2022 |
| Minnesota Department of Health | 2228443 | 12/31/2022 |
| Nebraska Department of Health and Human Services | NE-OS-25-13 | 4/30/2022 |
| Nevada Department of Concervation and Natural Resources | TX026932022-1 | 7/31/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209421 | 4/24/2022 |
| New Hampshire Environmental Laboratory Accreditation Program | 209419 | 4/24/2022 |
| New Jersey Department of Environmental Protection | TX008 | 6/30/2022 |
| New York Department of Health | 11707 | 3/31/2023 |
| Oklahoma Department of Environmental Quality | 2021-080 | 8/31/2022 |
| Pennsylvania Department of Environmental Protection | 68-03441-015 | 6/30/2022 |
| Tennessee Department of Environment and Concervation | 04016 | 4/30/2022 |
| Tennessee Department of Environment and Concervation | 04016-2021 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-28 | 4/30/2022 |
| Texas Commision on Environmental Quality | T104704231-21-27 | 4/30/2022 |
| United States Department of Agriculture | P330-19-00299 | 10/10/2022 |
| Utah Department of Health Environmental Laboratory Certification | TX026932021-12 | 7/31/2022 |
| Washington Department of Health | C819-2022 | 11/14/2022 |

# Chain of Custody

**ALS Environmental - Houston HRMS**
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# Subcontract Chain of Custody

**SAMPLING STATE:** **Dept of Defense** **COC ID: 18448**

**SUBCONTRACT TO:**

ALS Environmental
10450 Stancliff RoadSuite 210
Houston, TX 77084 **Phone:** +1 281 530 5656

**CUSTOMER INFORMATION:**

**Company:** ALS Houston
**Contact:** Ragen Giga
**Address:** 10450 Stancliff Rd, Ste 210
**Phone:** +1 281 530 5656
**Email:** RagenP.Giga@ALSGlobal.com
**Alternate Contact:**
**Email:**

**INVOICE INFORMATION:**

**Company:** ALS Houston
**Contact:** Accounts Payable
**Address:** 10450 Stancliff Rd, Ste 210
**Phone:** +1 281 530 5656
**Reference:** HS22031664
**TSR:** Houston House Acct

| | LAB SAMPLE ID | CLIENT SAMPLE ID | MATRIX | COLLECT DATE |
|---|---|---|---|---|
| | ANALYSIS REQUESTED | | | DUE DATE |
| 1. | **HS22031664-02** | **LH18/24-SP650_032922_AIX** | **Water** | **29 Mar 2022 14:00** |
| | 6850-Perch. DOD Level II & Level IV in separate pdf | | | 01 Apr 2022 |
| 2. | **HS22031664-03** | **LH18/24-SP650_032922_BIX** | **Water** | **29 Mar 2022 14:00** |
| | 6850-Perch. DOD Level II & Level IV in separate pdf | | | 01 Apr 2022 |

**Comments:** Please analyze for the analysis listed above.
Send report to the emails shown above.

**QC Level:** DOD IV (DoD Data Package)

Relinquished By: Paul [illegible] Date/Time: 3-31-22 12:30

Received By: [illegible] Date/Time: 3-31-22 1457

Cooler ID(s): Temperature(s):

ALS Environmental

# Cooler Receipt Form

Project Chemist: CG

Client/Project: ALS-H

Thermometer ID: IR41

Date/Time Received: 3-31-22 Initials: CG

Date/Time Logged in: 3-31-22 Initials: CG

1. Method of delivery: ○ US Mail ○ Fed Ex ○ UPS ○ DHL ☒ Courier (ALS) ○ Client
2. Samples received in: ☒ Cooler ○ Box ○ Envelope ○ Other
3. Were custody seals on coolers? ○ Yes ☒ No
   Were they intact? ○ Yes ○ No ☒ N/A
   Were they signed and dated? ○ Yes ○ No ☒ N/A
   If yes, how many and where?
4. Packing Material: ○ Inserts ☒ Baggies ○ Bubble Wrap ○ Gel Packs ☒ Wet Ice ○ Sleeves ○ Other
5. Foreign or Regulated Soil? ○ Yes ○ No Location of Sampling:

| Cooler Tracking Number | COC ID | Date Opened | Time Opened | Opened By | Temp. °C | Temp Blank? |
|---|---|---|---|---|---|---|
| NA | | 3-31-22 | 1417 | CG | 2.4 | ☒ |
| | | | | | | ☐ |
| | | | | | | ☐ |
| | | | | | | ☐ |

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☒ Yes ○ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☒ Yes ○ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☒ Yes ○ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☒ Yes ○ No
10. Did sample labels and tags agree with custody documents? ☒ Yes ○ No

Notes, Discrepancies, & Resolutions:

Service request Label:

HS-HRMSCoolerReceipt R1.0

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# 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

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# *Preparation Information Benchsheet*

**Prep Run#:** 397477 **Prep WorkFlow:** GenExt28Day **Status:** Prepped
**Team:** Semivoa GCMS/GRIVERA **Prep Method:** **Prep Date/Time:** 4/1/22 08:58

| # | Lab Code | Client ID | B# | Method /Test | pH | Cl | Matrix | Amt. Ext. | Sample Description |
|---|---|---|---|---|---|---|---|---|---|
| 1 | E2200249-001 | HTA-HTA10A-A-2203 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 2 | E2200249-002 | HTA-HTA20-A-2203 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 3 | E2200249-003 | HTA-HTA25-A-2203 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 4 | E2200249-004 | HTA-HTA19-A-2203 | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 5 | E2200260-001 | LH18/24-SP650_032922_AIX | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 6 | E2200260-002 | LH18/24-SP650_032922_BIX | .01 | 6850/ClO4 DOD | | | Water | 10mL | |
| 7 | EQ2200127-01 | MB | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 8 | EQ2200127-02 | LCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |
| 9 | EQ2200127-03 | DLCS | | 6850/ClO4 DOD | | | Liquid | 10mL | |

## Spiking Solutions

Name: Perchlorate Internal Standard 1ug/mL Inventory ID 221408 Logbook Ref: Perchlorate Internal Standard Expires On: 04/30/2022

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E2200249-001 | 100.00µL | E2200249-002 | 100.00µL | E2200249-003 | 100.00µL | E2200249-004 | 100.00µL | E2200260-001 | 100.00µL | E2200260-002 | 100.00µL |
| EQ2200127-01 | 100.00µL | EQ2200127-02 | 100.00µL | EQ2200127-03 | 100.00µL | | | | | | |

Name: Perchlorate Intermediate Stock1 Inventory ID 221456 Logbook Ref: Perchlorate Expires On: 04/30/2022

| | | | |
|---|---|---|---|
| EQ2200127-02 | 1.00µL | EQ2200127-03 | 1.00µL |

## Preparation Materials

| | | | | | |
|---|---|---|---|---|---|
| Water HPLC Grade | 08/03/2021 Water (218532) | 6850 Amber Glass screw vial | 2mL Screw Top Vial (221894) | 537M Glass Culture Tubes | 537M Glass Tubes (218064) |
| 6850 0.45um syringe filters | 6850 Syringe Filters (219639) | 6850 Luer-Lok Syringes | Luer-Lok Syringes (221305) | 6850 Pipette Tips 50-1000 uL | 6850 Pipette Tips (221929) |

## Preparation Steps

Step: Preparation
Started: 4/1/22 08:58
Finished: 4/1/22 09:30
By: GRIVERA
Comments

Comments:

Reviewed By: GR Date: 4/1/22

# Analytical Results

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**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200260 |
| **Project:** | HS22031664 | **Date Collected:** | 3/29/22 1400 |
| **Sample Matrix:** | Water | **Date Received:** | 3/31/22 |
| **Sample Name:** | LH18/24-SP650_032922_AIX | **Units:** | µg/L |
| **Lab Code:** | E2200260-001 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.102** | | 0.100 | 0.0500 | 0.0250 | 1 | 4/ 1/22 | 4/1/22 11:53 | 397477 | 759350 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200260 |
| **Project:** | HS22031664 | **Date Collected:** | 3/29/22 1400 |
| **Sample Matrix:** | Water | **Date Received:** | 3/31/22 |
| **Sample Name:** | LH18/24-SP650_032922_BIX | **Units:** | µg/L |
| **Lab Code:** | E2200260-002 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **605** | | 5.00 | 2.50 | 1.25 | 50 | 4/ 1/22 | 4/1/22 12:17 | 397477 | 759350 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200260 |
| **Project:** | HS22031664 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Units:** | µg/L |
| **Lab Code:** | EQ2200127-01 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | ND | U | 0.100 | 0.0500 | 0.0250 | 1 | 4/ 1/22 | 4/1/22 10:26 | 397477 | 759350 | |

# Accuracy & Precision

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**ALS Group USA, Corp. dba ALS Environmental**

QA/QC Report

**Client:** ALS Environmental - US
**Project:** HS22031664
**Sample Matrix:** Water

**Service Request:** E2200260
**Date Analyzed:** 4/ 1/22

**Lab Control Sample Summary**
**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850
**Prep Method:**

**Units:** µg/L
**Basis:** NA

**Extraction Lot:** 397477

| | Lab Control Sample EQ2200127-02 | | | Duplicate Lab Control Sample EQ2200127-03 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Perchlorate | 0.0840 | 0.100 | 84 | 0.103 | 0.100 | 103 | 84 - 119 | 21 * | 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:** | E2200260 |
| **Project:** | HS22031664 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200127-02 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.0840** | J | 0.100 | 0.0500 | 0.0250 | 1 | 4/ 1/22 | 4/1/22 10:34 | 397477 | 759350 | |

**ALS Group USA, Corp. dba ALS Environmental**

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - US | **Service Request:** | E2200260 |
| **Project:** | HS22031664 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Duplicate Lab Control Sample | **Units:** | µg/L |
| **Lab Code:** | EQ2200127-03 | **Basis:** | NA |

**Perchlorates in Water, Soils, Solid Wastes Using High Performance LC/Electrospray/Mass Spectrometry**

**Analytical Method:** 6850

| Analyte Name | Result | Q | LOQ | LOD | MDL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Analysis Lot | Note |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perchlorate | **0.103** | | 0.100 | 0.0500 | 0.0250 | 1 | 4/ 1/22 | 4/1/22 11:29 | 397477 | 759350 | |

# APPENDIX D
# QUALITY CONTROL SUMMARY REPORT

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# QUARTERLY CONTROL SUMMARY REPORT
# 1st QUARTER (JANUARY-MARCH) 2022
# GROUNDWATER TREATMENT PLANT
# LONGHORN ARMY AMMUNITION PLANT
# KARNACK, TEXAS

**June 2022**

*Prepared For:*

**Longhorn Army Ammunition Plant**
**Karnack, Texas**

*Under Contract To:*

**U.S. Army Corps of Engineers**
**Tulsa District**
**Tulsa, Oklahoma**

**Contract Number: W9128F-13-D-0012**
**Task Order Number: W912BV17F0150**

Prepared By:

**1608 13th Avenue South, Suite 300**
**Birmingham, Alabama 35205**
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**2 DATA USABILITY SUMMARY** ..... 5

**Tables**

Table 1: Field Sample Identification and Laboratory Packages
Table 2: Qualified Analytical Data
Table 3: Completeness by Method

# 1 INTRODUCTION

Bhate Environmental Associates, Inc. (Bhate) reviewed 28 data packages from ALS Environmental, Houston, Texas. Groundwater samples were collected January 5, 2022 through March 29, 2022 at the Groundwater Treatment Plant (GWTP) at Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas. Data were reviewed for conformance to the requirements of the following guidance documents: [United States Environmental Protection Agency] *USEPA Contract Laboratory Program* [CLP] *National Functional Guidelines for Superfund Organic Methods Data Review* (USEPA, November 2020), *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (USEPA, November 2020) and the *Final Basewide Uniform Federal Policy* [UFP] – *Quality Assurance Project Plan* [QAPP] *Longhorn Army Ammunition Plant* which is in Appendix C of the *Final Installation-Wide Work Plan for Longhorn Army Ammunition Plant Karnack, Texas* (Bhate, May 2018).

## 1.1 Intended Use of Data

The objective of sampling at the GWTP is to monitor effluent streams to confirm compliance with discharge limits.

Analyses performed include:

- SW6850 – Perchlorate
- E350.3– Nitrogen, Ammonia
- E365.3– Orthophosphate
- E415.1 – Total Organic Carbon
- SW8260C- Volatile Organic Compounds
- SW8270D SIM- 1,4-Dioxane
- SW6020A/7470A – Metals
- SW9056A – Chloride (Cl) and Sulfate ($SO_4$)
- SW7196A – Hexavalent Chromium
- E410.4 – Chemical Oxygen Demand
- E1664A – Oil and Grease
- TO-15 – Volatiles in Air

**Table 1** lists the sample identification numbers (IDs) and their associated laboratory package.

**Table 2** lists qualified results with the qualification flag and reason code.

The following narrative is a brief synopsis of data that required qualification due to quality control discrepancies.

## 1.2 Preservation and Holding Times

Sample identification data were evaluated for agreement with the chain-of-custody (COC). All samples were received in appropriate containers, within the proper temperature range, in good condition, and within the required hold time with the following exceptions:

- The o-phosphate analysis of sample LH18/24-SP650_020222 was performed outside hold time and flagged "J" estimated.
- The hexavalent analysis of samples LH18/24-SP650_020222 and LH18/24-SP140_020222 was also run outside hold times and the results were flagged estimated non-detects "UJ".

## 1.3 Calibrations

All analytes reported must be present in the initial and continuing calibration. The calibrations must meet the acceptance criteria specified in Worksheet 24 (Analytical Instrument Calibration) of the QAPP. All results reported must be within the calibration range. Samples were diluted, if necessary, to bring analyte responses within the calibration range.

### 1.3.1 Continuing Calibration Verifications

The calibrations must meet the following criteria otherwise the compound is qualified J or UJ: The continuing calibration verification (CCV) criteria are 20 percent difference (%D) for VOCs and SVOCs and 50% for closing CCVs. Metals and general chemistry - 10%D; perchlorate - 15%D; and volatiles in air - 30%D.

The CCV %D was outside control limits for:

- Acetone in biweekly sample LH18/24-SP650_022222;
- Dichlorodifluoromethane in air samples LH18/24-Air_030722_Downwind, LH18/24-Air_030722_GWTP, LH18/24-Air_030722_Stripper and LH18/24-Air_030722_Stripper_a;
- Acetone and methylene chloride in sample LH18/24-SP650_032222

All samples were qualified estimated "J/UJ".

## 1.4 Blanks

If the analyte result for an associated sample was less than 5X (10X for common laboratory contaminants) the analyte concentration in the blank, that result was qualified "UB" and considered an artifact of blank contamination. Where the sample result for the affected analyte was non-detect or greater than 5X the amount in the blank, no qualifier was applied.

### 1.4.1 Metals - SW6020

Quarterly effluent sample LH18/24-SP650_021522 reported a detection of aluminum and nickel <5x the method blank concentrations and were flagged "UB".

## 1.5 Surrogates

Surrogates were evaluated using limits defined by each method in the project-specific QAPP Worksheet 28.

No surrogates were outside control limits.

## 1.6 Laboratory Control Sample/Laboratory Control Sample Duplicate

The Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD) recoveries were evaluated using limits defined in the project-specific QAPP Worksheet 15.

The LCS/LCSD recoveries were within control limits.

## 1.7 Matrix Spike/Matrix Spike Duplicate Sample

The Matrix Spike (MS)/Matrix Spike Duplicate (MSD) recoveries were evaluated using limits defined in Worksheet 15 of the project-specific QAPP. When sample results were greater than 4x the spike amount, control limits were not applicable and require no qualification. Furthermore, if a MS/MSD analyses was performed on a batched (unrelated) sample no qualification was made to the sample data. Otherwise, only the sample used for spiking requires qualification.

### 1.7.1 Ortho-Phosphate – 365.3

Sample LH18/24-SP650_022222 reported the MS and MSD recoveries above control limits. The result was considered estimated and flagged "J".

## 1.8 Internal Standards

If the %R for an internal standard in a sample is not within the limit, the associated sample is qualified for those analytes associated with the internal standard(s) outside of the limit.

Internal standards were within acceptance criteria for the associated compounds.

## 1.9 Precision

Precision is the measure of variability of individual sample measurements. Evaluation of laboratory and/or field duplicates for precision was done using the relative percent difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. Field duplicate RPD limits were set at <30% for groundwater and air matrices. Laboratory duplicate RPD limits were set at <25% for air matrices.

### 1.9.1 Laboratory Duplicate

The laboratory duplicate results were within control limits.

### 1.9.2 Field Duplicate

The field duplicate RPDs were within control limits.

# 2 DATA USABILITY SUMMARY

The data are usable for the intended purposes of the project (Table 3). The data quality objectives have been met for the project.

**Table 1: Field Sample Identification and Laboratory Packages**

| Client Sample ID | Lab Package | SW6850 | E350.3 | E365.3 | E415.1 | SW8270D SIM | SW8260C | SW6020A | SW9056A | SW7196A | E410.4 | 1664A | TO-15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **GWTP Samples** | | | | | | | | | | | | | |
| LH18/24-SP650_010522_AIX | HS22010166 | X | X | X | X | | | | | | | | |
| LH18/24-SP650_010522_AIX | HS22010172 | X | | | | X | X | X | | X | | | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-SP140_010522 | HS22010170 | X | | | | | | X | | X | | | |
| LH18/24-SP650_011122_AIX | HS22010419 | X | X | X | X | | | | | | | | |
| LH18/24-SP650_011122 | HS22010420 | | | | | | X | | X | | | | |
| LH18/24-SP650_011922_AIX | HS22010825 | X | X | X | X | | | | | | | | |
| LH18/24-SP650_012522_AIX | HS22011130 | X | X | X | X | | | | | | | | |
| LH18/24-SP650_012522 | HS22011131 | | | | | | X | | X | | | | |
| LH18/24-SP650_020222_AIX | HS22020282 | X | X | X | X | | | | | | | | |
| LH18/24-SP140_020222 | HS22020283 | X | | | | | | X | | X | | | |
| LH18/24-SP650_020222_AIX | HS22020280 | X | | | | X | X | X | | X | | | |
| LH18/24-SP650_021022_AIX | HS22020588 | X | X | X | X | | | | | | | | |
| LH18/24-SP650_021022 | HS22020621 | | | | | | X | | X | | | | |
| LH18/24-SP650_021522_AIX | HS22020807 | X | X | X | X | | | | | | | | |
| LH18/24-SP650_021522_AIX | HS22020822 | X | | | | X | X | X | X | | X | X | |
| LH18/24-SP140_021522 | HS22020823 | X | | | | X | X | X | X | | X | X | |
| LH18/24-SP650_022222_AIX | HS22021124 | X | X | X | X | | | | | | | | |
| LH18/24-SP650_022222 | HS22021133 | | | | | | X | | X | | | | |
| LH18/24-SP650_030122_AIX | HS22030081 | X | X | X | X | | | | | | | | |
| LH18/24-SP650_030122_AIX | HS22030083 | X | | | | X | X | X | | X | | | |
| LH18/24-SP140_030122 | HS22030082 | X | | | | | | X | | X | | | |
| LH18/24-SP650_030822_BIX/AIX | HS22030443 | X | X | X | X | | | | | | | | |
| LH18/24-SP650_030822 | HS22030465 | | | | | | X | | X | | | | |
| LH18/24-SP650_031522_BIX/AIX | HS22030820 | X | X | X | X | | | | | | | | |
| LH18/24-SP650_032222_BIX/AIX | HS22031203 | X | X | X | X | | | | | | | | |
| LH18/24-SP650_032222 | HS22031243 | | | | | | X | | X | | | | |
| LH18/24-SP650_032922_BIX/AIX | HS22031664 | X | X | X | X | | | | | | | | |
| **Air Samples** | | | | | | | | | | | | | |
| LH18/24-Air_030722_Stripper | P2201166 | | | | | | | | | | | | X |
| LH18/24-Air_030722_Stripper_a | P2201166 | | | | | | | | | | | | X |
| LH18/24-Air_030722_GWTP | P2201166 | | | | | | | | | | | | X |
| LH18/24-Air_030722_Downwind | P2201166 | | | | | | | | | | | | X |

Notes:
ID – Identification
MW – Monitoring Well
SM – Standard Method
SW-846 - Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.
E – U.S. Environmental Protection Agency Method
HS – Houston
AIX/BIX – After/Before Ion Exchange
a – duplicate sample

## Table 2: Qualified Analytical Data

| Client Sample ID Laboratory | Laboratory Package | Analyte Name | Data Validation Qualifier | Reason for Qualification |
|---|---|---|---|---|
| LH18/24-SP650_020222 | HS22020282 | Ortho-phosphate | 0.967 J | HT |
| LH18/24-SP650_020222 | HS22020280 | Hexavalent Chromium | < 0.0100 UJ | HT |
| LH18/24-SP140_020222 | HS22020283 | Hexavalent Chromium | < 0.0100 UJ | HT |
| LH18/24-Air_030722_Downwind | P2201166 | Dichlorodifluoromethane | 2.2 J | CCV |
| LH18/24-Air_030722_GWTP | P2201166 | Dichlorodifluoromethane | 2.1 J | CCV |
| LH18/24-Air_030722_Stripper and duplicate | P2201166 | Dichlorodifluoromethane | 13 UJ | CCV |
| LH18/24-SP650_022222 | HS22021133 | Acetone | < 2.0 UJ | CCV |
| LH18/24-SP650_032222 | HS22031243 | Methylene Chloride<br>Acetone | < 1.0 UJ<br>< 2.0 UJ | CCV |
| LH18/24-SP650_021522 | HS22020822 | Aluminum<br>Nickel | 0.0254 UB<br>0.00254 UB | MB |
| LH18/24-SP650_022222 | HS22021124 | Ortho-phosphate | 21.5 J | MS/MSD > |

Notes:
ID – identification
J – Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
UJ – Estimated not detected; The analyte was not detected but considered estimated due to discrepancies in meeting quality control criteria and reported to the limit of detection.
UB – considered an artifact of blank contamination
HS – Houston
MB – Method Blank contamination
CCV – Continuing calibration verification percent recovery outside control limits
MS/MSD >– Matrix spike/Matrix spike duplicate above control limits
HT – hold time exceedance

## Table 3: Completeness by Method

| Method | No. of Rejected Results | % Completeness |
|---|---|---|
| SW6850 | 0 | 100 |
| E350.1 | 0 | 100 |
| E365.2 | 0 | 100 |
| E415.1 | 0 | 100 |
| SW8270D | 0 | 100 |
| SW8260B | 0 | 100 |
| SW6020A | 0 | 100 |
| SW9056 | 0 | 100 |
| SW7196A | 0 | 100 |
| E410.4 | 0 | 100 |
| E1664 | 0 | 100 |
| TO-15 | 0 | 100 |

E – U.S. Environmental Protection Agency method.
SW-846 - Test Methods for Evaluating Solid Waste, Physical/Chemical Methods

# APPENDIX E
# AIR MONITORING ANALYTICAL LABORATORY REPORT

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2655 Park Center Dr., Suite A
Simi Valley, CA 93065
**T:** +1 805 526 7161
www.alsglobal.com

# LABORATORY REPORT

April 1, 2022

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd., Suite 129
Lakewood, CO 80228

**RE: LHAAP GWTP / NW01312.0150**

Dear Marcia:

Enclosed are the results of the samples submitted to our laboratory on March 14, 2022. For your reference, these analyses have been assigned our service request number P2201166.

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 Sue Anderson at 2:16 pm, Apr 01, 2022*

Sue Anderson
Project Manager

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
**T:** +1 805 526 7161
www.alsglobal.com

Client: Bhate Environmental Associates, Inc. Service Request No: P2201166
Project: LHAAP GWTP / NW01312.0150

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## CASE NARRATIVE

The samples were received intact under chain of custody on March 14, 2022 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.

Volatile Organic Compound Analysis

The samples were analyzed for volatile organic compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. This procedure is described in laboratory SOP VOA-TO15. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator. 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 NELAP or DoD-ELAP accreditation.

The minimum criterion for dichlorodifluoromethane was not met in the Continuing Calibration Verification (CCV) analyzed on March 28, 2022. In accordance with ALS Environmental standard operating procedures, a level of detection (LOD) check standard containing the analyte of concern was analyzed and verified that instrument sensitivity was adequate to detect the analyte at the MRL. This analyte was found in sample LH18/24-Air 030722_GWTP and LH18/24-Air 030722_Downwind at concentration above the MRL. Since the LOD has recovery above the method criteria, the data quality has not been significantly affected. No further corrective action was necessary.

The containers were cleaned, prior to sampling, down to the method reporting limit (MRL) reported for this project. For projects requiring DoD QSM 5.3 compliance canisters were cleaned to <1/2 the MRL. Please note, projects which require reporting below the MRL could have results between the MRL and method detection limit (MDL) that are biased high.

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*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
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**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 | 4068-008 |
| 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: Bhate Environmental Associates, Inc.
Service Request: P2201166
Project ID: LHAAP GWTP / NW01312.0150

Date Received: 3/14/2022
Time Received: 09:30

| Client Sample ID | Lab Code | Matrix | Date Collected | Time Collected | Container ID | Pi1 (psig) | Pf1 (psig) | TO-15 - VOC Cans |
|---|---|---|---|---|---|---|---|---|
| LH18/24-Air_030722_Stripper | P2201166-001 | Air | 3/7/2022 | 14:00 | AS01682 | 0.04 | 3.62 | X |
| LH18/24-Air_030722_Stripper_a | P2201166-002 | Air | 3/7/2022 | 14:00 | AS01364 | -0.04 | 3.63 | X |
| LH18/24-Air_030722_GWTP | P2201166-003 | Air | 3/7/2022 | 14:15 | AS01672 | -0.31 | 3.91 | X |
| LH18/24-Air_030722_Downwind | P2201166-004 | Air | 3/8/2022 | 07:00 | AC02359 | -1.49 | 3.96 | X |

# Air - Chain of Custody Record & Analytical Service Request



2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard

ALS Project No. B701166

Company Name & Address (Reporting Information): BHATE ENVIRONMENTAL

Project Name: LHAAP- GWTP

Project Number: NW01312.0150

Project Manager: Kim Nemmers

P.O. # / Billing Information

Phone: 205-918-4000

Fax:

Email Address for Result Reporting: [redacted] molive@bhate.com

Sampler (Print & Sign): Scott Bessinger Scott Bessinger

ALS Contact:

Analysis Method: TO-15

| Client Sample ID | Laboratory ID Number | Date Collected | Time Collected | Canister ID (Bar code # - AC, SC, etc.) | Flow Controller ID (Bar code # - FC #) | Canister Start Pressure "Hg | Canister End Pressure "Hg/psig | Sample Volume | TO-15 | | Comments e.g. Actual Preservative or specific instructions |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LH18/24-Air.030722_Stripper | 1 | 3/7/22 | 1400 | AS01682 | | -30 | 0 | 6L | X | | |
| LH18/24-Air.030722_Stripper_a | 2 | 3/7/22 | 1400 | AS01364 | | -28 | 0 | 6L | X | | |
| LH18/24-Air.030722_GWTP | 3 | 3/7/22 | 1415 | AS01672 | FCR00584 | -26 | -2 | 6L | X | | |
| LH18/24-Air.030722_Downwind | 4 | 3/8/22 | 0700 | AC02359 | FCR00014 | -28 | -5 | 6L | X | | |

Report Tier Levels - please select

Tier I - Results (Default if not specified) ____
Tier II (Results + QC Summaries) ____
Tier III (Results + QC & Calibration Summaries) ____
Tier IV (Data Validation Package) 10% Surcharge ____

EDD required Yes / No
Type: _____ Units: _____

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Project Requirements (MRLs, QAPP)

| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) | Date: | Time: |
|---|---|---|---|---|---|
| Scott Bessinger | 3/8/22 | 0730 | | | |
| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) | Date: | Time: |
| | | | | 3-14-22 | 0930 |

Cooler / Blank Temperature ____°C

# ALS Environmental
## Sample Acceptance Check Form

Client: Bhate Environmental Associates, Inc. Work order: P2201166
Project: LHAAP GWTP / NW01312.0150
Sample(s) received on: 3/14/22 Date opened: 3/14/22 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? | ☐ | ☐ | ☒ |
| 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 |
|---|---|---|---|---|---|---|
| P2201166-001.01 | 6.0 L Silonite Can | | | | | |
| P2201166-002.01 | 6.0 L Silonite Can | | | | | |
| P2201166-003.01 | 6.0 L Silonite Can | | | | | |
| P2201166-004.01 | 6.0 L Ambient Can | | | | | |
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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:** **Bhate Environmental Associates, Inc.**
**Client Sample ID:** **LH18/24-Air_030722_Stripper** ALS Project ID: P2201166
**Client Project ID:** **LHAAP GWTP / NW01312.0150** ALS Sample ID: P2201166-001

Test Code: EPA TO-15 Date Collected: 3/7/22
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 3/14/22
Analyst: Topacio Zavala Date Analyzed: 3/28/22
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.050 Liter(s)
Test Notes: 0.015 Liter(s)
Container ID: AS01682

Initial Pressure (psig): 0.04 Final Pressure (psig): 3.62

Container Dilution Factor: 1.24

| CAS # | Compound | Result µg/m³ | MRL µg/m³ | Result ppbV | MRL ppbV | Data Qualifier |
|---|---|---|---|---|---|---|
| 115-07-1 | Propene | ND | 13 | ND | 7.5 | |
| 75-71-8 | Dichlorodifluoromethane (CFC 12) | ND | 13 | ND | 2.7 | **V** |
| 74-87-3 | Chloromethane | ND | 13 | ND | 6.1 | |
| 76-14-2 | 1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114) | ND | 13 | ND | 1.9 | |
| 75-01-4 | Vinyl Chloride | **32** | 13 | **12** | 5.0 | |
| 106-99-0 | 1,3-Butadiene | ND | 13 | ND | 5.8 | |
| 74-83-9 | Bromomethane | ND | 13 | ND | 3.3 | |
| 75-00-3 | Chloroethane | ND | 13 | ND | 4.8 | |
| 64-17-5 | Ethanol | ND | 120 | ND | 66 | |
| 75-05-8 | Acetonitrile | ND | 25 | ND | 15 | |
| 107-02-8 | Acrolein | ND | 25 | ND | 11 | |
| 67-64-1 | Acetone | ND | 130 | ND | 54 | |
| 75-69-4 | Trichlorofluoromethane | ND | 13 | ND | 2.3 | |
| 67-63-0 | 2-Propanol (Isopropyl Alcohol) | ND | 25 | ND | 10 | |
| 107-13-1 | Acrylonitrile | ND | 25 | ND | 11 | |
| 75-35-4 | 1,1-Dichloroethene | **27** | 13 | **6.8** | 3.4 | |
| 75-09-2 | Methylene Chloride | **110** | 13 | **33** | 3.7 | |
| 107-05-1 | 3-Chloro-1-propene (Allyl Chloride) | ND | 13 | ND | 4.2 | |
| 76-13-1 | Trichlorotrifluoroethane | **1,600** | 13 | **200** | 1.7 | |
| 75-15-0 | Carbon Disulfide | ND | 27 | ND | 8.8 | |
| 156-60-5 | trans-1,2-Dichloroethene | ND | 13 | ND | 3.3 | |
| 75-34-3 | 1,1-Dichloroethane | ND | 13 | ND | 3.2 | |
| 1634-04-4 | Methyl tert-Butyl Ether | ND | 13 | ND | 3.6 | |
| 108-05-4 | Vinyl Acetate | ND | 120 | ND | 35 | |
| 78-93-3 | 2-Butanone (MEK) | ND | 25 | ND | 8.4 | |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
V = The continuing calibration verification standard was outside (biased low) the specified limits for this compound.

# ALS ENVIRONMENTAL

RESULTS OF ANALYSIS



**Client:** **Bhate Environmental Associates, Inc.**
**Client Sample ID:** **LH18/24-Air_030722_Stripper** ALS Project ID: P2201166
**Client Project ID:** **LHAAP GWTP / NW01312.0150** ALS Sample ID: P2201166-001

Test Code: EPA TO-15 Date Collected: 3/7/22
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 3/14/22
Analyst: Topacio Zavala Date Analyzed: 3/28/22
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.050 Liter(s)
Test Notes: 0.015 Liter(s)
Container ID: AS01682

Initial Pressure (psig): 0.04 Final Pressure (psig): 3.62

Container Dilution Factor: 1.24

| CAS # | Compound | Result µg/m³ | MRL µg/m³ | Result ppbV | MRL ppbV | Data Qualifier |
|---|---|---|---|---|---|---|
| 156-59-2 | cis-1,2-Dichloroethene | **1,600** | 13 | **400** | 3.3 | |
| 141-78-6 | Ethyl Acetate | ND | 52 | ND | 14 | |
| 110-54-3 | n-Hexane | ND | 13 | ND | 3.7 | |
| 67-66-3 | Chloroform | **15** | 13 | **3.0** | 2.7 | |
| 109-99-9 | Tetrahydrofuran (THF) | ND | 25 | ND | 8.4 | |
| 107-06-2 | 1,2-Dichloroethane | **54** | 13 | **13** | 3.2 | |
| 71-55-6 | 1,1,1-Trichloroethane | ND | 13 | ND | 2.4 | |
| 71-43-2 | Benzene | ND | 12 | ND | 3.9 | |
| 56-23-5 | Carbon Tetrachloride | ND | 12 | ND | 2.0 | |
| 110-82-7 | Cyclohexane | ND | 27 | ND | 7.9 | |
| 78-87-5 | 1,2-Dichloropropane | ND | 12 | ND | 2.7 | |
| 75-27-4 | Bromodichloromethane | ND | 13 | ND | 2.0 | |
| 79-01-6 | Trichloroethene | **7,400** | 43 | **1,400** | 8.0 | **D** |
| 123-91-1 | 1,4-Dioxane | ND | 13 | ND | 3.6 | |
| 80-62-6 | Methyl Methacrylate | ND | 27 | ND | 6.7 | |
| 142-82-5 | n-Heptane | ND | 13 | ND | 3.2 | |
| 10061-01-5 | cis-1,3-Dichloropropene | ND | 12 | ND | 2.7 | |
| 108-10-1 | 4-Methyl-2-pentanone | ND | 27 | ND | 6.7 | |
| 10061-02-6 | trans-1,3-Dichloropropene | ND | 13 | ND | 2.8 | |
| 79-00-5 | 1,1,2-Trichloroethane | ND | 13 | ND | 2.4 | |
| 108-88-3 | Toluene | ND | 13 | ND | 3.4 | |
| 591-78-6 | 2-Hexanone | ND | 27 | ND | 6.7 | |
| 124-48-1 | Dibromochloromethane | ND | 13 | ND | 1.5 | |
| 106-93-4 | 1,2-Dibromoethane | ND | 13 | ND | 1.7 | |
| 123-86-4 | n-Butyl Acetate | ND | 27 | ND | 5.7 | |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
D = The reported result is from a dilution.

# ALS ENVIRONMENTAL

RESULTS OF ANALYSIS



**Client:** **Bhate Environmental Associates, Inc.**
**Client Sample ID:** **LH18/24-Air_030722_Stripper** ALS Project ID: P2201166
**Client Project ID:** **LHAAP GWTP / NW01312.0150** ALS Sample ID: P2201166-001

Test Code: EPA TO-15 Date Collected: 3/7/22
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 3/14/22
Analyst: Topacio Zavala Date Analyzed: 3/28/22
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.050 Liter(s)
Test Notes: 0.015 Liter(s)
Container ID: AS01682

Initial Pressure (psig): 0.04 Final Pressure (psig): 3.62

Container Dilution Factor: 1.24

| CAS # | Compound | Result µg/m³ | MRL µg/m³ | Result ppbV | MRL ppbV | Data Qualifier |
|---|---|---|---|---|---|---|
| 111-65-9 | n-Octane | ND | 13 | ND | 2.8 | |
| 127-18-4 | Tetrachloroethene | ND | 13 | ND | 1.9 | |
| 108-90-7 | Chlorobenzene | ND | 13 | ND | 2.8 | |
| 100-41-4 | Ethylbenzene | ND | 13 | ND | 3.0 | |
| 179601-23-1 | m,p-Xylenes | ND | 27 | ND | 6.3 | |
| 75-25-2 | Bromoform | ND | 13 | ND | 1.2 | |
| 100-42-5 | Styrene | ND | 12 | ND | 2.9 | |
| 95-47-6 | o-Xylene | ND | 13 | ND | 3.0 | |
| 111-84-2 | n-Nonane | ND | 13 | ND | 2.5 | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | ND | 13 | ND | 1.9 | |
| 98-82-8 | Cumene | ND | 13 | ND | 2.6 | |
| 80-56-8 | alpha-Pinene | ND | 13 | ND | 2.4 | |
| 103-65-1 | n-Propylbenzene | ND | 13 | ND | 2.7 | |
| 622-96-8 | 4-Ethyltoluene | ND | 13 | ND | 2.7 | |
| 108-67-8 | 1,3,5-Trimethylbenzene | ND | 13 | ND | 2.6 | |
| 95-63-6 | 1,2,4-Trimethylbenzene | ND | 13 | ND | 2.6 | |
| 100-44-7 | Benzyl Chloride | ND | 27 | ND | 5.3 | |
| 541-73-1 | 1,3-Dichlorobenzene | ND | 13 | ND | 2.1 | |
| 106-46-7 | 1,4-Dichlorobenzene | ND | 13 | ND | 2.1 | |
| 95-50-1 | 1,2-Dichlorobenzene | ND | 13 | ND | 2.2 | |
| 5989-27-5 | d-Limonene | ND | 12 | ND | 2.2 | |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | ND | 25 | ND | 2.6 | |
| 120-82-1 | 1,2,4-Trichlorobenzene | ND | 27 | ND | 3.7 | |
| 91-20-3 | Naphthalene | ND | 13 | ND | 2.5 | |
| 87-68-3 | Hexachlorobutadiene | ND | 13 | ND | 1.2 | |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = 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:** **Bhate Environmental Associates, Inc.**
**Client Sample ID:** **LH18/24-Air_030722_Stripper_a** ALS Project ID: P2201166
**Client Project ID:** **LHAAP GWTP / NW01312.0150** ALS Sample ID: P2201166-002

Test Code: EPA TO-15 Date Collected: 3/7/22
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 3/14/22
Analyst: Topacio Zavala Date Analyzed: 3/28/22
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.050 Liter(s)
Test Notes: 0.015 Liter(s)
Container ID: AS01364

Initial Pressure (psig): -0.04 Final Pressure (psig): 3.63

Container Dilution Factor: 1.25

| CAS # | Compound | Result µg/m³ | MRL µg/m³ | Result ppbV | MRL ppbV | Data Qualifier |
|---|---|---|---|---|---|---|
| 115-07-1 | Propene | ND | 13 | ND | 7.6 | |
| 75-71-8 | Dichlorodifluoromethane (CFC 12) | ND | 13 | ND | 2.7 | **V** |
| 74-87-3 | Chloromethane | ND | 13 | ND | 6.2 | |
| 76-14-2 | 1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114) | ND | 14 | ND | 1.9 | |
| 75-01-4 | Vinyl Chloride | **33** | 13 | **13** | 5.1 | |
| 106-99-0 | 1,3-Butadiene | ND | 13 | ND | 5.9 | |
| 74-83-9 | Bromomethane | ND | 13 | ND | 3.3 | |
| 75-00-3 | Chloroethane | ND | 13 | ND | 4.8 | |
| 64-17-5 | Ethanol | ND | 130 | ND | 66 | |
| 75-05-8 | Acetonitrile | ND | 25 | ND | 15 | |
| 107-02-8 | Acrolein | ND | 25 | ND | 11 | |
| 67-64-1 | Acetone | ND | 130 | ND | 55 | |
| 75-69-4 | Trichlorofluoromethane | ND | 13 | ND | 2.3 | |
| 67-63-0 | 2-Propanol (Isopropyl Alcohol) | ND | 25 | ND | 10 | |
| 107-13-1 | Acrylonitrile | ND | 25 | ND | 12 | |
| 75-35-4 | 1,1-Dichloroethene | **28** | 14 | **7.0** | 3.4 | |
| 75-09-2 | Methylene Chloride | **110** | 13 | **33** | 3.7 | |
| 107-05-1 | 3-Chloro-1-propene (Allyl Chloride) | ND | 13 | ND | 4.2 | |
| 76-13-1 | Trichlorotrifluoroethane | **1,500** | 14 | **200** | 1.8 | |
| 75-15-0 | Carbon Disulfide | ND | 28 | ND | 8.8 | |
| 156-60-5 | trans-1,2-Dichloroethene | ND | 13 | ND | 3.3 | |
| 75-34-3 | 1,1-Dichloroethane | ND | 13 | ND | 3.3 | |
| 1634-04-4 | Methyl tert-Butyl Ether | ND | 13 | ND | 3.7 | |
| 108-05-4 | Vinyl Acetate | ND | 130 | ND | 36 | |
| 78-93-3 | 2-Butanone (MEK) | ND | 25 | ND | 8.5 | |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
V = The continuing calibration verification standard was outside (biased low) the specified limits for this compound.

# ALS ENVIRONMENTAL

RESULTS OF ANALYSIS



**Client:** **Bhate Environmental Associates, Inc.**
**Client Sample ID:** **LH18/24-Air_030722_Stripper_a** ALS Project ID: P2201166
**Client Project ID:** **LHAAP GWTP / NW01312.0150** ALS Sample ID: P2201166-002

Test Code: EPA TO-15 Date Collected: 3/7/22
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 3/14/22
Analyst: Topacio Zavala Date Analyzed: 3/28/22
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.050 Liter(s)
Test Notes: 0.015 Liter(s)
Container ID: AS01364

Initial Pressure (psig): -0.04 Final Pressure (psig): 3.63

Container Dilution Factor: 1.25

| CAS # | Compound | Result µg/m³ | MRL µg/m³ | Result ppbV | MRL ppbV | Data Qualifier |
|---|---|---|---|---|---|---|
| 156-59-2 | cis-1,2-Dichloroethene | **1,600** | 13 | **410** | 3.3 | |
| 141-78-6 | Ethyl Acetate | ND | 53 | ND | 15 | |
| 110-54-3 | n-Hexane | ND | 13 | ND | 3.8 | |
| 67-66-3 | Chloroform | **15** | 14 | **3.0** | 2.8 | |
| 109-99-9 | Tetrahydrofuran (THF) | ND | 25 | ND | 8.5 | |
| 107-06-2 | 1,2-Dichloroethane | **55** | 13 | **14** | 3.3 | |
| 71-55-6 | 1,1,1-Trichloroethane | ND | 13 | ND | 2.4 | |
| 71-43-2 | Benzene | ND | 13 | ND | 3.9 | |
| 56-23-5 | Carbon Tetrachloride | ND | 13 | ND | 2.0 | |
| 110-82-7 | Cyclohexane | ND | 28 | ND | 8.0 | |
| 78-87-5 | 1,2-Dichloropropane | ND | 13 | ND | 2.7 | |
| 75-27-4 | Bromodichloromethane | ND | 13 | ND | 2.0 | |
| 79-01-6 | Trichloroethene | **7,000** | 43 | **1,300** | 8.1 | **D** |
| 123-91-1 | 1,4-Dioxane | ND | 13 | ND | 3.6 | |
| 80-62-6 | Methyl Methacrylate | ND | 28 | ND | 6.7 | |
| 142-82-5 | n-Heptane | ND | 13 | ND | 3.2 | |
| 10061-01-5 | cis-1,3-Dichloropropene | ND | 13 | ND | 2.8 | |
| 108-10-1 | 4-Methyl-2-pentanone | ND | 28 | ND | 6.7 | |
| 10061-02-6 | trans-1,3-Dichloropropene | ND | 13 | ND | 2.8 | |
| 79-00-5 | 1,1,2-Trichloroethane | ND | 13 | ND | 2.4 | |
| 108-88-3 | Toluene | ND | 13 | ND | 3.5 | |
| 591-78-6 | 2-Hexanone | ND | 28 | ND | 6.7 | |
| 124-48-1 | Dibromochloromethane | ND | 13 | ND | 1.6 | |
| 106-93-4 | 1,2-Dibromoethane | ND | 13 | ND | 1.7 | |
| 123-86-4 | n-Butyl Acetate | ND | 28 | ND | 5.8 | |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
D = The reported result is from a dilution.

# ALS ENVIRONMENTAL

RESULTS OF ANALYSIS



**Client:** **Bhate Environmental Associates, Inc.**
**Client Sample ID:** **LH18/24-Air_030722_Stripper_a** ALS Project ID: P2201166
**Client Project ID:** **LHAAP GWTP / NW01312.0150** ALS Sample ID: P2201166-002

Test Code: EPA TO-15 Date Collected: 3/7/22
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 3/14/22
Analyst: Topacio Zavala Date Analyzed: 3/28/22
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.050 Liter(s)
Test Notes: 0.015 Liter(s)
Container ID: AS01364

Initial Pressure (psig): -0.04 Final Pressure (psig): 3.63

Container Dilution Factor: 1.25

| CAS # | Compound | Result µg/m³ | MRL µg/m³ | Result ppbV | MRL ppbV | Data Qualifier |
|---|---|---|---|---|---|---|
| 111-65-9 | n-Octane | ND | 13 | ND | 2.8 | |
| 127-18-4 | Tetrachloroethene | ND | 13 | ND | 1.9 | |
| 108-90-7 | Chlorobenzene | ND | 13 | ND | 2.8 | |
| 100-41-4 | Ethylbenzene | ND | 13 | ND | 3.0 | |
| 179601-23-1 | m,p-Xylenes | ND | 28 | ND | 6.3 | |
| 75-25-2 | Bromoform | ND | 13 | ND | 1.3 | |
| 100-42-5 | Styrene | ND | 13 | ND | 2.9 | |
| 95-47-6 | o-Xylene | ND | 13 | ND | 3.0 | |
| 111-84-2 | n-Nonane | ND | 13 | ND | 2.5 | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | ND | 13 | ND | 1.9 | |
| 98-82-8 | Cumene | ND | 13 | ND | 2.6 | |
| 80-56-8 | alpha-Pinene | ND | 14 | ND | 2.4 | |
| 103-65-1 | n-Propylbenzene | ND | 13 | ND | 2.7 | |
| 622-96-8 | 4-Ethyltoluene | ND | 13 | ND | 2.7 | |
| 108-67-8 | 1,3,5-Trimethylbenzene | ND | 13 | ND | 2.6 | |
| 95-63-6 | 1,2,4-Trimethylbenzene | ND | 13 | ND | 2.6 | |
| 100-44-7 | Benzyl Chloride | ND | 28 | ND | 5.3 | |
| 541-73-1 | 1,3-Dichlorobenzene | ND | 13 | ND | 2.2 | |
| 106-46-7 | 1,4-Dichlorobenzene | ND | 13 | ND | 2.2 | |
| 95-50-1 | 1,2-Dichlorobenzene | ND | 13 | ND | 2.2 | |
| 5989-27-5 | d-Limonene | ND | 13 | ND | 2.2 | |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | ND | 25 | ND | 2.6 | |
| 120-82-1 | 1,2,4-Trichlorobenzene | ND | 28 | ND | 3.7 | |
| 91-20-3 | Naphthalene | ND | 13 | ND | 2.5 | |
| 87-68-3 | Hexachlorobutadiene | ND | 13 | ND | 1.2 | |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = 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:** **Bhate Environmental Associates, Inc.**
**Client Sample ID:** **LH18/24-Air_030722_GWTP** ALS Project ID: P2201166
**Client Project ID:** **LHAAP GWTP / NW01312.0150** ALS Sample ID: P2201166-003

Test Code: EPA TO-15 Date Collected: 3/7/22
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 3/14/22
Analyst: Topacio Zavala Date Analyzed: 3/28/22
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes: 0.10 Liter(s)
Container ID: AS01672

Initial Pressure (psig): -0.31 Final Pressure (psig): 3.91

Container Dilution Factor: 1.29

| CAS # | Compound | Result µg/m³ | MRL µg/m³ | Result ppbV | MRL ppbV | Data Qualifier |
|---|---|---|---|---|---|---|
| 115-07-1 | Propene | **50** | 6.7 | **29** | 3.9 | **D** |
| 75-71-8 | Dichlorodifluoromethane (CFC 12) | **2.1** | 0.68 | **0.43** | 0.14 | **V** |
| 74-87-3 | Chloromethane | ND | 0.66 | ND | 0.32 | |
| 76-14-2 | 1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114) | ND | 0.70 | ND | 0.10 | |
| 75-01-4 | Vinyl Chloride | ND | 0.67 | ND | 0.26 | |
| 106-99-0 | 1,3-Butadiene | ND | 0.67 | ND | 0.30 | |
| 74-83-9 | Bromomethane | ND | 0.66 | ND | 0.17 | |
| 75-00-3 | Chloroethane | ND | 0.66 | ND | 0.25 | |
| 64-17-5 | Ethanol | **180** | 6.5 | **96** | 3.4 | |
| 75-05-8 | Acetonitrile | ND | 1.3 | ND | 0.77 | |
| 107-02-8 | Acrolein | ND | 1.3 | ND | 0.56 | |
| 67-64-1 | Acetone | **150** | 6.7 | **63** | 2.8 | |
| 75-69-4 | Trichlorofluoromethane | **1.2** | 0.67 | **0.22** | 0.12 | |
| 67-63-0 | 2-Propanol (Isopropyl Alcohol) | **450** | 13 | **180** | 5.3 | **D** |
| 107-13-1 | Acrylonitrile | ND | 1.3 | ND | 0.59 | |
| 75-35-4 | 1,1-Dichloroethene | ND | 0.70 | ND | 0.18 | |
| 75-09-2 | Methylene Chloride | **15** | 0.67 | **4.4** | 0.19 | |
| 107-05-1 | 3-Chloro-1-propene (Allyl Chloride) | ND | 0.68 | ND | 0.22 | |
| 76-13-1 | Trichlorotrifluoroethane | **0.73** | 0.70 | **0.095** | 0.091 | |
| 75-15-0 | Carbon Disulfide | ND | 1.4 | ND | 0.46 | |
| 156-60-5 | trans-1,2-Dichloroethene | ND | 0.68 | ND | 0.17 | |
| 75-34-3 | 1,1-Dichloroethane | ND | 0.68 | ND | 0.17 | |
| 1634-04-4 | Methyl tert-Butyl Ether | ND | 0.68 | ND | 0.19 | |
| 108-05-4 | Vinyl Acetate | ND | 6.5 | ND | 1.8 | |
| 78-93-3 | 2-Butanone (MEK) | **2.3** | 1.3 | **0.77** | 0.44 | |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
V = The continuing calibration verification standard was outside (biased low) the specified limits for this compound.
D = The reported result is from a dilution.

# ALS ENVIRONMENTAL

RESULTS OF ANALYSIS



**Client:** **Bhate Environmental Associates, Inc.**
**Client Sample ID:** **LH18/24-Air_030722_GWTP** ALS Project ID: P2201166
**Client Project ID:** **LHAAP GWTP / NW01312.0150** ALS Sample ID: P2201166-003

Test Code: EPA TO-15 Date Collected: 3/7/22
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 3/14/22
Analyst: Topacio Zavala Date Analyzed: 3/28/22
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes: 0.10 Liter(s)
Container ID: AS01672

Initial Pressure (psig): -0.31 Final Pressure (psig): 3.91

Container Dilution Factor: 1.29

| CAS # | Compound | Result µg/m³ | MRL µg/m³ | Result ppbV | MRL ppbV | Data Qualifier |
|---|---|---|---|---|---|---|
| 156-59-2 | cis-1,2-Dichloroethene | ND | 0.67 | ND | 0.17 | |
| 141-78-6 | Ethyl Acetate | **100** | 2.7 | **28** | 0.75 | |
| 110-54-3 | n-Hexane | **7.6** | 0.68 | **2.2** | 0.19 | |
| 67-66-3 | Chloroform | ND | 0.70 | ND | 0.14 | |
| 109-99-9 | Tetrahydrofuran (THF) | ND | 1.3 | ND | 0.44 | |
| 107-06-2 | 1,2-Dichloroethane | ND | 0.68 | ND | 0.17 | |
| 71-55-6 | 1,1,1-Trichloroethane | ND | 0.67 | ND | 0.12 | |
| 71-43-2 | Benzene | **1.4** | 0.65 | **0.45** | 0.20 | |
| 56-23-5 | Carbon Tetrachloride | ND | 0.65 | ND | 0.10 | |
| 110-82-7 | Cyclohexane | ND | 1.4 | ND | 0.41 | |
| 78-87-5 | 1,2-Dichloropropane | ND | 0.65 | ND | 0.14 | |
| 75-27-4 | Bromodichloromethane | ND | 0.68 | ND | 0.10 | |
| 79-01-6 | Trichloroethene | **1.3** | 0.67 | **0.25** | 0.12 | |
| 123-91-1 | 1,4-Dioxane | ND | 0.67 | ND | 0.19 | |
| 80-62-6 | Methyl Methacrylate | **18** | 1.4 | **4.5** | 0.35 | |
| 142-82-5 | n-Heptane | **1.9** | 0.68 | **0.45** | 0.17 | |
| 10061-01-5 | cis-1,3-Dichloropropene | ND | 0.65 | ND | 0.14 | |
| 108-10-1 | 4-Methyl-2-pentanone | ND | 1.4 | ND | 0.35 | |
| 10061-02-6 | trans-1,3-Dichloropropene | ND | 0.66 | ND | 0.14 | |
| 79-00-5 | 1,1,2-Trichloroethane | ND | 0.67 | ND | 0.12 | |
| 108-88-3 | Toluene | **10** | 0.67 | **2.7** | 0.18 | |
| 591-78-6 | 2-Hexanone | ND | 1.4 | ND | 0.35 | |
| 124-48-1 | Dibromochloromethane | ND | 0.68 | ND | 0.080 | |
| 106-93-4 | 1,2-Dibromoethane | ND | 0.67 | ND | 0.087 | |
| 123-86-4 | n-Butyl Acetate | ND | 1.4 | ND | 0.30 | |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = 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:** **Bhate Environmental Associates, Inc.**
**Client Sample ID:** **LH18/24-Air_030722_GWTP** ALS Project ID: P2201166
**Client Project ID:** **LHAAP GWTP / NW01312.0150** ALS Sample ID: P2201166-003

Test Code: EPA TO-15 Date Collected: 3/7/22
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 3/14/22
Analyst: Topacio Zavala Date Analyzed: 3/28/22
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes: 0.10 Liter(s)
Container ID: AS01672

Initial Pressure (psig): -0.31 Final Pressure (psig): 3.91

Container Dilution Factor: 1.29

| CAS # | Compound | Result µg/m³ | MRL µg/m³ | Result ppbV | MRL ppbV | Data Qualifier |
|---|---|---|---|---|---|---|
| 111-65-9 | n-Octane | **0.71** | 0.68 | **0.15** | 0.15 | |
| 127-18-4 | Tetrachloroethene | ND | 0.67 | ND | 0.099 | |
| 108-90-7 | Chlorobenzene | ND | 0.67 | ND | 0.15 | |
| 100-41-4 | Ethylbenzene | **0.90** | 0.67 | **0.21** | 0.15 | |
| 179601-23-1 | m,p-Xylenes | **3.5** | 1.4 | **0.81** | 0.33 | |
| 75-25-2 | Bromoform | ND | 0.67 | ND | 0.065 | |
| 100-42-5 | Styrene | ND | 0.65 | ND | 0.15 | |
| 95-47-6 | o-Xylene | **1.3** | 0.67 | **0.31** | 0.15 | |
| 111-84-2 | n-Nonane | ND | 0.67 | ND | 0.13 | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | ND | 0.67 | ND | 0.098 | |
| 98-82-8 | Cumene | ND | 0.67 | ND | 0.14 | |
| 80-56-8 | alpha-Pinene | ND | 0.70 | ND | 0.13 | |
| 103-65-1 | n-Propylbenzene | ND | 0.68 | ND | 0.14 | |
| 622-96-8 | 4-Ethyltoluene | ND | 0.68 | ND | 0.14 | |
| 108-67-8 | 1,3,5-Trimethylbenzene | ND | 0.67 | ND | 0.14 | |
| 95-63-6 | 1,2,4-Trimethylbenzene | **1.6** | 0.67 | **0.33** | 0.14 | |
| 100-44-7 | Benzyl Chloride | ND | 1.4 | ND | 0.27 | |
| 541-73-1 | 1,3-Dichlorobenzene | ND | 0.67 | ND | 0.11 | |
| 106-46-7 | 1,4-Dichlorobenzene | ND | 0.67 | ND | 0.11 | |
| 95-50-1 | 1,2-Dichlorobenzene | ND | 0.68 | ND | 0.11 | |
| 5989-27-5 | d-Limonene | **1.8** | 0.65 | **0.33** | 0.12 | |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | ND | 1.3 | ND | 0.13 | |
| 120-82-1 | 1,2,4-Trichlorobenzene | ND | 1.4 | ND | 0.19 | |
| 91-20-3 | Naphthalene | ND | 0.67 | ND | 0.13 | |
| 87-68-3 | Hexachlorobutadiene | ND | 0.67 | ND | 0.063 | |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = 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:** **Bhate Environmental Associates, Inc.**
**Client Sample ID:** **LH18/24-Air_030722_Downwind** ALS Project ID: P2201166
**Client Project ID:** **LHAAP GWTP / NW01312.0150** ALS Sample ID: P2201166-004

Test Code: EPA TO-15 Date Collected: 3/8/22
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 3/14/22
Analyst: Topacio Zavala Date Analyzed: 3/28/22
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC02359

Initial Pressure (psig): -1.49 Final Pressure (psig): 3.96

Container Dilution Factor: 1.41

| CAS # | Compound | Result µg/m³ | MRL µg/m³ | Result ppbV | MRL ppbV | Data Qualifier |
|---|---|---|---|---|---|---|
| 115-07-1 | Propene | **1.0** | 0.73 | **0.60** | 0.43 | |
| 75-71-8 | Dichlorodifluoromethane (CFC 12) | **2.2** | 0.75 | **0.45** | 0.15 | **V** |
| 74-87-3 | Chloromethane | ND | 0.72 | ND | 0.35 | |
| 76-14-2 | 1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114) | ND | 0.76 | ND | 0.11 | |
| 75-01-4 | Vinyl Chloride | ND | 0.73 | ND | 0.29 | |
| 106-99-0 | 1,3-Butadiene | ND | 0.73 | ND | 0.33 | |
| 74-83-9 | Bromomethane | ND | 0.72 | ND | 0.19 | |
| 75-00-3 | Chloroethane | ND | 0.72 | ND | 0.27 | |
| 64-17-5 | Ethanol | ND | 7.1 | ND | 3.7 | |
| 75-05-8 | Acetonitrile | ND | 1.4 | ND | 0.84 | |
| 107-02-8 | Acrolein | ND | 1.4 | ND | 0.62 | |
| 67-64-1 | Acetone | ND | 7.3 | ND | 3.1 | |
| 75-69-4 | Trichlorofluoromethane | **1.2** | 0.73 | **0.22** | 0.13 | |
| 67-63-0 | 2-Propanol (Isopropyl Alcohol) | ND | 1.4 | ND | 0.57 | |
| 107-13-1 | Acrylonitrile | ND | 1.4 | ND | 0.65 | |
| 75-35-4 | 1,1-Dichloroethene | ND | 0.76 | ND | 0.19 | |
| 75-09-2 | Methylene Chloride | ND | 0.73 | ND | 0.21 | |
| 107-05-1 | 3-Chloro-1-propene (Allyl Chloride) | ND | 0.75 | ND | 0.24 | |
| 76-13-1 | Trichlorotrifluoroethane | ND | 0.76 | ND | 0.099 | |
| 75-15-0 | Carbon Disulfide | ND | 1.6 | ND | 0.50 | |
| 156-60-5 | trans-1,2-Dichloroethene | ND | 0.75 | ND | 0.19 | |
| 75-34-3 | 1,1-Dichloroethane | ND | 0.75 | ND | 0.18 | |
| 1634-04-4 | Methyl tert-Butyl Ether | ND | 0.75 | ND | 0.21 | |
| 108-05-4 | Vinyl Acetate | ND | 7.1 | ND | 2.0 | |
| 78-93-3 | 2-Butanone (MEK) | ND | 1.4 | ND | 0.48 | |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
V = The continuing calibration verification standard was outside (biased low) the specified limits for this compound.

# ALS ENVIRONMENTAL

RESULTS OF ANALYSIS



**Client:** **Bhate Environmental Associates, Inc.**
**Client Sample ID:** **LH18/24-Air_030722_Downwind** ALS Project ID: P2201166
**Client Project ID:** **LHAAP GWTP / NW01312.0150** ALS Sample ID: P2201166-004

Test Code: EPA TO-15 Date Collected: 3/8/22
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 3/14/22
Analyst: Topacio Zavala Date Analyzed: 3/28/22
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC02359

Initial Pressure (psig): -1.49 Final Pressure (psig): 3.96

Container Dilution Factor: 1.41

| CAS # | Compound | Result µg/m³ | MRL µg/m³ | Result ppbV | MRL ppbV | Data Qualifier |
|---|---|---|---|---|---|---|
| 156-59-2 | cis-1,2-Dichloroethene | ND | 0.73 | ND | 0.19 | |
| 141-78-6 | Ethyl Acetate | ND | 3.0 | ND | 0.82 | |
| 110-54-3 | n-Hexane | **2.5** | 0.75 | **0.72** | 0.21 | |
| 67-66-3 | Chloroform | ND | 0.76 | ND | 0.16 | |
| 109-99-9 | Tetrahydrofuran (THF) | ND | 1.4 | ND | 0.48 | |
| 107-06-2 | 1,2-Dichloroethane | ND | 0.75 | ND | 0.18 | |
| 71-55-6 | 1,1,1-Trichloroethane | ND | 0.73 | ND | 0.13 | |
| 71-43-2 | Benzene | ND | 0.71 | ND | 0.22 | |
| 56-23-5 | Carbon Tetrachloride | ND | 0.71 | ND | 0.11 | |
| 110-82-7 | Cyclohexane | ND | 1.6 | ND | 0.45 | |
| 78-87-5 | 1,2-Dichloropropane | ND | 0.71 | ND | 0.15 | |
| 75-27-4 | Bromodichloromethane | ND | 0.75 | ND | 0.11 | |
| 79-01-6 | Trichloroethene | ND | 0.73 | ND | 0.14 | |
| 123-91-1 | 1,4-Dioxane | ND | 0.73 | ND | 0.20 | |
| 80-62-6 | Methyl Methacrylate | ND | 1.6 | ND | 0.38 | |
| 142-82-5 | n-Heptane | ND | 0.75 | ND | 0.18 | |
| 10061-01-5 | cis-1,3-Dichloropropene | ND | 0.71 | ND | 0.16 | |
| 108-10-1 | 4-Methyl-2-pentanone | ND | 1.6 | ND | 0.38 | |
| 10061-02-6 | trans-1,3-Dichloropropene | ND | 0.72 | ND | 0.16 | |
| 79-00-5 | 1,1,2-Trichloroethane | ND | 0.73 | ND | 0.13 | |
| 108-88-3 | Toluene | ND | 0.73 | ND | 0.19 | |
| 591-78-6 | 2-Hexanone | ND | 1.6 | ND | 0.38 | |
| 124-48-1 | Dibromochloromethane | ND | 0.75 | ND | 0.088 | |
| 106-93-4 | 1,2-Dibromoethane | ND | 0.73 | ND | 0.095 | |
| 123-86-4 | n-Butyl Acetate | ND | 1.6 | ND | 0.33 | |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = 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:** **Bhate Environmental Associates, Inc.**
**Client Sample ID:** **LH18/24-Air_030722_Downwind** ALS Project ID: P2201166
**Client Project ID:** **LHAAP GWTP / NW01312.0150** ALS Sample ID: P2201166-004

Test Code: EPA TO-15 Date Collected: 3/8/22
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 3/14/22
Analyst: Topacio Zavala Date Analyzed: 3/28/22
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC02359

Initial Pressure (psig): -1.49 Final Pressure (psig): 3.96

Container Dilution Factor: 1.41

| CAS # | Compound | Result µg/m³ | MRL µg/m³ | Result ppbV | MRL ppbV | Data Qualifier |
|---|---|---|---|---|---|---|
| 111-65-9 | n-Octane | ND | 0.75 | ND | 0.16 | |
| 127-18-4 | Tetrachloroethene | ND | 0.73 | ND | 0.11 | |
| 108-90-7 | Chlorobenzene | ND | 0.73 | ND | 0.16 | |
| 100-41-4 | Ethylbenzene | ND | 0.73 | ND | 0.17 | |
| 179601-23-1 | m,p-Xylenes | ND | 1.6 | ND | 0.36 | |
| 75-25-2 | Bromoform | ND | 0.73 | ND | 0.071 | |
| 100-42-5 | Styrene | ND | 0.71 | ND | 0.17 | |
| 95-47-6 | o-Xylene | ND | 0.73 | ND | 0.17 | |
| 111-84-2 | n-Nonane | ND | 0.73 | ND | 0.14 | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | ND | 0.73 | ND | 0.11 | |
| 98-82-8 | Cumene | ND | 0.73 | ND | 0.15 | |
| 80-56-8 | alpha-Pinene | ND | 0.76 | ND | 0.14 | |
| 103-65-1 | n-Propylbenzene | ND | 0.75 | ND | 0.15 | |
| 622-96-8 | 4-Ethyltoluene | ND | 0.75 | ND | 0.15 | |
| 108-67-8 | 1,3,5-Trimethylbenzene | ND | 0.73 | ND | 0.15 | |
| 95-63-6 | 1,2,4-Trimethylbenzene | ND | 0.73 | ND | 0.15 | |
| 100-44-7 | Benzyl Chloride | ND | 1.6 | ND | 0.30 | |
| 541-73-1 | 1,3-Dichlorobenzene | ND | 0.73 | ND | 0.12 | |
| 106-46-7 | 1,4-Dichlorobenzene | ND | 0.73 | ND | 0.12 | |
| 95-50-1 | 1,2-Dichlorobenzene | ND | 0.75 | ND | 0.12 | |
| 5989-27-5 | d-Limonene | ND | 0.71 | ND | 0.13 | |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | ND | 1.4 | ND | 0.15 | |
| 120-82-1 | 1,2,4-Trichlorobenzene | ND | 1.6 | ND | 0.21 | |
| 91-20-3 | Naphthalene | ND | 0.73 | ND | 0.14 | |
| 87-68-3 | Hexachlorobutadiene | ND | 0.73 | ND | 0.069 | |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = 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:** **Bhate Environmental Associates, Inc.**
**Client Sample ID:** **Method Blank** ALS Project ID: P2201166
**Client Project ID:** **LHAAP GWTP / NW01312.0150** ALS Sample ID: P220328-MB

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA
Analyst: Wida Ang Date Analyzed: 3/28/22
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Container Dilution Factor: 1.00

| CAS # | Compound | Result µg/m³ | MRL µg/m³ | Result ppbV | MRL ppbV | Data Qualifier |
|---|---|---|---|---|---|---|
| 115-07-1 | Propene | ND | 0.52 | ND | 0.30 | |
| 75-71-8 | Dichlorodifluoromethane (CFC 12) | ND | 0.53 | ND | 0.11 | V |
| 74-87-3 | Chloromethane | ND | 0.51 | ND | 0.25 | |
| 76-14-2 | 1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114) | ND | 0.54 | ND | 0.077 | |
| 75-01-4 | Vinyl Chloride | ND | 0.52 | ND | 0.20 | |
| 106-99-0 | 1,3-Butadiene | ND | 0.52 | ND | 0.24 | |
| 74-83-9 | Bromomethane | ND | 0.51 | ND | 0.13 | |
| 75-00-3 | Chloroethane | ND | 0.51 | ND | 0.19 | |
| 64-17-5 | Ethanol | ND | 5.0 | ND | 2.7 | |
| 75-05-8 | Acetonitrile | ND | 1.0 | ND | 0.60 | |
| 107-02-8 | Acrolein | ND | 1.0 | ND | 0.44 | |
| 67-64-1 | Acetone | ND | 5.2 | ND | 2.2 | |
| 75-69-4 | Trichlorofluoromethane | ND | 0.52 | ND | 0.093 | |
| 67-63-0 | 2-Propanol (Isopropyl Alcohol) | ND | 1.0 | ND | 0.41 | |
| 107-13-1 | Acrylonitrile | ND | 1.0 | ND | 0.46 | |
| 75-35-4 | 1,1-Dichloroethene | ND | 0.54 | ND | 0.14 | |
| 75-09-2 | Methylene Chloride | ND | 0.52 | ND | 0.15 | |
| 107-05-1 | 3-Chloro-1-propene (Allyl Chloride) | ND | 0.53 | ND | 0.17 | |
| 76-13-1 | Trichlorotrifluoroethane | ND | 0.54 | ND | 0.070 | |
| 75-15-0 | Carbon Disulfide | ND | 1.1 | ND | 0.35 | |
| 156-60-5 | trans-1,2-Dichloroethene | ND | 0.53 | ND | 0.13 | |
| 75-34-3 | 1,1-Dichloroethane | ND | 0.53 | ND | 0.13 | |
| 1634-04-4 | Methyl tert-Butyl Ether | ND | 0.53 | ND | 0.15 | |
| 108-05-4 | Vinyl Acetate | ND | 5.0 | ND | 1.4 | |
| 78-93-3 | 2-Butanone (MEK) | ND | 1.0 | ND | 0.34 | |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
V = The continuing calibration verification standard was outside (biased low) the specified limits for this compound.

# ALS ENVIRONMENTAL

RESULTS OF ANALYSIS



**Client:** **Bhate Environmental Associates, Inc.**
**Client Sample ID:** **Method Blank** ALS Project ID: P2201166
**Client Project ID:** **LHAAP GWTP / NW01312.0150** ALS Sample ID: P220328-MB

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA
Analyst: Wida Ang Date Analyzed: 3/28/22
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Container Dilution Factor: 1.00

| CAS # | Compound | Result µg/m³ | MRL µg/m³ | Result ppbV | MRL ppbV | Data Qualifier |
|---|---|---|---|---|---|---|
| 156-59-2 | cis-1,2-Dichloroethene | ND | 0.52 | ND | 0.13 | |
| 141-78-6 | Ethyl Acetate | ND | 2.1 | ND | 0.58 | |
| 110-54-3 | n-Hexane | ND | 0.53 | ND | 0.15 | |
| 67-66-3 | Chloroform | ND | 0.54 | ND | 0.11 | |
| 109-99-9 | Tetrahydrofuran (THF) | ND | 1.0 | ND | 0.34 | |
| 107-06-2 | 1,2-Dichloroethane | ND | 0.53 | ND | 0.13 | |
| 71-55-6 | 1,1,1-Trichloroethane | ND | 0.52 | ND | 0.095 | |
| 71-43-2 | Benzene | ND | 0.50 | ND | 0.16 | |
| 56-23-5 | Carbon Tetrachloride | ND | 0.50 | ND | 0.080 | |
| 110-82-7 | Cyclohexane | ND | 1.1 | ND | 0.32 | |
| 78-87-5 | 1,2-Dichloropropane | ND | 0.50 | ND | 0.11 | |
| 75-27-4 | Bromodichloromethane | ND | 0.53 | ND | 0.079 | |
| 79-01-6 | Trichloroethene | ND | 0.52 | ND | 0.097 | |
| 123-91-1 | 1,4-Dioxane | ND | 0.52 | ND | 0.14 | |
| 80-62-6 | Methyl Methacrylate | ND | 1.1 | ND | 0.27 | |
| 142-82-5 | n-Heptane | ND | 0.53 | ND | 0.13 | |
| 10061-01-5 | cis-1,3-Dichloropropene | ND | 0.50 | ND | 0.11 | |
| 108-10-1 | 4-Methyl-2-pentanone | ND | 1.1 | ND | 0.27 | |
| 10061-02-6 | trans-1,3-Dichloropropene | ND | 0.51 | ND | 0.11 | |
| 79-00-5 | 1,1,2-Trichloroethane | ND | 0.52 | ND | 0.095 | |
| 108-88-3 | Toluene | ND | 0.52 | ND | 0.14 | |
| 591-78-6 | 2-Hexanone | ND | 1.1 | ND | 0.27 | |
| 124-48-1 | Dibromochloromethane | ND | 0.53 | ND | 0.062 | |
| 106-93-4 | 1,2-Dibromoethane | ND | 0.52 | ND | 0.068 | |
| 123-86-4 | n-Butyl Acetate | ND | 1.1 | ND | 0.23 | |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = 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:** **Bhate Environmental Associates, Inc.**
**Client Sample ID:** **Method Blank** ALS Project ID: P2201166
**Client Project ID:** **LHAAP GWTP / NW01312.0150** ALS Sample ID: P220328-MB

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA
Analyst: Wida Ang Date Analyzed: 3/28/22
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Container Dilution Factor: 1.00

| CAS # | Compound | Result µg/m³ | MRL µg/m³ | Result ppbV | MRL ppbV | Data Qualifier |
|---|---|---|---|---|---|---|
| 111-65-9 | n-Octane | ND | 0.53 | ND | 0.11 | |
| 127-18-4 | Tetrachloroethene | ND | 0.52 | ND | 0.077 | |
| 108-90-7 | Chlorobenzene | ND | 0.52 | ND | 0.11 | |
| 100-41-4 | Ethylbenzene | ND | 0.52 | ND | 0.12 | |
| 179601-23-1 | m,p-Xylenes | ND | 1.1 | ND | 0.25 | |
| 75-25-2 | Bromoform | ND | 0.52 | ND | 0.050 | |
| 100-42-5 | Styrene | ND | 0.50 | ND | 0.12 | |
| 95-47-6 | o-Xylene | ND | 0.52 | ND | 0.12 | |
| 111-84-2 | n-Nonane | ND | 0.52 | ND | 0.099 | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | ND | 0.52 | ND | 0.076 | |
| 98-82-8 | Cumene | ND | 0.52 | ND | 0.11 | |
| 80-56-8 | alpha-Pinene | ND | 0.54 | ND | 0.097 | |
| 103-65-1 | n-Propylbenzene | ND | 0.53 | ND | 0.11 | |
| 622-96-8 | 4-Ethyltoluene | ND | 0.53 | ND | 0.11 | |
| 108-67-8 | 1,3,5-Trimethylbenzene | ND | 0.52 | ND | 0.11 | |
| 95-63-6 | 1,2,4-Trimethylbenzene | ND | 0.52 | ND | 0.11 | |
| 100-44-7 | Benzyl Chloride | ND | 1.1 | ND | 0.21 | |
| 541-73-1 | 1,3-Dichlorobenzene | ND | 0.52 | ND | 0.087 | |
| 106-46-7 | 1,4-Dichlorobenzene | ND | 0.52 | ND | 0.087 | |
| 95-50-1 | 1,2-Dichlorobenzene | ND | 0.53 | ND | 0.088 | |
| 5989-27-5 | d-Limonene | ND | 0.50 | ND | 0.090 | |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | ND | 1.0 | ND | 0.10 | |
| 120-82-1 | 1,2,4-Trichlorobenzene | ND | 1.1 | ND | 0.15 | |
| 91-20-3 | Naphthalene | ND | 0.52 | ND | 0.099 | |
| 87-68-3 | Hexachlorobutadiene | ND | 0.52 | ND | 0.049 | |

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

SURROGATE SPIKE RECOVERY RESULTS



**Client:** **Bhate Environmental Associates, Inc.**
**Client Project ID:** **LHAAP GWTP / NW01312.0150** ALS Project ID: P2201166

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date(s) Collected: 3/7 - 3/8/22
Analyst: Topacio Zavala/Wida Ang Date(s) Received: 3/14/22
Sample Type: 6.0 L Silonite Canister(s) / 6.0 L Summa Canister(s) Date(s) Analyzed: 3/28/22
Test Notes:

| Client Sample ID | ALS Sample ID | 1,2-Dichloroethane-d4 Percent Recovered | Toluene-d8 Percent Recovered | Bromofluorobenzene Percent Recovered | Acceptance Limits | Data Qualifier |
|---|---|---|---|---|---|---|
| Method Blank | P220328-MB | **101** | **91** | **97** | 70-130 | |
| Lab Control Sample | P220328-LCS | **101** | **88** | **103** | 70-130 | |
| Duplicate Lab Control Sample | P220328-DLCS | **97** | **91** | **107** | 70-130 | |
| LH18/24-Air_030722_Stripper | P2201166-001 | **99** | **90** | **100** | 70-130 | |
| LH18/24-Air_030722_Stripper_a | P2201166-002 | **99** | **91** | **98** | 70-130 | |
| LH18/24-Air_030722_GWTP | P2201166-003 | **101** | **89** | **99** | 70-130 | |
| LH18/24-Air_030722_Downwind | P2201166-004 | **101** | **91** | **98** | 70-130 | |

Surrogate percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly from the on-column percent recovery.

# ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY



**Client:** **Bhate Environmental Associates, Inc.**
**Client Sample ID:** **Duplicate Lab Control Sample** ALS Project ID: P2201166
**Client Project ID:** **LHAAP GWTP / NW01312.0150** ALS Sample ID: P220328-DLCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA
Analyst: Wida Ang Date Analyzed: 3/28/22
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

| CAS # | Compound | Spike Amount LCS / DLCS µg/m³ | Result LCS µg/m³ | Result DLCS µg/m³ | % Recovery LCS | % Recovery DLCS | ALS Acceptance Limits | RPD | RPD Limit | Data Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| 115-07-1 | Propene | 206 | 217 | 211 | **105** | **102** | 56-128 | 3 | 25 | |
| 75-71-8 | Dichlorodifluoromethane (CFC 12) | 208 | 174 | 168 | **84** | **81** | 71-112 | 4 | 25 | |
| 74-87-3 | Chloromethane | 206 | 184 | 182 | **89** | **88** | 53-126 | 1 | 25 | |
| 76-14-2 | 1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114) | 208 | 194 | 187 | **93** | **90** | 62-121 | 3 | 25 | |
| 75-01-4 | Vinyl Chloride | 208 | 180 | 176 | **87** | **85** | 63-123 | 2 | 25 | |
| 106-99-0 | 1,3-Butadiene | 206 | 198 | 194 | **96** | **94** | 63-135 | 2 | 25 | |
| 74-83-9 | Bromomethane | 206 | 174 | 180 | **84** | **87** | 71-112 | 4 | 25 | |
| 75-00-3 | Chloroethane | 206 | 185 | 188 | **90** | **91** | 66-117 | 1 | 25 | |
| 64-17-5 | Ethanol | 832 | 836 | 810 | **100** | **97** | 57-117 | 3 | 25 | |
| 75-05-8 | Acetonitrile | 202 | 169 | 166 | **84** | **82** | 59-131 | 2 | 25 | |
| 107-02-8 | Acrolein | 416 | 439 | 427 | **106** | **103** | 71-123 | 3 | 25 | |
| 67-64-1 | Acetone | 1,020 | 970 | 918 | **95** | **90** | 60-117 | 5 | 25 | |
| 75-69-4 | Trichlorofluoromethane | 202 | 175 | 173 | **87** | **86** | 71-114 | 1 | 25 | |
| 67-63-0 | 2-Propanol (Isopropyl Alcohol) | 400 | 320 | 310 | **80** | **78** | 61-124 | 3 | 25 | |
| 107-13-1 | Acrylonitrile | 402 | 382 | 369 | **95** | **92** | 65-130 | 3 | 25 | |
| 75-35-4 | 1,1-Dichloroethene | 210 | 189 | 186 | **90** | **89** | 74-114 | 1 | 25 | |
| 75-09-2 | Methylene Chloride | 208 | 188 | 182 | **90** | **88** | 75-112 | 2 | 25 | |
| 107-05-1 | 3-Chloro-1-propene (Allyl Chloride) | 204 | 179 | 174 | **88** | **85** | 57-127 | 3 | 25 | |
| 76-13-1 | Trichlorotrifluoroethane | 216 | 197 | 195 | **91** | **90** | 73-114 | 1 | 25 | |
| 75-15-0 | Carbon Disulfide | 414 | 400 | 383 | **97** | **93** | 70-113 | 4 | 25 | |
| 156-60-5 | trans-1,2-Dichloroethene | 208 | 190 | 185 | **91** | **89** | 76-119 | 2 | 25 | |
| 75-34-3 | 1,1-Dichloroethane | 214 | 191 | 186 | **89** | **87** | 70-114 | 2 | 25 | |
| 1634-04-4 | Methyl tert-Butyl Ether | 206 | 191 | 187 | **93** | **91** | 72-118 | 2 | 25 | |
| 108-05-4 | Vinyl Acetate | 942 | 1070 | 1020 | **114** | **108** | 56-137 | 5 | 25 | |
| 78-93-3 | 2-Butanone (MEK) | 408 | 386 | 366 | **95** | **90** | 74-121 | 5 | 25 | |

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

# ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY



**Client:** **Bhate Environmental Associates, Inc.**
**Client Sample ID:** **Duplicate Lab Control Sample** — ALS Project ID: P2201166
**Client Project ID:** **LHAAP GWTP / NW01312.0150** — ALS Sample ID: P220328-DLCS

Test Code: EPA TO-15 — Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 — Date Received: NA
Analyst: Wida Ang — Date Analyzed: 3/28/22
Sample Type: 6.0 L Silonite Canister — Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

| CAS # | Compound | Spike Amount LCS / DLCS µg/m³ | Result LCS µg/m³ | Result DLCS µg/m³ | % Recovery LCS | % Recovery DLCS | ALS Acceptance Limits | RPD | RPD Limit | Data Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| 156-59-2 | cis-1,2-Dichloroethene | 206 | 189 | 184 | **92** | **89** | 73-117 | 3 | 25 | |
| 141-78-6 | Ethyl Acetate | 580 | 605 | 561 | **104** | **97** | 59-161 | 7 | 25 | |
| 110-54-3 | n-Hexane | 208 | 229 | 212 | **110** | **102** | 55-130 | 8 | 25 | |
| 67-66-3 | Chloroform | 210 | 200 | 190 | **95** | **90** | 71-114 | 5 | 25 | |
| 109-99-9 | Tetrahydrofuran (THF) | 404 | 393 | 374 | **97** | **93** | 73-114 | 4 | 25 | |
| 107-06-2 | 1,2-Dichloroethane | 210 | 187 | 179 | **89** | **85** | 71-119 | 5 | 25 | |
| 71-55-6 | 1,1,1-Trichloroethane | 208 | 181 | 178 | **87** | **86** | 73-119 | 1 | 25 | |
| 71-43-2 | Benzene | 208 | 193 | 188 | **93** | **90** | 72-113 | 3 | 25 | |
| 56-23-5 | Carbon Tetrachloride | 202 | 181 | 179 | **90** | **89** | 67-123 | 1 | 25 | |
| 110-82-7 | Cyclohexane | 412 | 430 | 411 | **104** | **100** | 70-119 | 4 | 25 | |
| 78-87-5 | 1,2-Dichloropropane | 206 | 199 | 194 | **97** | **94** | 70-118 | 3 | 25 | |
| 75-27-4 | Bromodichloromethane | 208 | 202 | 197 | **97** | **95** | 74-119 | 2 | 25 | |
| 79-01-6 | Trichloroethene | 204 | 198 | 194 | **97** | **95** | 74-115 | 2 | 25 | |
| 123-91-1 | 1,4-Dioxane | 206 | 190 | 184 | **92** | **89** | 77-124 | 3 | 25 | |
| 80-62-6 | Methyl Methacrylate | 410 | 422 | 407 | **103** | **99** | 78-126 | 4 | 25 | |
| 142-82-5 | n-Heptane | 206 | 208 | 200 | **101** | **97** | 70-119 | 4 | 25 | |
| 10061-01-5 | cis-1,3-Dichloropropene | 208 | 208 | 202 | **100** | **97** | 81-126 | 3 | 25 | |
| 108-10-1 | 4-Methyl-2-pentanone | 412 | 446 | 421 | **108** | **102** | 73-129 | 6 | 25 | |
| 10061-02-6 | trans-1,3-Dichloropropene | 200 | 198 | 193 | **99** | **97** | 80-127 | 2 | 25 | |
| 79-00-5 | 1,1,2-Trichloroethane | 208 | 198 | 191 | **95** | **92** | 78-117 | 3 | 25 | |
| 108-88-3 | Toluene | 206 | 175 | 177 | **85** | **86** | 70-118 | 1 | 25 | |
| 591-78-6 | 2-Hexanone | 406 | 359 | 356 | **88** | **88** | 74-132 | 0 | 25 | |
| 124-48-1 | Dibromochloromethane | 210 | 181 | 185 | **86** | **88** | 69-137 | 2 | 25 | |
| 106-93-4 | 1,2-Dibromoethane | 208 | 171 | 175 | **82** | **84** | 76-128 | 2 | 25 | |
| 123-86-4 | n-Butyl Acetate | 406 | 371 | 366 | **91** | **90** | 75-134 | 1 | 25 | |

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

# ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY



**Client:** **Bhate Environmental Associates, Inc.**
**Client Sample ID:** **Duplicate Lab Control Sample** ALS Project ID: P2201166
**Client Project ID:** **LHAAP GWTP / NW01312.0150** ALS Sample ID: P220328-DLCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA
Analyst: Wida Ang Date Analyzed: 3/28/22
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

| CAS # | Compound | Spike Amount LCS / DLCS µg/m³ | Result LCS µg/m³ | Result DLCS µg/m³ | % Recovery LCS | % Recovery DLCS | ALS Acceptance Limits | RPD | RPD Limit | Data Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|
| 111-65-9 | n-Octane | 208 | 196 | 197 | **94** | **95** | 68-120 | 1 | 25 | |
| 127-18-4 | Tetrachloroethene | 212 | 187 | 191 | **88** | **90** | 63-130 | 2 | 25 | |
| 108-90-7 | Chlorobenzene | 206 | 188 | 189 | **91** | **92** | 70-118 | 1 | 25 | |
| 100-41-4 | Ethylbenzene | 206 | 188 | 188 | **91** | **91** | 71-123 | 0 | 25 | |
| 179601-23-1 | m,p-Xylenes | 416 | 395 | 392 | **95** | **94** | 67-127 | 1 | 25 | |
| 75-25-2 | Bromoform | 210 | 189 | 194 | **90** | **92** | 65-149 | 2 | 25 | |
| 100-42-5 | Styrene | 202 | 191 | 192 | **95** | **95** | 76-132 | 0 | 25 | |
| 95-47-6 | o-Xylene | 208 | 199 | 196 | **96** | **94** | 69-124 | 2 | 25 | |
| 111-84-2 | n-Nonane | 208 | 205 | 203 | **99** | **98** | 64-127 | 1 | 25 | |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 208 | 209 | 208 | **100** | **100** | 69-128 | 0 | 25 | |
| 98-82-8 | Cumene | 206 | 193 | 193 | **94** | **94** | 69-125 | 0 | 25 | |
| 80-56-8 | alpha-Pinene | 210 | 213 | 212 | **101** | **101** | 68-129 | 0 | 25 | |
| 103-65-1 | n-Propylbenzene | 208 | 201 | 198 | **97** | **95** | 70-127 | 2 | 25 | |
| 622-96-8 | 4-Ethyltoluene | 208 | 202 | 196 | **97** | **94** | 69-127 | 3 | 25 | |
| 108-67-8 | 1,3,5-Trimethylbenzene | 208 | 204 | 191 | **98** | **92** | 66-129 | 6 | 25 | |
| 95-63-6 | 1,2,4-Trimethylbenzene | 206 | 226 | 213 | **110** | **103** | 63-142 | 7 | 25 | |
| 100-44-7 | Benzyl Chloride | 416 | 473 | 447 | **114** | **107** | 73-145 | 6 | 25 | |
| 541-73-1 | 1,3-Dichlorobenzene | 208 | 234 | 216 | **113** | **104** | 67-136 | 8 | 25 | |
| 106-46-7 | 1,4-Dichlorobenzene | 210 | 211 | 194 | **100** | **92** | 63-134 | 8 | 25 | |
| 95-50-1 | 1,2-Dichlorobenzene | 210 | 238 | 223 | **113** | **106** | 64-139 | 6 | 25 | |
| 5989-27-5 | d-Limonene | 206 | 243 | 230 | **118** | **112** | 63-137 | 5 | 25 | |
| 96-12-8 | 1,2-Dibromo-3-chloropropane | 404 | 472 | 444 | **117** | **110** | 72-145 | 6 | 25 | |
| 120-82-1 | 1,2,4-Trichlorobenzene | 420 | 492 | 480 | **117** | **114** | 62-154 | 3 | 25 | |
| 91-20-3 | Naphthalene | 210 | 212 | 210 | **101** | **100** | 62-156 | 1 | 25 | |
| 87-68-3 | Hexachlorobutadiene | 212 | 212 | 211 | **100** | **100** | 55-142 | 0 | 25 | |

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

# ALS ENVIRONMENTAL

RESULTS OF ANALYSIS



**Client:** **Bhate Environmental Associates, Inc.** ALS Project ID: P2201166
**Client Project ID:** **LHAAP GWTP / NW01312.0150**

## Internal Standard Area and RT Summary

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Lab File ID: 03282201.D
Analyst: Wida Ang Date Analyzed: 3/28/22
Sample Type: 6.0 L Silonite Canister(s) Time Analyzed: 03:34
Test Notes:

| | | IS1 (BCM) | | | IS2 (DFB) | | | IS3 (CBZ) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | AREA | # | RT | # | AREA | # | RT | # | AREA | # | RT | # |
| | **24 Hour Standard** | 162964 | | 11.32 | | 762910 | | 13.43 | | 154533 | | 17.73 | |
| | **Upper Limit** | 228150 | | 11.65 | | 1068074 | | 13.76 | | 216346 | | 18.06 | |
| | **Lower Limit** | 97778 | | 10.99 | | 457746 | | 13.10 | | 92720 | | 17.40 | |
| | **Client Sample ID** | | | | | | | | | | | | |
| 01 | Method Blank | 141242 | | 11.29 | | 659514 | | 13.42 | | 127235 | | 17.73 | |
| 02 | Lab Control Sample | 157457 | | 11.31 | | 735576 | | 13.43 | | 150304 | | 17.73 | |
| 03 | Duplicate Lab Control Sample | 181620 | | 11.31 | | 830675 | | 13.43 | | 160367 | | 17.73 | |
| 04 | LH18/24-Air_030722_Stripper | 150101 | | 11.30 | | 667730 | | 13.43 | | 130263 | | 17.73 | |
| 05 | LH18/24-Air_030722_Stripper_a | 132836 | | 11.30 | | 594669 | | 13.43 | | 116569 | | 17.73 | |
| 06 | LH18/24-Air_030722_GWTP | 135831 | | 11.31 | | 629992 | | 13.43 | | 128662 | | 17.73 | |
| 07 | LH18/24-Air_030722_Downwind | 142538 | | 11.30 | | 666298 | | 13.42 | | 127531 | | 17.73 | |
| 08 | LH18/24-Air_030722_Stripper (Dilution) | 145706 | | 11.30 | | 660534 | | 13.42 | | 126071 | | 17.73 | |
| 09 | LH18/24-Air_030722_GWTP (Dilution) | 137036 | | 11.30 | | 635895 | | 13.42 | | 127165 | | 17.73 | |
| 10 | LH18/24-Air_030722_Stripper_a (Dilution) | 133527 | | 11.30 | | 600112 | | 13.42 | | 119202 | | 17.73 | |
| 11 | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | |

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = 140% of internal standard area
AREA LOWER LIMIT = 60% of internal standard area
RT UPPER LIMIT = 0.33 minutes of internal standard RT
RT LOWER LIMIT = 0.33 minutes of internal standard RT

# Column used to flag values outside QC limits with an I.
I = Internal standard not within the speicified limits.

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282212.D Vial: 5
Acq On : 28 Mar 2022 11:13 Operator: TZ/MT
Sample : P2201166-001 (50mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 29 02:08:45 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

3/29/22

| Internal Standards | R.T. | QIon | Response | Conc Units | Dev(Min) |
|---|---|---|---|---|---|
| 1) Bromochloromethane (IS1) | 11.30 | 130 | 150101 | 12.500 ng | -0.02 |
| 37) 1,4-Difluorobenzene (IS2) | 13.43 | 114 | 667730 | 12.500 ng | 0.00 |
| 56) Chlorobenzene-d5 (IS3) | 17.73 | 54 | 130263 | 12.500 ng | 0.00 |
| **System Monitoring Compounds** | | | | | |
| 33) 1,2-Dichloroethane-d4(... | 12.15 | 65 | 255654 | 12.399 ng | -0.02 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 99.20% | | |
| 57) Toluene-d8 (SS2) | 15.88 | 98 | 708601 | 11.257 ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 90.08% | | |
| 73) Bromofluorobenzene (SS3) | 19.11 | 174 | 250551 | 12.488 ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 99.92% | | |

| Target Compounds | | | | | | Qvalue |
|---|---|---|---|---|---|---|
| 2) Propene | 4.20 | 42 | 777 | N.D. | | |
| 3) Dichlorodifluoromethan... | 4.34 | 85 | 3136 | N.D. | | |
| 4) Chloromethane | 4.63 | 50 | 1390 | N.D. | | |
| 5) 1,2-Dichloro-1,1,2,2-t... | 0.00 | 135 | 0 | N.D. | | |
| 6) Vinyl Chloride | 5.05 | 62 | 36234 | 1.285 ng | | 100 |
| 7) 1,3-Butadiene | 0.00 | 54 | 0 | N.D. | | |
| 8) Bromomethane | 0.00 | 94 | 0 | N.D. | | |
| 9) Chloroethane | 0.00 | 64 | 0 | N.D. | | |
| 10) Ethanol | 6.46 | 45 | 993 | N.D. | | |
| 11) Acetonitrile | 6.75 | 41 | 280 | N.D. | | |
| 12) Acrolein | 6.95 | 56 | 156 | N.D. | | |
| 13) Acetone | 7.17 | 58 | 20285 | 1.434 ng | # | 69 |
| 14) Trichlorofluoromethane | 7.39 | 101 | 1284 | N.D. | | |
| 15) 2-Propanol (Isopropanol) | 7.65 | 45 | 1849 | N.D. | | |
| 16) Acrylonitrile | 0.00 | 53 | 0 | N.D. | | |
| 17) 1,1-Dichloroethene | 8.36 | 96 | 18316 | 1.085 ng | | 90 |
| 18) 2-Methyl-2-Propanol (t... | 8.56 | 59 | 56 | N.D. | | |
| 19) Methylene Chloride | 8.56 | 84 | 84947 | 4.607 ng | | 88 |
| 20) 3-Chloro-1-propene (Al... | 0.00 | 41 | 0 | N.D. | | |
| 21) Trichlorotrifluoroethane | 9.00 | 151 | 914873 | 62.736 ng | | 95 |
| 22) Carbon Disulfide | 8.84 | 76 | 663 | N.D. | | |
| 23) trans-1,2-Dichloroethene | 9.84 | 61 | 5086 | N.D. | | |
| 24) 1,1-Dichloroethane | 10.10 | 63 | 8552 | N.D. | | |
| 25) Methyl tert-Butyl Ether | 0.00 | 73 | 0 | N.D. | | |
| 26) Vinyl Acetate | 0.00 | 86 | 0 | N.D. | | |
| 27) 2-Butanone (MEK) | 10.62 | 72 | 3253 | N.D. | | |
| 28) cis-1,2-Dichloroethene | 11.11 | 61 | 1559655 | 64.469 ng | | 99 |
| 29) Diisopropyl Ether | 11.46 | 87 | 1753 | N.D. | | |
| 30) Ethyl Acetate | 0.00 | 61 | 0 | N.D. | | |
| 31) n-Hexane | 11.42 | 57 | 378 | N.D. | | |
| 32) Chloroform | 11.47 | 83 | 17863 | 0.589 ng | | 99 |
| 34) Tetrahydrofuran (THF) | 11.91 | 72 | 523 | N.D. | | |
| 35) Ethyl tert-Butyl Ether | 0.00 | 87 | 0 | N.D. | | |
| 36) 1,2-Dichloroethane | 12.27 | 62 | 51707 | 2.191 ng | | 100 |
| 38) 1,1,1-Trichloroethane | 12.55 | 97 | 1142 | N.D. | | |
| 39) Isopropyl Acetate | 0.00 | 61 | 0 | N.D. | | |
| 40) 1-Butanol | 13.01 | 56 | 367 | No Calib | # | |
| 41) Benzene | 13.03 | 78 | 4910 | N.D. | | |
| 42) Carbon Tetrachloride | 13.19 | 117 | 7926 | N.D. | | |
| 43) Cyclohexane | 13.42 | 84 | 1166 | N.D. | | |
| 44) tert-Amyl Methyl Ether | 13.70 | 73 | 5409 | N.D. | | |
| 45) 1,2-Dichloropropane | 0.00 | 63 | 0 | N.D. | | |
| 46) Bromodichloromethane | 0.00 | 83 | 0 | N.D. d | | |
| 47) Trichloroethene | 14.13 | 130 | 4420337 | 238.299 ng | | 95 |
| 48) 1,4-Dioxane | 14.11 | 88 | 1475 | N.D. | | |
| 49) 2,2,4-Trimethylpentane... | 14.14 | 57 | 147 | N.D. | | |
| 50) Methyl Methacrylate | 0.00 | 100 | 0 | N.D. d | | |

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282212.D Vial: 5
Acq On : 28 Mar 2022 11:13 Operator: TZ/MT
Sample : P2201166-001 (50mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 29 02:08:45 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

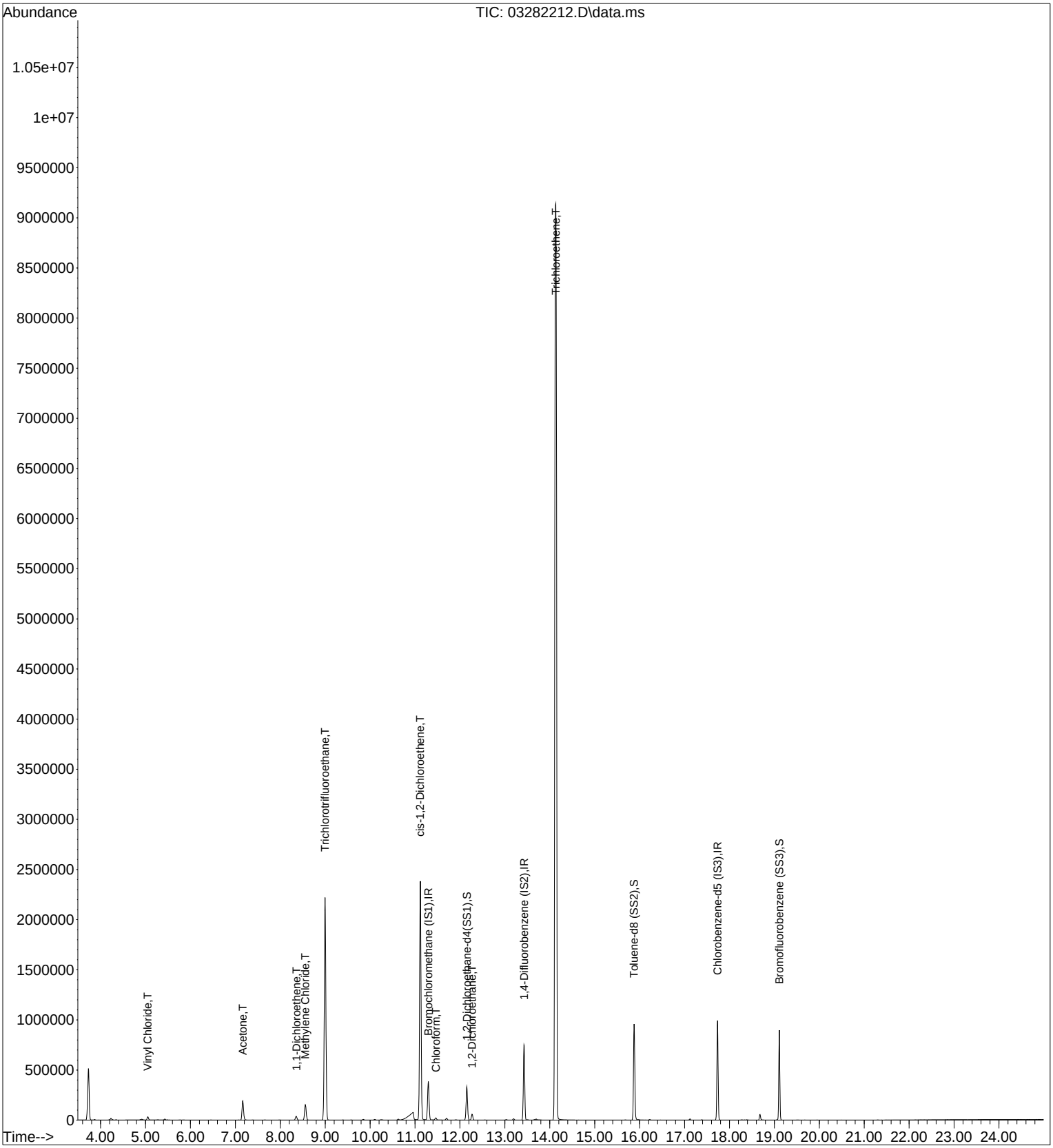
| Internal Standards | R.T. | QIon | Response | Conc Units | Dev(Min) |
|---|---|---|---|---|---|
| 51) n-Heptane | 0.00 | 71 | 0 | N.D. | |
| 52) cis-1,3-Dichloropropene | 0.00 | 75 | 0 | N.D. | |
| 53) 4-Methyl-2-pentanone | 0.00 | 58 | 0 | N.D. | |
| 54) trans-1,3-Dichloropropene | 0.00 | 75 | 0 | N.D. | |
| 55) 1,1,2-Trichloroethane | 15.68 | 97 | 780 | N.D. | |
| 58) Toluene | 15.98 | 91 | 2650 | N.D. | |
| 59) 2-Hexanone | 16.22 | 43 | 4737 | N.D. | |
| 60) Dibromochloromethane | 0.00 | 129 | 0 | N.D. | |
| 61) 1,2-Dibromoethane | 0.00 | 107 | 0 | N.D. | |
| 62) n-Butyl Acetate | 16.72 | 43 | 548 | N.D. | |
| 63) n-Octane | 0.00 | 57 | 0 | N.D. | |
| 64) Tetrachloroethene | 17.12 | 166 | 3573 | N.D. | |
| 65) Chlorobenzene | 0.00 | 112 | 0 | N.D. | |
| 66) Ethylbenzene | 18.28 | 91 | 112 | N.D. | |
| 67) m- & p-Xylenes | 18.28 | 91 | 112 | N.D. | |
| 68) Bromoform | 0.00 | 173 | 0 | N.D. | |
| 69) Styrene | 0.00 | 104 | 0 | N.D. | |
| 70) o-Xylene | 18.71 | 91 | 282 | N.D. | |
| 71) n-Nonane | 18.90 | 43 | 289 | N.D. | |
| 72) 1,1,2,2-Tetrachloroethane | 0.00 | 83 | 0 | N.D. | |
| 74) Cumene | 19.10 | 105 | 340 | N.D. | |
| 75) alpha-Pinene | 0.00 | 93 | 0 | N.D. | |
| 76) n-Propylbenzene | 0.00 | 91 | 0 | N.D. | |
| 77) 3-Ethyltoluene | 0.00 | 105 | 0 | N.D. | |
| 78) 4-Ethyltoluene | 0.00 | 105 | 0 | N.D. | |
| 79) 1,3,5-Trimethylbenzene | 0.00 | 105 | 0 | N.D. | |
| 80) alpha-Methylstyrene | 0.00 | 118 | 0 | N.D. | |
| 81) 2-Ethyltoluene | 0.00 | 105 | 0 | N.D. | |
| 82) 1,2,4-Trimethylbenzene | 0.00 | 105 | 0 | N.D. | |
| 83) n-Decane | 0.00 | 58 | 0 | N.D. | |
| 84) Benzyl Chloride | 0.00 | 91 | 0 | N.D. | |
| 85) 1,3-Dichlorobenzene | 0.00 | 146 | 0 | N.D. | |
| 86) 1,4-Dichlorobenzene | 0.00 | 146 | 0 | N.D. | |
| 87) sec-Butylbenzene | 0.00 | 105 | 0 | N.D. | |
| 88) 4-Isopropyltoluene (p-... | 0.00 | 119 | 0 | N.D. | |
| 89) 1,2,3-Trimethylbenzene | 0.00 | 105 | 0 | N.D. | |
| 90) 1,2-Dichlorobenzene | 0.00 | 146 | 0 | N.D. | |
| 91) d-Limonene | 0.00 | 68 | 0 | N.D. | |
| 92) 1,2-Dibromo-3-Chloropr... | 0.00 | 157 | 0 | N.D. | |
| 93) n-Undecane | 0.00 | 57 | 0 | N.D. | |
| 94) 1,2,4-Trichlorobenzene | 0.00 | 180 | 0 | N.D. | |
| 95) Naphthalene | 22.35 | 128 | 253 | N.D. | |
| 96) n-Dodecane | 0.00 | 57 | 0 | N.D. | |
| 97) Hexachlorobutadiene | 0.00 | 225 | 0 | N.D. | |
| 98) Cyclohexanone | 18.42 | 55 | 407 | No Calib | # |
| 99) tert-Butylbenzene | 0.00 | 119 | 0 | N.D. | |
| 100) n-Butylbenzene | 0.00 | 91 | 0 | N.D. | |
| 101) 1,1,1,2-Tetrachloroethane | 0.00 | 131 | 0 | N.D. | |

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282212.D Vial: 5
Acq On : 28 Mar 2022 11:13 Operator: TZ/MT
Sample : P2201166-001 (50mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 29 02:08:45 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282212.D Vial: 5
Acq On : 28 Mar 2022 11:13 Operator: TZ/MT
Sample : P2201166-001 (50mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 29 02:08:45 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

3/29/22

| Internal Standards | R.T. | QIon | Response | Conc Units | Dev(Min) |
|---|---|---|---|---|---|
| 1) Bromochloromethane (IS1) | 11.30 | 130 | 150101 | 12.500 ng | -0.02 |
| 37) 1,4-Difluorobenzene (IS2) | 13.43 | 114 | 667730 | 12.500 ng | 0.00 |
| 56) Chlorobenzene-d5 (IS3) | 17.73 | 54 | 130263 | 12.500 ng | 0.00 |
| **System Monitoring Compounds** | | | | | |
| 33) 1,2-Dichloroethane-d4(... | 12.15 | 65 | 255654 | 12.399 ng | -0.02 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 99.20% | | |
| 57) Toluene-d8 (SS2) | 15.88 | 98 | 708601 | 11.257 ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 90.08% | | |
| 73) Bromofluorobenzene (SS3) | 19.11 | 174 | 250551 | 12.488 ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 99.92% | | |

| Target Compounds | | | | | | Qvalue |
|---|---|---|---|---|---|---|
| 6) Vinyl Chloride | 5.05 | 62 | 36234 | 1.285 ng | | 100 |
| 13) Acetone | 7.17 | 58 | 20285 | 1.434 ng | # | 69 |
| 17) 1,1-Dichloroethene | 8.36 | 96 | 18316 | 1.085 ng | | 90 |
| 19) Methylene Chloride | 8.56 | 84 | 84947 | 4.607 ng | | 88 |
| 21) Trichlorotrifluoroethane | 9.00 | 151 | 914873 | 62.736 ng | | 95 |
| 28) cis-1,2-Dichloroethene | 11.11 | 61 | 1559655 | 64.469 ng | | 99 |
| 32) Chloroform | 11.47 | 83 | 17863 | 0.589 ng | | 99 |
| 36) 1,2-Dichloroethane | 12.27 | 62 | 51707 | 2.191 ng | | 100 |
| 47) Trichloroethene | 14.13 | 130 | 4420337 | 238.299 ng | | 95 |

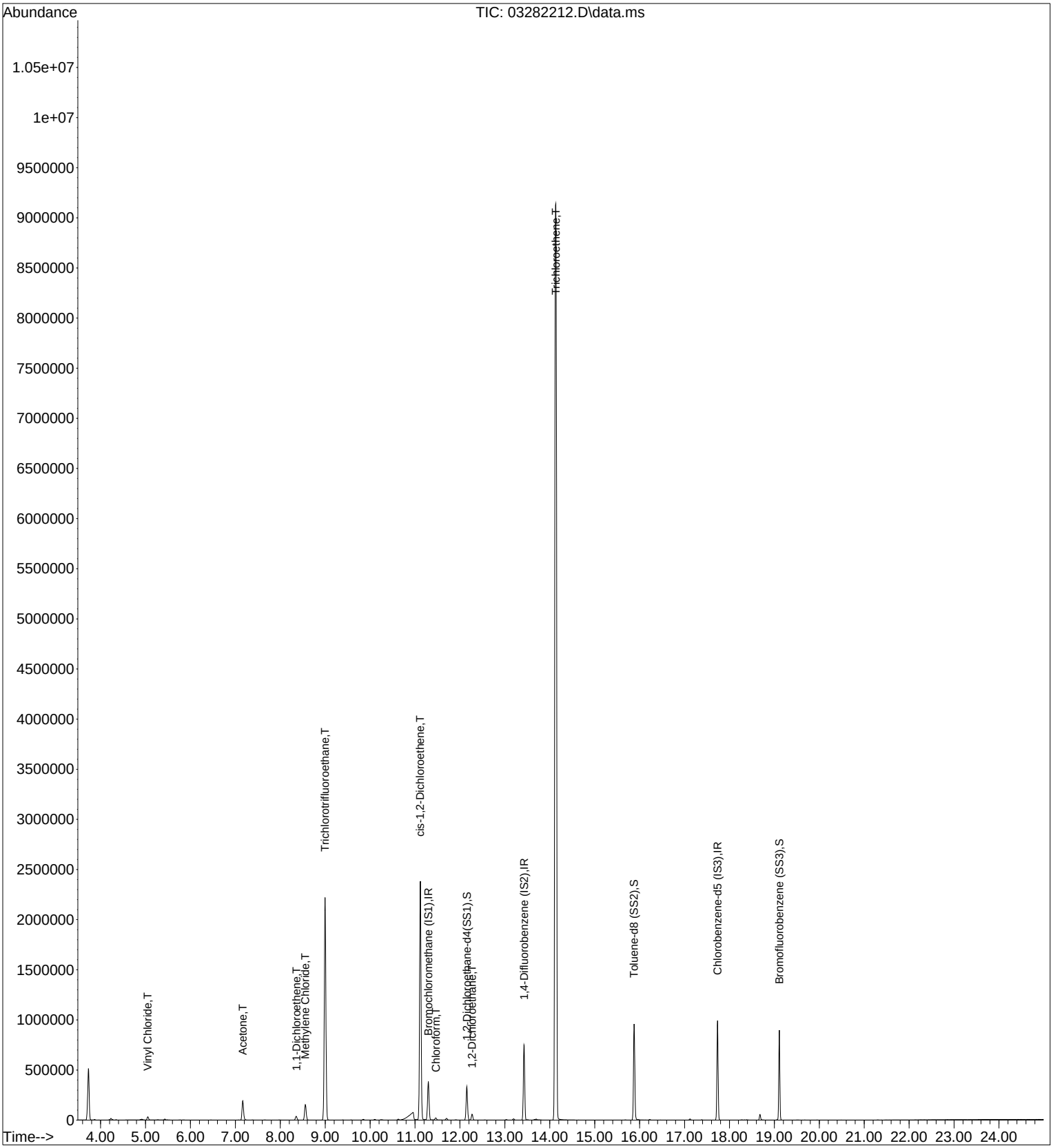
(#) = qualifier out of range (m) = manual integration (+) = signals summed

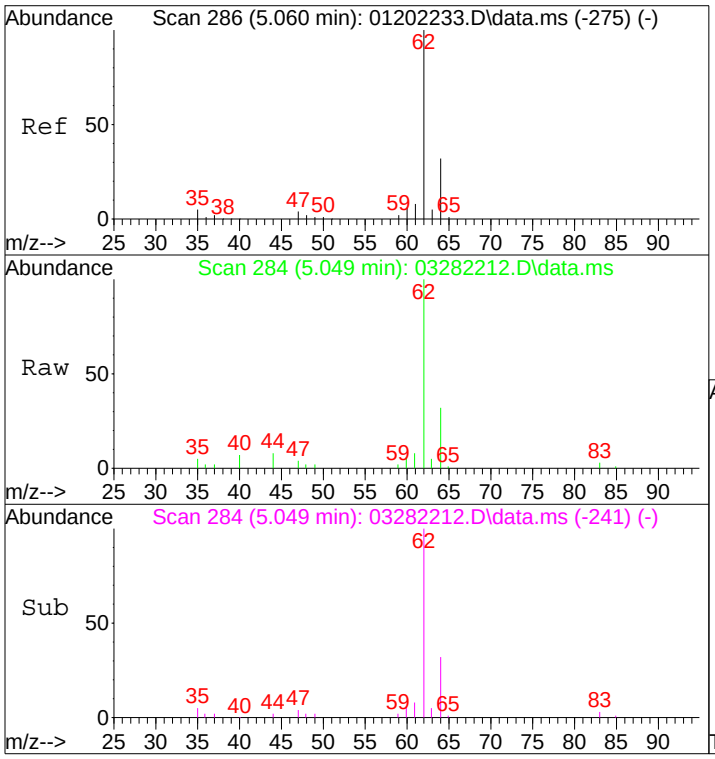
Quantitation Report (QT Reviewed)

01118089

Data File : I:\MS16\DATA\2022 03\28\03282212.D Vial: 5
Acq On : 28 Mar 2022 11:13 Operator: TZ/MT
Sample : P2201166-001 (50mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 29 02:08:45 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

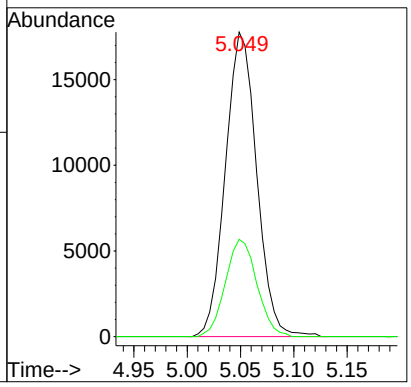


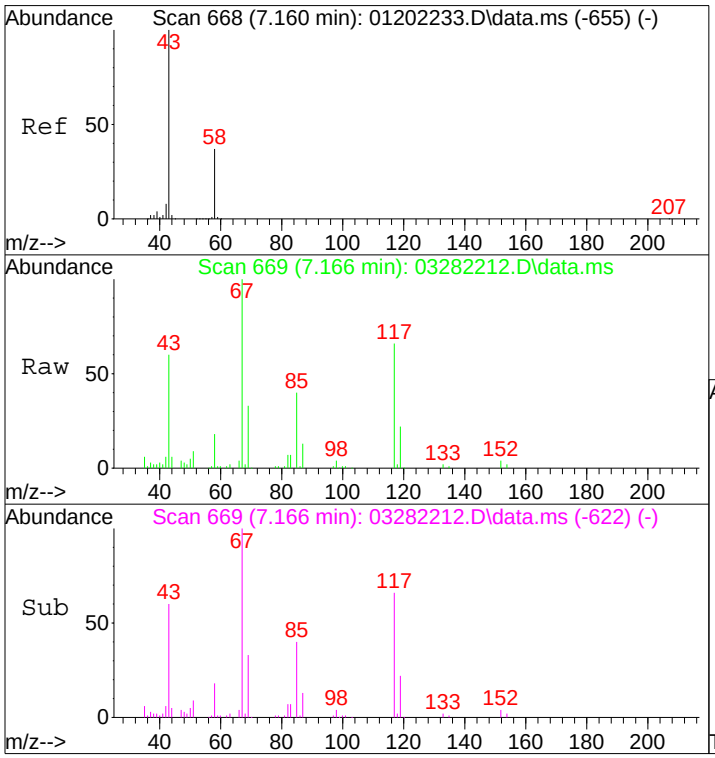



#6
Vinyl Chloride
Concen: 1.29 ng
RT: 5.05 min Scan# 284
Delta R.T. -0.011 min
Lab File: 03282212.D
Acq: 28 Mar 2022 11:13

Tgt Ion: 62 Resp: 36234

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 62 | 100 | | |
| 64 | 32.2 | 12.0 | 52.0 |

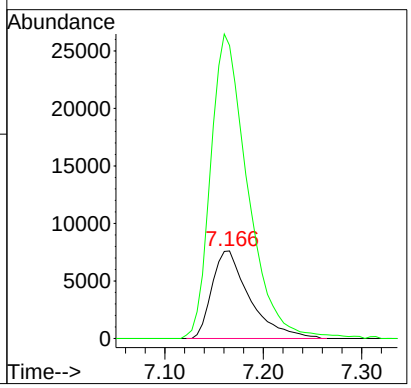


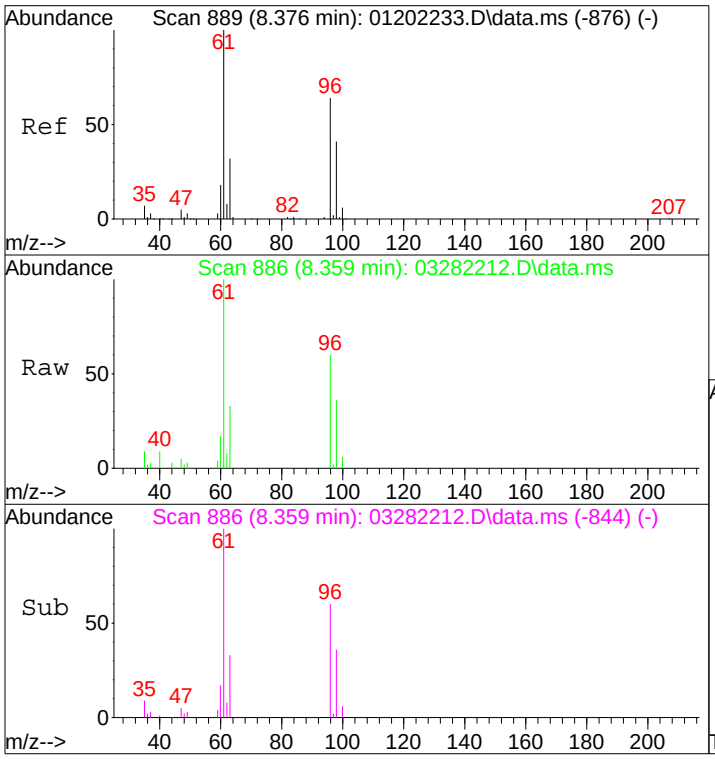




#13
Acetone
Concen: 1.43 ng
RT: 7.17 min Scan# 669
Delta R.T. 0.011 min
Lab File: 03282212.D
Acq: 28 Mar 2022 11:13

Tgt Ion: 58 Resp: 20285

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 58 | 100 | | |
| 43 | 341.8 | 253.5 | 313.5# |

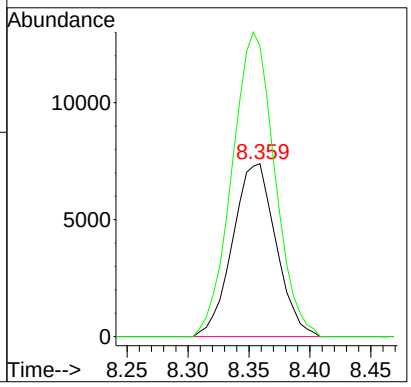


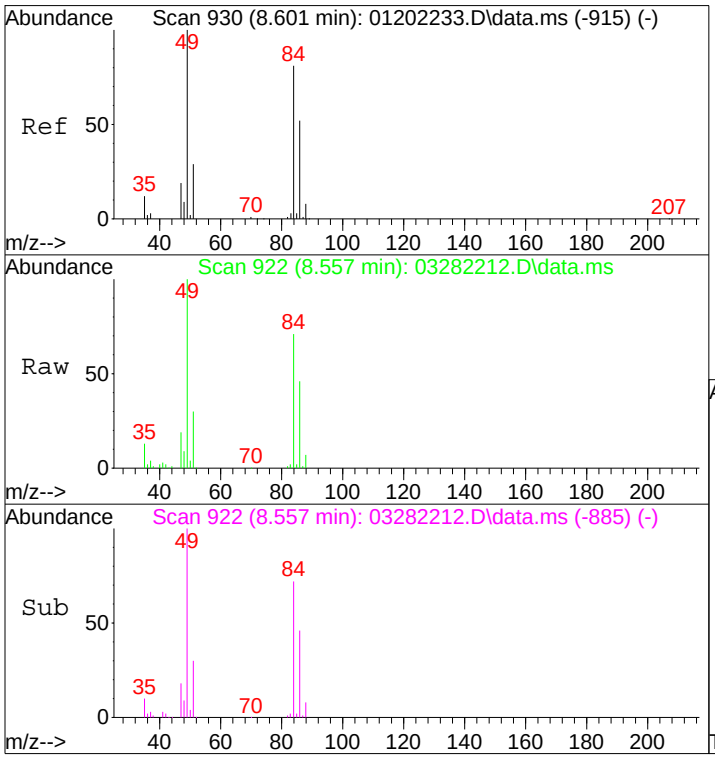



#17
1,1-Dichloroethene
Concen: 1.08 ng
RT: 8.36 min Scan# 886
Delta R.T. -0.016 min
Lab File: 03282212.D
Acq: 28 Mar 2022 11:13

Tgt Ion: 96 Resp: 18316

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 96 | 100 | | |
| 61 | 173.3 | 140.0 | 180.0 |

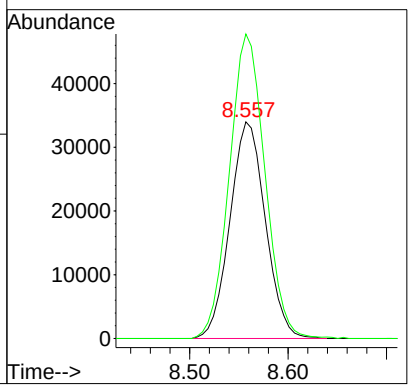


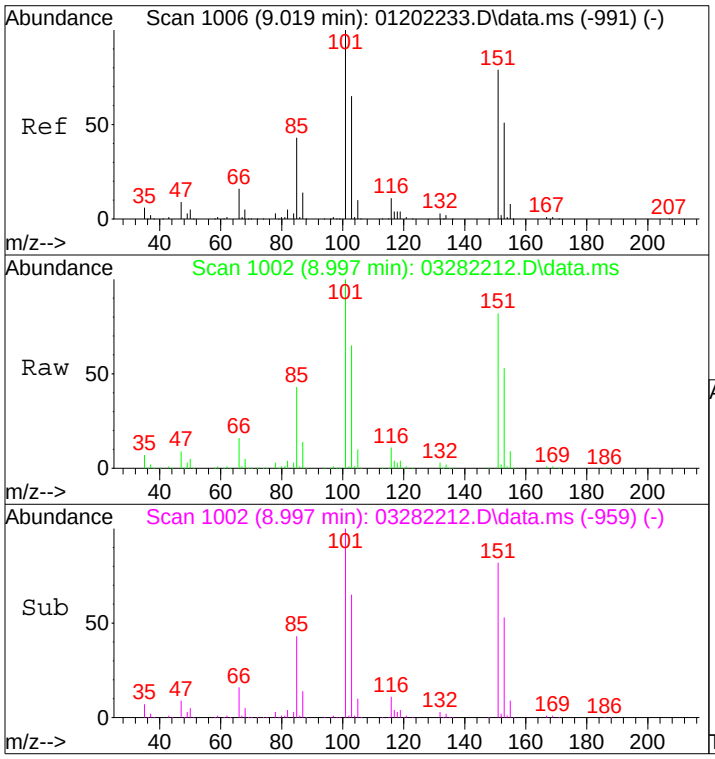




#19
Methylene Chloride
Concen: 4.61 ng
RT: 8.56 min Scan# 922
Delta R.T. -0.044 min
Lab File: 03282212.D
Acq: 28 Mar 2022 11:13

Tgt Ion: 84 Resp: 84947

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 84 | 100 | | |
| 49 | 141.2 | 102.1 | 152.1 |

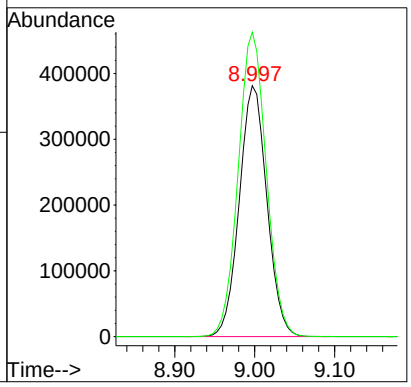


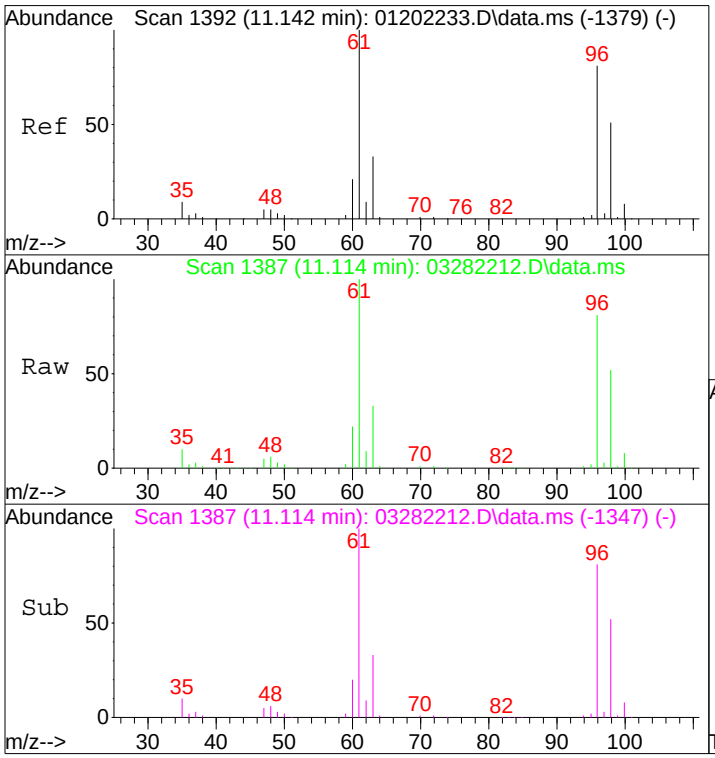



#21
Trichlorotrifluoroethane
Concen: 62.74 ng
RT: 9.00 min Scan# 1002
Delta R.T. -0.016 min
Lab File: 03282212.D
Acq: 28 Mar 2022 11:13

Tgt Ion:151 Resp: 914873

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 151 | 100 | | |
| 101 | 123.5 | 108.9 | 148.9 |

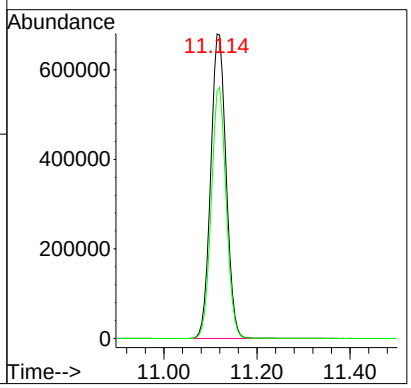


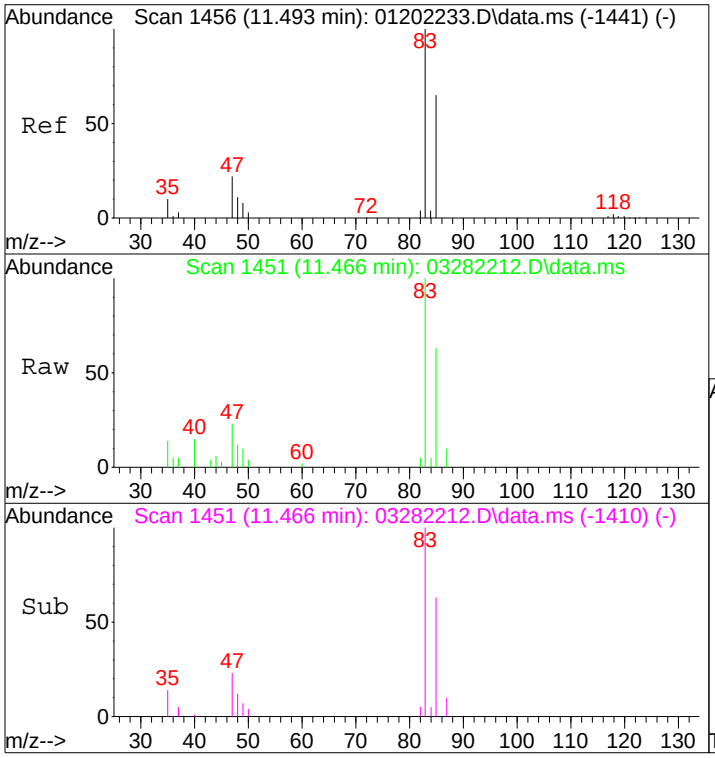




#28
cis-1,2-Dichloroethene
Concen: 64.47 ng
RT: 11.11 min Scan# 1387
Delta R.T. -0.027 min
Lab File: 03282212.D
Acq: 28 Mar 2022 11:13

Tgt Ion: 61 Resp: 1559655

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 61 | 100 | | |
| 96 | 79.8 | 59.2 | 99.2 |

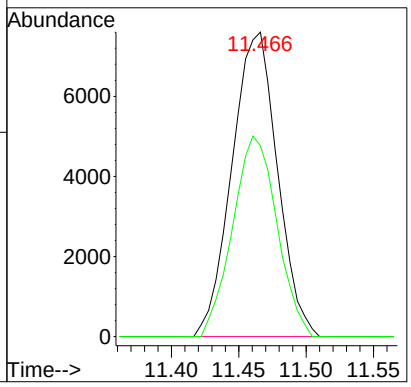


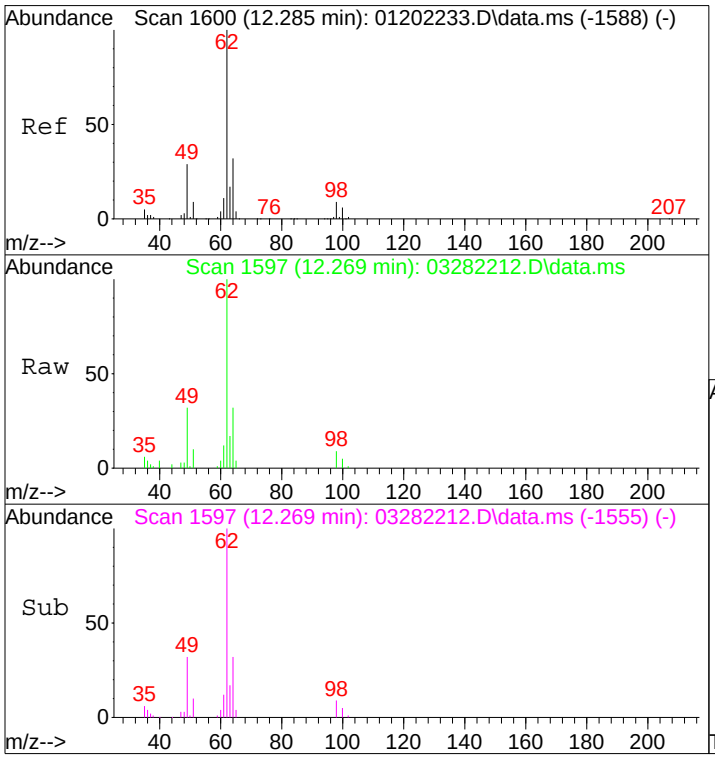



#32
Chloroform
Concen: 0.59 ng
RT: 11.47 min Scan# 1451
Delta R.T. -0.022 min
Lab File: 03282212.D
Acq: 28 Mar 2022 11:13

Tgt Ion: 83 Resp: 17863

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 83 | 100 | | |
| 85 | 64.0 | 45.2 | 85.2 |

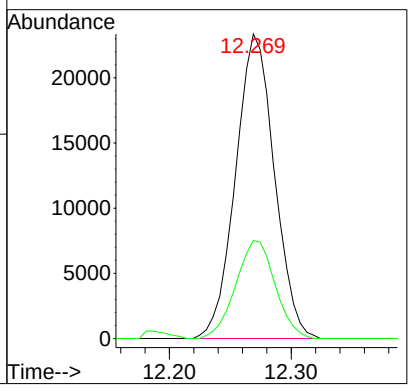


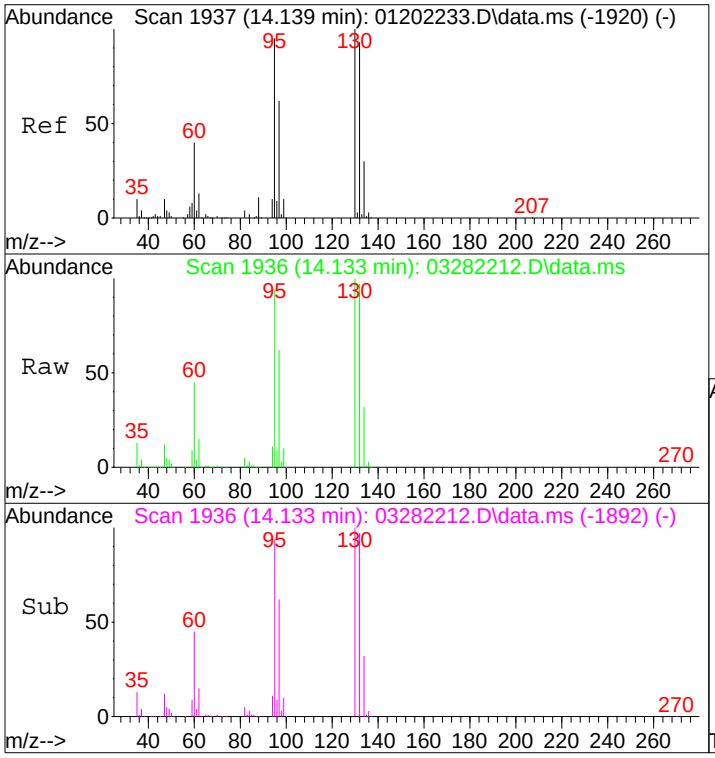




#36
1,2-Dichloroethane
Concen: 2.19 ng
RT: 12.27 min Scan# 1597
Delta R.T. -0.016 min
Lab File: 03282212.D
Acq: 28 Mar 2022 11:13

Tgt Ion: 62 Resp: 51707

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 62 | 100 | | |
| 64 | 32.6 | 12.5 | 52.5 |

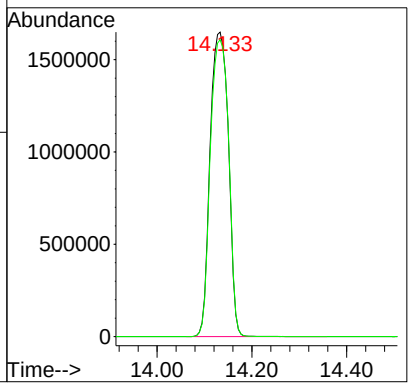





#47
Trichloroethene
Concen: 238.30 ng
RT: 14.13 min Scan# 1936
Delta R.T. -0.005 min
Lab File: 03282212.D
Acq: 28 Mar 2022 11:13

Tgt Ion:130 Resp: 4420337

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 130 | 100 | | |
| 132 | 98.0 | 72.9 | 112.9 |



Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282216.D Vial: 5
Acq On : 28 Mar 2022 13:28 Operator: TZ/MT
Sample : P2201166-001dil (15mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 29 02:23:16 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

3/29/22

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) Bromochloromethane (IS1) | 11.30 | 130 | 145706 | 12.500 | ng | -0.02 |
| 37) 1,4-Difluorobenzene (IS2) | 13.42 | 114 | 660534 | 12.500 | ng | -0.01 |
| 56) Chlorobenzene-d5 (IS3) | 17.73 | 54 | 126071 | 12.500 | ng | 0.00 |

System Monitoring Compounds

| | | | | | | |
|---|---|---|---|---|---|---|
| 33) 1,2-Dichloroethane-d4(... | 12.15 | 65 | 252091 | 12.595 | ng | -0.02 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 100.80% | | | |
| 57) Toluene-d8 (SS2) | 15.88 | 98 | 701293 | 11.511 | ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 92.08% | | | |
| 73) Bromofluorobenzene (SS3) | 19.11 | 174 | 234875 | 12.096 | ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 96.80% | | | |

Target Compounds

| | | | | | | Qvalue |
|---|---|---|---|---|---|---|
| 2) Propene | 4.21 | 42 | 249 | N.D. | | |
| 3) Dichlorodifluoromethan... | 4.36 | 85 | 846 | N.D. | | |
| 4) Chloromethane | 4.64 | 50 | 408 | N.D. | | |
| 5) 1,2-Dichloro-1,1,2,2-t... | 0.00 | 135 | 0 | N.D. | | |
| 6) Vinyl Chloride | 5.06 | 62 | 10179 | N.D. | | |
| 7) 1,3-Butadiene | 0.00 | 54 | 0 | N.D. | | |
| 8) Bromomethane | 0.00 | 94 | 0 | N.D. | | |
| 9) Chloroethane | 0.00 | 64 | 0 | N.D. | | |
| 10) Ethanol | 6.47 | 45 | 347 | N.D. | | |
| 11) Acetonitrile | 0.00 | 41 | 0 | N.D. | | |
| 12) Acrolein | 0.00 | 56 | 0 | N.D. | | |
| 13) Acetone | 7.18 | 58 | 5659 | N.D. | | |
| 14) Trichlorofluoromethane | 7.40 | 101 | 213 | N.D. | | |
| 15) 2-Propanol (Isopropanol) | 7.67 | 45 | 473 | N.D. | | |
| 16) Acrylonitrile | 0.00 | 53 | 0 | N.D. | | |
| 17) 1,1-Dichloroethene | 8.36 | 96 | 4850 | N.D. | | |
| 18) 2-Methyl-2-Propanol (t... | 0.00 | 59 | 0 | N.D. | | |
| 19) Methylene Chloride | 8.56 | 84 | 23546 | 1.316 | ng | 88 |
| 20) 3-Chloro-1-propene (Al... | 0.00 | 41 | 0 | N.D. | | |
| 21) Trichlorotrifluoroethane | 9.00 | 151 | 220672 | 15.589 | ng | 99 |
| 22) Carbon Disulfide | 8.85 | 76 | 395 | N.D. | | |
| 23) trans-1,2-Dichloroethene | 9.85 | 61 | 1312 | N.D. | | |
| 24) 1,1-Dichloroethane | 10.11 | 63 | 2224 | N.D. | | |
| 25) Methyl tert-Butyl Ether | 0.00 | 73 | 0 | N.D. | | |
| 26) Vinyl Acetate | 0.00 | 86 | 0 | N.D. | | |
| 27) 2-Butanone (MEK) | 10.64 | 72 | 687 | N.D. | | |
| 28) cis-1,2-Dichloroethene | 11.12 | 61 | 393911 | 16.773 | ng | 96 |
| 29) Diisopropyl Ether | 11.47 | 87 | 368 | N.D. | | |
| 30) Ethyl Acetate | 0.00 | 61 | 0 | N.D. | | |
| 31) n-Hexane | 0.00 | 57 | 0 | N.D. | | |
| 32) Chloroform | 11.46 | 83 | 4979 | N.D. | | |
| 34) Tetrahydrofuran (THF) | 0.00 | 72 | 0 | N.D. | | |
| 35) Ethyl tert-Butyl Ether | 0.00 | 87 | 0 | N.D. | | |
| 36) 1,2-Dichloroethane | 12.27 | 62 | 14695 | 0.642 | ng | 100 |
| 38) 1,1,1-Trichloroethane | 0.00 | 97 | 0 | N.D. | | |
| 39) Isopropyl Acetate | 0.00 | 61 | 0 | N.D. | | |
| 40) 1-Butanol | 0.00 | 56 | 0 | N.D. | | |
| 41) Benzene | 13.03 | 78 | 1661 | N.D. | | |
| 42) Carbon Tetrachloride | 13.20 | 117 | 2010 | N.D. | | |
| 43) Cyclohexane | 13.42 | 84 | 1046 | N.D. | | |
| 44) tert-Amyl Methyl Ether | 0.00 | 73 | 0 | N.D. | | |
| 45) 1,2-Dichloropropane | 0.00 | 63 | 0 | N.D. | | |
| 46) Bromodichloromethane | 0.00 | 83 | 0 | N.D. d | | |
| 47) Trichloroethene | 14.13 | 130 | 1640678 | 89.412 | ng | 93 |
| 48) 1,4-Dioxane | 14.13 | 88 | 399 | N.D. | | |
| 49) 2,2,4-Trimethylpentane... | 0.00 | 57 | 0 | N.D. | | |
| 50) Methyl Methacrylate | 0.00 | 100 | 0 | N.D. d | | |

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282216.D Vial: 5
Acq On : 28 Mar 2022 13:28 Operator: TZ/MT
Sample : P2201166-001dil (15mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 29 02:23:16 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

| Internal Standards | R.T. | QIon | Response | Conc Units Dev(Min) |
|---|---|---|---|---|
| 51) n-Heptane | 0.00 | 71 | 0 | N.D. |
| 52) cis-1,3-Dichloropropene | 0.00 | 75 | 0 | N.D. |
| 53) 4-Methyl-2-pentanone | 0.00 | 58 | 0 | N.D. |
| 54) trans-1,3-Dichloropropene | 0.00 | 75 | 0 | N.D. |
| 55) 1,1,2-Trichloroethane | 0.00 | 97 | 0 | N.D. |
| 58) Toluene | 15.98 | 91 | 696 | N.D. |
| 59) 2-Hexanone | 16.23 | 43 | 981 | N.D. |
| 60) Dibromochloromethane | 0.00 | 129 | 0 | N.D. |
| 61) 1,2-Dibromoethane | 0.00 | 107 | 0 | N.D. |
| 62) n-Butyl Acetate | 0.00 | 43 | 0 | N.D. |
| 63) n-Octane | 0.00 | 57 | 0 | N.D. |
| 64) Tetrachloroethene | 17.12 | 166 | 911 | N.D. |
| 65) Chlorobenzene | 0.00 | 112 | 0 | N.D. |
| 66) Ethylbenzene | 0.00 | 91 | 0 | N.D. |
| 67) m- & p-Xylenes | 0.00 | 91 | 0 | N.D. |
| 68) Bromoform | 0.00 | 173 | 0 | N.D. |
| 69) Styrene | 0.00 | 104 | 0 | N.D. |
| 70) o-Xylene | 0.00 | 91 | 0 | N.D. |
| 71) n-Nonane | 0.00 | 43 | 0 | N.D. |
| 72) 1,1,2,2-Tetrachloroethane | 0.00 | 83 | 0 | N.D. |
| 74) Cumene | 19.11 | 105 | 309 | N.D. |
| 75) alpha-Pinene | 0.00 | 93 | 0 | N.D. |
| 76) n-Propylbenzene | 0.00 | 91 | 0 | N.D. |
| 77) 3-Ethyltoluene | 0.00 | 105 | 0 | N.D. |
| 78) 4-Ethyltoluene | 0.00 | 105 | 0 | N.D. |
| 79) 1,3,5-Trimethylbenzene | 0.00 | 105 | 0 | N.D. |
| 80) alpha-Methylstyrene | 0.00 | 118 | 0 | N.D. |
| 81) 2-Ethyltoluene | 0.00 | 105 | 0 | N.D. |
| 82) 1,2,4-Trimethylbenzene | 0.00 | 105 | 0 | N.D. |
| 83) n-Decane | 0.00 | 58 | 0 | N.D. |
| 84) Benzyl Chloride | 0.00 | 91 | 0 | N.D. |
| 85) 1,3-Dichlorobenzene | 0.00 | 146 | 0 | N.D. |
| 86) 1,4-Dichlorobenzene | 0.00 | 146 | 0 | N.D. |
| 87) sec-Butylbenzene | 0.00 | 105 | 0 | N.D. |
| 88) 4-Isopropyltoluene (p-... | 0.00 | 119 | 0 | N.D. |
| 89) 1,2,3-Trimethylbenzene | 0.00 | 105 | 0 | N.D. |
| 90) 1,2-Dichlorobenzene | 0.00 | 146 | 0 | N.D. |
| 91) d-Limonene | 0.00 | 68 | 0 | N.D. |
| 92) 1,2-Dibromo-3-Chloropr... | 0.00 | 157 | 0 | N.D. |
| 93) n-Undecane | 0.00 | 57 | 0 | N.D. |
| 94) 1,2,4-Trichlorobenzene | 0.00 | 180 | 0 | N.D. |
| 95) Naphthalene | 0.00 | 128 | 0 | N.D. |
| 96) n-Dodecane | 0.00 | 57 | 0 | N.D. |
| 97) Hexachlorobutadiene | 0.00 | 225 | 0 | N.D. |
| 98) Cyclohexanone | 0.00 | 55 | 0 | N.D. |
| 99) tert-Butylbenzene | 0.00 | 119 | 0 | N.D. |
| 100) n-Butylbenzene | 0.00 | 91 | 0 | N.D. |
| 101) 1,1,1,2-Tetrachloroethane | 0.00 | 131 | 0 | N.D. |

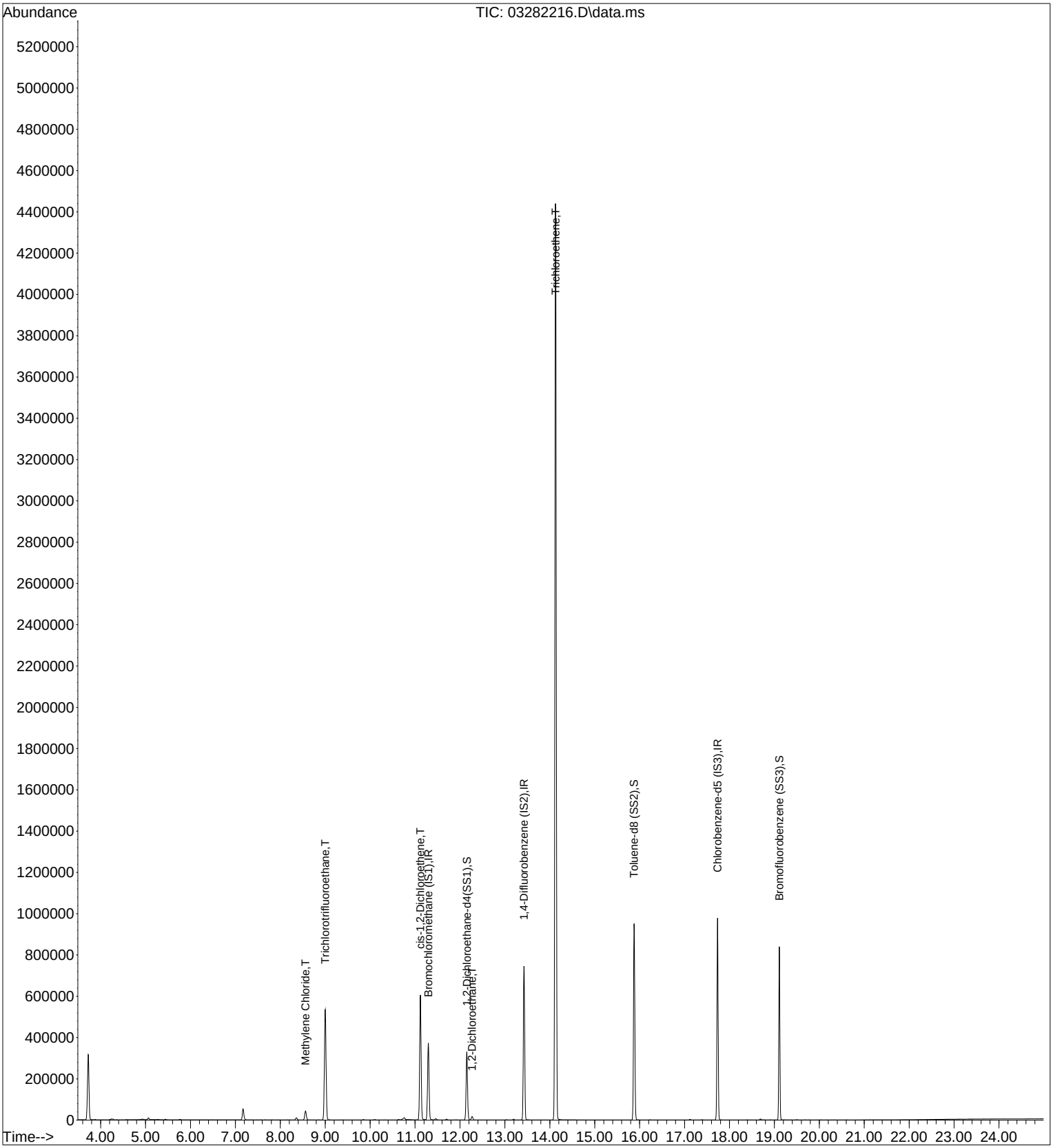
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

01118097

Data File : I:\MS16\DATA\2022 03\28\03282216.D Vial: 5
Acq On : 28 Mar 2022 13:28 Operator: TZ/MT
Sample : P2201166-001dil (15mL) Inst : GCMS-16
Misc : S35-01102201

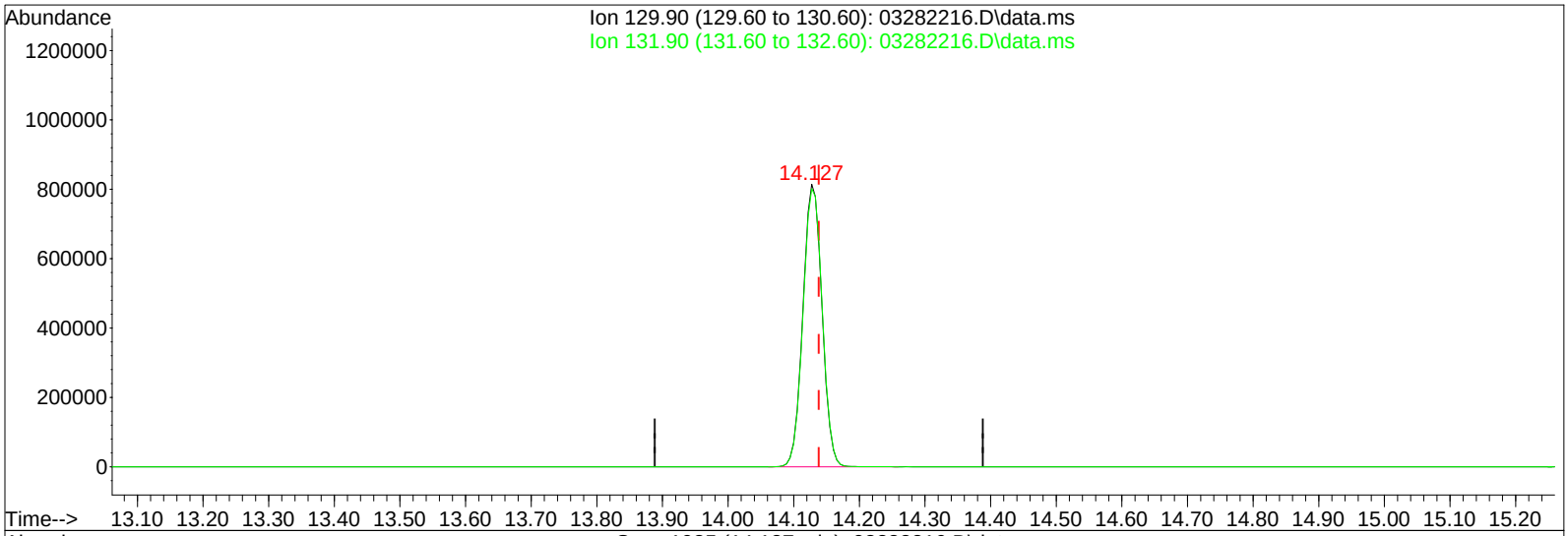
Quant Time: Mar 29 02:23:16 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

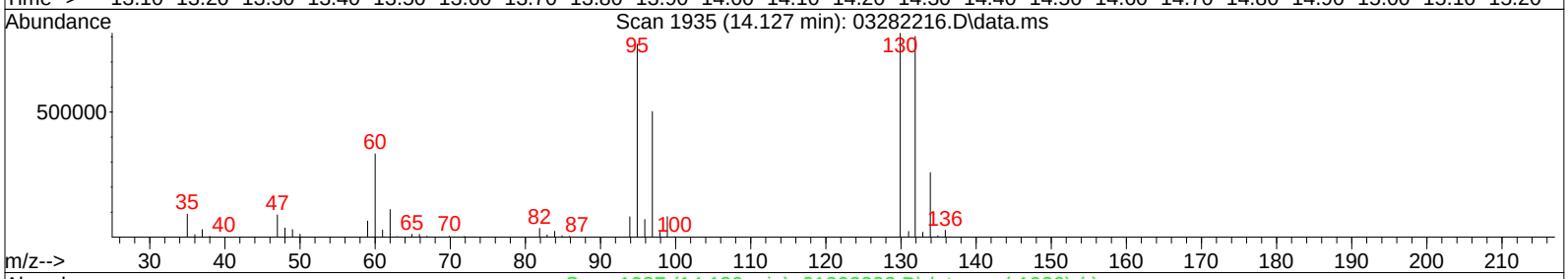


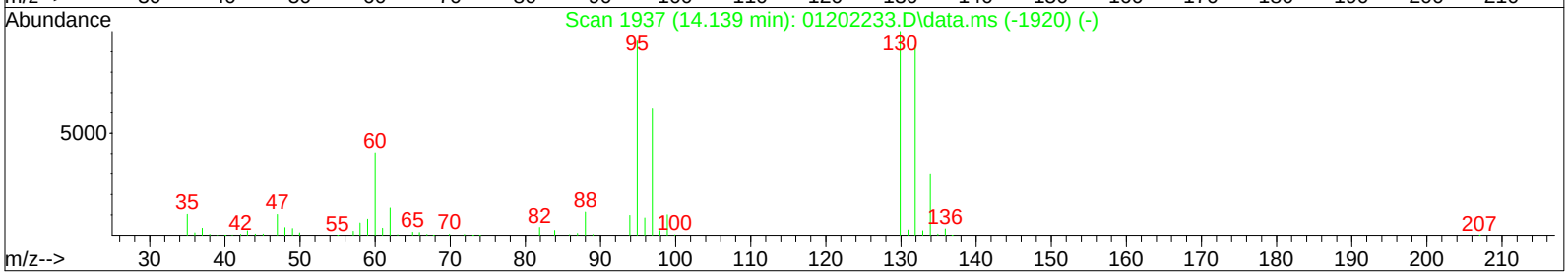
01118098

Data File : I:\MS16\DATA\2022 03\28\03282216.D  Vial: 5
Acq On : 28 Mar 2022 13:28  Operator: TZ/MT
Sample : P2201166-001dil (15mL)  Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 28 13:53:59 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M




TIC: 03282216.D\data.ms

(47) Trichloroethene (T)

14.127min (-0.011) 89.41ng

response 1640678

| Ion | Exp% | Act% |
|---|---|---|
| 129.90 | 100 | 100 |
| 131.90 | 92.90 | 99.36 |
| 0.00 | 0.00 | 0.00 |
| 0.00 | 0.00 | 0.00 |

Quantitation Report (QT Reviewed)

01118099

Data File : I:\MS16\DATA\2022 03\28\03282213.D Vial: 6
Acq On : 28 Mar 2022 11:47 Operator: TZ/MT
Sample : P2201166-002 (50mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 29 02:10:32 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

3/29/22

| Internal Standards | R.T. | QIon | Response | Conc Units | Dev(Min) |
|---|---|---|---|---|---|
| 1) Bromochloromethane (IS1) | 11.30 | 130 | 132836 | 12.500 ng | -0.02 |
| 37) 1,4-Difluorobenzene (IS2) | 13.43 | 114 | 594669 | 12.500 ng | 0.00 |
| 56) Chlorobenzene-d5 (IS3) | 17.73 | 54 | 116569 | 12.500 ng | 0.00 |

System Monitoring Compounds

| | | | | | |
|---|---|---|---|---|---|
| 33) 1,2-Dichloroethane-d4(... | 12.15 | 65 | 226827 | 12.431 ng | -0.02 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 99.44% | | |
| 57) Toluene-d8 (SS2) | 15.88 | 98 | 640051 | 11.362 ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 90.88% | | |
| 73) Bromofluorobenzene (SS3) | 19.11 | 174 | 220716 | 12.294 ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 98.32% | | |

Target Compounds

| | | | | | | Qvalue |
|---|---|---|---|---|---|---|
| 2) Propene | 4.21 | 42 | 813 | N.D. | | |
| 3) Dichlorodifluoromethan... | 4.35 | 85 | 2801 | N.D. | | |
| 4) Chloromethane | 4.64 | 50 | 1315 | N.D. | | |
| 5) 1,2-Dichloro-1,1,2,2-t... | 0.00 | 135 | 0 | N.D. | | |
| 6) Vinyl Chloride | 5.06 | 62 | 32926 | 1.320 ng | | 99 |
| 7) 1,3-Butadiene | 0.00 | 54 | 0 | N.D. | | |
| 8) Bromomethane | 0.00 | 94 | 0 | N.D. | | |
| 9) Chloroethane | 0.00 | 64 | 0 | N.D. | | |
| 10) Ethanol | 6.46 | 45 | 2194 | N.D. | | |
| 11) Acetonitrile | 6.75 | 41 | 55 | N.D. | | |
| 12) Acrolein | 6.95 | 56 | 117 | N.D. | | |
| 13) Acetone | 7.17 | 58 | 18120 | 1.448 ng | # | 59 |
| 14) Trichlorofluoromethane | 7.40 | 101 | 1142 | N.D. | | |
| 15) 2-Propanol (Isopropanol) | 7.65 | 45 | 2421 | N.D. | | |
| 16) Acrylonitrile | 0.00 | 53 | 0 | N.D. | | |
| 17) 1,1-Dichloroethene | 8.36 | 96 | 16663 | 1.115 ng | | 91 |
| 18) 2-Methyl-2-Propanol (t... | 8.36 | 59 | 884 | N.D. | | |
| 19) Methylene Chloride | 8.56 | 84 | 74343 | 4.556 ng | | 86 |
| 20) 3-Chloro-1-propene (Al... | 0.00 | 41 | 0 | N.D. | | |
| 21) Trichlorotrifluoroethane | 9.00 | 151 | 793830 | 61.511 ng | | 97 |
| 22) Carbon Disulfide | 8.85 | 76 | 439 | N.D. | | |
| 23) trans-1,2-Dichloroethene | 9.85 | 61 | 4164 | N.D. | | |
| 24) 1,1-Dichloroethane | 10.11 | 63 | 7429 | N.D. | | |
| 25) Methyl tert-Butyl Ether | 0.00 | 73 | 0 | N.D. | | |
| 26) Vinyl Acetate | 0.00 | 86 | 0 | N.D. | | |
| 27) 2-Butanone (MEK) | 10.63 | 72 | 2958 | N.D. | | |
| 28) cis-1,2-Dichloroethene | 11.12 | 61 | 1387351 | 64.800 ng | | 100 |
| 29) Diisopropyl Ether | 11.46 | 87 | 1507 | N.D. | | |
| 30) Ethyl Acetate | 0.00 | 61 | 0 | N.D. | | |
| 31) n-Hexane | 11.42 | 57 | 1092 | N.D. | | |
| 32) Chloroform | 11.47 | 83 | 15708 | 0.585 ng | | 100 |
| 34) Tetrahydrofuran (THF) | 11.91 | 72 | 574 | N.D. | | |
| 35) Ethyl tert-Butyl Ether | 0.00 | 87 | 0 | N.D. | | |
| 36) 1,2-Dichloroethane | 12.27 | 62 | 45853 | 2.196 ng | | 100 |
| 38) 1,1,1-Trichloroethane | 12.55 | 97 | 1075 | N.D. | | |
| 39) Isopropyl Acetate | 0.00 | 61 | 0 | N.D. | | |
| 40) 1-Butanol | 13.01 | 56 | 158 | No Calib | # | |
| 41) Benzene | 13.03 | 78 | 4122 | N.D. | | |
| 42) Carbon Tetrachloride | 13.19 | 117 | 6821 | N.D. | | |
| 43) Cyclohexane | 13.32 | 84 | 180 | N.D. | | |
| 44) tert-Amyl Methyl Ether | 13.65 | 73 | 812 | N.D. | | |
| 45) 1,2-Dichloropropane | 0.00 | 63 | 0 | N.D. | | |
| 46) Bromodichloromethane | 0.00 | 83 | 0 | N.D. d | | |
| 47) Trichloroethene | 14.13 | 130 | 4192055 | 253.758 ng | | 95 |
| 48) 1,4-Dioxane | 14.11 | 88 | 1451 | N.D. | | |
| 49) 2,2,4-Trimethylpentane... | 14.20 | 57 | 104 | N.D. | | |
| 50) Methyl Methacrylate | 0.00 | 100 | 0 | N.D. d | | |

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282213.D Vial: 6
Acq On : 28 Mar 2022 11:47 Operator: TZ/MT
Sample : P2201166-002 (50mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 29 02:10:32 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

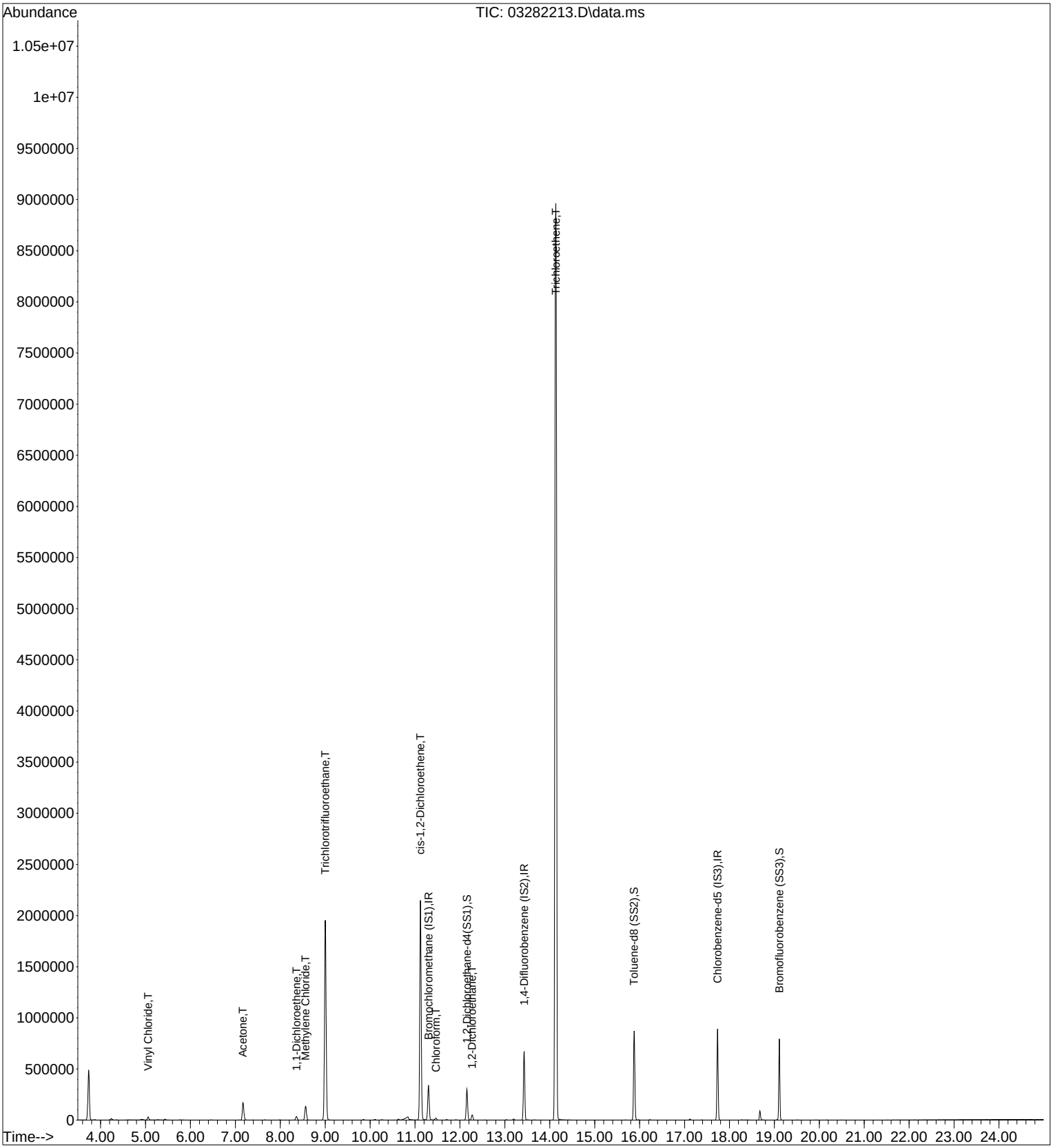
| Internal Standards | R.T. | QIon | Response | Conc Units | Dev(Min) |
|---|---|---|---|---|---|
| 51) n-Heptane | 0.00 | 71 | 0 | N.D. | |
| 52) cis-1,3-Dichloropropene | 0.00 | 75 | 0 | N.D. | |
| 53) 4-Methyl-2-pentanone | 0.00 | 58 | 0 | N.D. | |
| 54) trans-1,3-Dichloropropene | 0.00 | 75 | 0 | N.D. | |
| 55) 1,1,2-Trichloroethane | 15.68 | 97 | 728 | N.D. | |
| 58) Toluene | 15.98 | 91 | 2643 | N.D. | |
| 59) 2-Hexanone | 16.23 | 43 | 3817 | N.D. | |
| 60) Dibromochloromethane | 0.00 | 129 | 0 | N.D. | |
| 61) 1,2-Dibromoethane | 0.00 | 107 | 0 | N.D. | |
| 62) n-Butyl Acetate | 16.72 | 43 | 389 | N.D. | |
| 63) n-Octane | 0.00 | 57 | 0 | N.D. | |
| 64) Tetrachloroethene | 17.12 | 166 | 3190 | N.D. | |
| 65) Chlorobenzene | 0.00 | 112 | 0 | N.D. | |
| 66) Ethylbenzene | 18.28 | 91 | 325 | N.D. | |
| 67) m- & p-Xylenes | 18.28 | 91 | 325 | N.D. | |
| 68) Bromoform | 0.00 | 173 | 0 | N.D. | |
| 69) Styrene | 0.00 | 104 | 0 | N.D. | |
| 70) o-Xylene | 18.71 | 91 | 324 | N.D. | |
| 71) n-Nonane | 18.94 | 43 | 107 | N.D. | |
| 72) 1,1,2,2-Tetrachloroethane | 0.00 | 83 | 0 | N.D. | |
| 74) Cumene | 19.12 | 105 | 207 | N.D. | |
| 75) alpha-Pinene | 0.00 | 93 | 0 | N.D. | |
| 76) n-Propylbenzene | 0.00 | 91 | 0 | N.D. | |
| 77) 3-Ethyltoluene | 0.00 | 105 | 0 | N.D. | |
| 78) 4-Ethyltoluene | 0.00 | 105 | 0 | N.D. | |
| 79) 1,3,5-Trimethylbenzene | 0.00 | 105 | 0 | N.D. | |
| 80) alpha-Methylstyrene | 0.00 | 118 | 0 | N.D. | |
| 81) 2-Ethyltoluene | 0.00 | 105 | 0 | N.D. | |
| 82) 1,2,4-Trimethylbenzene | 0.00 | 105 | 0 | N.D. | |
| 83) n-Decane | 0.00 | 58 | 0 | N.D. | |
| 84) Benzyl Chloride | 0.00 | 91 | 0 | N.D. | |
| 85) 1,3-Dichlorobenzene | 0.00 | 146 | 0 | N.D. | |
| 86) 1,4-Dichlorobenzene | 0.00 | 146 | 0 | N.D. | |
| 87) sec-Butylbenzene | 0.00 | 105 | 0 | N.D. | |
| 88) 4-Isopropyltoluene (p-... | 0.00 | 119 | 0 | N.D. | |
| 89) 1,2,3-Trimethylbenzene | 0.00 | 105 | 0 | N.D. | |
| 90) 1,2-Dichlorobenzene | 0.00 | 146 | 0 | N.D. | |
| 91) d-Limonene | 0.00 | 68 | 0 | N.D. | |
| 92) 1,2-Dibromo-3-Chloropr... | 0.00 | 157 | 0 | N.D. | |
| 93) n-Undecane | 0.00 | 57 | 0 | N.D. | |
| 94) 1,2,4-Trichlorobenzene | 0.00 | 180 | 0 | N.D. | |
| 95) Naphthalene | 22.34 | 128 | 359 | N.D. | |
| 96) n-Dodecane | 0.00 | 57 | 0 | N.D. | |
| 97) Hexachlorobutadiene | 0.00 | 225 | 0 | N.D. | |
| 98) Cyclohexanone | 18.42 | 55 | 753 | No Calib | # |
| 99) tert-Butylbenzene | 0.00 | 119 | 0 | N.D. | |
| 100) n-Butylbenzene | 0.00 | 91 | 0 | N.D. | |
| 101) 1,1,1,2-Tetrachloroethane | 0.00 | 131 | 0 | N.D. | |

(#) = qualifier out of range (m) = manual integration (+) = signals summed

01118101

Data File : I:\MS16\DATA\2022 03\28\03282213.D Vial: 6
Acq On : 28 Mar 2022 11:47 Operator: TZ/MT
Sample : P2201166-002 (50mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 29 02:10:32 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282213.D Vial: 6
Acq On : 28 Mar 2022 11:47 Operator: TZ/MT
Sample : P2201166-002 (50mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 29 02:10:32 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

3/29/22

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) Bromochloromethane (IS1) | 11.30 | 130 | 132836 | 12.500 | ng | -0.02 |
| 37) 1,4-Difluorobenzene (IS2) | 13.43 | 114 | 594669 | 12.500 | ng | 0.00 |
| 56) Chlorobenzene-d5 (IS3) | 17.73 | 54 | 116569 | 12.500 | ng | 0.00 |
| **System Monitoring Compounds** | | | | | | |
| 33) 1,2-Dichloroethane-d4(... | 12.15 | 65 | 226827 | 12.431 | ng | -0.02 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 99.44% | | | |
| 57) Toluene-d8 (SS2) | 15.88 | 98 | 640051 | 11.362 | ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 90.88% | | | |
| 73) Bromofluorobenzene (SS3) | 19.11 | 174 | 220716 | 12.294 | ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 98.32% | | | |

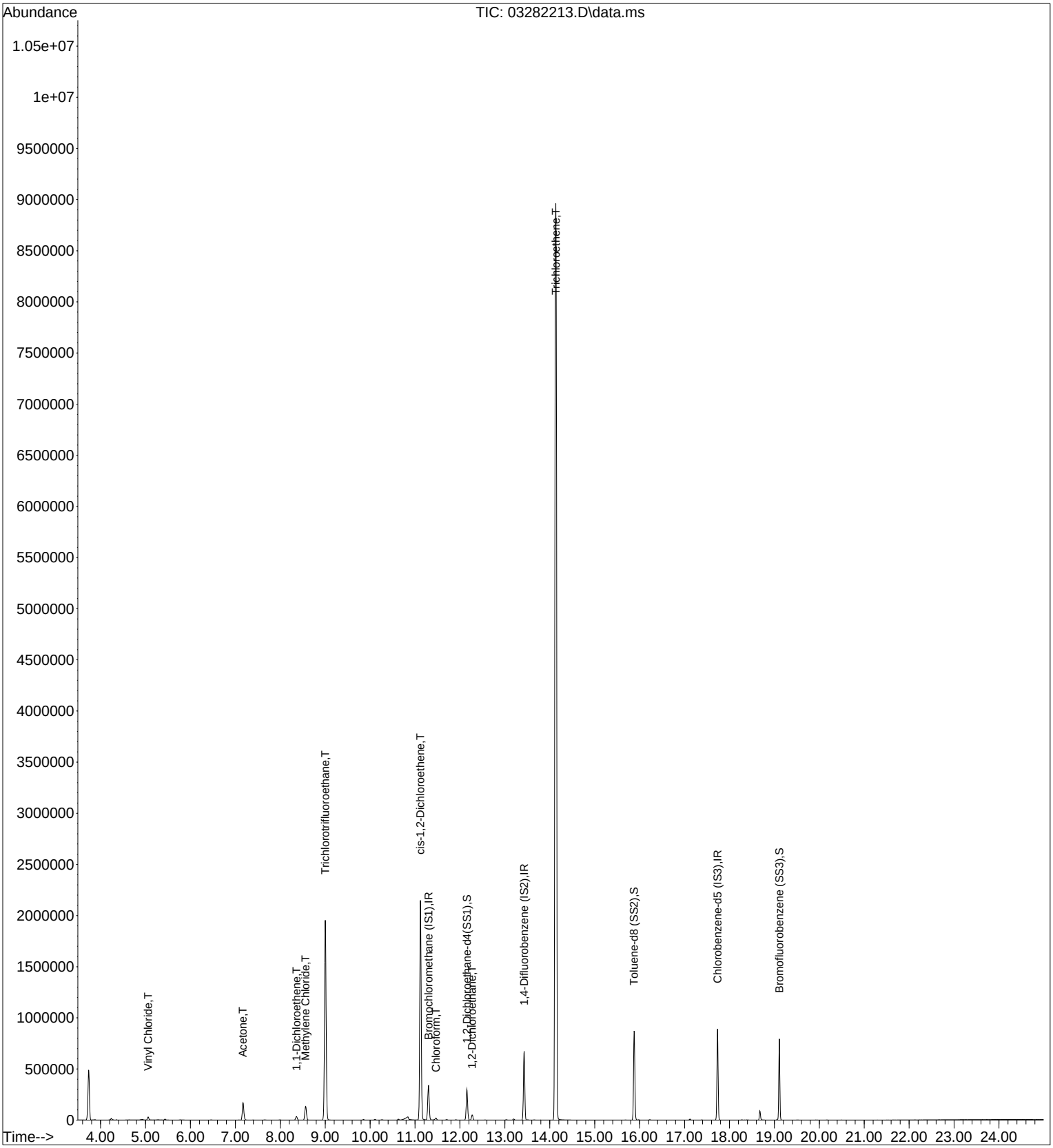
| Target Compounds | | | | | | | Qvalue |
|---|---|---|---|---|---|---|---|
| 6) Vinyl Chloride | 5.06 | 62 | 32926 | 1.320 | ng | | 99 |
| 13) Acetone | 7.17 | 58 | 18120 | 1.448 | ng | # | 59 |
| 17) 1,1-Dichloroethene | 8.36 | 96 | 16663 | 1.115 | ng | | 91 |
| 19) Methylene Chloride | 8.56 | 84 | 74343 | 4.556 | ng | | 86 |
| 21) Trichlorotrifluoroethane | 9.00 | 151 | 793830 | 61.511 | ng | | 97 |
| 28) cis-1,2-Dichloroethene | 11.12 | 61 | 1387351 | 64.800 | ng | | 100 |
| 32) Chloroform | 11.47 | 83 | 15708 | 0.585 | ng | | 100 |
| 36) 1,2-Dichloroethane | 12.27 | 62 | 45853 | 2.196 | ng | | 100 |
| 47) Trichloroethene | 14.13 | 130 | 4192055 | 253.758 | ng | | 95 |

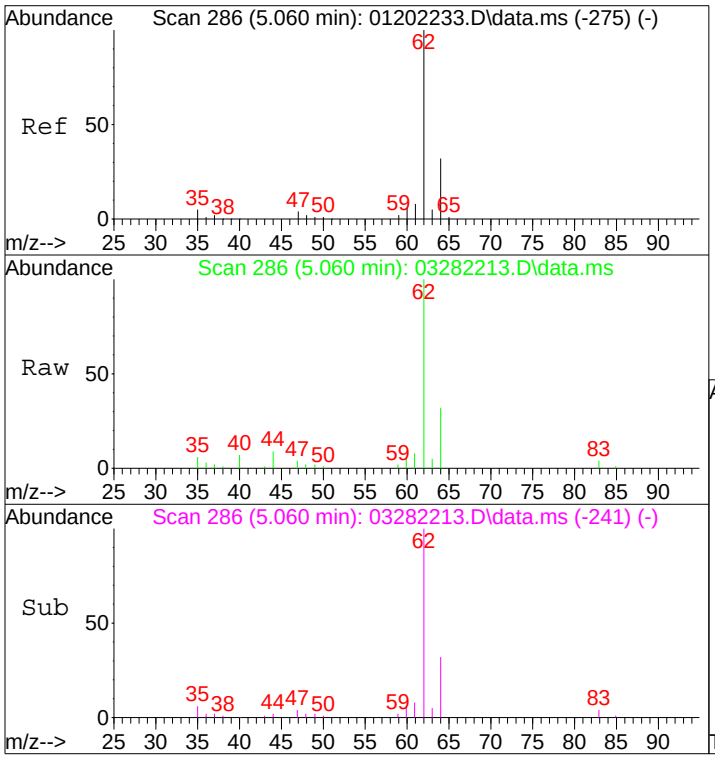
(#) = qualifier out of range (m) = manual integration (+) = signals summed

01118103

Data File : I:\MS16\DATA\2022 03\28\03282213.D Vial: 6
Acq On : 28 Mar 2022 11:47 Operator: TZ/MT
Sample : P2201166-002 (50mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 29 02:10:32 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

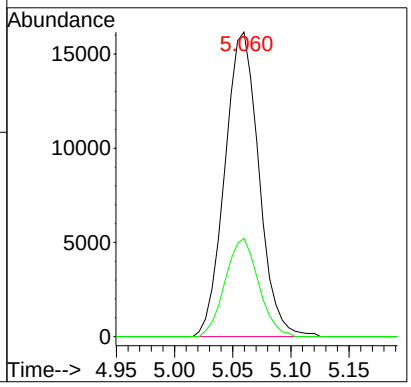


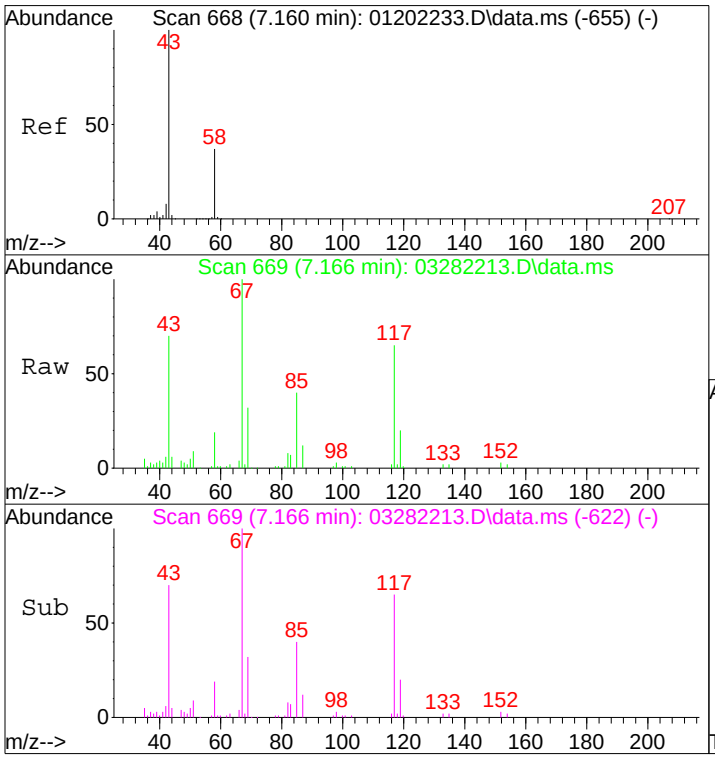



#6
Vinyl Chloride
Concen: 1.32 ng
RT: 5.06 min Scan# 286
Delta R.T. 0.000 min
Lab File: 03282213.D
Acq: 28 Mar 2022 11:47

Tgt Ion: 62 Resp: 32926

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 62 | 100 | | |
| 64 | 31.6 | 12.0 | 52.0 |

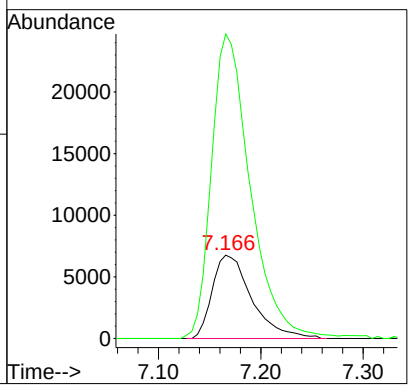


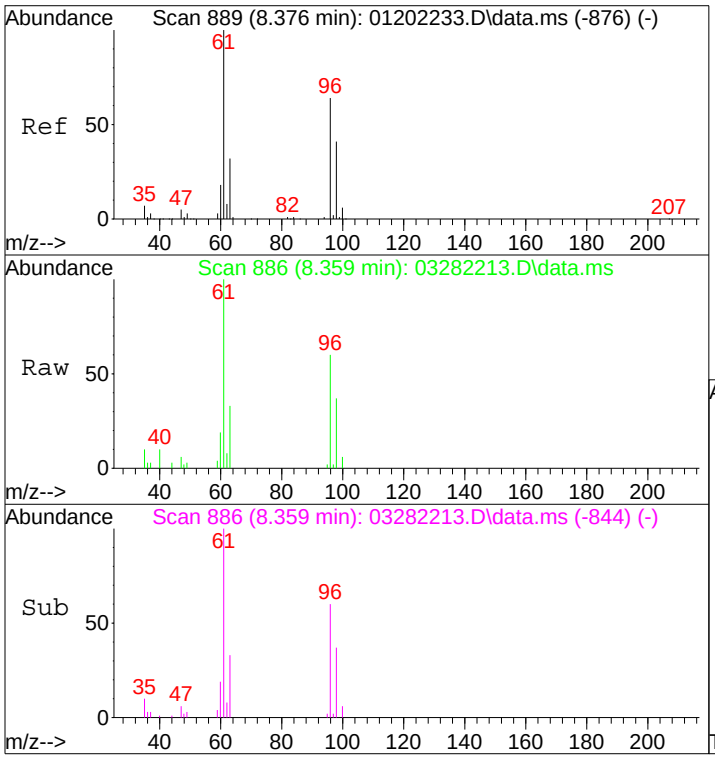




#13
Acetone
Concen: 1.45 ng
RT: 7.17 min Scan# 669
Delta R.T. 0.011 min
Lab File: 03282213.D
Acq: 28 Mar 2022 11:47

Tgt Ion: 58 Resp: 18120

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 58 | 100 | | |
| 43 | 361.3 | 253.5 | 313.5# |

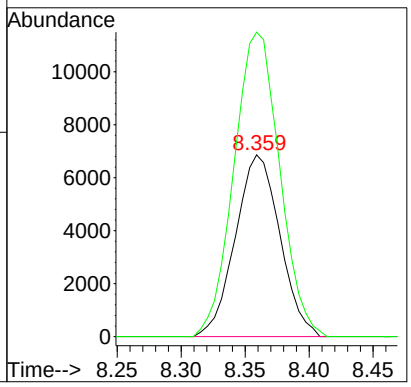


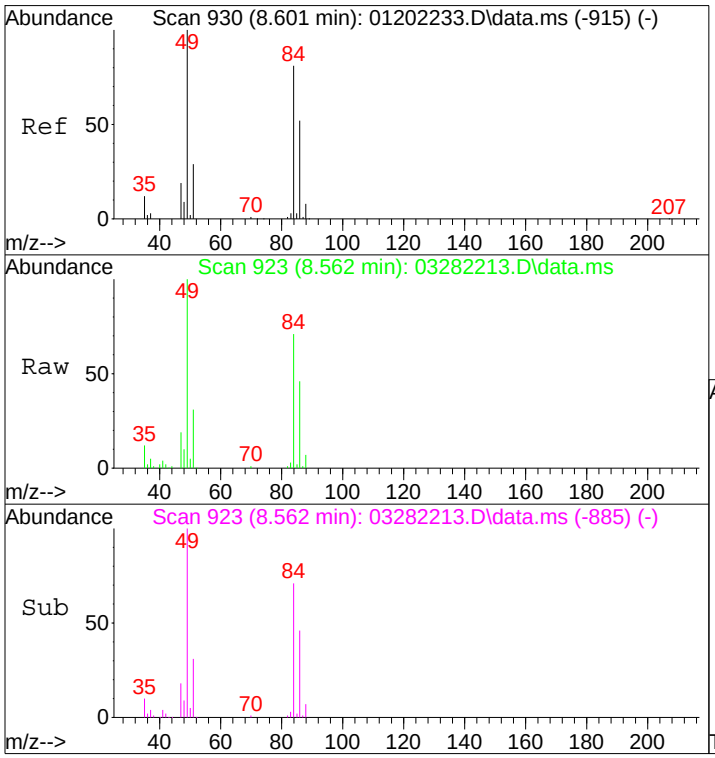



#17
1,1-Dichloroethene
Concen: 1.12 ng
RT: 8.36 min Scan# 886
Delta R.T. -0.016 min
Lab File: 03282213.D
Acq: 28 Mar 2022 11:47

Tgt Ion: 96 Resp: 16663

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 96 | 100 | | |
| 61 | 171.8 | 140.0 | 180.0 |

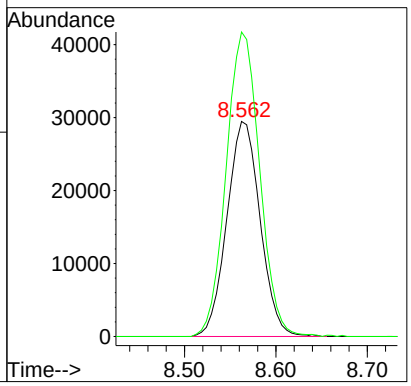


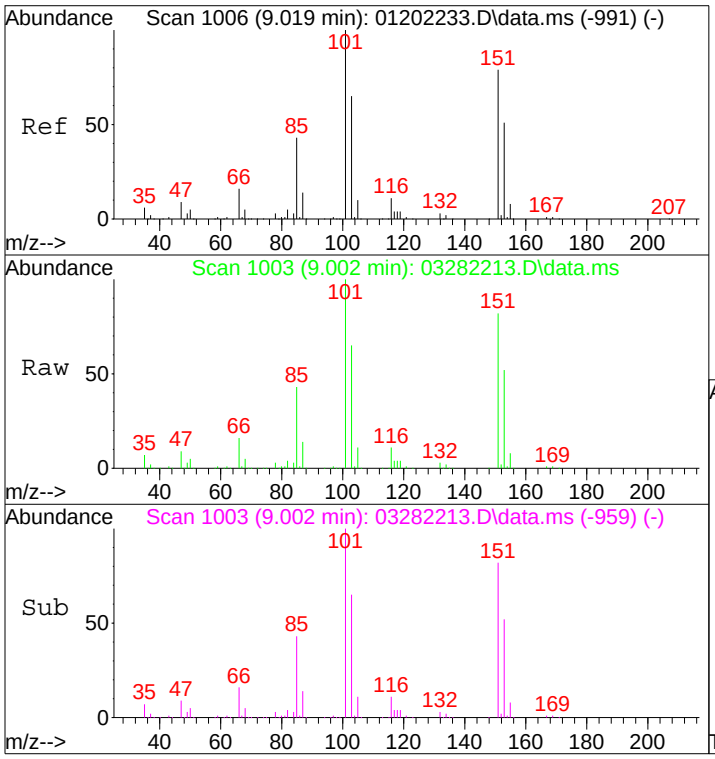




#19
Methylene Chloride
Concen: 4.56 ng
RT: 8.56 min Scan# 923
Delta R.T. -0.038 min
Lab File: 03282213.D
Acq: 28 Mar 2022 11:47

Tgt Ion: 84 Resp: 74343

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 84 | 100 | | |
| 49 | 142.7 | 102.1 | 152.1 |

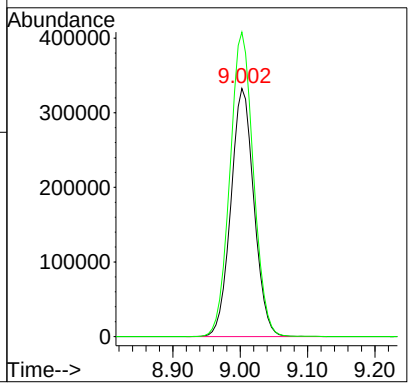


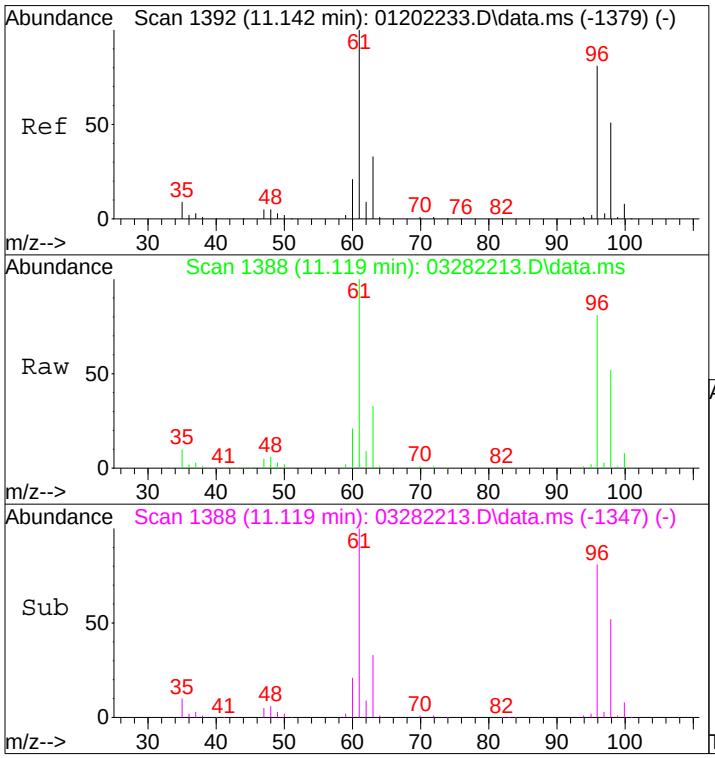



#21
Trichlorotrifluoroethane
Concen: 61.51 ng
RT: 9.00 min Scan# 1003
Delta R.T. -0.011 min
Lab File: 03282213.D
Acq: 28 Mar 2022 11:47

Tgt Ion:151 Resp: 793830

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 151 | 100 | | |
| 101 | 124.9 | 108.9 | 148.9 |

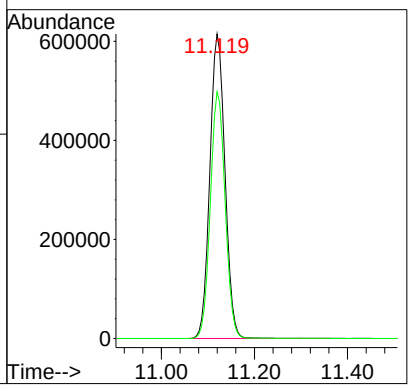


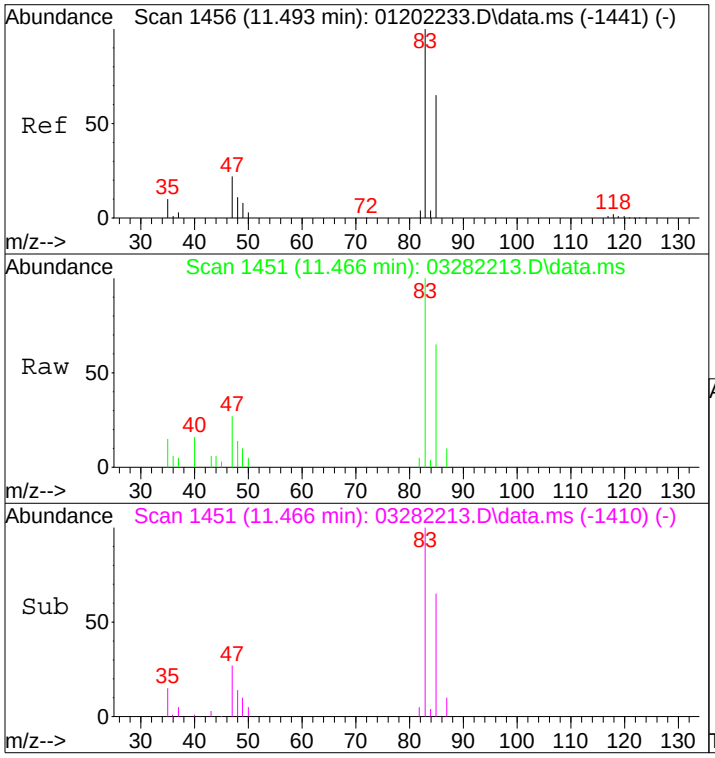




#28
cis-1,2-Dichloroethene
Concen: 64.80 ng
RT: 11.12 min Scan# 1388
Delta R.T. -0.022 min
Lab File: 03282213.D
Acq: 28 Mar 2022 11:47

Tgt Ion: 61 Resp: 1387351

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 61 | 100 | | |
| 96 | 79.3 | 59.2 | 99.2 |

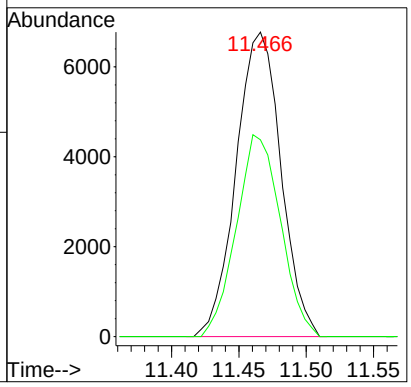


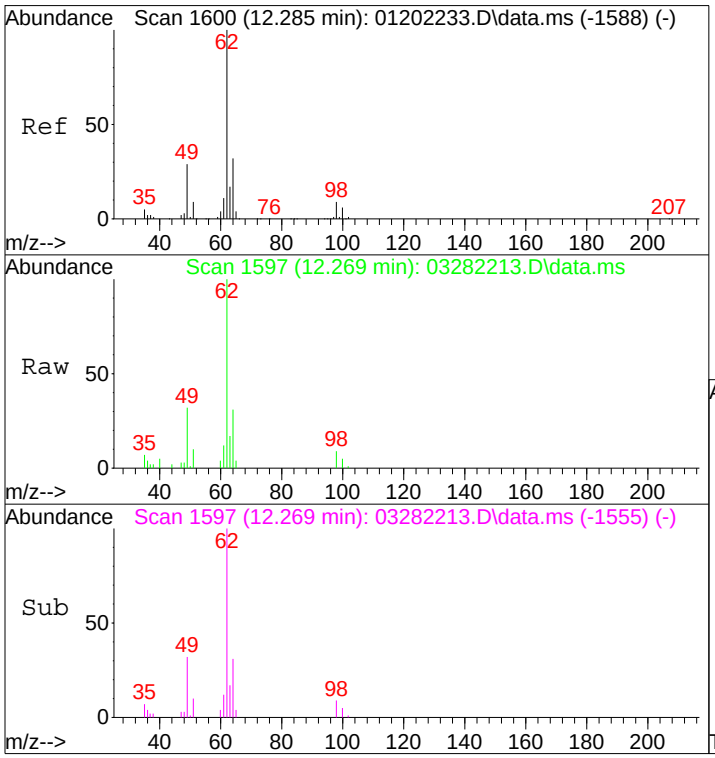



#32
Chloroform
Concen: 0.58 ng
RT: 11.47 min Scan# 1451
Delta R.T. -0.022 min
Lab File: 03282213.D
Acq: 28 Mar 2022 11:47

Tgt Ion: 83 Resp: 15708

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 83 | 100 | | |
| 85 | 65.2 | 45.2 | 85.2 |

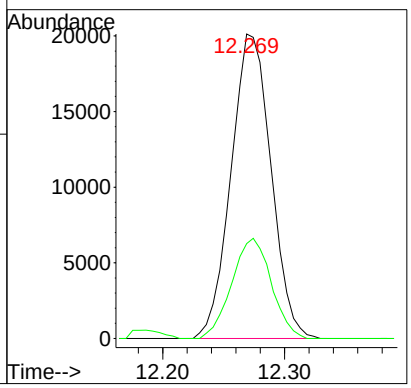


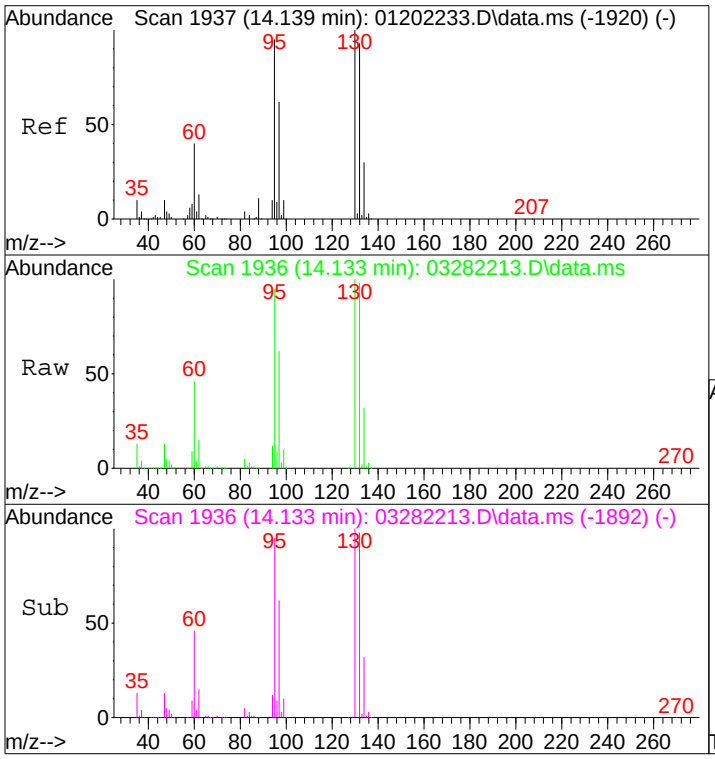




#36
1,2-Dichloroethane
Concen: 2.20 ng
RT: 12.27 min Scan# 1597
Delta R.T. -0.016 min
Lab File: 03282213.D
Acq: 28 Mar 2022 11:47

Tgt Ion: 62 Resp: 45853

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 62 | 100 | | |
| 64 | 32.5 | 12.5 | 52.5 |

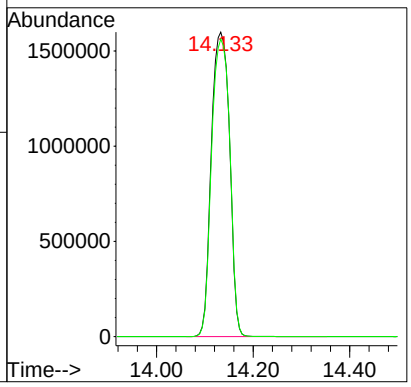





#47
Trichloroethene
Concen: 253.76 ng
RT: 14.13 min Scan# 1936
Delta R.T. -0.005 min
Lab File: 03282213.D
Acq: 28 Mar 2022 11:47

Tgt Ion:130 Resp: 4192055

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 130 | 100 | | |
| 132 | 97.9 | 72.9 | 112.9 |



Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282218.D Vial: 6
Acq On : 28 Mar 2022 14:42 Operator: TZ/MT
Sample : P2201166-002dil (15mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 29 02:22:06 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

3/29/22

| Internal Standards | R.T. | QIon | Response | Conc Units | Dev(Min) |
|---|---|---|---|---|---|
| 1) Bromochloromethane (IS1) | 11.30 | 130 | 133527 | 12.500 ng | -0.02 |
| 37) 1,4-Difluorobenzene (IS2) | 13.42 | 114 | 600112 | 12.500 ng | -0.01 |
| 56) Chlorobenzene-d5 (IS3) | 17.73 | 54 | 119202 | 12.500 ng | 0.00 |

System Monitoring Compounds

| | | | | | |
|---|---|---|---|---|---|
| 33) 1,2-Dichloroethane-d4(... | 12.15 | 65 | 231149 | 12.602 ng | -0.02 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 100.80% | | |
| 57) Toluene-d8 (SS2) | 15.88 | 98 | 612925 | 10.640 ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 85.12% | | |
| 73) Bromofluorobenzene (SS3) | 19.11 | 174 | 203817 | 11.102 ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 88.80% | | |

Target Compounds

| | | | | | Qvalue |
|---|---|---|---|---|---|
| 2) Propene | 4.22 | 42 | 184 | N.D. | |
| 3) Dichlorodifluoromethan... | 4.37 | 85 | 718 | N.D. | |
| 4) Chloromethane | 4.65 | 50 | 272 | N.D. | |
| 5) 1,2-Dichloro-1,1,2,2-t... | 0.00 | 135 | 0 | N.D. | |
| 6) Vinyl Chloride | 5.07 | 62 | 8888 | N.D. | |
| 7) 1,3-Butadiene | 0.00 | 54 | 0 | N.D. | |
| 8) Bromomethane | 0.00 | 94 | 0 | N.D. | |
| 9) Chloroethane | 0.00 | 64 | 0 | N.D. | |
| 10) Ethanol | 6.47 | 45 | 781 | N.D. | |
| 11) Acetonitrile | 0.00 | 41 | 0 | N.D. | |
| 12) Acrolein | 0.00 | 56 | 0 | N.D. | |
| 13) Acetone | 7.18 | 58 | 4716 | N.D. | |
| 14) Trichlorofluoromethane | 0.00 | 101 | 0 | N.D. | |
| 15) 2-Propanol (Isopropanol) | 7.67 | 45 | 1064 | N.D. | |
| 16) Acrylonitrile | 0.00 | 53 | 0 | N.D. | |
| 17) 1,1-Dichloroethene | 8.36 | 96 | 3978 | N.D. | |
| 18) 2-Methyl-2-Propanol (t... | 0.00 | 59 | 0 | N.D. | |
| 19) Methylene Chloride | 8.56 | 84 | 19686 | 1.200 ng | 87 |
| 20) 3-Chloro-1-propene (Al... | 0.00 | 41 | 0 | N.D. | |
| 21) Trichlorotrifluoroethane | 9.00 | 151 | 180897 | 13.944 ng | 99 |
| 22) Carbon Disulfide | 8.85 | 76 | 357 | N.D. | |
| 23) trans-1,2-Dichloroethene | 9.85 | 61 | 890 | N.D. | |
| 24) 1,1-Dichloroethane | 10.10 | 63 | 1877 | N.D. | |
| 25) Methyl tert-Butyl Ether | 0.00 | 73 | 0 | N.D. | |
| 26) Vinyl Acetate | 0.00 | 86 | 0 | N.D. | |
| 27) 2-Butanone (MEK) | 10.64 | 72 | 528 | N.D. | |
| 28) cis-1,2-Dichloroethene | 11.12 | 61 | 330110 | 15.339 ng | 95 |
| 29) Diisopropyl Ether | 11.47 | 87 | 203 | N.D. | |
| 30) Ethyl Acetate | 11.31 | 61 | 350 | N.D. | |
| 31) n-Hexane | 0.00 | 57 | 0 | N.D. | |
| 32) Chloroform | 11.46 | 83 | 4186 | N.D. | |
| 34) Tetrahydrofuran (THF) | 0.00 | 72 | 0 | N.D. | |
| 35) Ethyl tert-Butyl Ether | 0.00 | 87 | 0 | N.D. | |
| 36) 1,2-Dichloroethane | 12.27 | 62 | 12150 | 0.579 ng | 97 |
| 38) 1,1,1-Trichloroethane | 0.00 | 97 | 0 | N.D. | |
| 39) Isopropyl Acetate | 0.00 | 61 | 0 | N.D. | |
| 40) 1-Butanol | 0.00 | 56 | 0 | N.D. | |
| 41) Benzene | 13.03 | 78 | 1358 | N.D. | |
| 42) Carbon Tetrachloride | 13.20 | 117 | 1742 | N.D. | |
| 43) Cyclohexane | 13.41 | 84 | 1057 | N.D. | |
| 44) tert-Amyl Methyl Ether | 0.00 | 73 | 0 | N.D. | |
| 45) 1,2-Dichloropropane | 0.00 | 63 | 0 | N.D. | |
| 46) Bromodichloromethane | 0.00 | 83 | 0 | N.D. d | |
| 47) Trichloroethene | 14.13 | 130 | 1403020 | 84.159 ng | 94 |
| 48) 1,4-Dioxane | 14.12 | 88 | 442 | N.D. | |
| 49) 2,2,4-Trimethylpentane... | 0.00 | 57 | 0 | N.D. | |
| 50) Methyl Methacrylate | 0.00 | 100 | 0 | N.D. d | |

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282218.D Vial: 6
Acq On : 28 Mar 2022 14:42 Operator: TZ/MT
Sample : P2201166-002dil (15mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 29 02:22:06 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

| Internal Standards | R.T. | QIon | Response | Conc Units Dev(Min) |
|---|---|---|---|---|
| 51) n-Heptane | 0.00 | 71 | 0 | N.D. |
| 52) cis-1,3-Dichloropropene | 0.00 | 75 | 0 | N.D. |
| 53) 4-Methyl-2-pentanone | 0.00 | 58 | 0 | N.D. |
| 54) trans-1,3-Dichloropropene | 0.00 | 75 | 0 | N.D. |
| 55) 1,1,2-Trichloroethane | 0.00 | 97 | 0 | N.D. |
| 58) Toluene | 15.98 | 91 | 635 | N.D. |
| 59) 2-Hexanone | 16.23 | 43 | 604 | N.D. |
| 60) Dibromochloromethane | 0.00 | 129 | 0 | N.D. |
| 61) 1,2-Dibromoethane | 0.00 | 107 | 0 | N.D. |
| 62) n-Butyl Acetate | 0.00 | 43 | 0 | N.D. |
| 63) n-Octane | 0.00 | 57 | 0 | N.D. |
| 64) Tetrachloroethene | 17.12 | 166 | 784 | N.D. |
| 65) Chlorobenzene | 0.00 | 112 | 0 | N.D. |
| 66) Ethylbenzene | 0.00 | 91 | 0 | N.D. |
| 67) m- & p-Xylenes | 0.00 | 91 | 0 | N.D. |
| 68) Bromoform | 0.00 | 173 | 0 | N.D. |
| 69) Styrene | 0.00 | 104 | 0 | N.D. |
| 70) o-Xylene | 0.00 | 91 | 0 | N.D. |
| 71) n-Nonane | 0.00 | 43 | 0 | N.D. |
| 72) 1,1,2,2-Tetrachloroethane | 0.00 | 83 | 0 | N.D. |
| 74) Cumene | 19.11 | 105 | 221 | N.D. |
| 75) alpha-Pinene | 0.00 | 93 | 0 | N.D. |
| 76) n-Propylbenzene | 0.00 | 91 | 0 | N.D. |
| 77) 3-Ethyltoluene | 0.00 | 105 | 0 | N.D. |
| 78) 4-Ethyltoluene | 0.00 | 105 | 0 | N.D. |
| 79) 1,3,5-Trimethylbenzene | 0.00 | 105 | 0 | N.D. |
| 80) alpha-Methylstyrene | 0.00 | 118 | 0 | N.D. |
| 81) 2-Ethyltoluene | 0.00 | 105 | 0 | N.D. |
| 82) 1,2,4-Trimethylbenzene | 0.00 | 105 | 0 | N.D. |
| 83) n-Decane | 0.00 | 58 | 0 | N.D. |
| 84) Benzyl Chloride | 0.00 | 91 | 0 | N.D. |
| 85) 1,3-Dichlorobenzene | 0.00 | 146 | 0 | N.D. |
| 86) 1,4-Dichlorobenzene | 0.00 | 146 | 0 | N.D. |
| 87) sec-Butylbenzene | 0.00 | 105 | 0 | N.D. |
| 88) 4-Isopropyltoluene (p-... | 0.00 | 119 | 0 | N.D. |
| 89) 1,2,3-Trimethylbenzene | 0.00 | 105 | 0 | N.D. |
| 90) 1,2-Dichlorobenzene | 0.00 | 146 | 0 | N.D. |
| 91) d-Limonene | 0.00 | 68 | 0 | N.D. |
| 92) 1,2-Dibromo-3-Chloropr... | 0.00 | 157 | 0 | N.D. |
| 93) n-Undecane | 0.00 | 57 | 0 | N.D. |
| 94) 1,2,4-Trichlorobenzene | 0.00 | 180 | 0 | N.D. |
| 95) Naphthalene | 0.00 | 128 | 0 | N.D. |
| 96) n-Dodecane | 0.00 | 57 | 0 | N.D. |
| 97) Hexachlorobutadiene | 0.00 | 225 | 0 | N.D. |
| 98) Cyclohexanone | 0.00 | 55 | 0 | N.D. |
| 99) tert-Butylbenzene | 0.00 | 119 | 0 | N.D. |
| 100) n-Butylbenzene | 0.00 | 91 | 0 | N.D. |
| 101) 1,1,1,2-Tetrachloroethane | 0.00 | 131 | 0 | N.D. |

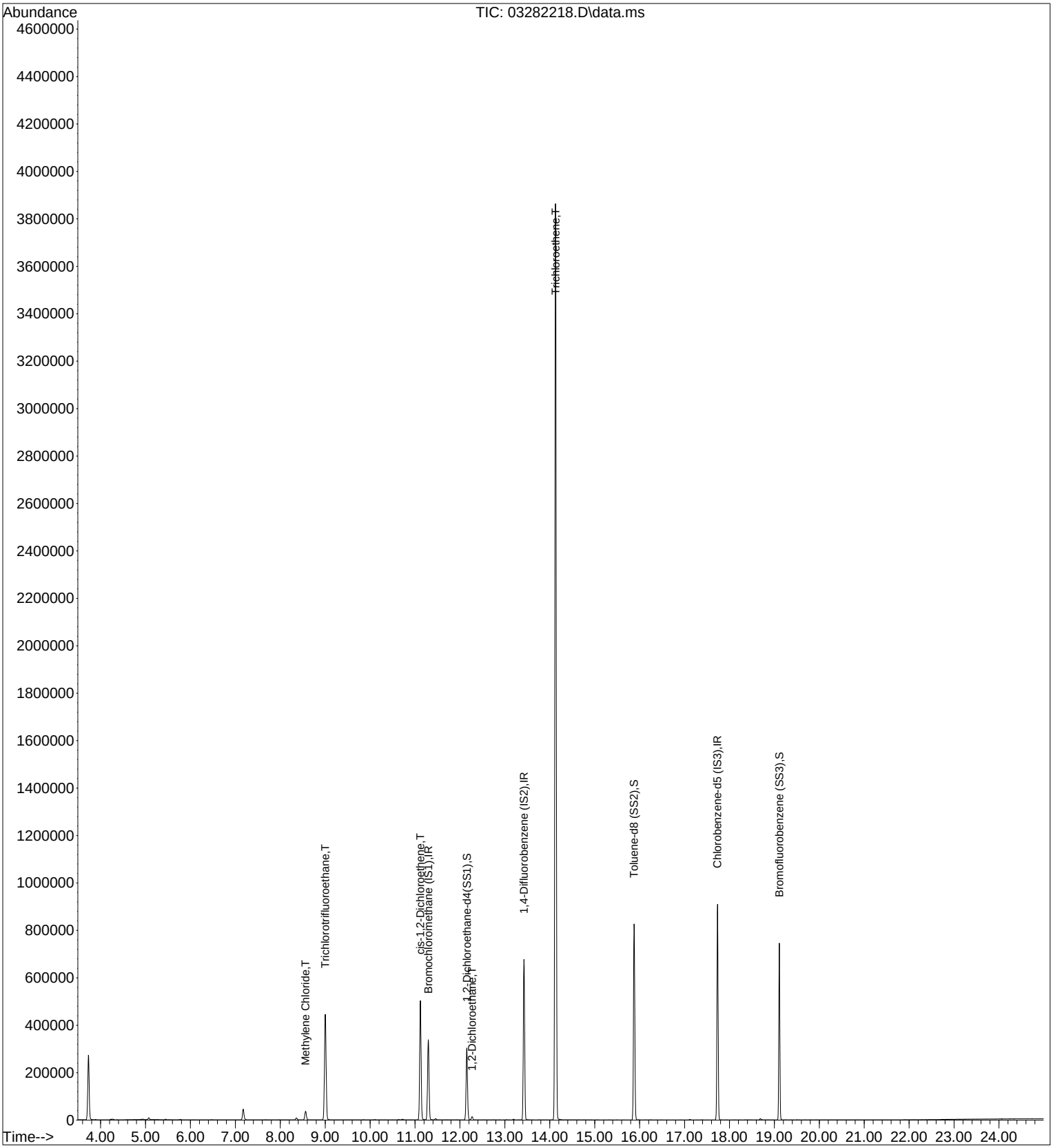
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

01118111

Data File : I:\MS16\DATA\2022 03\28\03282218.D Vial: 6
Acq On : 28 Mar 2022 14:42 Operator: TZ/MT
Sample : P2201166-002dil (15mL) Inst : GCMS-16
Misc : S35-01102201

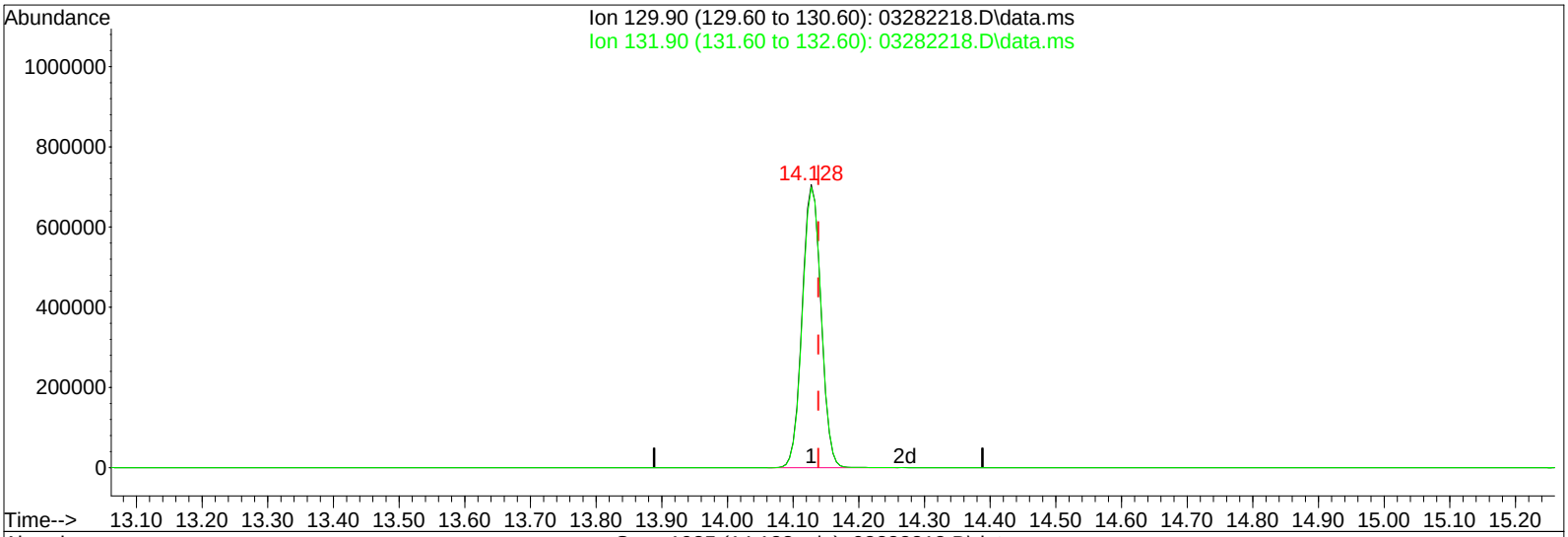
Quant Time: Mar 29 02:22:06 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

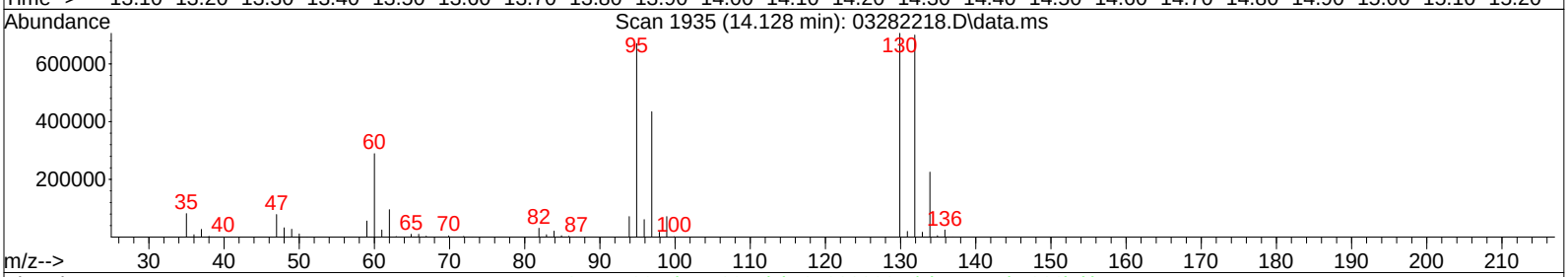


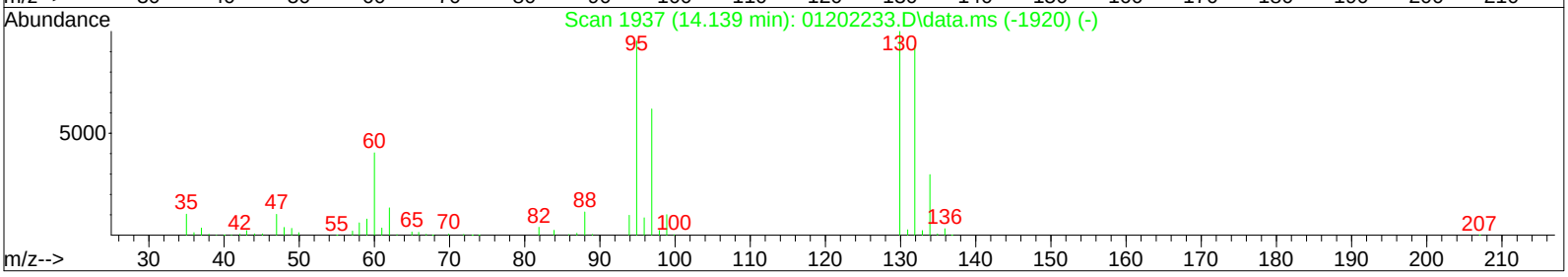
01118112

Data File : I:\MS16\DATA\2022 03\28\03282218.D  Vial: 6
Acq On : 28 Mar 2022 14:42  Operator: TZ/MT
Sample : P2201166-002dil (15mL)  Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 28 15:09:23 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M




TIC: 03282218.D\data.ms

(47) Trichloroethene (T)

14.128min (-0.011) 84.16ng

response 1403020

| Ion | Exp% | Act% |
|---|---|---|
| 129.90 | 100 | 100 |
| 131.90 | 92.90 | 99.07 |
| 0.00 | 0.00 | 0.00 |
| 0.00 | 0.00 | 0.00 |

Quantitation Report (QT Reviewed)

01118113

Data File : I:\MS16\DATA\2022 03\28\03282214.D Vial: 7
Acq On : 28 Mar 2022 12:21 Operator: TZ/MT
Sample : P2201166-003 (1000mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 29 02:14:02 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

3/29/22

| Internal Standards | R.T. | QIon | Response | Conc Units | Dev(Min) |
|---|---|---|---|---|---|
| 1) Bromochloromethane (IS1) | 11.31 | 130 | 135831 | 12.500 ng | -0.01 |
| 37) 1,4-Difluorobenzene (IS2) | 13.43 | 114 | 629992 | 12.500 ng | 0.00 |
| 56) Chlorobenzene-d5 (IS3) | 17.73 | 54 | 128662 | 12.500 ng | 0.00 |
| **System Monitoring Compounds** | | | | | |
| 33) 1,2-Dichloroethane-d4(... | 12.16 | 65 | 235764 | 12.636 ng | -0.01 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 101.12% | | |
| 57) Toluene-d8 (SS2) | 15.88 | 98 | 692059 | 11.131 ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 89.04% | | |
| 73) Bromofluorobenzene (SS3) | 19.11 | 174 | 244904 | 12.359 ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 98.88% | | |

| Target Compounds | | | | | Qvalue |
|---|---|---|---|---|---|
| 2) Propene | 4.19 | 42 | 2921676 | 141.199 ng | 100 |
| 3) Dichlorodifluoromethan... | 4.34 | 85 | 56717 | 1.659 ng | 100 |
| 4) Chloromethane | 4.63 | 50 | 9692 | N.D. | |
| 5) 1,2-Dichloro-1,1,2,2-t... | 4.90 | 135 | 1521 | N.D. | |
| 6) Vinyl Chloride | 0.00 | 62 | 0 | N.D. | |
| 7) 1,3-Butadiene | 5.32 | 54 | 588 | N.D. | |
| 8) Bromomethane | 5.77 | 94 | 113 | N.D. | |
| 9) Chloroethane | 0.00 | 64 | 0 | N.D. | |
| 10) Ethanol | 6.51 | 45 | 1792652 | 140.127 ng | 100 |
| 11) Acetonitrile | 6.74 | 41 | 12927 | N.D. | |
| 12) Acrolein | 6.93 | 56 | 3858 | N.D. | |
| 13) Acetone | 7.14 | 58 | 1493265 | 116.673 ng | 85 |
| 14) Trichlorofluoromethane | 7.39 | 101 | 27480 | 0.945 ng | 100 |
| 15) 2-Propanol (Isopropanol) | 7.67 | 45 | 9123295 | 209.132 ng | 99 |
| 16) Acrylonitrile | 7.91 | 53 | 468 | N.D. | |
| 17) 1,1-Dichloroethene | 0.00 | 96 | 0 | N.D. | |
| 18) 2-Methyl-2-Propanol (t... | 8.57 | 59 | 4641 | N.D. | |
| 19) Methylene Chloride | 8.58 | 84 | 195916 | 11.742 ng | 89 |
| 20) 3-Chloro-1-propene (Al... | 8.67 | 41 | 6920 | N.D. | |
| 21) Trichlorotrifluoroethane | 9.00 | 151 | 7454 | 0.565 ng | 97 |
| 22) Carbon Disulfide | 8.85 | 76 | 7260 | N.D. | |
| 23) trans-1,2-Dichloroethene | 0.00 | 61 | 0 | N.D. | |
| 24) 1,1-Dichloroethane | 10.15 | 63 | 532 | N.D. | |
| 25) Methyl tert-Butyl Ether | 10.24 | 73 | 241 | N.D. | |
| 26) Vinyl Acetate | 0.00 | 86 | 0 | N.D. d | |
| 27) 2-Butanone (MEK) | 10.61 | 72 | 20733 | 1.760 ng # | 62 |
| 28) cis-1,2-Dichloroethene | 11.13 | 61 | 5104 | N.D. | |
| 29) Diisopropyl Ether | 0.00 | 87 | 0 | N.D. d | |
| 30) Ethyl Acetate | 11.43 | 61 | 468449 | 77.525 ng | 83 |
| 31) n-Hexane | 11.42 | 57 | 135070 | 5.888 ng | 97 |
| 32) Chloroform | 11.47 | 83 | 2934 | N.D. | |
| 34) Tetrahydrofuran (THF) | 11.89 | 72 | 10105 | 0.940 ng # | 66 |
| 35) Ethyl tert-Butyl Ether | 0.00 | 87 | 0 | N.D. | |
| 36) 1,2-Dichloroethane | 12.28 | 62 | 3426 | N.D. | |
| 38) 1,1,1-Trichloroethane | 0.00 | 97 | 0 | N.D. | |
| 39) Isopropyl Acetate | 13.00 | 61 | 471 | No Calib # | |
| 40) 1-Butanol | 13.00 | 56 | 16274 | No Calib # | |
| 41) Benzene | 13.03 | 78 | 72419 | 1.106 ng | 99 |
| 42) Carbon Tetrachloride | 13.20 | 117 | 6038 | N.D. | |
| 43) Cyclohexane | 13.33 | 84 | 21661 | 0.900 ng | 86 |
| 44) tert-Amyl Methyl Ether | 0.00 | 73 | 0 | N.D. | |
| 45) 1,2-Dichloropropane | 13.89 | 63 | 116 | N.D. | |
| 46) Bromodichloromethane | 14.10 | 83 | 2264 | N.D. | |
| 47) Trichloroethene | 14.13 | 130 | 18086 | 1.033 ng | 93 |
| 48) 1,4-Dioxane | 0.00 | 88 | 0 | N.D. | |
| 49) 2,2,4-Trimethylpentane... | 14.20 | 57 | 126109 | 1.987 ng | 84 |
| 50) Methyl Methacrylate | 14.33 | 100 | 96637 | 14.201 ng # | 81 |

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282214.D Vial: 7
Acq On : 28 Mar 2022 12:21 Operator: TZ/MT
Sample : P2201166-003 (1000mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 29 02:14:02 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

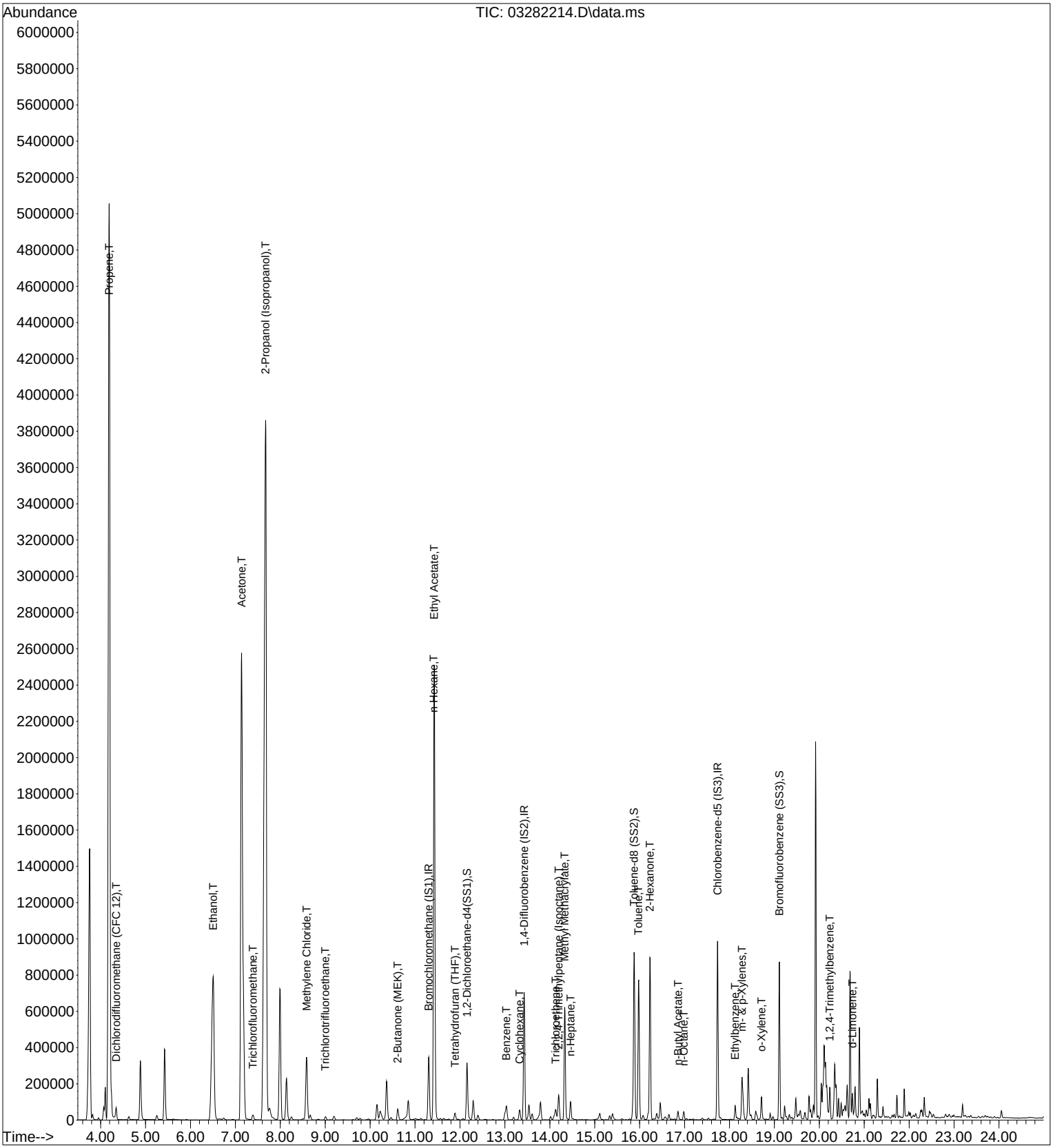
| Internal Standards | R.T. | QIon | Response | Conc Units | Dev(Min) |
|---|---|---|---|---|---|
| 51) n-Heptane | 14.46 | 71 | 23413 | 1.440 ng | 92 |
| 52) cis-1,3-Dichloropropene | 0.00 | 75 | 0 | N.D. | |
| 53) 4-Methyl-2-pentanone | 15.03 | 58 | 1176 | N.D. | |
| 54) trans-1,3-Dichloropropene | 0.00 | 75 | 0 | N.D. | |
| 55) 1,1,2-Trichloroethane | 0.00 | 97 | 0 | N.D. | |
| 58) Toluene | 15.97 | 91 | 603647 | 8.028 ng | 99 |
| 59) 2-Hexanone | 16.23 | 43 | 32653 | 0.769 ng | 100 |
| 60) Dibromochloromethane | 0.00 | 129 | 0 | N.D. | |
| 61) 1,2-Dibromoethane | 0.00 | 107 | 0 | N.D. | |
| 62) n-Butyl Acetate | 16.85 | 43 | 34801 | 0.749 ng | 97 |
| 63) n-Octane | 16.98 | 57 | 8249 | 0.549 ng | 85 |
| 64) Tetrachloroethene | 17.12 | 166 | 1410 | N.D. | |
| 65) Chlorobenzene | 17.80 | 112 | 830 | N.D. | |
| 66) Ethylbenzene | 18.13 | 91 | 58589 | 0.700 ng | 97 |
| 67) m- & p-Xylenes | 18.28 | 91 | 173796 | 2.730 ng | 97 |
| 68) Bromoform | 0.00 | 173 | 0 | N.D. | |
| 69) Styrene | 18.61 | 104 | 6619 | N.D. | |
| 70) o-Xylene | 18.71 | 91 | 66614 | 1.040 ng | 97 |
| 71) n-Nonane | 18.91 | 43 | 12493 | N.D. | |
| 72) 1,1,2,2-Tetrachloroethane | 18.72 | 83 | 388 | N.D. | |
| 74) Cumene | 19.24 | 105 | 6032 | N.D. | |
| 75) alpha-Pinene | 19.58 | 93 | 13688 | N.D. | |
| 76) n-Propylbenzene | 19.68 | 91 | 21818 | N.D. | |
| 77) 3-Ethyltoluene | 19.81 | 105 | 21807 | No Calib | |
| 78) 4-Ethyltoluene | 19.81 | 105 | 21807 | N.D. | |
| 79) 1,3,5-Trimethylbenzene | 19.87 | 105 | 18621 | N.D. | |
| 80) alpha-Methylstyrene | 19.81 | 118 | 248 | No Calib # | |
| 81) 2-Ethyltoluene | 19.87 | 105 | 18621 | No Calib | |
| 82) 1,2,4-Trimethylbenzene | 20.23 | 105 | 79408 | 1.252 ng | 87 |
| 83) n-Decane | 20.23 | 58 | 2648 | No Calib # | |
| 84) Benzyl Chloride | 20.34 | 91 | 836 | N.D. | |
| 85) 1,3-Dichlorobenzene | 20.42 | 146 | 8333 | N.D. | |
| 86) 1,4-Dichlorobenzene | 20.42 | 146 | 8333 | N.D. | |
| 87) sec-Butylbenzene | 20.47 | 105 | 2330 | N.D. | |
| 88) 4-Isopropyltoluene (p-... | 20.61 | 119 | 8395 | N.D. | |
| 89) 1,2,3-Trimethylbenzene | 20.56 | 105 | 477 | No Calib # | |
| 90) 1,2-Dichlorobenzene | 0.00 | 146 | 0 | N.D. | |
| 91) d-Limonene | 20.74 | 68 | 32025 | 1.411 ng | 93 |
| 92) 1,2-Dibromo-3-Chloropr... | 0.00 | 157 | 0 | N.D. | |
| 93) n-Undecane | 22.25 | 57 | 5378 | No Calib # | |
| 94) 1,2,4-Trichlorobenzene | 0.00 | 180 | 0 | N.D. | |
| 95) Naphthalene | 22.34 | 128 | 14720 | N.D. | |
| 96) n-Dodecane | 22.34 | 57 | 24565 | No Calib # | |
| 97) Hexachlorobutadiene | 0.00 | 225 | 0 | N.D. | |
| 98) Cyclohexanone | 18.27 | 55 | 1057 | No Calib # | |
| 99) tert-Butylbenzene | 20.23 | 119 | 9643 | N.D. | |
| 100) n-Butylbenzene | 20.97 | 91 | 8786 | N.D. | |
| 101) 1,1,1,2-Tetrachloroethane | 0.00 | 131 | 0 | N.D. | |

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282214.D Vial: 7
Acq On : 28 Mar 2022 12:21 Operator: TZ/MT
Sample : P2201166-003 (1000mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 29 02:14:02 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282214.D Vial: 7
Acq On : 28 Mar 2022 12:21 Operator: TZ/MT
Sample : P2201166-003 (1000mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 29 02:14:02 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

3/29/22

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) Bromochloromethane (IS1) | 11.31 | 130 | 135831 | 12.500 | ng | -0.01 |
| 37) 1,4-Difluorobenzene (IS2) | 13.43 | 114 | 629992 | 12.500 | ng | 0.00 |
| 56) Chlorobenzene-d5 (IS3) | 17.73 | 54 | 128662 | 12.500 | ng | 0.00 |

System Monitoring Compounds

| | | | | | | |
|---|---|---|---|---|---|---|
| 33) 1,2-Dichloroethane-d4(... | 12.16 | 65 | 235764 | 12.636 | ng | -0.01 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 101.12% | | | |
| 57) Toluene-d8 (SS2) | 15.88 | 98 | 692059 | 11.131 | ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 89.04% | | | |
| 73) Bromofluorobenzene (SS3) | 19.11 | 174 | 244904 | 12.359 | ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 98.88% | | | |

Target Compounds

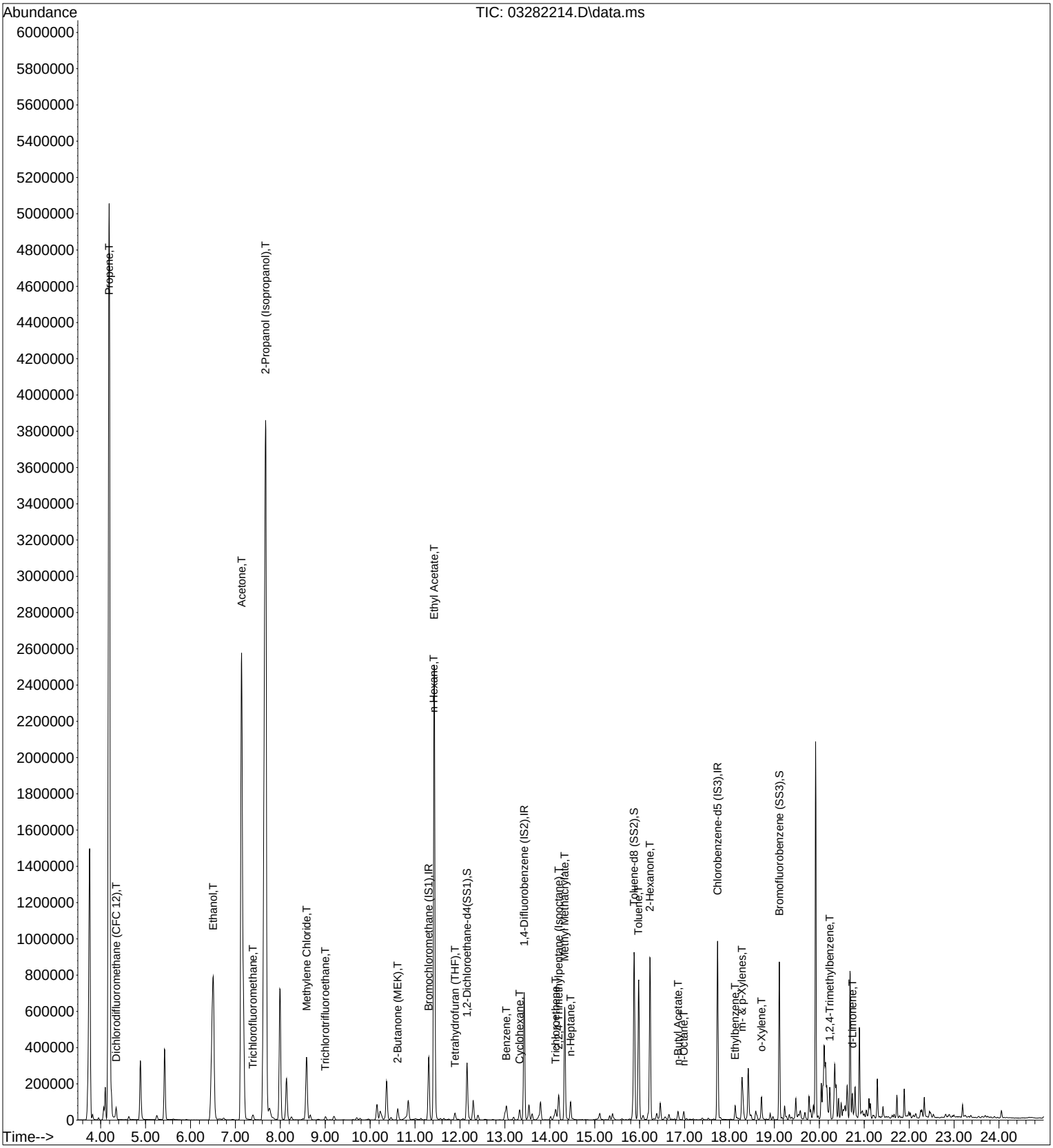
| | | | | | | | Qvalue |
|---|---|---|---|---|---|---|---|
| 2) Propene | 4.19 | 42 | 2921676 | 141.199 | ng | | 100 |
| 3) Dichlorodifluoromethan... | 4.34 | 85 | 56717 | 1.659 | ng | | 100 |
| 10) Ethanol | 6.51 | 45 | 1792652 | 140.127 | ng | | 100 |
| 13) Acetone | 7.14 | 58 | 1493265 | 116.673 | ng | | 85 |
| 14) Trichlorofluoromethane | 7.39 | 101 | 27480 | 0.945 | ng | | 100 |
| 15) 2-Propanol (Isopropanol) | 7.67 | 45 | 9123295 | 209.132 | ng | | 99 |
| 19) Methylene Chloride | 8.58 | 84 | 195916 | 11.742 | ng | | 89 |
| 21) Trichlorotrifluoroethane | 9.00 | 151 | 7454 | 0.565 | ng | | 97 |
| 27) 2-Butanone (MEK) | 10.61 | 72 | 20733 | 1.760 | ng | # | 62 |
| 30) Ethyl Acetate | 11.43 | 61 | 468449 | 77.525 | ng | | 83 |
| 31) n-Hexane | 11.42 | 57 | 135070 | 5.888 | ng | | 97 |
| 34) Tetrahydrofuran (THF) | 11.89 | 72 | 10105 | 0.940 | ng | # | 66 |
| 41) Benzene | 13.03 | 78 | 72419 | 1.106 | ng | | 99 |
| 43) Cyclohexane | 13.33 | 84 | 21661 | 0.900 | ng | | 86 |
| 47) Trichloroethene | 14.13 | 130 | 18086 | 1.033 | ng | | 93 |
| 49) 2,2,4-Trimethylpentane... | 14.20 | 57 | 126109 | 1.987 | ng | | 84 |
| 50) Methyl Methacrylate | 14.33 | 100 | 96637 | 14.201 | ng | # | 81 |
| 51) n-Heptane | 14.46 | 71 | 23413 | 1.440 | ng | | 92 |
| 58) Toluene | 15.97 | 91 | 603647 | 8.028 | ng | | 99 |
| 59) 2-Hexanone | 16.23 | 43 | 32653 | 0.769 | ng | | 100 |
| 62) n-Butyl Acetate | 16.85 | 43 | 34801 | 0.749 | ng | | 97 |
| 63) n-Octane | 16.98 | 57 | 8249 | 0.549 | ng | | 85 |
| 66) Ethylbenzene | 18.13 | 91 | 58589 | 0.700 | ng | | 97 |
| 67) m- & p-Xylenes | 18.28 | 91 | 173796 | 2.730 | ng | | 97 |
| 70) o-Xylene | 18.71 | 91 | 66614 | 1.040 | ng | | 97 |
| 82) 1,2,4-Trimethylbenzene | 20.23 | 105 | 79408 | 1.252 | ng | | 87 |
| 91) d-Limonene | 20.74 | 68 | 32025 | 1.411 | ng | | 93 |

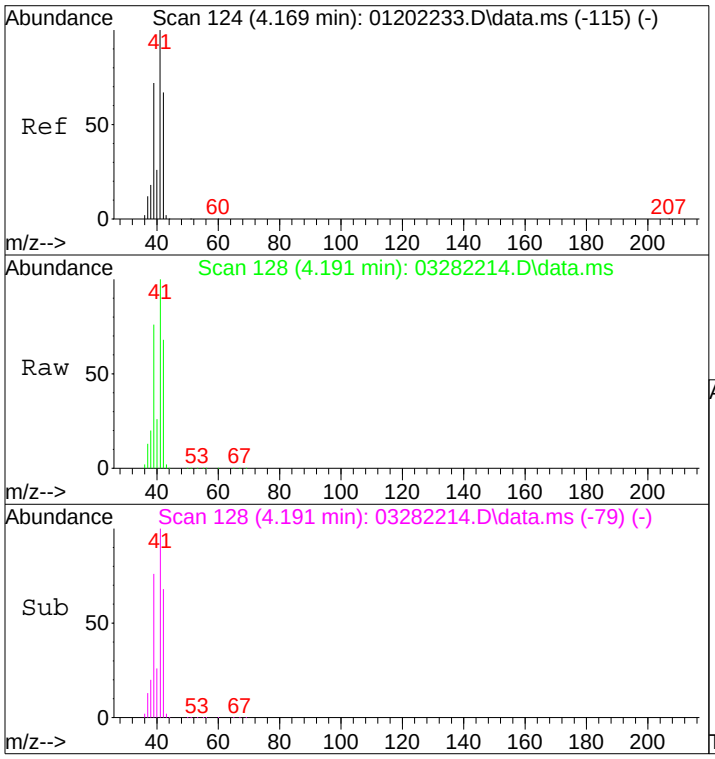
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282214.D Vial: 7
Acq On : 28 Mar 2022 12:21 Operator: TZ/MT
Sample : P2201166-003 (1000mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 29 02:14:02 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

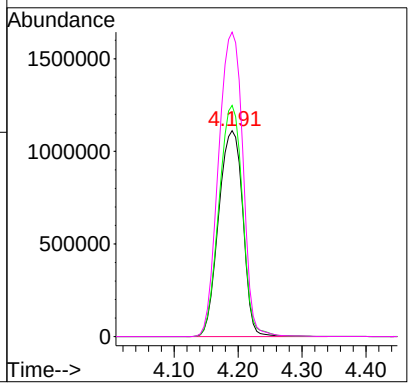


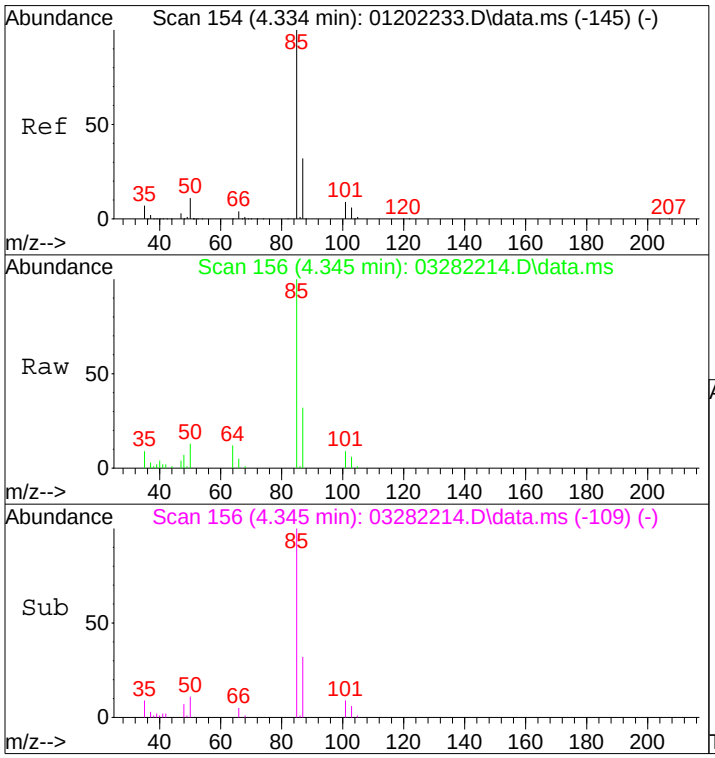



#2
Propene
Concen: 141.20 ng
RT: 4.19 min Scan# 128
Delta R.T. 0.022 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion: 42 Resp: 2921676

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 42 | 100 | | |
| 39 | 109.8 | 89.5 | 129.5 |
| 41 | 148.7 | 129.4 | 169.4 |

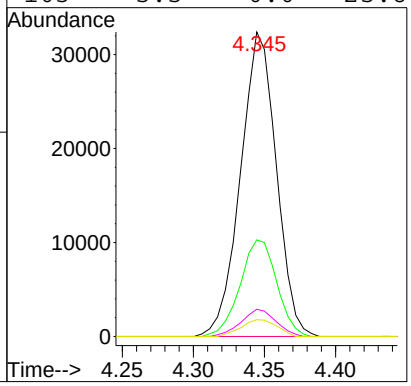


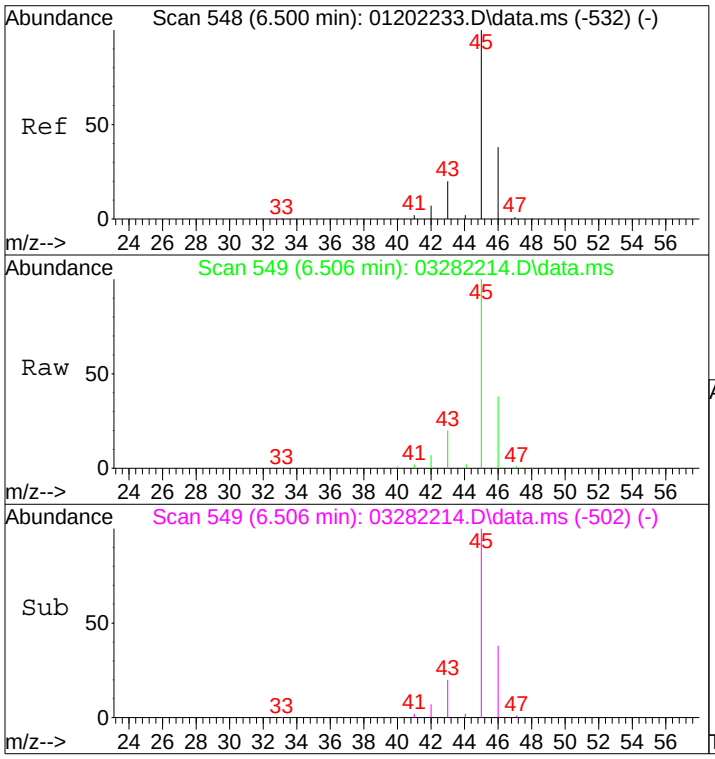




#3
Dichlorodifluoromethane (CFC 12)
Concen: 1.66 ng
RT: 4.34 min Scan# 156
Delta R.T. 0.011 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion: 85 Resp: 56717

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 85 | 100 | | |
| 87 | 32.5 | 12.6 | 52.6 |
| 101 | 8.7 | 0.0 | 29.1 |
| 103 | 5.5 | 0.0 | 25.8 |

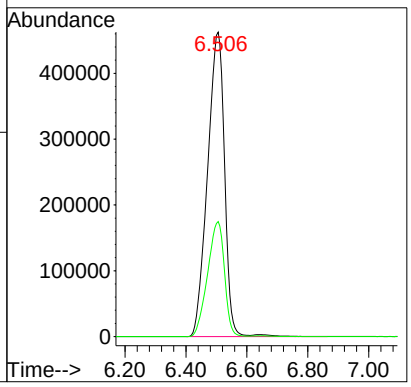


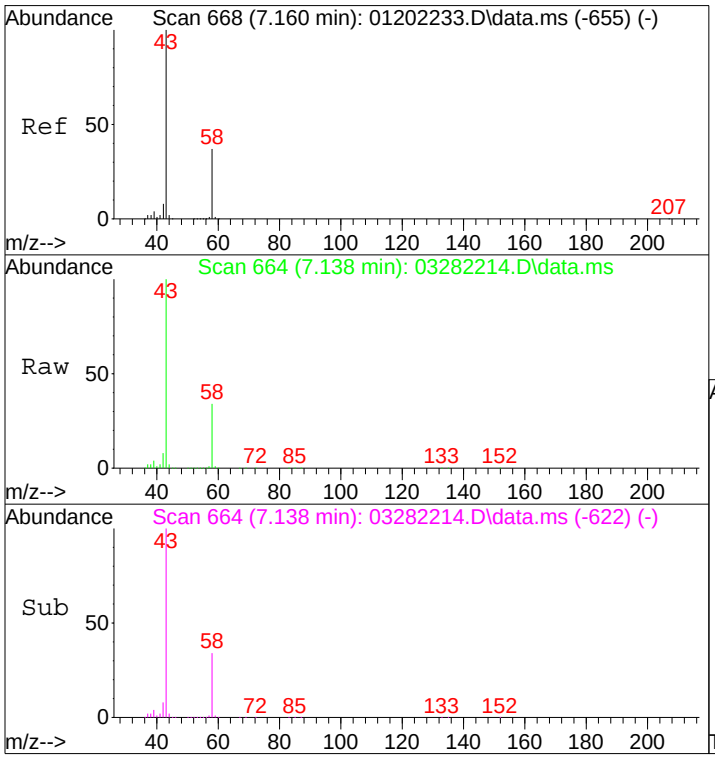



#10
Ethanol
Concen: 140.13 ng
RT: 6.51 min Scan# 549
Delta R.T. 0.011 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion: 45 Resp: 1792652

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 45 | 100 | | |
| 46 | 37.7 | 17.6 | 57.6 |

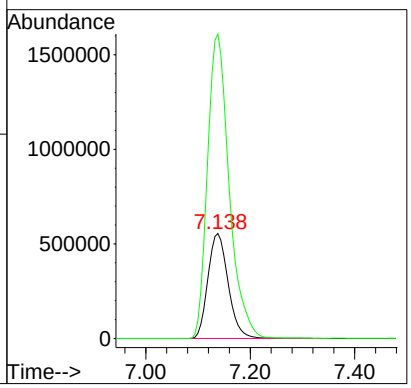


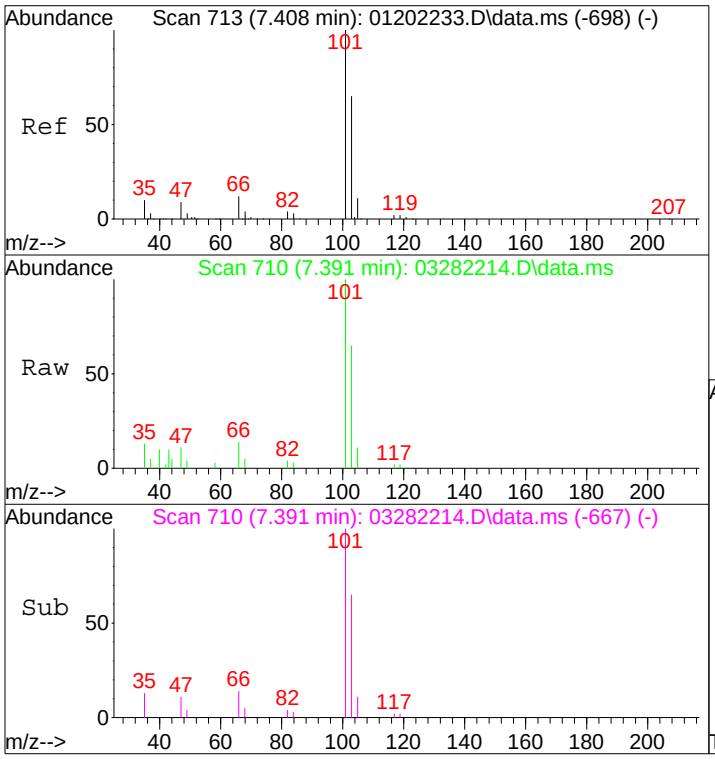




#13
Acetone
Concen: 116.67 ng
RT: 7.14 min Scan# 664
Delta R.T. -0.017 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion: 58 Resp: 1493265

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 58 | 100 | | |
| 43 | 311.3 | 253.5 | 313.5 |

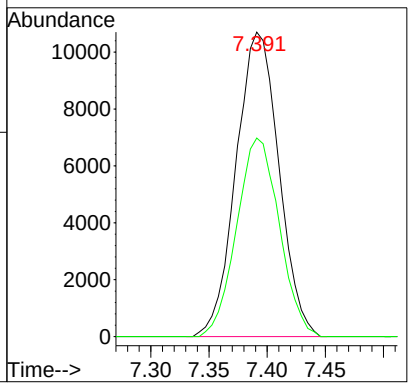


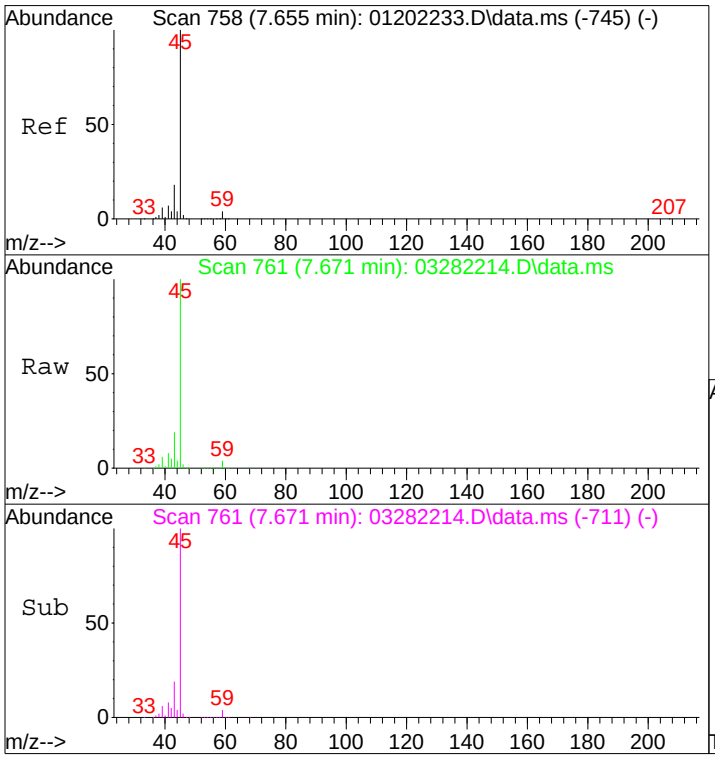



#14
Trichlorofluoromethane
Concen: 0.95 ng
RT: 7.39 min Scan# 710
Delta R.T. -0.011 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion:101 Resp: 27480

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 101 | 100 | | |
| 103 | 64.8 | 45.0 | 85.0 |

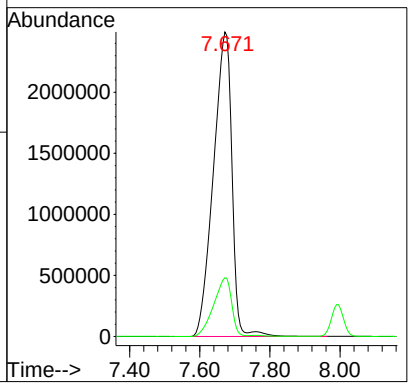


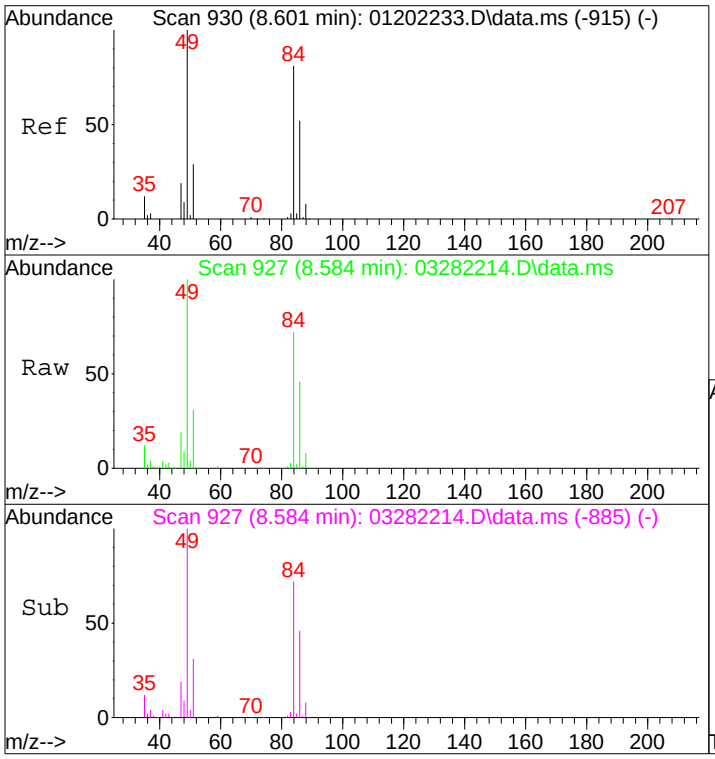




#15
2-Propanol (Isopropanol)
Concen: 209.13 ng
RT: 7.67 min Scan# 761
Delta R.T. 0.022 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion: 45 Resp: 9123295

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 45 | 100 | | |
| 43 | 19.0 | 0.0 | 38.6 |

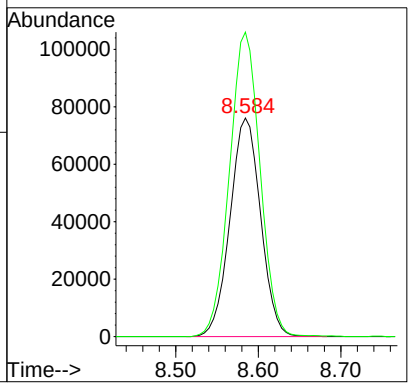


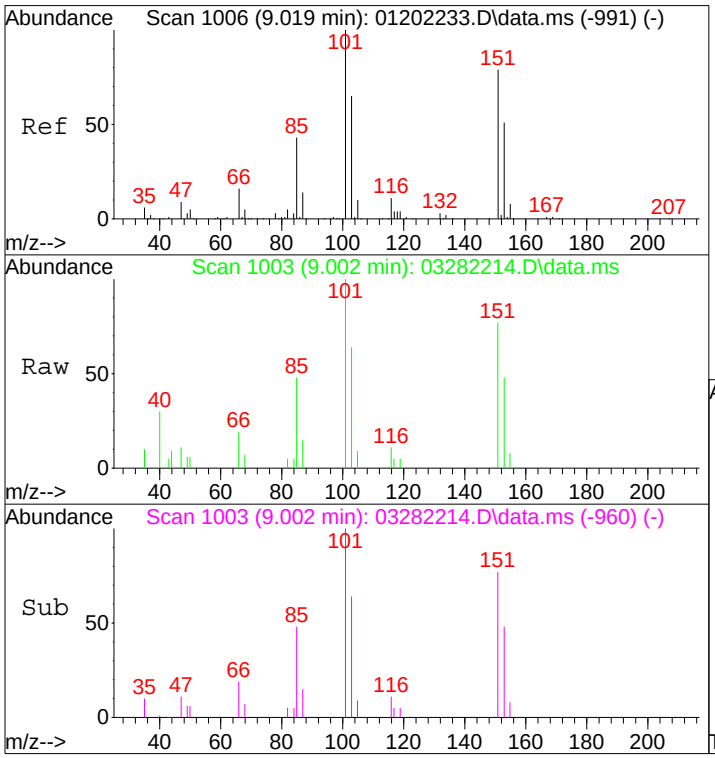



#19
Methylene Chloride
Concen: 11.74 ng
RT: 8.58 min Scan# 927
Delta R.T. -0.017 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion: 84 Resp: 195916

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 84 | 100 | | |
| 49 | 139.6 | 102.1 | 152.1 |

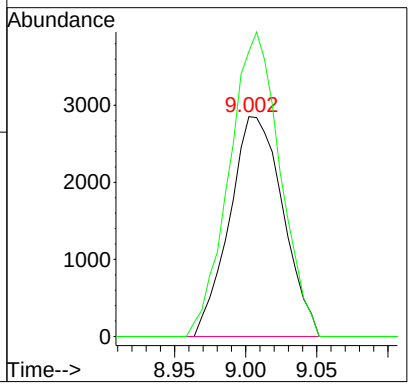


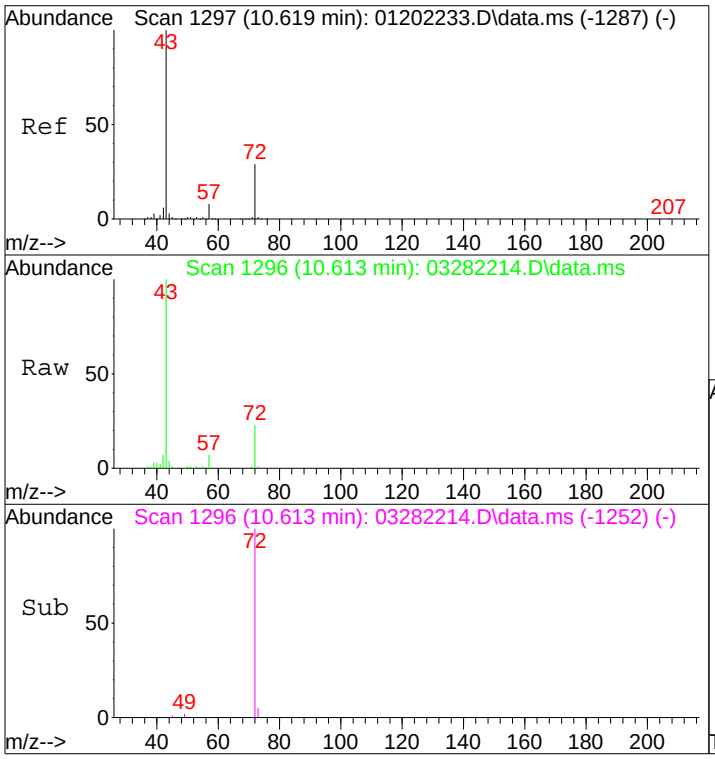




#21
Trichlorotrifluoroethane
Concen: 0.56 ng
RT: 9.00 min Scan# 1003
Delta R.T. -0.011 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion:151 Resp: 7454

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 151 | 100 | | |
| 101 | 132.3 | 108.9 | 148.9 |

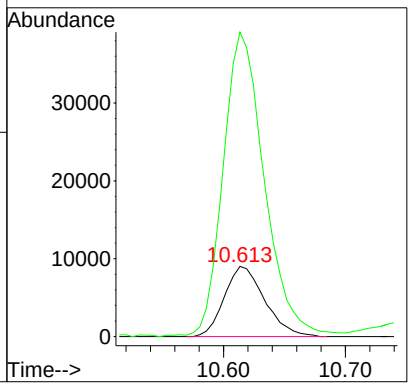


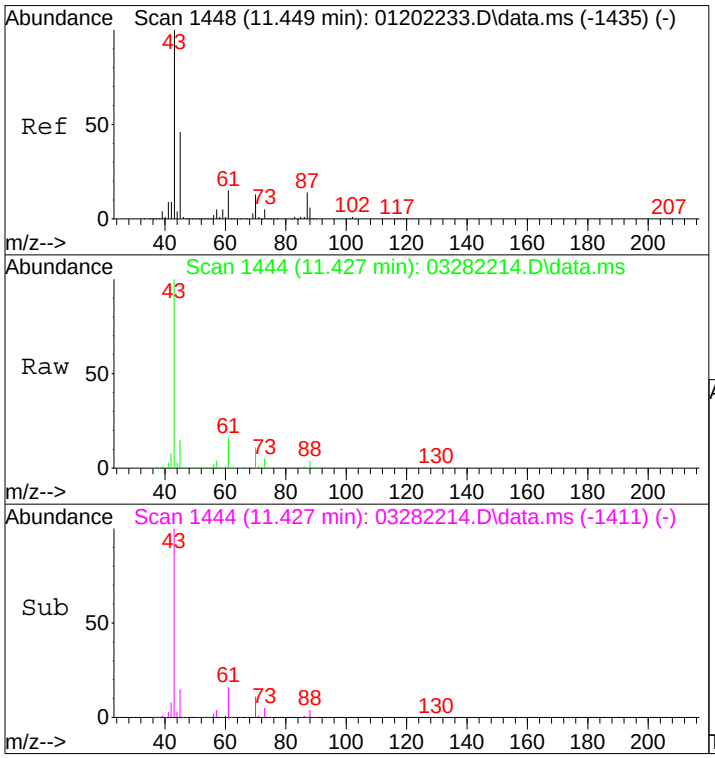



#27
2-Butanone (MEK)
Concen: 1.76 ng
RT: 10.61 min Scan# 1296
Delta R.T. -0.006 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion: 72 Resp: 20733

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 72 | 100 | | |
| 43 | 443.8 | 339.3 | 379.3# |

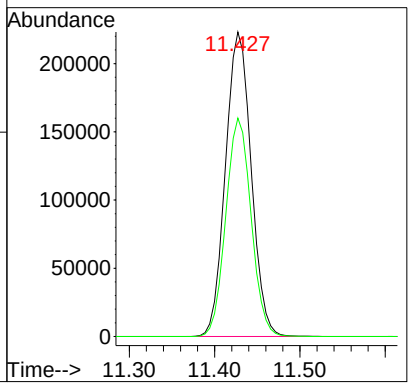


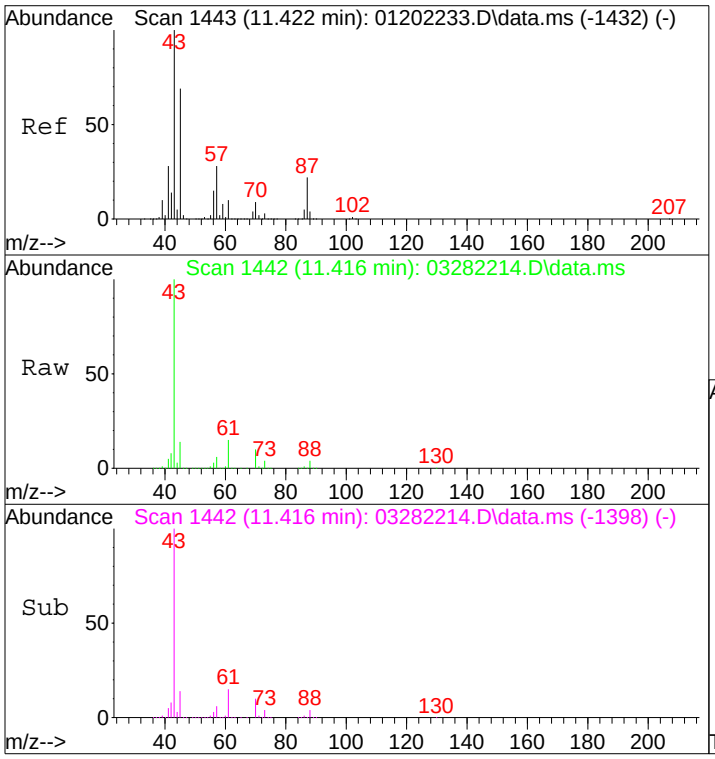




#30
Ethyl Acetate
Concen: 77.52 ng
RT: 11.43 min Scan# 1444
Delta R.T. -0.017 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion: 61 Resp: 468449

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 61 | 100 | | |
| 70 | 70.4 | 66.4 | 106.4 |

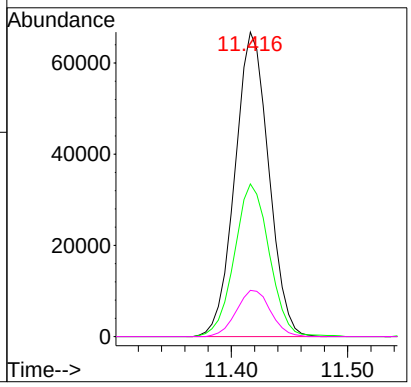


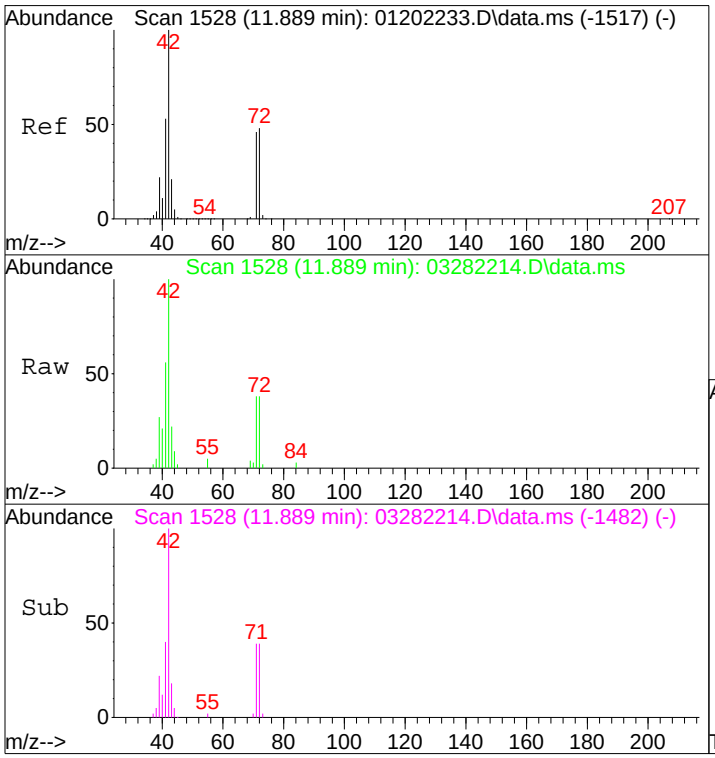



#31
n-Hexane
Concen: 5.89 ng
RT: 11.42 min Scan# 1442
Delta R.T. -0.006 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion: 57 Resp: 135070

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 57 | 100 | | |
| 56 | 51.8 | 41.0 | 61.6 |
| 86 | 15.4 | 15.3 | 22.9 |

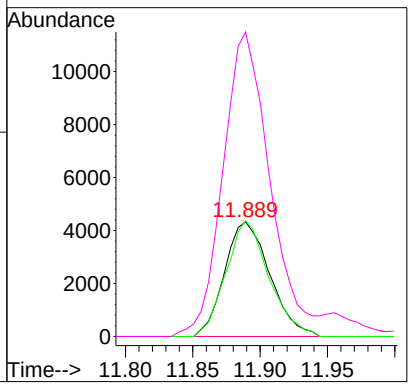


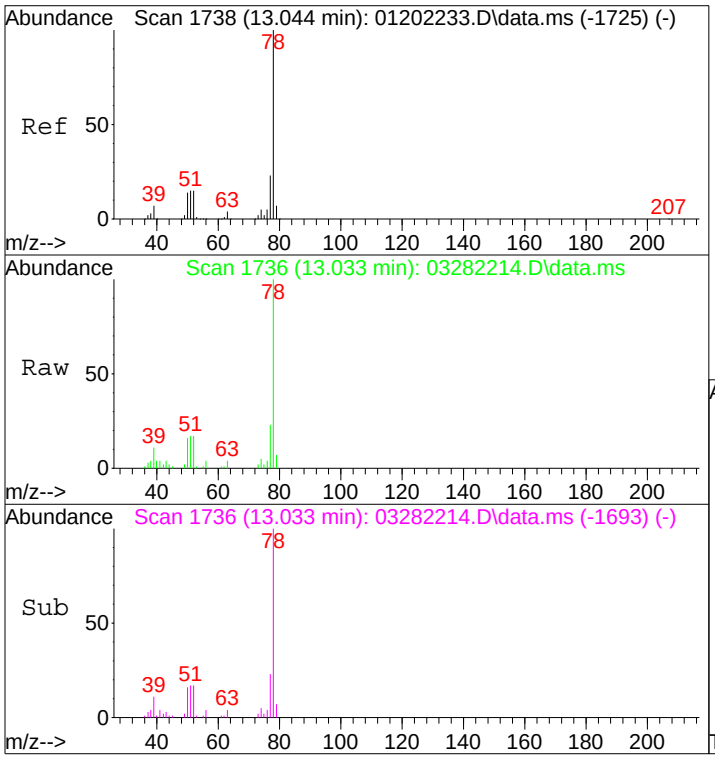




#34
Tetrahydrofuran (THF)
Concen: 0.94 ng
RT: 11.89 min Scan# 1528
Delta R.T. 0.005 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion: 72 Resp: 10105

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 72 | 100 | | |
| 71 | 96.1 | 75.6 | 115.6 |
| 42 | 291.9 | 194.2 | 234.2# |

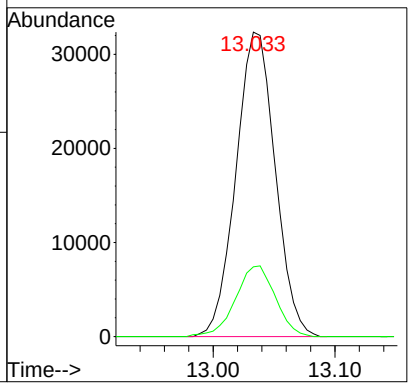


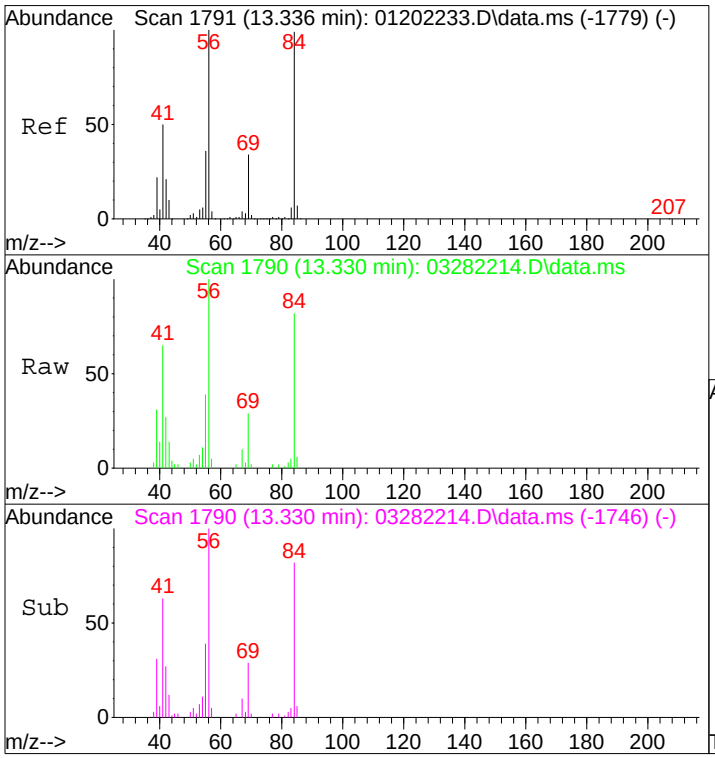



#41
Benzene
Concen: 1.11 ng
RT: 13.03 min Scan# 1736
Delta R.T. -0.011 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion: 78 Resp: 72419

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 78 | 100 | | |
| 77 | 23.6 | 3.0 | 43.0 |

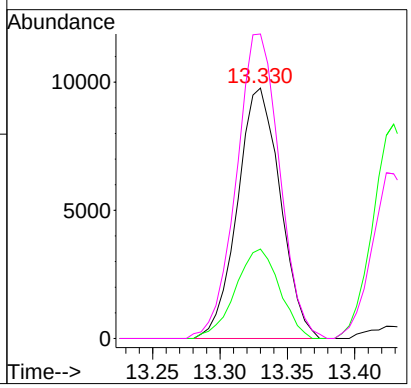


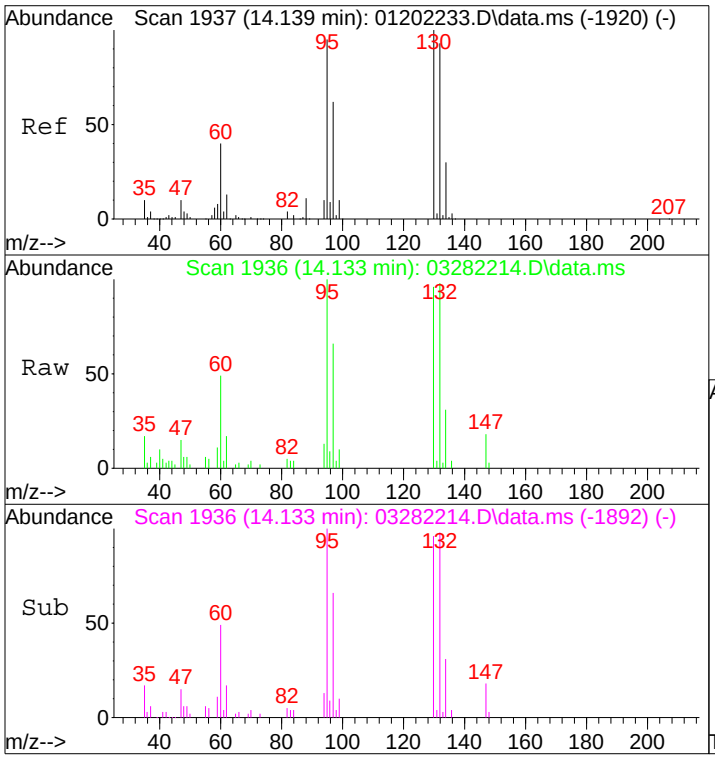




#43
Cyclohexane
Concen: 0.90 ng
RT: 13.33 min Scan# 1790
Delta R.T. -0.006 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion: 84 Resp: 21661

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 84 | 100 | | |
| 69 | 36.9 | 14.7 | 54.7 |
| 56 | 122.7 | 84.7 | 124.7 |

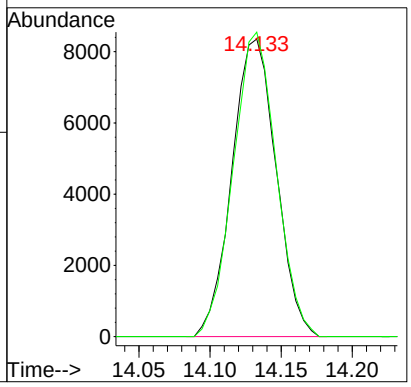


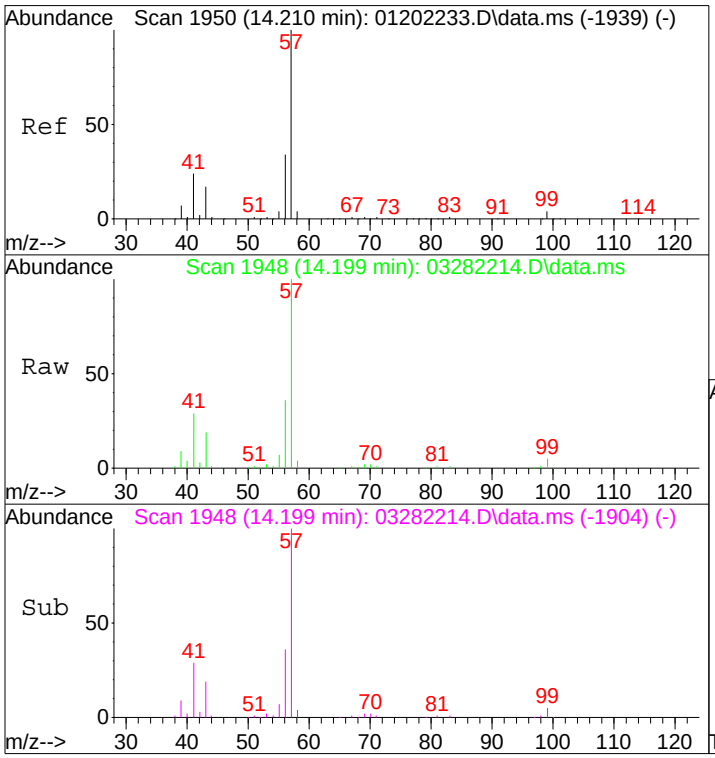



#47
Trichloroethene
Concen: 1.03 ng
RT: 14.13 min Scan# 1936
Delta R.T. -0.006 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion:130 Resp: 18086

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 130 | 100 | | |
| 132 | 99.6 | 72.9 | 112.9 |

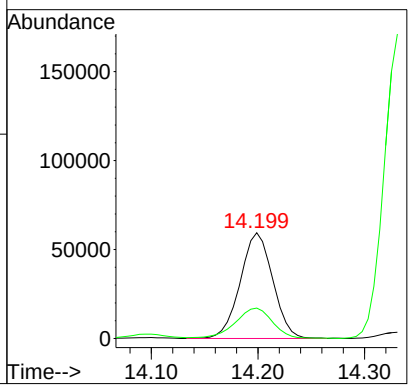


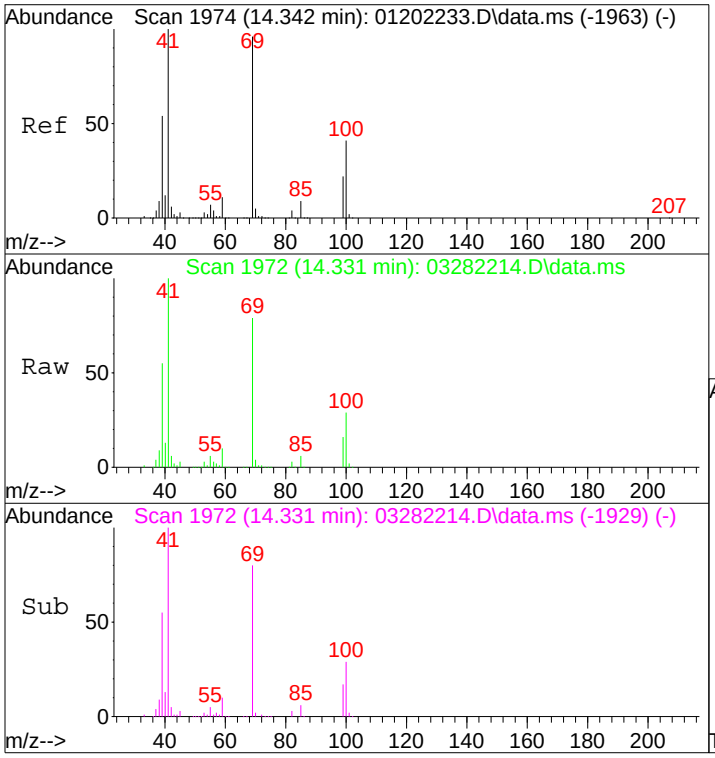




#49
2,2,4-Trimethylpentane (Isooctane)
Concen: 1.99 ng
RT: 14.20 min Scan# 1948
Delta R.T. -0.006 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion: 57 Resp: 126109

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 57 | 100 | | |
| 41 | 33.2 | 5.2 | 45.2 |

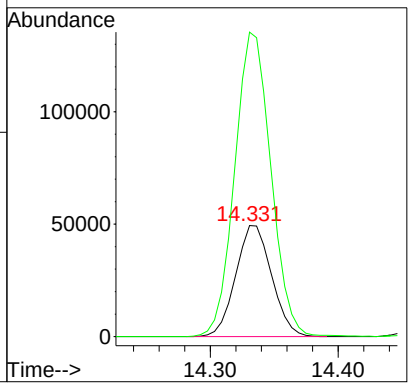


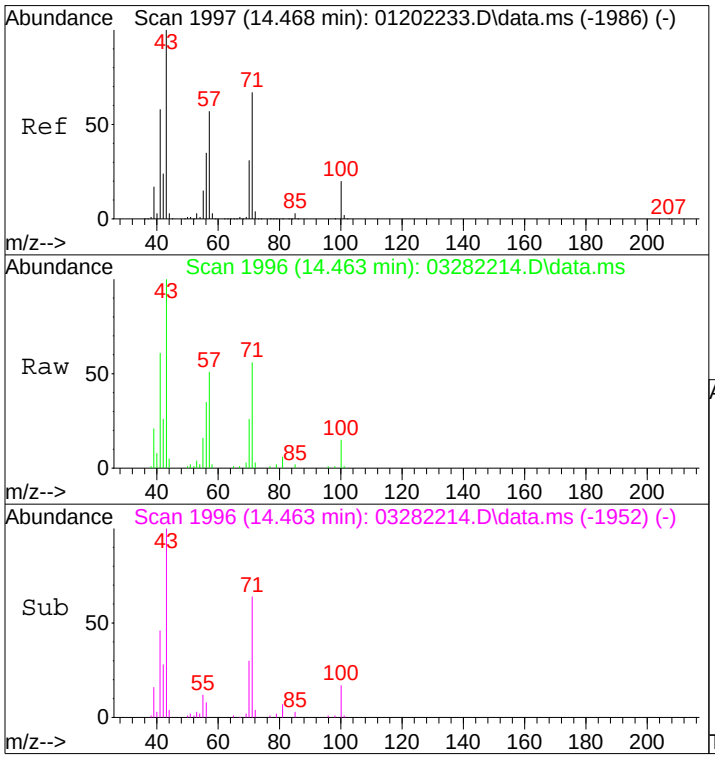



#50
Methyl Methacrylate
Concen: 14.20 ng
RT: 14.33 min Scan# 1972
Delta R.T. -0.011 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion:100 Resp: 96637

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 100 | 100 | | |
| 69 | 275.8 | 223.1 | 263.1# |

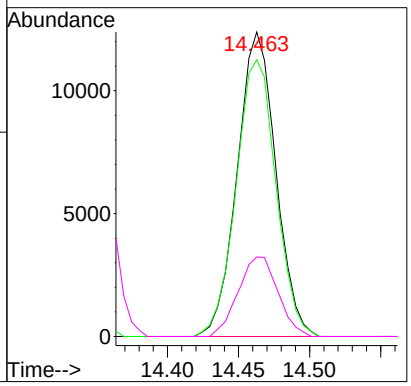


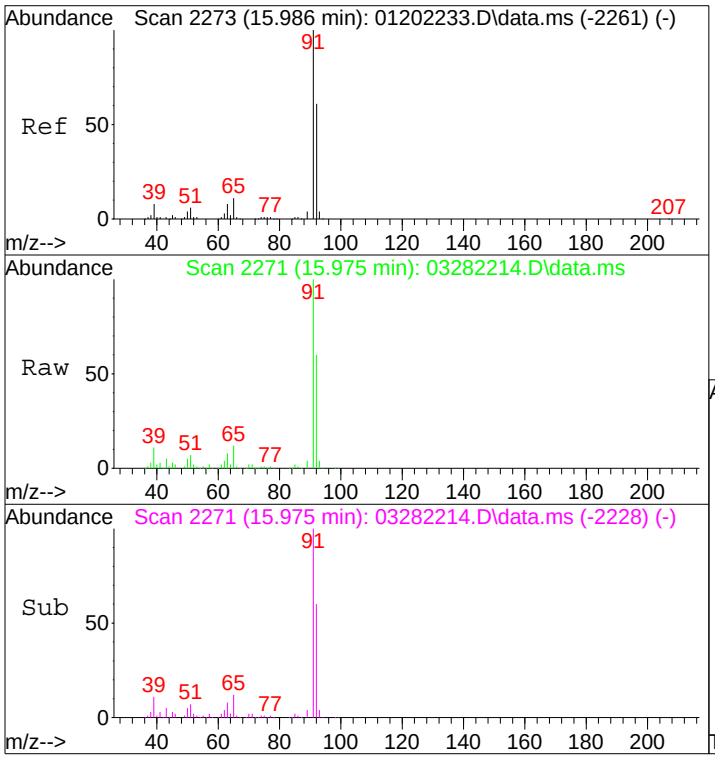




#51
n-Heptane
Concen: 1.44 ng
RT: 14.46 min Scan# 1996
Delta R.T. -0.006 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion: 71 Resp: 23413

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 71 | 100 | | |
| 57 | 94.0 | 65.8 | 105.8 |
| 100 | 26.9 | 9.6 | 49.6 |

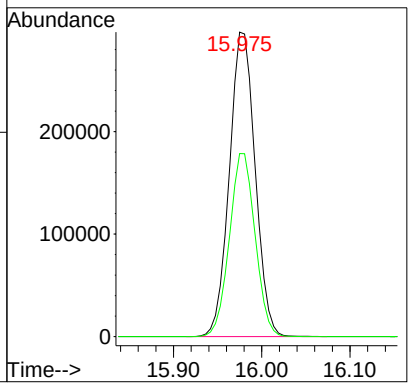


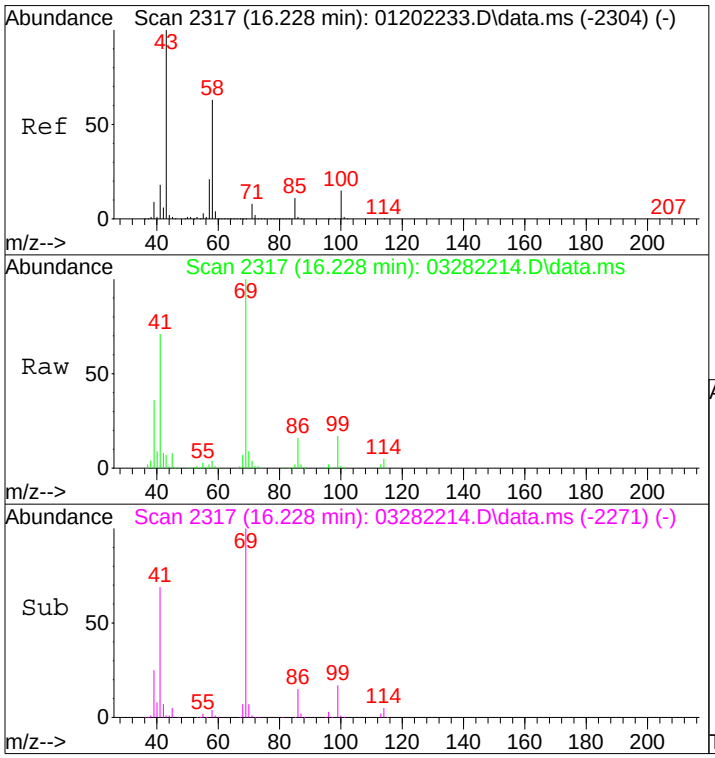



#58
Toluene
Concen: 8.03 ng
RT: 15.97 min Scan# 2271
Delta R.T. -0.011 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion: 91 Resp: 603647

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 91 | 100 | | |
| 92 | 59.8 | 40.6 | 80.6 |

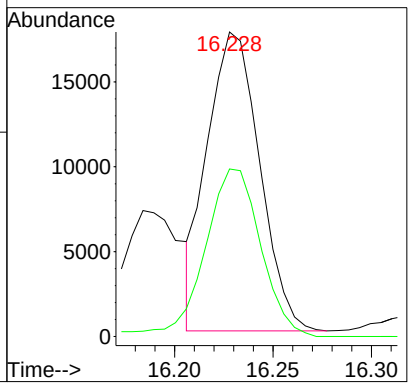


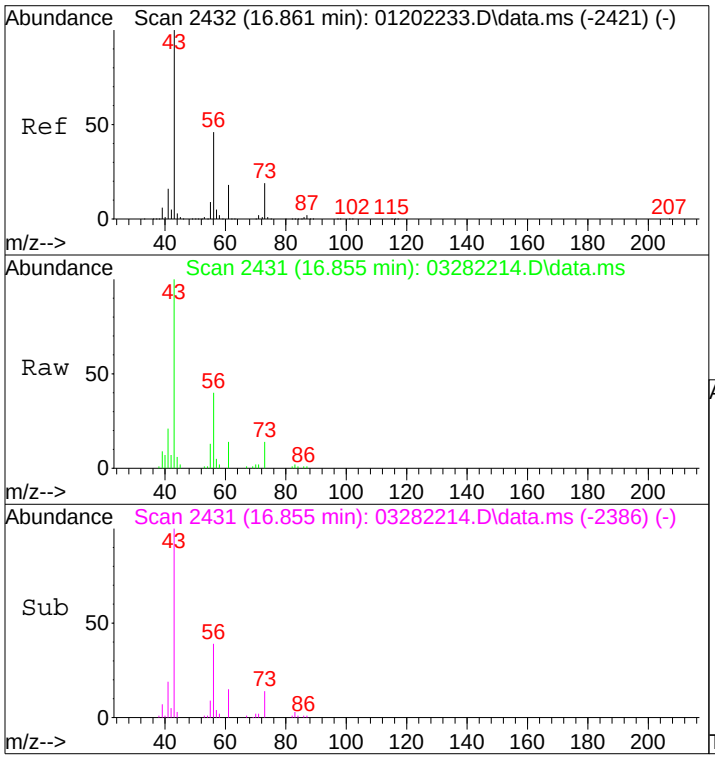




#59
2-Hexanone
Concen: 0.77 ng
RT: 16.23 min Scan# 2317
Delta R.T. 0.005 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion: 43 Resp: 32653

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 43 | 100 | | |
| 58 | 59.9 | 40.0 | 80.0 |

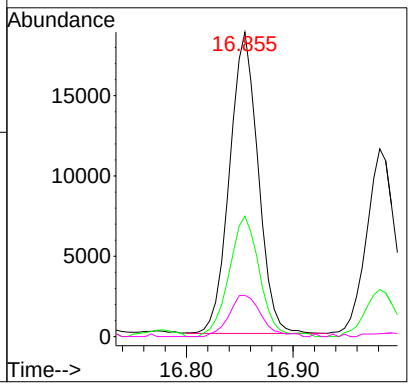


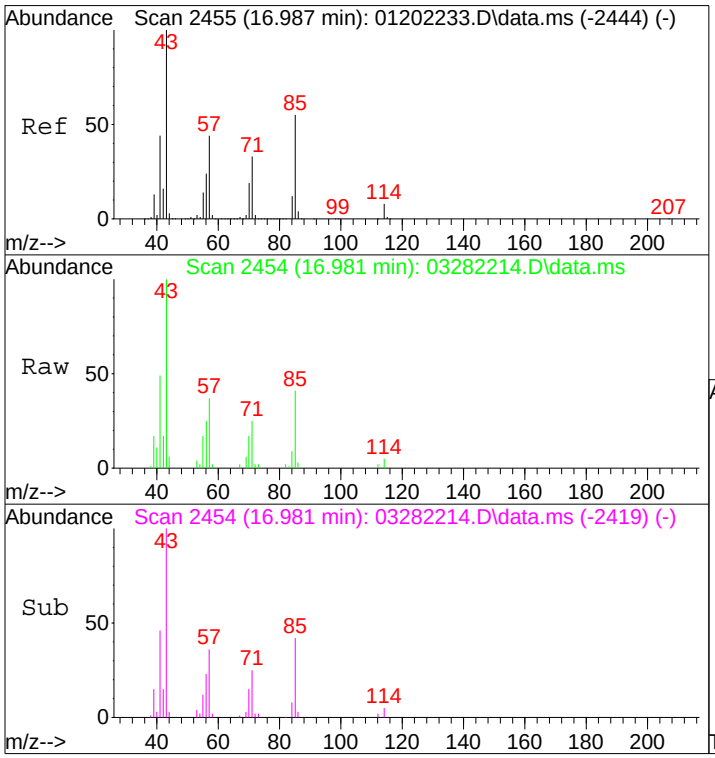



#62
n-Butyl Acetate
Concen: 0.75 ng
RT: 16.85 min Scan# 2431
Delta R.T. -0.000 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion: 43 Resp: 34801

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 43 | 100 | | |
| 56 | 42.9 | 24.6 | 64.6 |
| 73 | 15.6 | 0.0 | 37.5 |

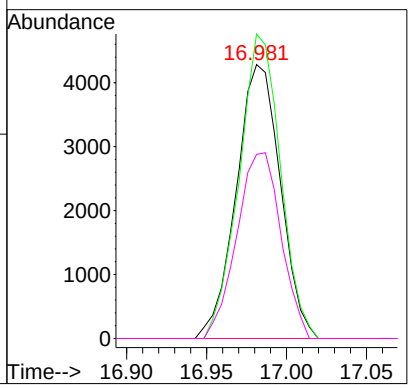


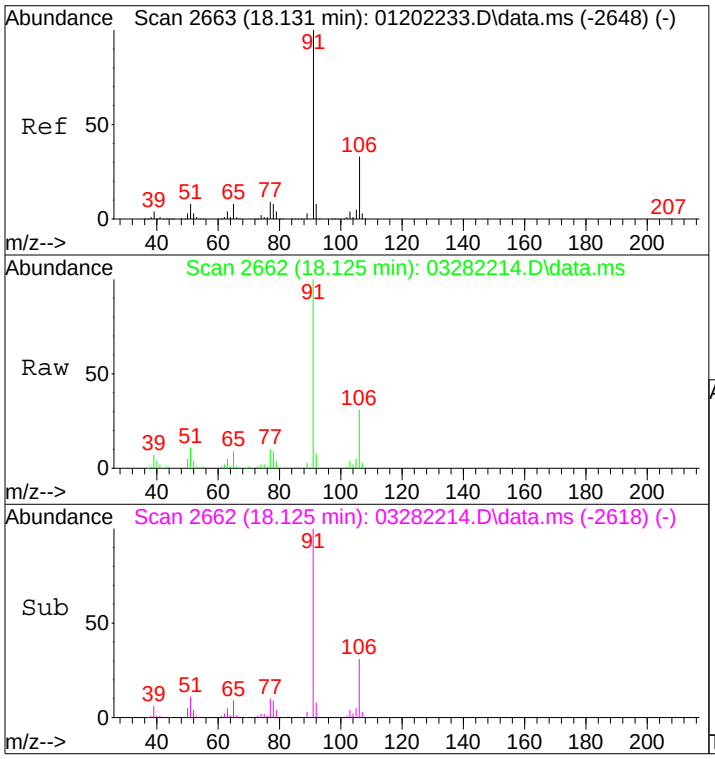




#63
n-Octane
Concen: 0.55 ng
RT: 16.98 min Scan# 2454
Delta R.T. -0.006 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion: 57 Resp: 8249

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 57 | 100 | | |
| 85 | 104.1 | 99.8 | 149.8 |
| 71 | 67.7 | 60.6 | 90.8 |

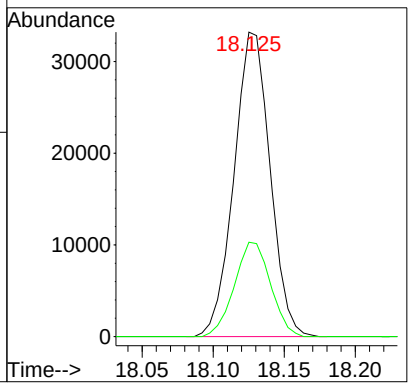


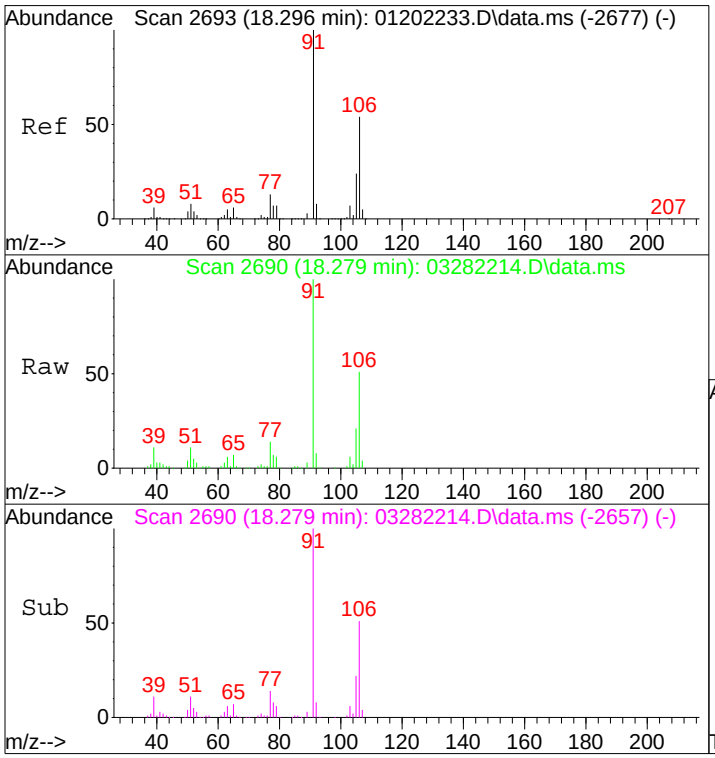



#66
Ethylbenzene
Concen: 0.70 ng
RT: 18.13 min Scan# 2662
Delta R.T. -0.006 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion: 91 Resp: 58589

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 91 | 100 | | |
| 106 | 31.0 | 12.8 | 52.8 |

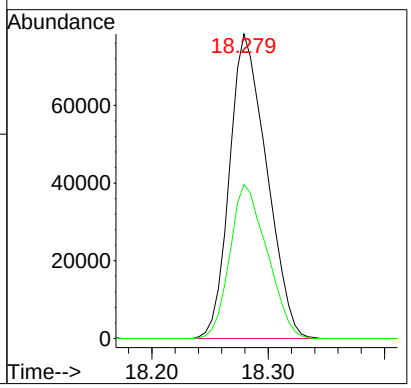


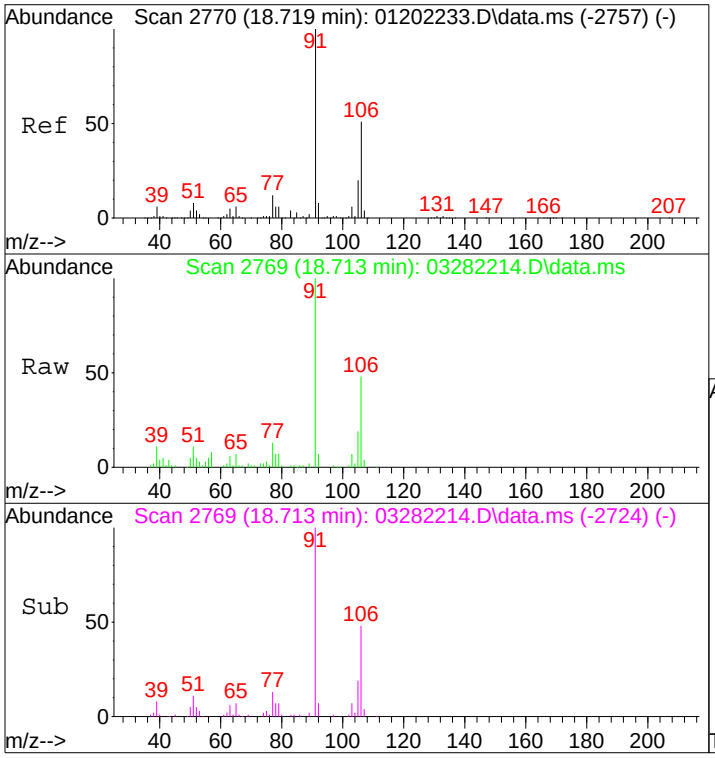




#67
m- & p-Xylenes
Concen: 2.73 ng
RT: 18.28 min Scan# 2690
Delta R.T. -0.017 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion: 91 Resp: 173796

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 91 | 100 | | |
| 106 | 50.7 | 32.9 | 72.9 |

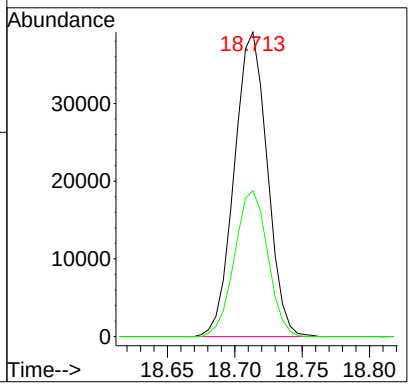


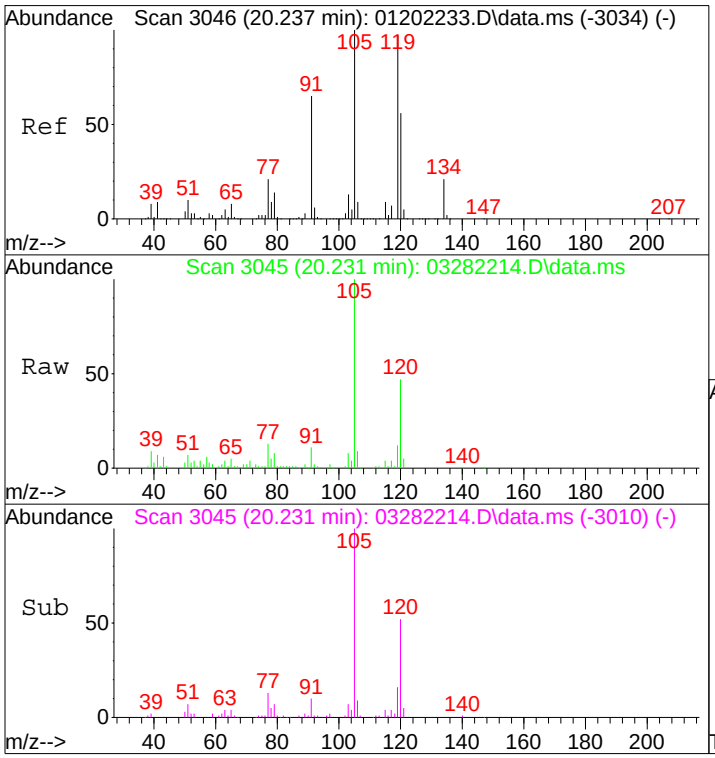



#70
o-Xylene
Concen: 1.04 ng
RT: 18.71 min Scan# 2769
Delta R.T. -0.000 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion: 91 Resp: 66614

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 91 | 100 | | |
| 106 | 48.2 | 30.1 | 70.1 |

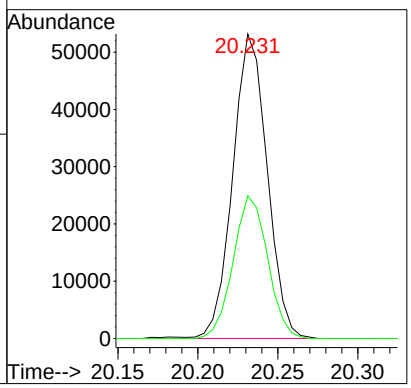


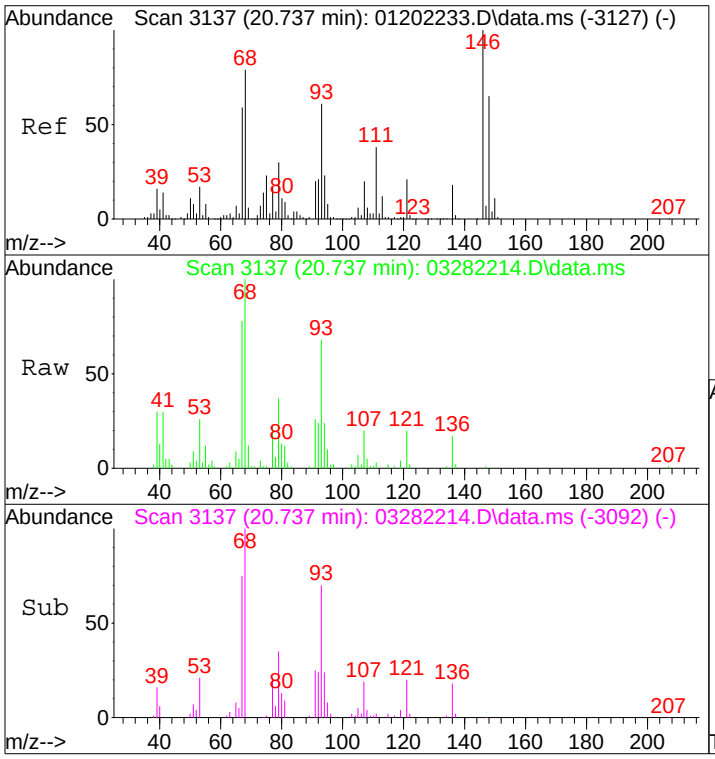




#82
1,2,4-Trimethylbenzene
Concen: 1.25 ng
RT: 20.23 min Scan# 3045
Delta R.T. -0.006 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion:105 Resp: 79408

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 105 | 100 | | |
| 120 | 47.0 | 36.6 | 76.6 |

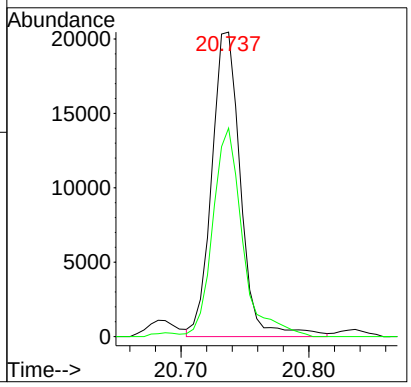





#91
d-Limonene
Concen: 1.41 ng
RT: 20.74 min Scan# 3137
Delta R.T. -0.000 min
Lab File: 03282214.D
Acq: 28 Mar 2022 12:21

Tgt Ion: 68 Resp: 32025

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 68 | 100 | | |
| 93 | 70.7 | 56.7 | 96.7 |



Quantitation Report (QT Reviewed)

01118132

Data File : I:\MS16\DATA\2022 03\28\03282217.D Vial: 7
Acq On : 28 Mar 2022 14:02 Operator: TZ/MT
Sample : P2201166-003dil (100mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 28 14:44:17 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

3/29/22

| Internal Standards | R.T. | QIon | Response | Conc Units | Dev(Min) |
|---|---|---|---|---|---|
| 1) Bromochloromethane (IS1) | 11.30 | 130 | 137036 | 12.500 ng | -0.02 |
| 37) 1,4-Difluorobenzene (IS2) | 13.42 | 114 | 635895 | 12.500 ng | -0.01 |
| 56) Chlorobenzene-d5 (IS3) | 17.73 | 54 | 127165 | 12.500 ng | 0.00 |
| **System Monitoring Compounds** | | | | | |
| 33) 1,2-Dichloroethane-d4(... | 12.15 | 65 | 242525 | 12.884 ng | -0.02 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 103.04% | | |
| 57) Toluene-d8 (SS2) | 15.88 | 98 | 686036 | 11.164 ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 89.28% | | |
| 73) Bromofluorobenzene (SS3) | 19.11 | 174 | 231257 | 11.807 ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 94.48% | | |

| Target Compounds | | | | | | Qvalue |
|---|---|---|---|---|---|---|
| 2) Propene | 4.17 | 42 | 81023 | 3.881 ng | | 96 |
| 3) Dichlorodifluoromethan... | 4.35 | 85 | 5476 | N.D. | | |
| 4) Chloromethane | 4.63 | 50 | 3506 | N.D. | | |
| 5) 1,2-Dichloro-1,1,2,2-t... | 0.00 | 135 | 0 | N.D. | | |
| 6) Vinyl Chloride | 0.00 | 62 | 0 | N.D. | | |
| 7) 1,3-Butadiene | 0.00 | 54 | 0 | N.D. | | |
| 8) Bromomethane | 0.00 | 94 | 0 | N.D. | | |
| 9) Chloroethane | 0.00 | 64 | 0 | N.D. | | |
| 10) Ethanol | 6.45 | 45 | 144545 | 11.199 ng | | 100 |
| 11) Acetonitrile | 6.72 | 41 | 1092 | N.D. | | |
| 12) Acrolein | 6.93 | 56 | 52 | N.D. | | |
| 13) Acetone | 7.13 | 58 | 125751 | 9.739 ng | # | 73 |
| 14) Trichlorofluoromethane | 7.39 | 101 | 2544 | N.D. | | |
| 15) 2-Propanol (Isopropanol) | 7.61 | 45 | 1541836 | 35.033 ng | | 98 |
| 16) Acrylonitrile | 7.99 | 53 | 900 | N.D. | | |
| 17) 1,1-Dichloroethene | 0.00 | 96 | 0 | N.D. | | |
| 18) 2-Methyl-2-Propanol (t... | 8.56 | 59 | 643 | N.D. | | |
| 19) Methylene Chloride | 8.56 | 84 | 17442 | 1.036 ng | | 87 |
| 20) 3-Chloro-1-propene (Al... | 8.67 | 41 | 471 | N.D. | | |
| 21) Trichlorotrifluoroethane | 9.00 | 151 | 731 | N.D. | | |
| 22) Carbon Disulfide | 8.85 | 76 | 992 | N.D. | | |
| 23) trans-1,2-Dichloroethene | 0.00 | 61 | 0 | N.D. | | |
| 24) 1,1-Dichloroethane | 0.00 | 63 | 0 | N.D. | | |
| 25) Methyl tert-Butyl Ether | 0.00 | 73 | 0 | N.D. | | |
| 26) Vinyl Acetate | 10.37 | 86 | 329 | N.D. | | |
| 27) 2-Butanone (MEK) | 10.62 | 72 | 1531 | N.D. | | |
| 28) cis-1,2-Dichloroethene | 11.12 | 61 | 627 | N.D. | | |
| 29) Diisopropyl Ether | 11.42 | 87 | 463 | N.D. | | |
| 30) Ethyl Acetate | 11.43 | 61 | 34375 | 5.639 ng | | 80 |
| 31) n-Hexane | 11.42 | 57 | 9594 | N.D. | | |
| 32) Chloroform | 0.00 | 83 | 0 | N.D. | | |
| 34) Tetrahydrofuran (THF) | 11.91 | 72 | 608 | N.D. | | |
| 35) Ethyl tert-Butyl Ether | 0.00 | 87 | 0 | N.D. | | |
| 36) 1,2-Dichloroethane | 0.00 | 62 | 0 | N.D. | | |
| 38) 1,1,1-Trichloroethane | 0.00 | 97 | 0 | N.D. | | |
| 39) Isopropyl Acetate | 0.00 | 61 | 0 | N.D. | | |
| 40) 1-Butanol | 13.02 | 56 | 724 | No Calib | # | |
| 41) Benzene | 13.03 | 78 | 6342 | N.D. | | |
| 42) Carbon Tetrachloride | 13.19 | 117 | 412 | N.D. | | |
| 43) Cyclohexane | 13.32 | 84 | 1427 | N.D. | | |
| 44) tert-Amyl Methyl Ether | 0.00 | 73 | 0 | N.D. | | |
| 45) 1,2-Dichloropropane | 0.00 | 63 | 0 | N.D. | | |
| 46) Bromodichloromethane | 0.00 | 83 | 0 | N.D. | | |
| 47) Trichloroethene | 14.13 | 130 | 2564 | N.D. | | |
| 48) 1,4-Dioxane | 0.00 | 88 | 0 | N.D. | | |
| 49) 2,2,4-Trimethylpentane... | 14.20 | 57 | 8612 | N.D. | | |
| 50) Methyl Methacrylate | 14.34 | 100 | 5860 | 0.853 ng | # | 78 |

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282217.D Vial: 7
Acq On : 28 Mar 2022 14:02 Operator: TZ/MT
Sample : P2201166-003dil (100mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 28 14:44:17 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

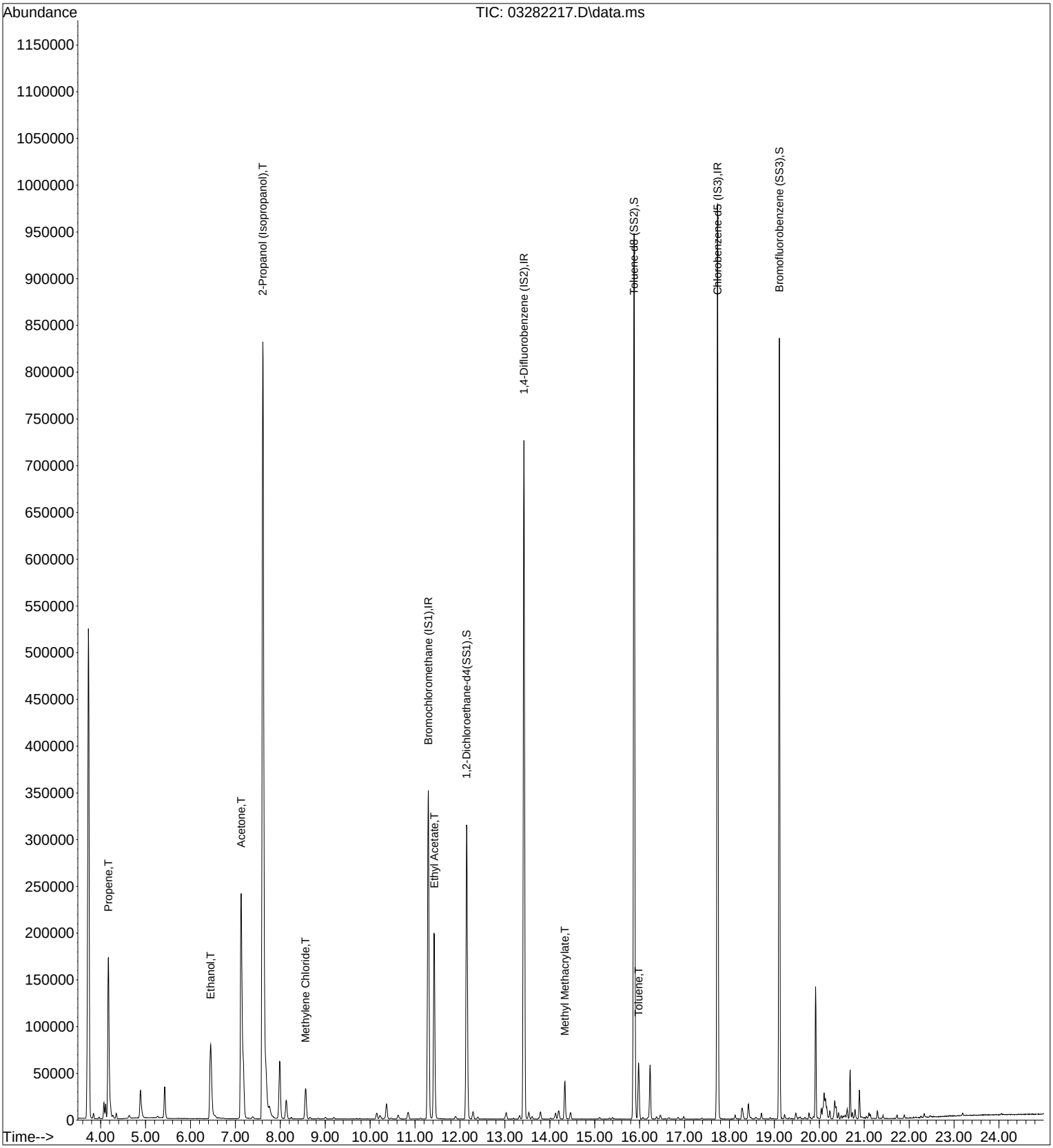
| Internal Standards | R.T. | QIon | Response | Conc Units | Dev(Min) |
|---|---|---|---|---|---|
| 51) n-Heptane | 14.46 | 71 | 1442 | N.D. | |
| 52) cis-1,3-Dichloropropene | 0.00 | 75 | 0 | N.D. | |
| 53) 4-Methyl-2-pentanone | 0.00 | 58 | 0 | N.D. | |
| 54) trans-1,3-Dichloropropene | 0.00 | 75 | 0 | N.D. | |
| 55) 1,1,2-Trichloroethane | 0.00 | 97 | 0 | N.D. | |
| 58) Toluene | 15.98 | 91 | 46922 | 0.631 ng | 99 |
| 59) 2-Hexanone | 16.23 | 43 | 2671 | N.D. | |
| 60) Dibromochloromethane | 0.00 | 129 | 0 | N.D. | |
| 61) 1,2-Dibromoethane | 0.00 | 107 | 0 | N.D. | |
| 62) n-Butyl Acetate | 16.85 | 43 | 1860 | N.D. | |
| 63) n-Octane | 16.99 | 57 | 346 | N.D. | |
| 64) Tetrachloroethene | 0.00 | 166 | 0 | N.D. | |
| 65) Chlorobenzene | 0.00 | 112 | 0 | N.D. | |
| 66) Ethylbenzene | 18.13 | 91 | 3703 | N.D. | |
| 67) m- & p-Xylenes | 18.28 | 91 | 9868 | N.D. | |
| 68) Bromoform | 0.00 | 173 | 0 | N.D. | |
| 69) Styrene | 18.61 | 104 | 264 | N.D. | |
| 70) o-Xylene | 18.71 | 91 | 3977 | N.D. | |
| 71) n-Nonane | 18.91 | 43 | 694 | N.D. | |
| 72) 1,1,2,2-Tetrachloroethane | 0.00 | 83 | 0 | N.D. | |
| 74) Cumene | 19.24 | 105 | 282 | N.D. | |
| 75) alpha-Pinene | 19.58 | 93 | 704 | N.D. | |
| 76) n-Propylbenzene | 19.68 | 91 | 1196 | N.D. | |
| 77) 3-Ethyltoluene | 19.81 | 105 | 1245 | No Calib | |
| 78) 4-Ethyltoluene | 19.81 | 105 | 1245 | N.D. | |
| 79) 1,3,5-Trimethylbenzene | 19.87 | 105 | 962 | N.D. | |
| 80) alpha-Methylstyrene | 0.00 | 118 | 0 | N.D. | |
| 81) 2-Ethyltoluene | 19.87 | 105 | 962 | No Calib | |
| 82) 1,2,4-Trimethylbenzene | 20.23 | 105 | 4652 | N.D. | |
| 83) n-Decane | 20.13 | 58 | 714 | No Calib | # |
| 84) Benzyl Chloride | 20.24 | 91 | 523 | N.D. | |
| 85) 1,3-Dichlorobenzene | 20.42 | 146 | 578 | N.D. | |
| 86) 1,4-Dichlorobenzene | 20.42 | 146 | 578 | N.D. | |
| 87) sec-Butylbenzene | 20.61 | 105 | 1033 | N.D. | |
| 88) 4-Isopropyltoluene (p-... | 20.61 | 119 | 556 | N.D. | |
| 89) 1,2,3-Trimethylbenzene | 20.61 | 105 | 1033 | No Calib | # |
| 90) 1,2-Dichlorobenzene | 0.00 | 146 | 0 | N.D. | |
| 91) d-Limonene | 20.73 | 68 | 1603 | N.D. | |
| 92) 1,2-Dibromo-3-Chloropr... | 0.00 | 157 | 0 | N.D. | |
| 93) n-Undecane | 22.25 | 57 | 253 | No Calib | # |
| 94) 1,2,4-Trichlorobenzene | 0.00 | 180 | 0 | N.D. | |
| 95) Naphthalene | 22.35 | 128 | 847 | N.D. | |
| 96) n-Dodecane | 22.33 | 57 | 1059 | No Calib | # |
| 97) Hexachlorobutadiene | 0.00 | 225 | 0 | N.D. | |
| 98) Cyclohexanone | 18.42 | 55 | 7111 | No Calib | # |
| 99) tert-Butylbenzene | 20.23 | 119 | 539 | N.D. | |
| 100) n-Butylbenzene | 20.97 | 91 | 542 | N.D. | |
| 101) 1,1,1,2-Tetrachloroethane | 0.00 | 131 | 0 | N.D. | |

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282217.D Vial: 7
Acq On : 28 Mar 2022 14:02 Operator: TZ/MT
Sample : P2201166-003dil (100mL) Inst : GCMS-16
Misc : S35-01102201

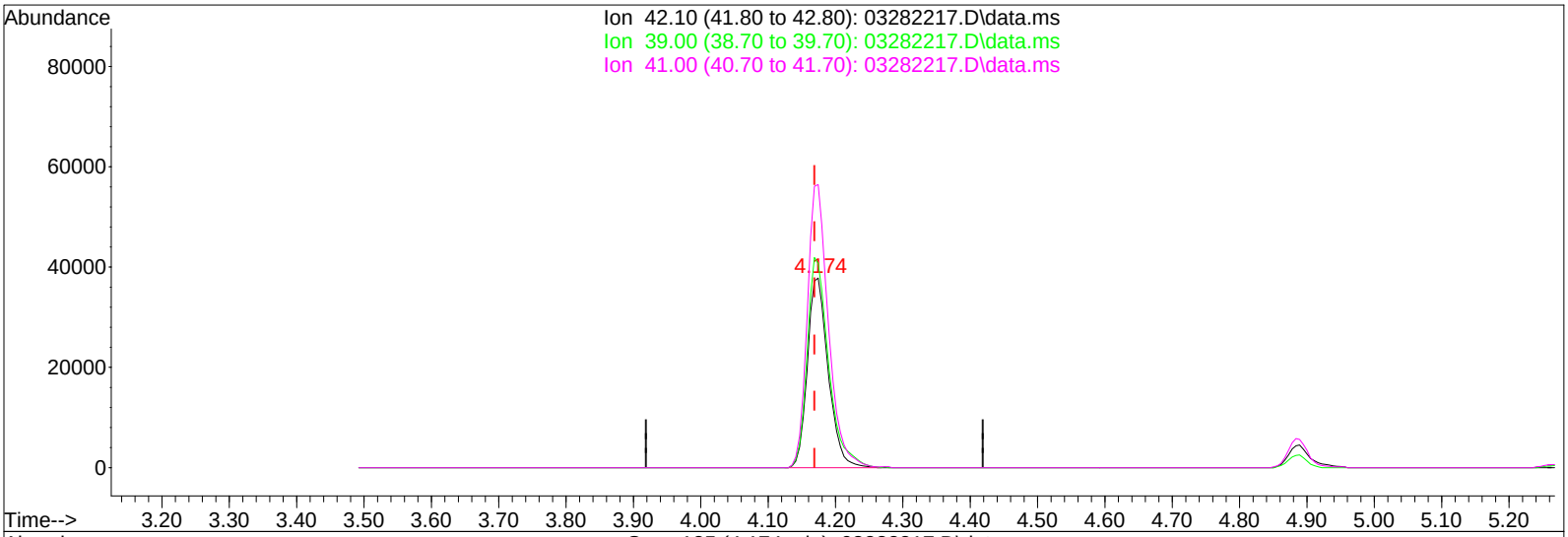
Quant Time: Mar 28 14:44:17 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

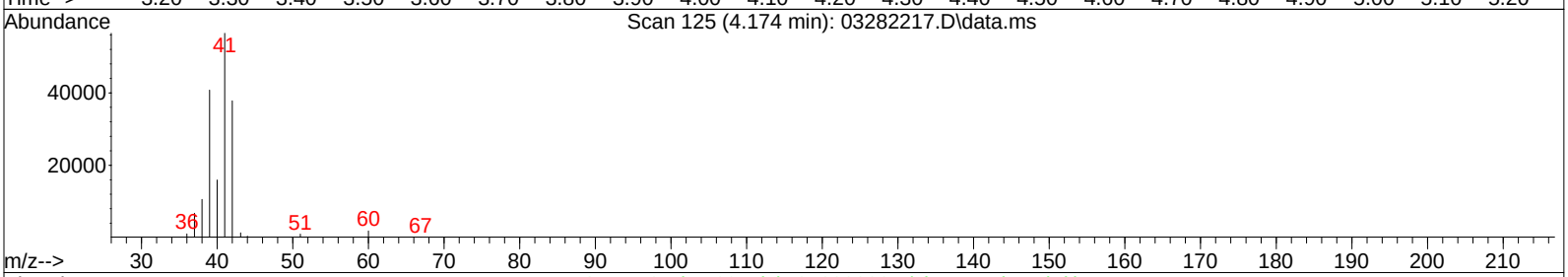


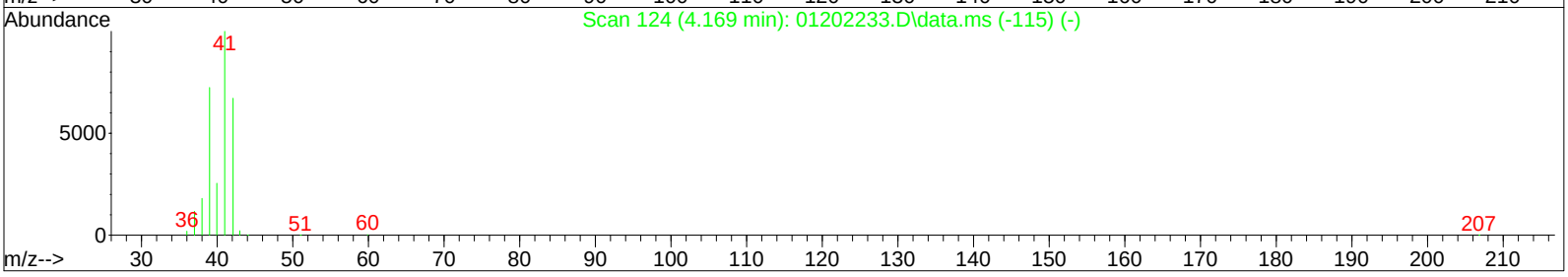
01118135

Data File : I:\MS16\DATA\2022 03\28\03282217.D  Vial: 7
Acq On : 28 Mar 2022 14:02  Operator: TZ/MT
Sample : P2201166-003dil (100mL)  Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 28 14:44:17 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M




TIC: 03282217.D\data.ms

(2) Propene (T)

4.174min (+0.006) 3.88ng

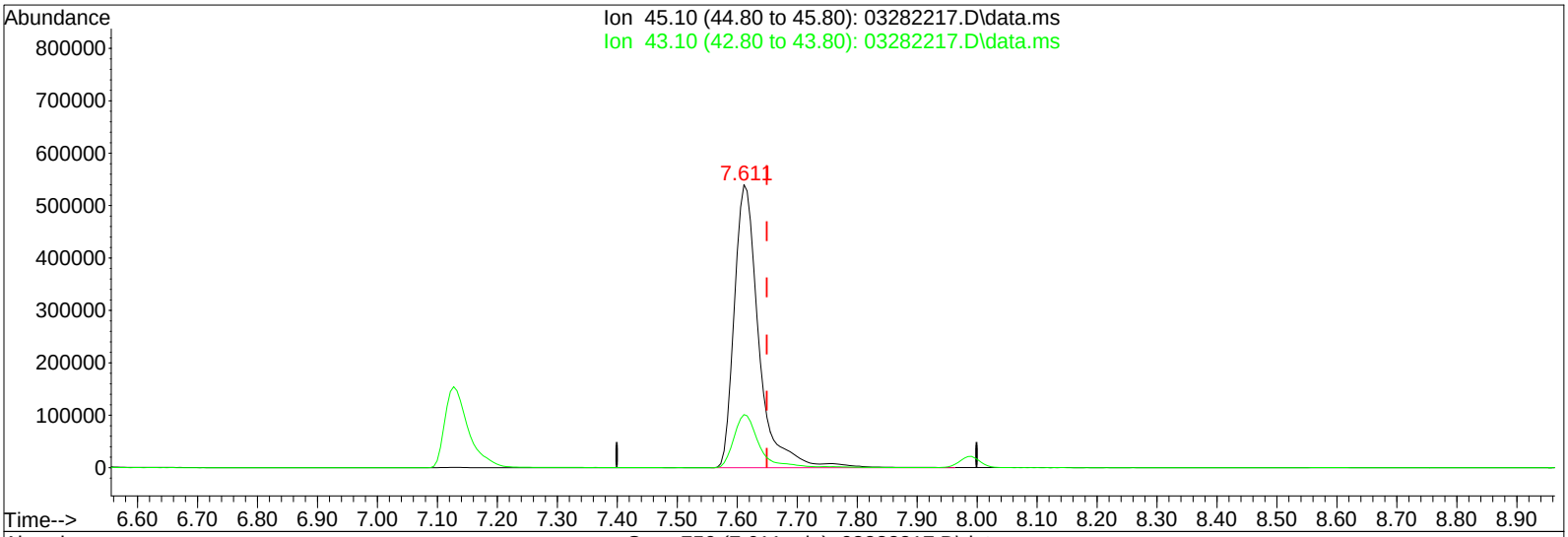
response 81023

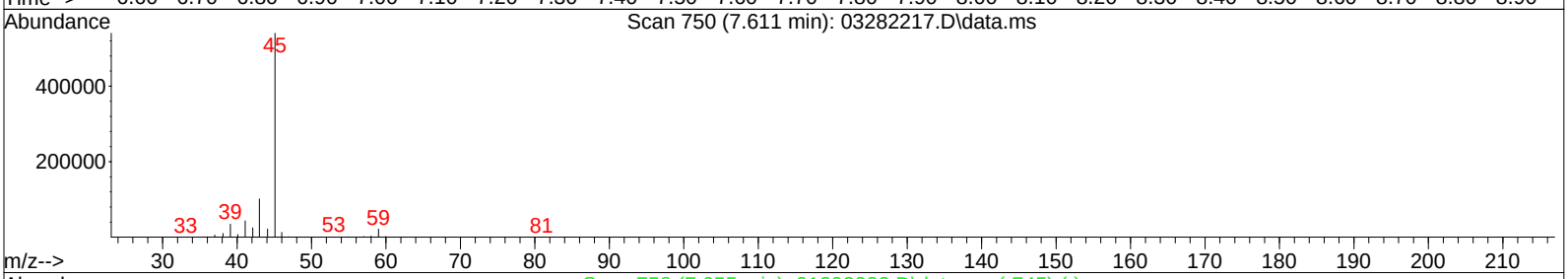
| Ion | Exp% | Act% |
|---|---|---|
| 42.10 | 100 | 100 |
| 39.00 | 109.50 | 114.97 |
| 41.00 | 149.40 | 152.38 |
| 0.00 | 0.00 | 0.00 |

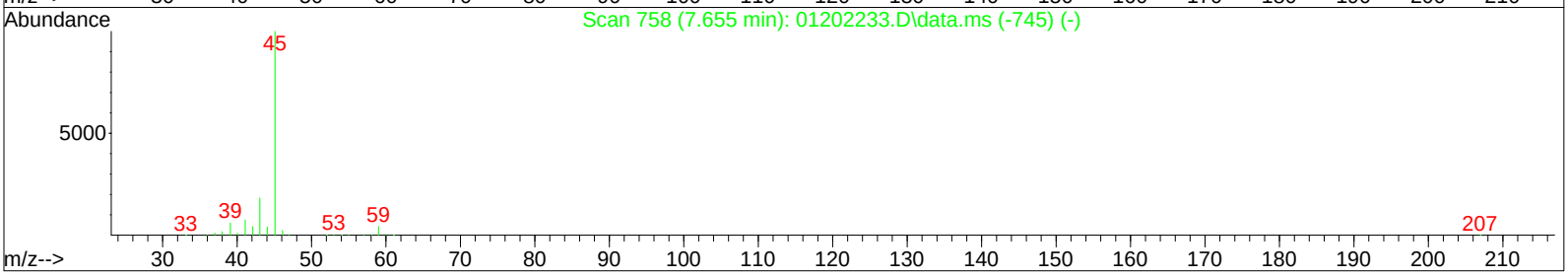
01118136

Data File : I:\MS16\DATA\2022 03\28\03282217.D  Vial: 7
Acq On : 28 Mar 2022 14:02  Operator: TZ/MT
Sample : P2201166-003dil (100mL)  Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 28 14:44:17 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M




TIC: 03282217.D\data.ms

(15) 2-Propanol (Isopropanol) (T)

7.611min (-0.038) 35.03ng

response 1541836

| Ion | Exp% | Act% |
|---|---|---|
| 45.10 | 100 | 100 |
| 43.10 | 18.60 | 19.56 |
| 0.00 | 0.00 | 0.00 |
| 0.00 | 0.00 | 0.00 |

Quantitation Report (QT Reviewed)

01118137

Data File : I:\MS16\DATA\2022 03\28\03282215.D Vial: 8
Acq On : 28 Mar 2022 12:54 Operator: TZ/MT
Sample : P2201166-004 (1000mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 29 02:17:13 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS) 3/29/22
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

| Internal Standards | R.T. | QIon | Response | Conc Units | Dev(Min) |
|---|---|---|---|---|---|
| 1) Bromochloromethane (IS1) | 11.30 | 130 | 142538 | 12.500 ng | -0.02 |
| 37) 1,4-Difluorobenzene (IS2) | 13.42 | 114 | 666298 | 12.500 ng | -0.01 |
| 56) Chlorobenzene-d5 (IS3) | 17.73 | 54 | 127531 | 12.500 ng | 0.00 |

System Monitoring Compounds

| | | | | | |
|---|---|---|---|---|---|
| 33) 1,2-Dichloroethane-d4(... | 12.15 | 65 | 247409 | 12.636 ng | -0.02 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 101.12% | | |
| 57) Toluene-d8 (SS2) | 15.88 | 98 | 701102 | 11.376 ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 91.04% | | |
| 73) Bromofluorobenzene (SS3) | 19.11 | 174 | 240470 | 12.243 ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 97.92% | | |

Target Compounds

| | | | | | | Qvalue |
|---|---|---|---|---|---|---|
| 2) Propene | 4.17 | 42 | 15786m | 0.727 ng | | |
| 3) Dichlorodifluoromethan... | 4.34 | 85 | 56378 | 1.572 ng | | 99 |
| 4) Chloromethane | 4.63 | 50 | 5876 | N.D. | | |
| 5) 1,2-Dichloro-1,1,2,2-t... | 4.91 | 135 | 1556 | N.D. | | |
| 6) Vinyl Chloride | 0.00 | 62 | 0 | N.D. | | |
| 7) 1,3-Butadiene | 5.42 | 54 | 114 | N.D. | | |
| 8) Bromomethane | 0.00 | 94 | 0 | N.D. | | |
| 9) Chloroethane | 0.00 | 64 | 0 | N.D. | | |
| 10) Ethanol | 6.43 | 45 | 49996 | 3.724 ng | | 100 |
| 11) Acetonitrile | 6.71 | 41 | 4123 | N.D. | | |
| 12) Acrolein | 6.93 | 56 | 1162 | N.D. | | |
| 13) Acetone | 7.14 | 58 | 58744 | 4.374 ng | # | 56 |
| 14) Trichlorofluoromethane | 7.39 | 101 | 26444 | 0.867 ng | | 98 |
| 15) 2-Propanol (Isopropanol) | 7.63 | 45 | 22207 | 0.485 ng | | 71 |
| 16) Acrylonitrile | 7.98 | 53 | 698 | N.D. | | |
| 17) 1,1-Dichloroethene | 0.00 | 96 | 0 | N.D. | | |
| 18) 2-Methyl-2-Propanol (t... | 8.56 | 59 | 535 | N.D. | | |
| 19) Methylene Chloride | 8.56 | 84 | 4149 | N.D. | | |
| 20) 3-Chloro-1-propene (Al... | 8.68 | 41 | 173 | N.D. | | |
| 21) Trichlorotrifluoroethane | 9.01 | 151 | 4729 | N.D. | | |
| 22) Carbon Disulfide | 8.84 | 76 | 2958 | N.D. | | |
| 23) trans-1,2-Dichloroethene | 0.00 | 61 | 0 | N.D. | | |
| 24) 1,1-Dichloroethane | 0.00 | 63 | 0 | N.D. | | |
| 25) Methyl tert-Butyl Ether | 0.00 | 73 | 0 | N.D. | | |
| 26) Vinyl Acetate | 10.32 | 86 | 1317 | N.D. | | |
| 27) 2-Butanone (MEK) | 10.61 | 72 | 7710 | 0.624 ng | # | 62 |
| 28) cis-1,2-Dichloroethene | 11.11 | 61 | 990 | N.D. | | |
| 29) Diisopropyl Ether | 11.42 | 87 | 335 | N.D. | | |
| 30) Ethyl Acetate | 11.43 | 61 | 6423 | 1.013 ng | | 88 |
| 31) n-Hexane | 11.42 | 57 | 43344 | 1.800 ng | # | 96 |
| 32) Chloroform | 11.46 | 83 | 1395 | N.D. | | |
| 34) Tetrahydrofuran (THF) | 11.89 | 72 | 4725 | N.D. | | |
| 35) Ethyl tert-Butyl Ether | 0.00 | 87 | 0 | N.D. | | |
| 36) 1,2-Dichloroethane | 12.27 | 62 | 1077 | N.D. | | |
| 38) 1,1,1-Trichloroethane | 0.00 | 97 | 0 | N.D. | | |
| 39) Isopropyl Acetate | 0.00 | 61 | 0 | N.D. | | |
| 40) 1-Butanol | 13.02 | 56 | 1928 | No Calib | # | |
| 41) Benzene | 13.03 | 78 | 17845 | N.D. | | |
| 42) Carbon Tetrachloride | 13.19 | 117 | 5638 | N.D. | | |
| 43) Cyclohexane | 13.32 | 84 | 2110 | N.D. | | |
| 44) tert-Amyl Methyl Ether | 0.00 | 73 | 0 | N.D. | | |
| 45) 1,2-Dichloropropane | 0.00 | 63 | 0 | N.D. | | |
| 46) Bromodichloromethane | 0.00 | 83 | 0 | N.D. | | |
| 47) Trichloroethene | 14.13 | 130 | 3699 | N.D. | | |
| 48) 1,4-Dioxane | 0.00 | 88 | 0 | N.D. | | |
| 49) 2,2,4-Trimethylpentane... | 14.20 | 57 | 5113 | N.D. | | |
| 50) Methyl Methacrylate | 14.34 | 100 | 768 | N.D. | | |

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282215.D Vial: 8
Acq On : 28 Mar 2022 12:54 Operator: TZ/MT
Sample : P2201166-004 (1000mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 29 02:17:13 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

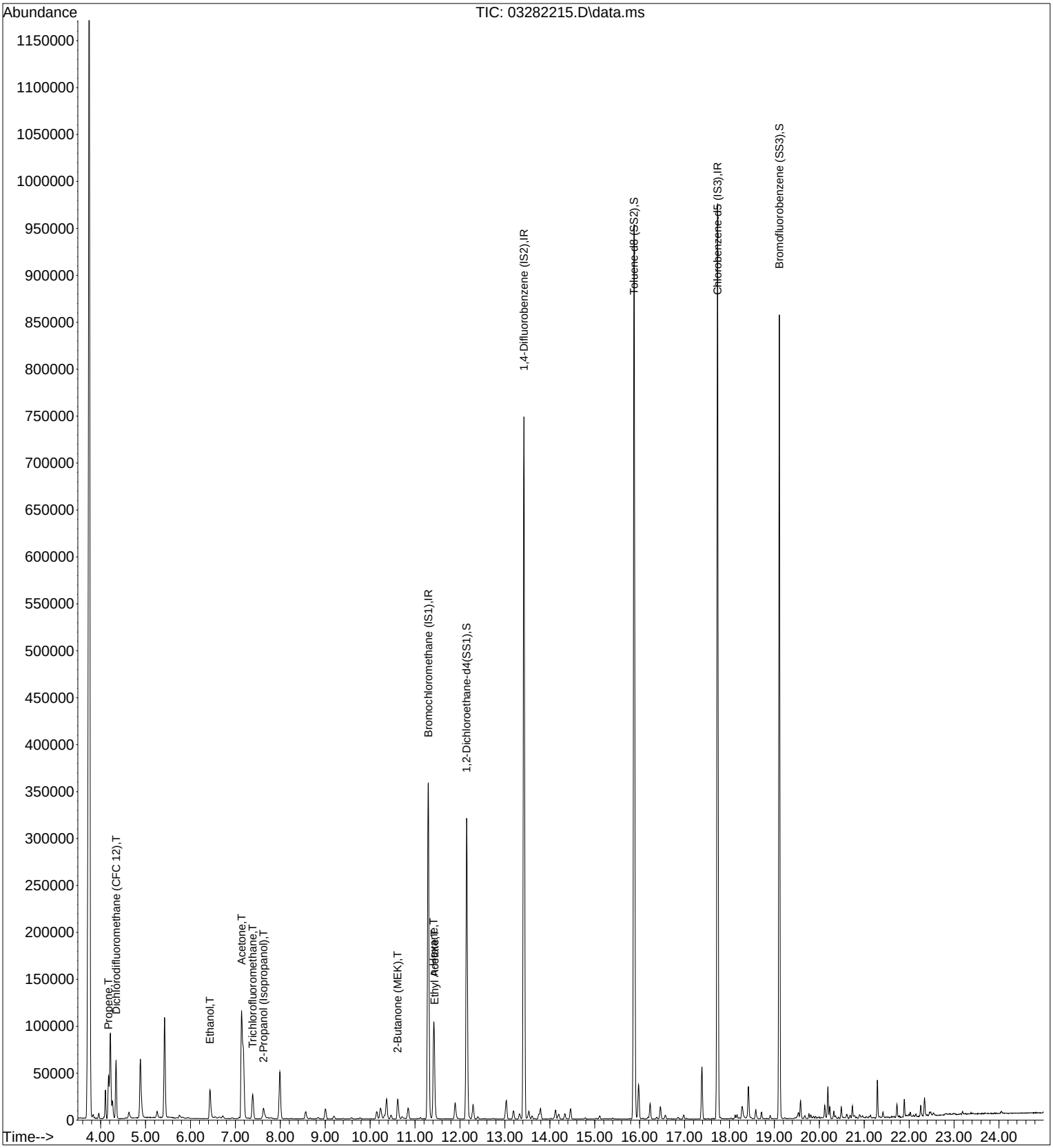
| Internal Standards | R.T. | QIon | Response | Conc Units | Dev(Min) |
|---|---|---|---|---|---|
| 51) n-Heptane | 14.46 | 71 | 2501 | N.D. | |
| 52) cis-1,3-Dichloropropene | 0.00 | 75 | 0 | N.D. | |
| 53) 4-Methyl-2-pentanone | 0.00 | 58 | 0 | N.D. | |
| 54) trans-1,3-Dichloropropene | 0.00 | 75 | 0 | N.D. | |
| 55) 1,1,2-Trichloroethane | 0.00 | 97 | 0 | N.D. | |
| 58) Toluene | 15.98 | 91 | 30206 | N.D. | |
| 59) 2-Hexanone | 16.23 | 43 | 1824 | N.D. | |
| 60) Dibromochloromethane | 0.00 | 129 | 0 | N.D. | |
| 61) 1,2-Dibromoethane | 0.00 | 107 | 0 | N.D. | |
| 62) n-Butyl Acetate | 16.85 | 43 | 1690 | N.D. | |
| 63) n-Octane | 16.98 | 57 | 737 | N.D. | |
| 64) Tetrachloroethene | 0.00 | 166 | 0 | N.D. | |
| 65) Chlorobenzene | 0.00 | 112 | 0 | N.D. | |
| 66) Ethylbenzene | 18.13 | 91 | 3858 | N.D. | |
| 67) m- & p-Xylenes | 18.28 | 91 | 10920 | N.D. | |
| 68) Bromoform | 0.00 | 173 | 0 | N.D. | |
| 69) Styrene | 18.61 | 104 | 801 | N.D. | |
| 70) o-Xylene | 18.71 | 91 | 4090 | N.D. | |
| 71) n-Nonane | 18.91 | 43 | 1544 | N.D. | |
| 72) 1,1,2,2-Tetrachloroethane | 0.00 | 83 | 0 | N.D. | |
| 74) Cumene | 19.23 | 105 | 367 | N.D. | |
| 75) alpha-Pinene | 19.58 | 93 | 7123 | N.D. | |
| 76) n-Propylbenzene | 19.68 | 91 | 1411 | N.D. | |
| 77) 3-Ethyltoluene | 19.81 | 105 | 1434 | No Calib | |
| 78) 4-Ethyltoluene | 19.81 | 105 | 1434 | N.D. | |
| 79) 1,3,5-Trimethylbenzene | 19.87 | 105 | 1099 | N.D. | |
| 80) alpha-Methylstyrene | 20.01 | 118 | 484 | No Calib | # |
| 81) 2-Ethyltoluene | 19.87 | 105 | 1099 | No Calib | |
| 82) 1,2,4-Trimethylbenzene | 20.23 | 105 | 5999 | N.D. | |
| 83) n-Decane | 0.00 | 58 | 0 | N.D. | |
| 84) Benzyl Chloride | 20.35 | 91 | 157 | N.D. | |
| 85) 1,3-Dichlorobenzene | 20.43 | 146 | 578 | N.D. | |
| 86) 1,4-Dichlorobenzene | 20.43 | 146 | 578 | N.D. | |
| 87) sec-Butylbenzene | 20.61 | 105 | 1403 | N.D. | |
| 88) 4-Isopropyltoluene (p-... | 20.61 | 119 | 1267 | N.D. | |
| 89) 1,2,3-Trimethylbenzene | 20.61 | 105 | 1403 | No Calib | # |
| 90) 1,2-Dichlorobenzene | 0.00 | 146 | 0 | N.D. | |
| 91) d-Limonene | 20.73 | 68 | 2815 | N.D. | |
| 92) 1,2-Dibromo-3-Chloropr... | 0.00 | 157 | 0 | N.D. | |
| 93) n-Undecane | 22.26 | 57 | 1720 | No Calib | # |
| 94) 1,2,4-Trichlorobenzene | 0.00 | 180 | 0 | N.D. | |
| 95) Naphthalene | 22.34 | 128 | 10566 | N.D. | |
| 96) n-Dodecane | 22.33 | 57 | 1985 | No Calib | # |
| 97) Hexachlorobutadiene | 0.00 | 225 | 0 | N.D. | |
| 98) Cyclohexanone | 18.32 | 55 | 162 | No Calib | # |
| 99) tert-Butylbenzene | 20.23 | 119 | 809 | N.D. | |
| 100) n-Butylbenzene | 20.97 | 91 | 1033 | N.D. | |
| 101) 1,1,1,2-Tetrachloroethane | 0.00 | 131 | 0 | N.D. | |

(#) = qualifier out of range (m) = manual integration (+) = signals summed

01118139

Data File : I:\MS16\DATA\2022 03\28\03282215.D Vial: 8
Acq On : 28 Mar 2022 12:54 Operator: TZ/MT
Sample : P2201166-004 (1000mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 29 02:17:13 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282215.D Vial: 8
Acq On : 28 Mar 2022 12:54 Operator: TZ/MT
Sample : P2201166-004 (1000mL) Inst : GCMS-16
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Quant Time: Mar 29 02:17:13 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

3/29/22

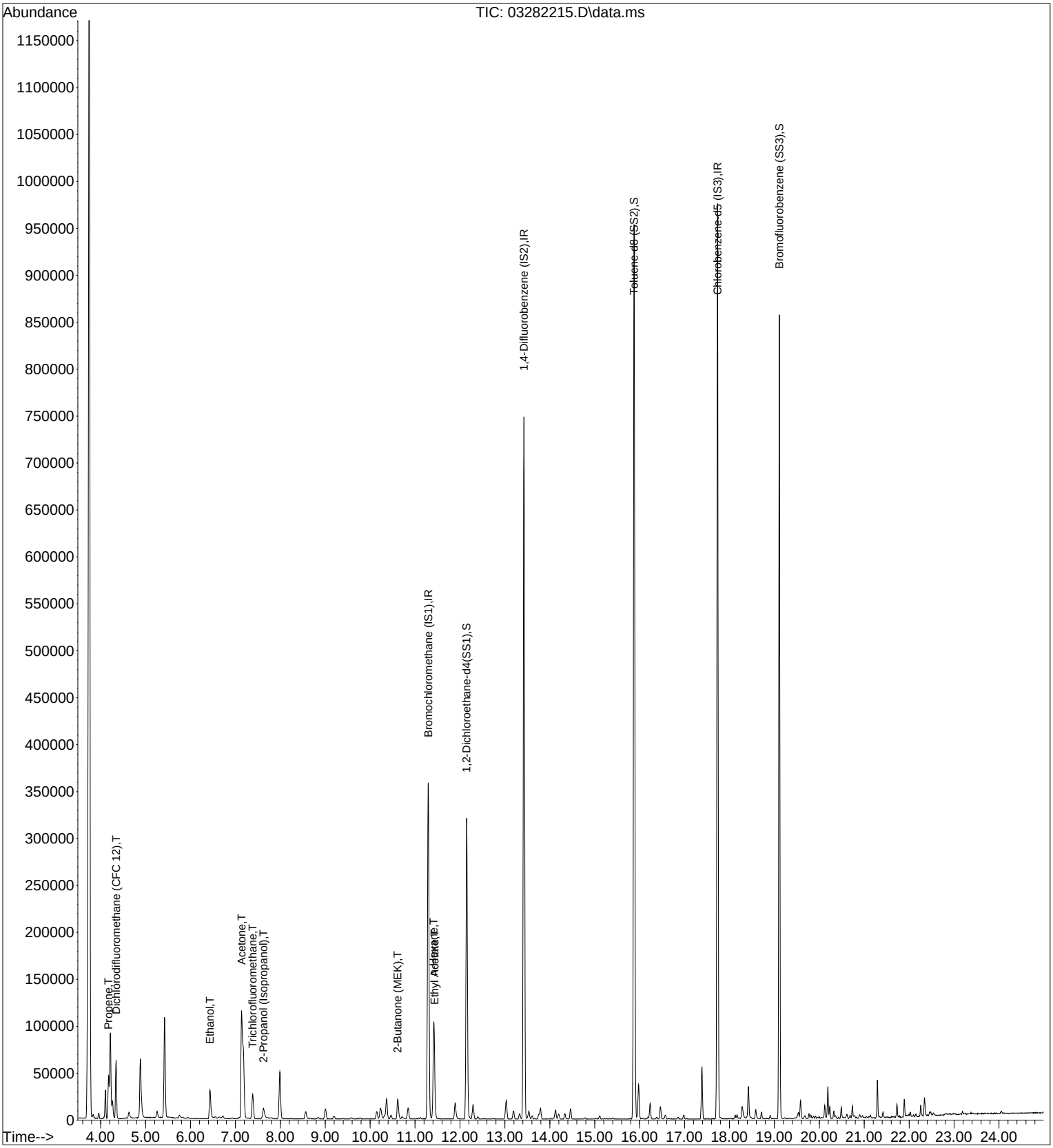
| Internal Standards | R.T. | QIon | Response | Conc | Units | | Dev(Min) |
|---|---|---|---|---|---|---|---|
| 1) Bromochloromethane (IS1) | 11.30 | 130 | 142538 | 12.500 | ng | | -0.02 |
| 37) 1,4-Difluorobenzene (IS2) | 13.42 | 114 | 666298 | 12.500 | ng | | -0.01 |
| 56) Chlorobenzene-d5 (IS3) | 17.73 | 54 | 127531 | 12.500 | ng | | 0.00 |
| **System Monitoring Compounds** | | | | | | | |
| 33) 1,2-Dichloroethane-d4(... | 12.15 | 65 | 247409 | 12.636 | ng | | -0.02 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 101.12% | | | | |
| 57) Toluene-d8 (SS2) | 15.88 | 98 | 701102 | 11.376 | ng | | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 91.04% | | | | |
| 73) Bromofluorobenzene (SS3) | 19.11 | 174 | 240470 | 12.243 | ng | | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 97.92% | | | | |
| **Target Compounds** | | | | | | | Qvalue |
| 2) Propene | 4.17 | 42 | 15786m | 0.727 | ng | | |
| 3) Dichlorodifluoromethan... | 4.34 | 85 | 56378 | 1.572 | ng | | 99 |
| 10) Ethanol | 6.43 | 45 | 49996 | 3.724 | ng | | 100 |
| 13) Acetone | 7.14 | 58 | 58744 | 4.374 | ng | # | 56 |
| 14) Trichlorofluoromethane | 7.39 | 101 | 26444 | 0.867 | ng | | 98 |
| 15) 2-Propanol (Isopropanol) | 7.63 | 45 | 22207 | 0.485 | ng | | 71 |
| 27) 2-Butanone (MEK) | 10.61 | 72 | 7710 | 0.624 | ng | # | 62 |
| 30) Ethyl Acetate | 11.43 | 61 | 6423 | 1.013 | ng | | 88 |
| 31) n-Hexane | 11.42 | 57 | 43344 | 1.800 | ng | # | 96 |

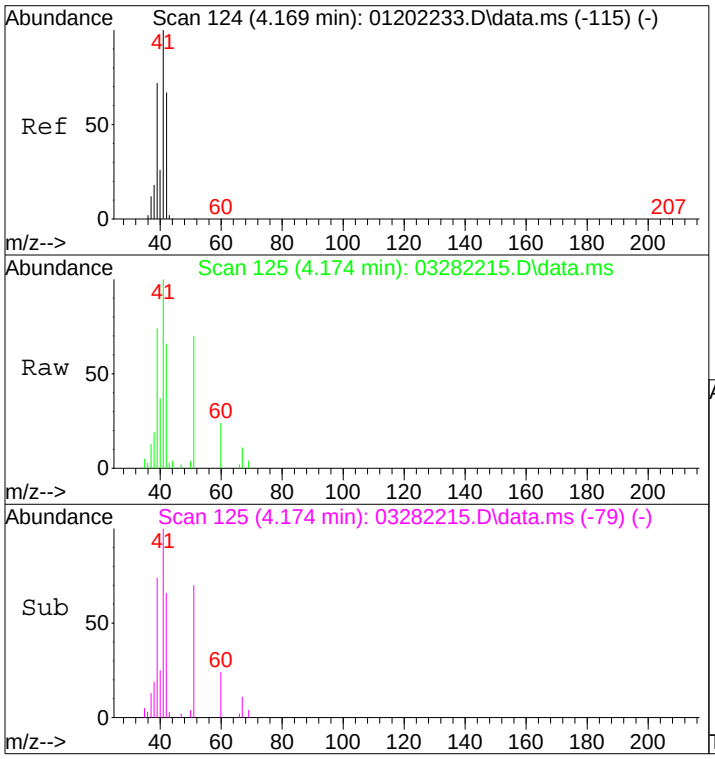
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282215.D Vial: 8
Acq On : 28 Mar 2022 12:54 Operator: TZ/MT
Sample : P2201166-004 (1000mL) Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 29 02:17:13 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

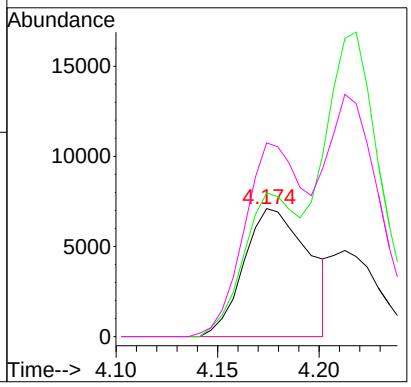


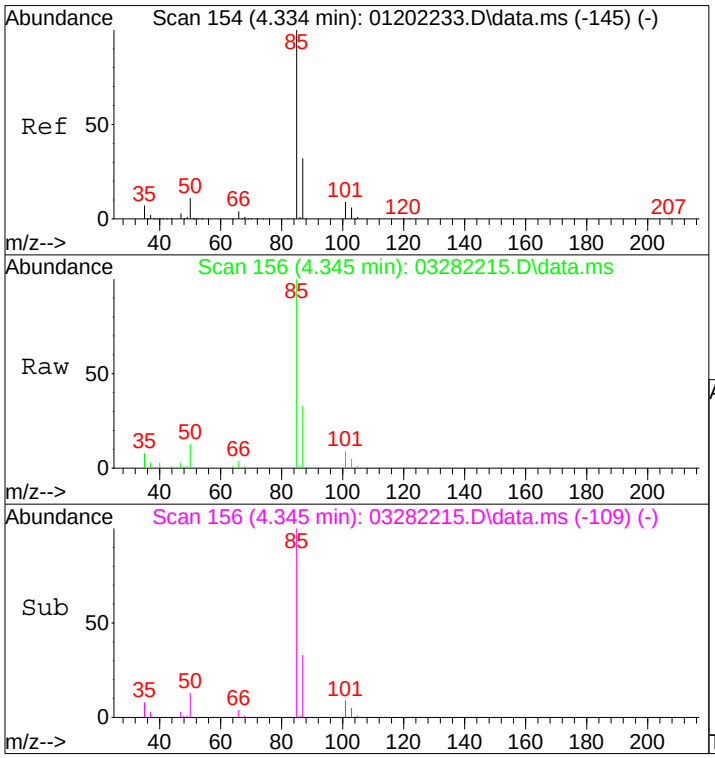



#2
Propene
Concen: 0.73 ng m
RT: 4.17 min Scan# 125
Delta R.T. 0.006 min
Lab File: 03282215.D
Acq: 28 Mar 2022 12:54

Tgt Ion: 42 Resp: 15786

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 42 | 100 | | |
| 39 | 93.9 | 89.5 | 129.5 |
| 41 | 140.6 | 129.4 | 169.4 |

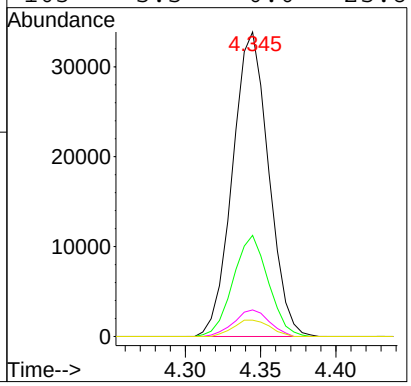


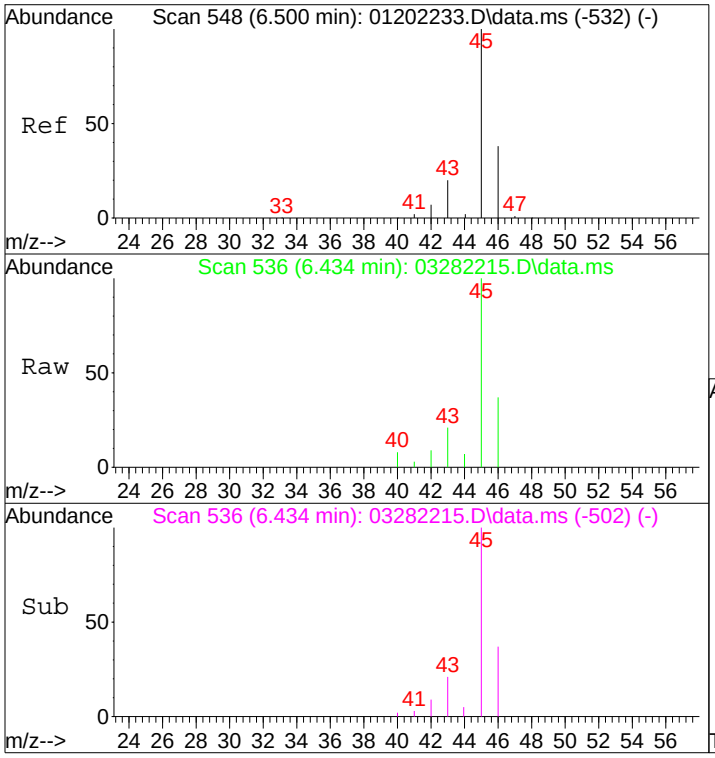




#3
Dichlorodifluoromethane (CFC 12)
Concen: 1.57 ng
RT: 4.34 min Scan# 156
Delta R.T. 0.011 min
Lab File: 03282215.D
Acq: 28 Mar 2022 12:54

Tgt Ion: 85 Resp: 56378

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 85 | 100 | | |
| 87 | 32.4 | 12.6 | 52.6 |
| 101 | 8.6 | 0.0 | 29.1 |
| 103 | 5.5 | 0.0 | 25.8 |

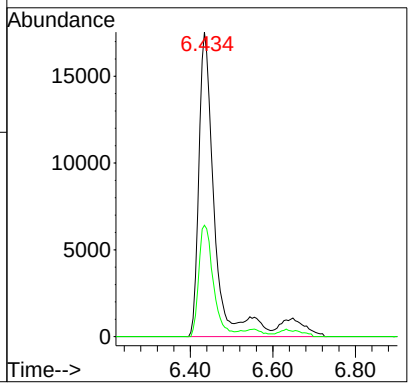


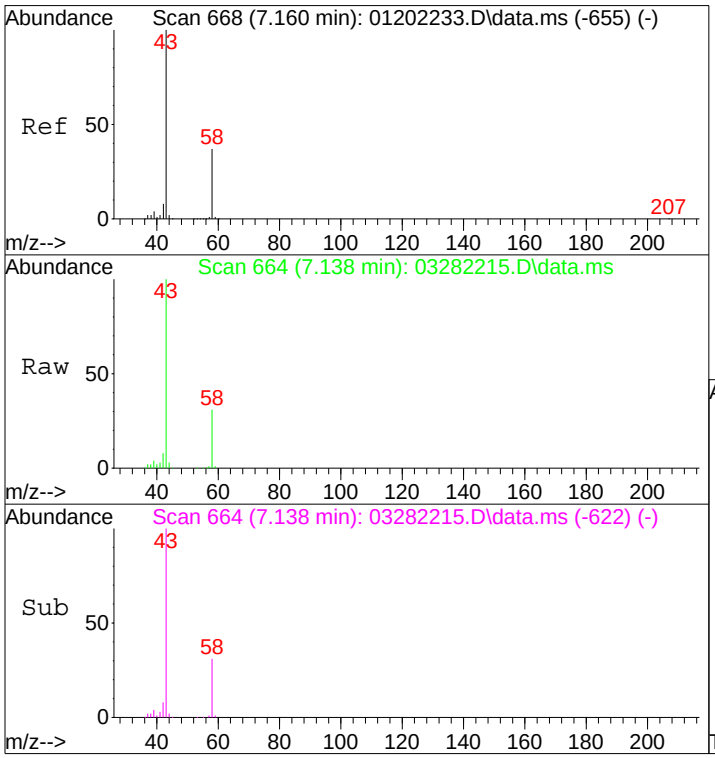



#10
Ethanol
Concen: 3.72 ng
RT: 6.43 min Scan# 536
Delta R.T. -0.061 min
Lab File: 03282215.D
Acq: 28 Mar 2022 12:54

Tgt Ion: 45 Resp: 49996

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 45 | 100 | | |
| 46 | 37.8 | 17.6 | 57.6 |

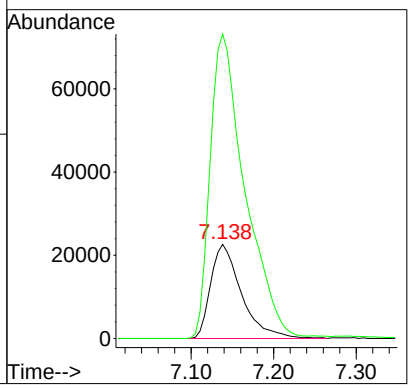


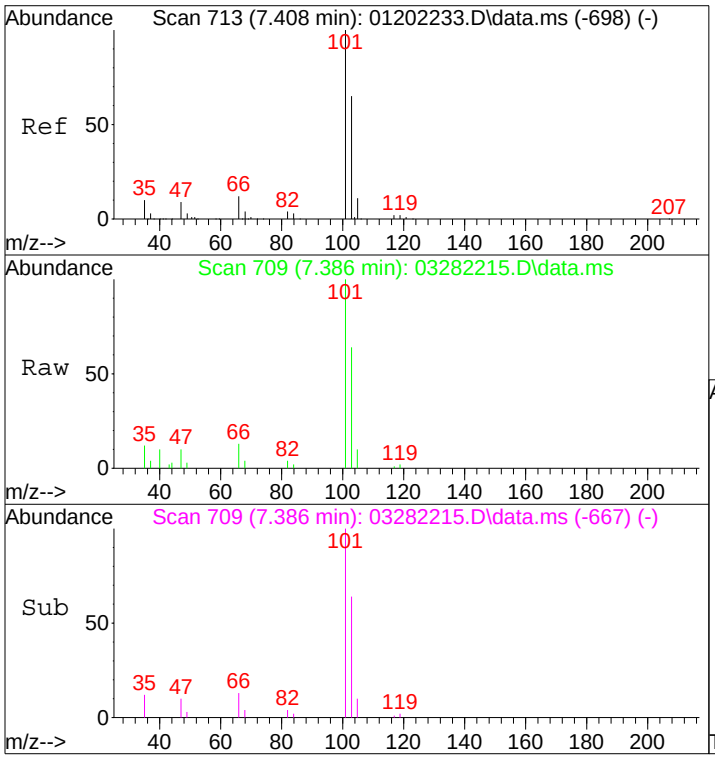




#13
Acetone
Concen: 4.37 ng
RT: 7.14 min Scan# 664
Delta R.T. -0.016 min
Lab File: 03282215.D
Acq: 28 Mar 2022 12:54

Tgt Ion: 58 Resp: 58744

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 58 | 100 | | |
| 43 | 367.0 | 253.5 | 313.5# |

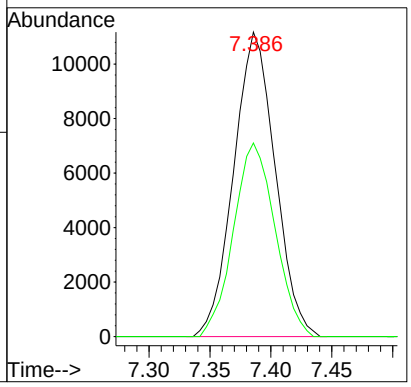


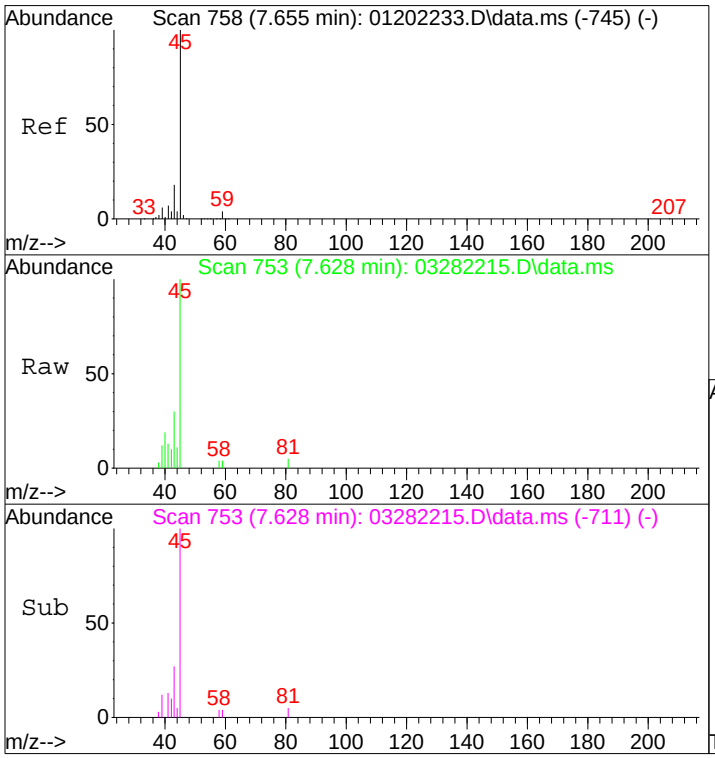



#14
Trichlorofluoromethane
Concen: 0.87 ng
RT: 7.39 min Scan# 709
Delta R.T. -0.016 min
Lab File: 03282215.D
Acq: 28 Mar 2022 12:54

Tgt Ion:101 Resp: 26444

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 101 | 100 | | |
| 103 | 63.7 | 45.0 | 85.0 |

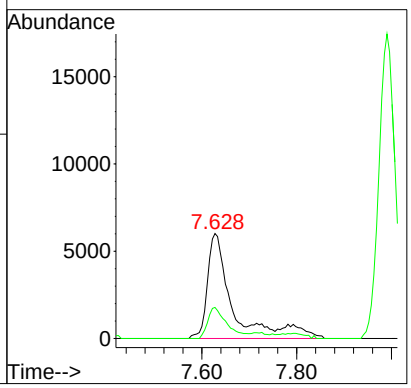


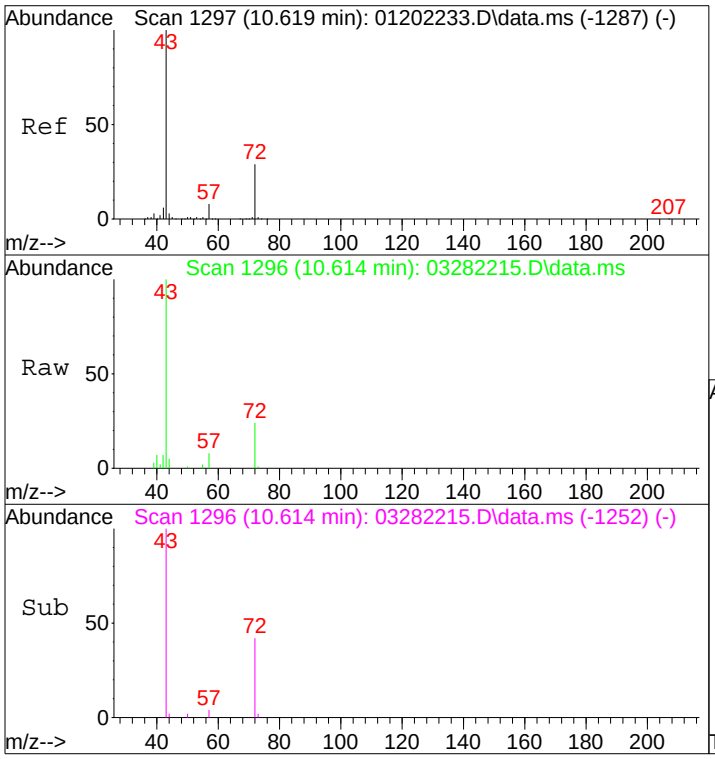




#15
2-Propanol (Isopropanol)
Concen: 0.49 ng
RT: 7.63 min Scan# 753
Delta R.T. -0.021 min
Lab File: 03282215.D
Acq: 28 Mar 2022 12:54

Tgt Ion: 45 Resp: 22207

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 45 | 100 | | |
| 43 | 31.8 | 0.0 | 38.6 |

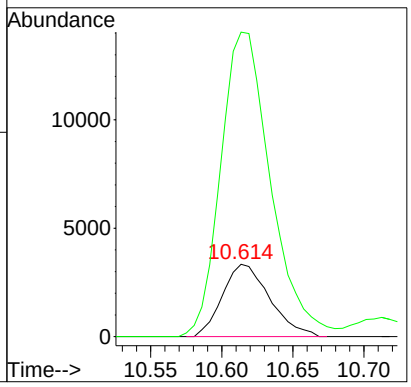


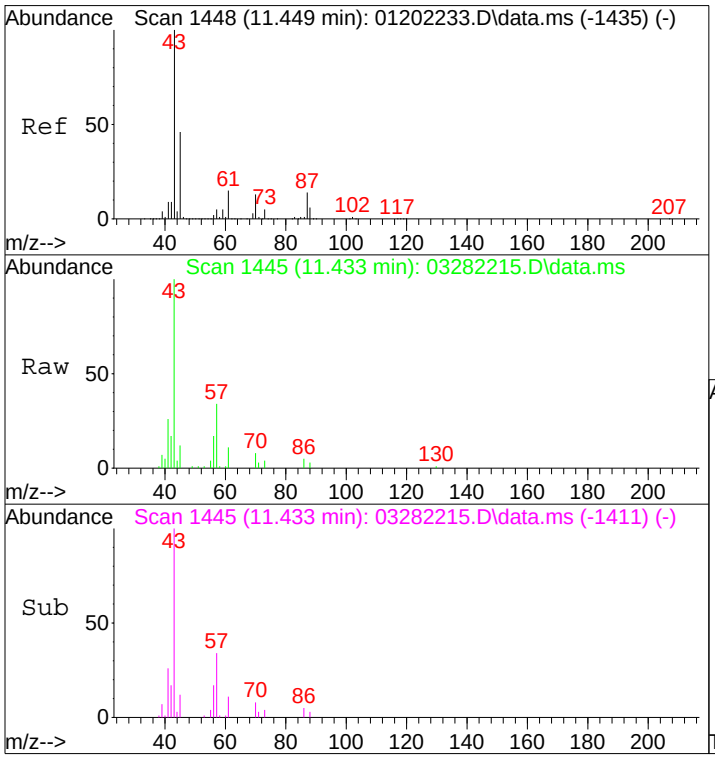



#27
2-Butanone (MEK)
Concen: 0.62 ng
RT: 10.61 min Scan# 1296
Delta R.T. -0.005 min
Lab File: 03282215.D
Acq: 28 Mar 2022 12:54

Tgt Ion: 72 Resp: 7710

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 72 | 100 | | |
| 43 | 443.9 | 339.3 | 379.3# |

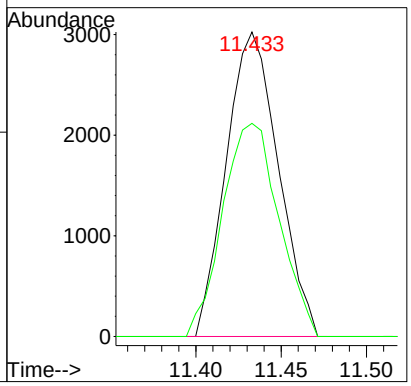


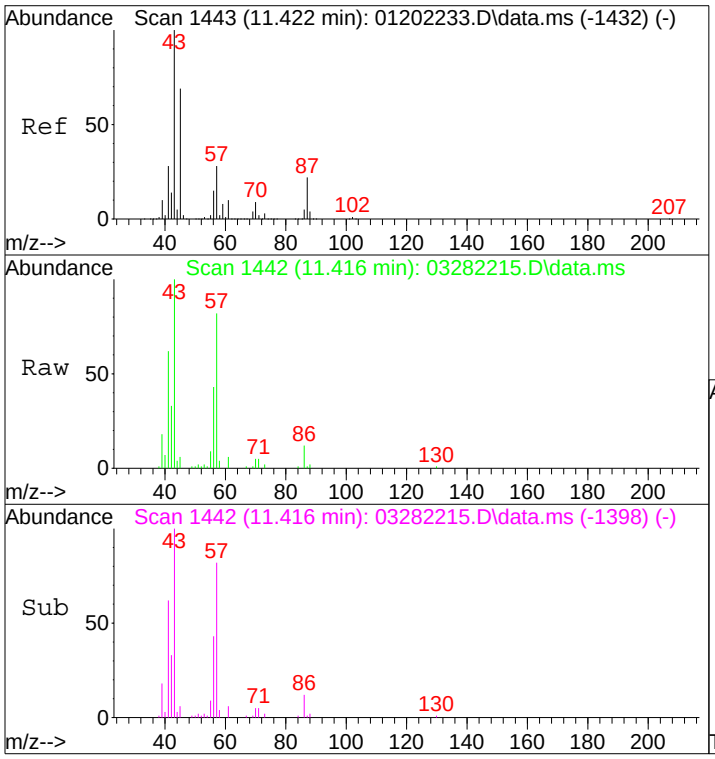




#30
Ethyl Acetate
Concen: 1.01 ng
RT: 11.43 min Scan# 1445
Delta R.T. -0.011 min
Lab File: 03282215.D
Acq: 28 Mar 2022 12:54

Tgt Ion: 61 Resp: 6423

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 61 | 100 | | |
| 70 | 75.8 | 66.4 | 106.4 |

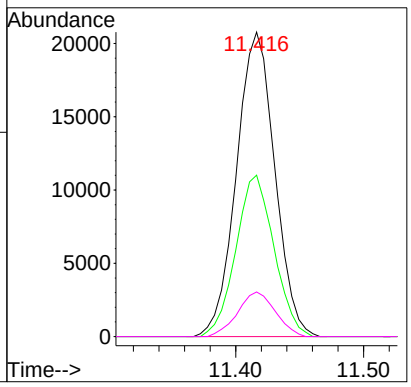





#31
n-Hexane
Concen: 1.80 ng
RT: 11.42 min Scan# 1442
Delta R.T. -0.005 min
Lab File: 03282215.D
Acq: 28 Mar 2022 12:54

Tgt Ion: 57 Resp: 43344

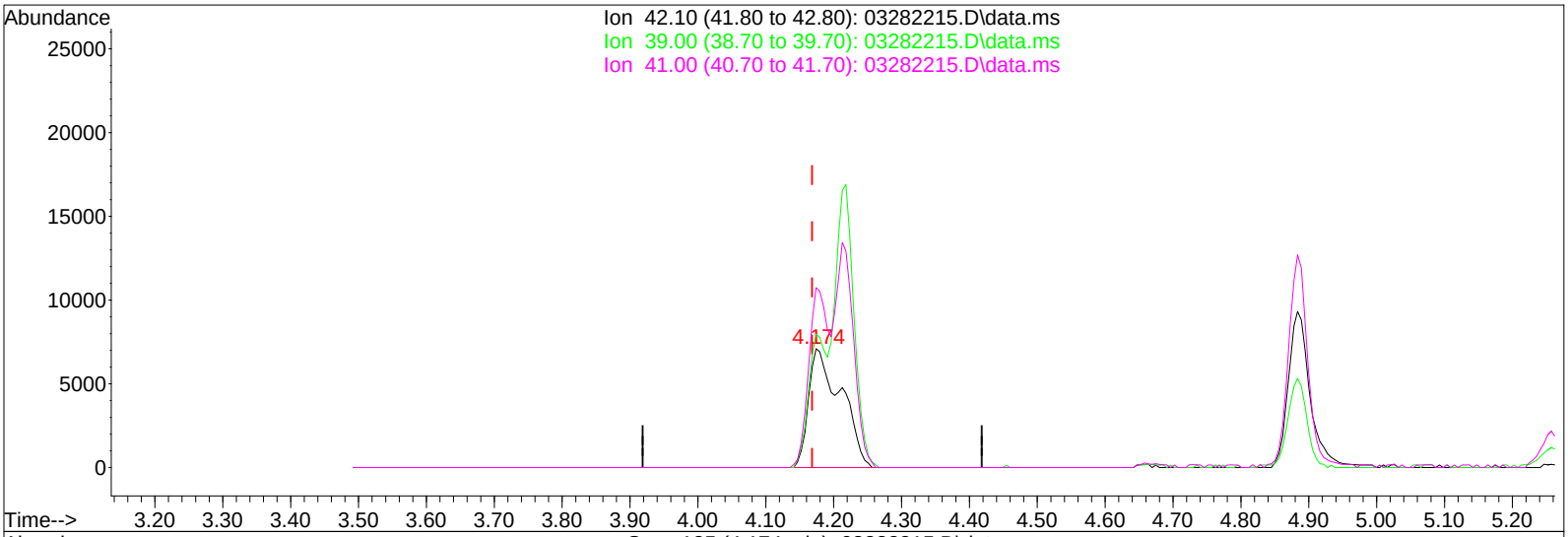
| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 57 | 100 | | |
| 56 | 52.7 | 41.0 | 61.6 |
| 86 | 14.4 | 15.3 | 22.9# |

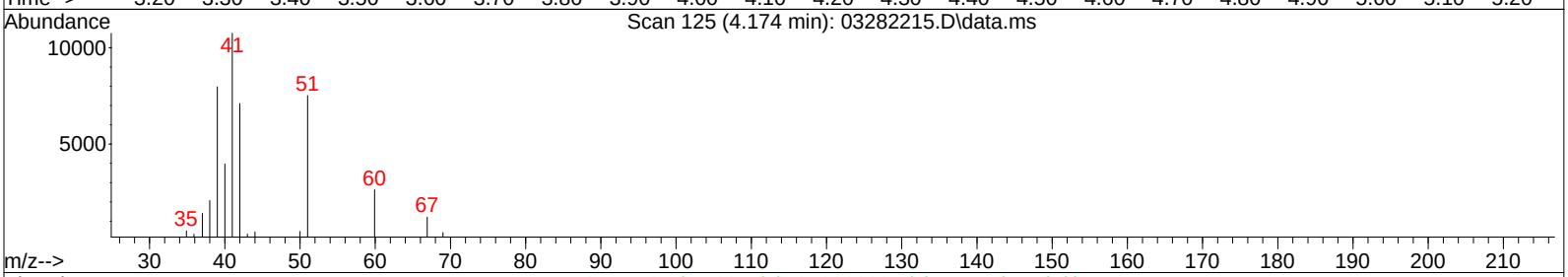


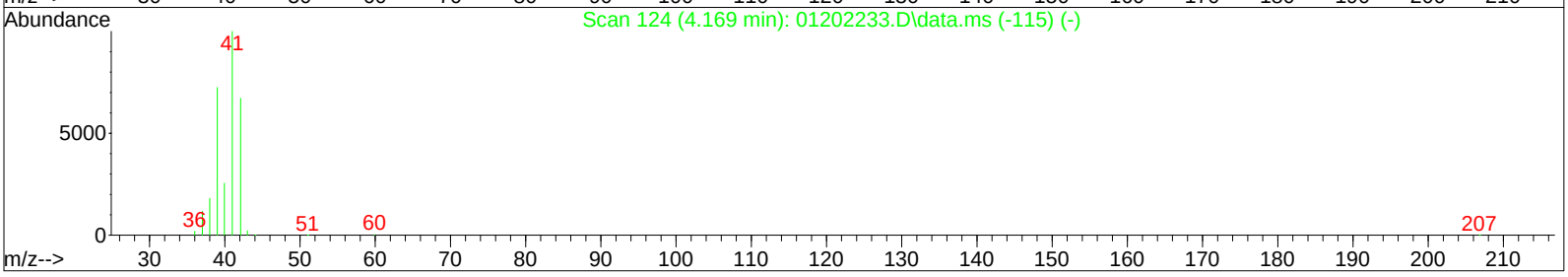
01118147

Data File : I:\MS16\DATA\2022 03\28\03282215.D  Vial: 8
Acq On : 28 Mar 2022 12:54  Operator: TZ/MT
Sample : P2201166-004 (1000mL)  Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 28 13:24:55 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M




TIC: 03282215.D\data.ms

(2) Propene (T)

4.174min (+0.006) 1.09ng

response 23600

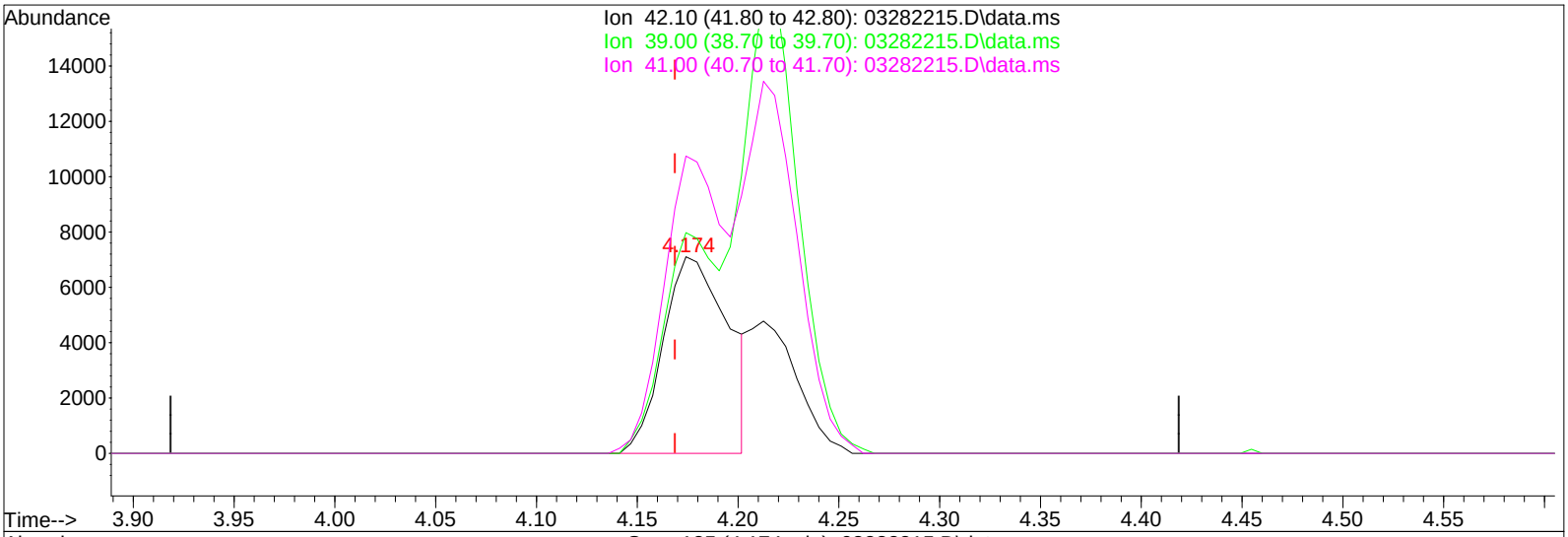
| Ion | Exp% | Act% |
|---|---|---|
| 42.10 | 100 | 100 |
| 39.00 | 109.50 | 62.82# |
| 41.00 | 149.40 | 94.03# |
| 0.00 | 0.00 | 0.00 |

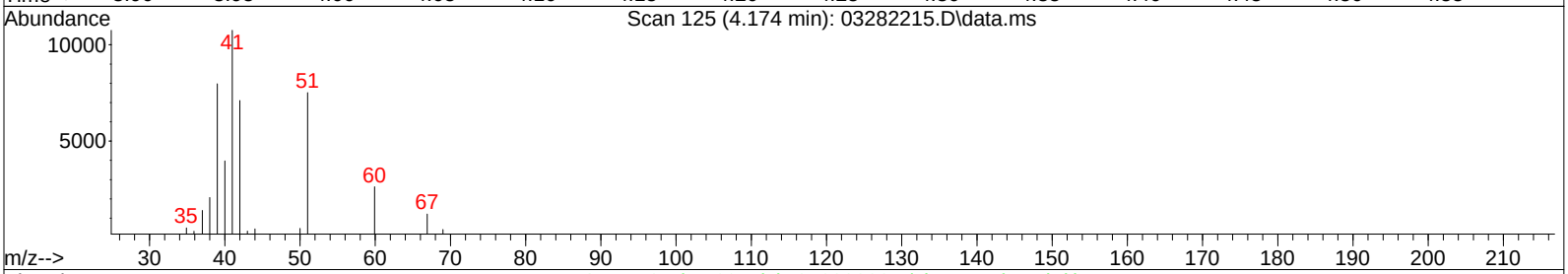
Quantitation Report (Qedit)

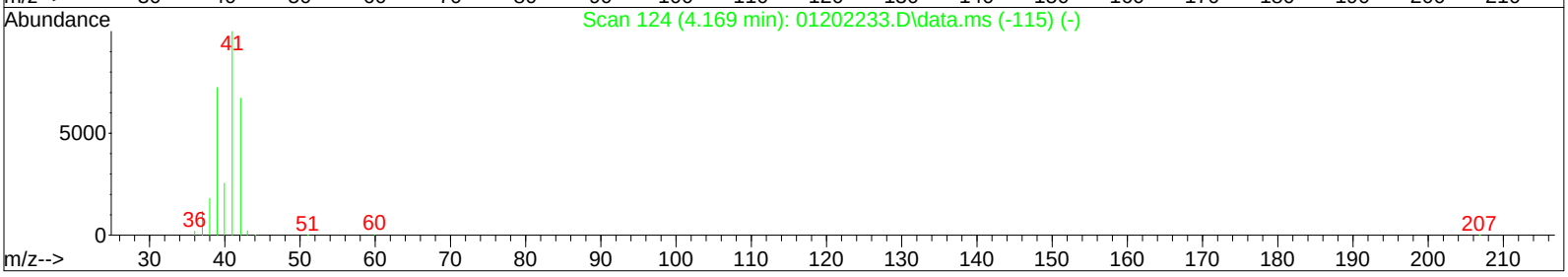
01118148

Data File : I:\MS16\DATA\2022 03\28\03282215.D  Vial: 8
Acq On : 28 Mar 2022 12:54  Operator: TZ/MT
Sample : P2201166-004 (1000mL)  Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 28 13:24:55 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M




TIC: 03282215.D\data.ms

(2) Propene (T)

4.174min (+0.006) 0.73ng m

response 15786

| Ion | Exp% | Act% |
|---|---|---|
| 42.10 | 100 | 100 |
| 39.00 | 109.50 | 93.91 |
| 41.00 | 149.40 | 140.58 |
| 0.00 | 0.00 | 0.00 |

IPC

WA 3/29/22

Tz 3/29/22

Quantitation Report (QT Reviewed)

01118149

Data File : I:\MS16\DATA\2022 03\28\03282203.D Vial: 2
Acq On : 28 Mar 2022 4:42 Operator: WA
Sample : MB R16032822_1000mL Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 28 05:48:17 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

3/28/22

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) Bromochloromethane (IS1) | 11.29 | 130 | 141242 | 12.500 | ng | -0.03 |
| 37) 1,4-Difluorobenzene (IS2) | 13.42 | 114 | 659514 | 12.500 | ng | -0.01 |
| 56) Chlorobenzene-d5 (IS3) | 17.73 | 54 | 127235 | 12.500 | ng | 0.00 |

System Monitoring Compounds

| | | | | | | |
|---|---|---|---|---|---|---|
| 33) 1,2-Dichloroethane-d4(... | 12.15 | 65 | 245641 | 12.661 | ng | -0.02 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 101.28% | | | |
| 57) Toluene-d8 (SS2) | 15.88 | 98 | 699604 | 11.378 | ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 91.04% | | | |
| 73) Bromofluorobenzene (SS3) | 19.11 | 174 | 237838 | 12.137 | ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 97.12% | | | |

| Target Compounds | | | | | | | Qvalue |
|---|---|---|---|---|---|---|---|
| 2) Propene | 0.00 | 42 | 0 | N.D. | | | |
| 3) Dichlorodifluoromethan... | 0.00 | 85 | 0 | N.D. | | | |
| 4) Chloromethane | 0.00 | 50 | 0 | N.D. | | | |
| 5) 1,2-Dichloro-1,1,2,2-t... | 0.00 | 135 | 0 | N.D. | | | |
| 6) Vinyl Chloride | 0.00 | 62 | 0 | N.D. | | | |
| 7) 1,3-Butadiene | 0.00 | 54 | 0 | N.D. | | | |
| 8) Bromomethane | 0.00 | 94 | 0 | N.D. | | | |
| 9) Chloroethane | 0.00 | 64 | 0 | N.D. | | | |
| 10) Ethanol | 6.46 | 45 | 910 | 0.068 | ng | | 68 |
| 11) Acetonitrile | 6.73 | 41 | 987 | N.D. | | | |
| 12) Acrolein | 0.00 | 56 | 0 | N.D. | | | |
| 13) Acetone | 7.18 | 58 | 1003 | 0.075 | ng | # | 58 |
| 14) Trichlorofluoromethane | 0.00 | 101 | 0 | N.D. | | | |
| 15) 2-Propanol (Isopropanol) | 0.00 | 45 | 0 | N.D. | | | |
| 16) Acrylonitrile | 7.90 | 53 | 419 | N.D. | | | |
| 17) 1,1-Dichloroethene | 0.00 | 96 | 0 | N.D. | | | |
| 18) 2-Methyl-2-Propanol (t... | 0.00 | 59 | 0 | N.D. | | | |
| 19) Methylene Chloride | 0.00 | 84 | 0 | N.D. | | | |
| 20) 3-Chloro-1-propene (Al... | 0.00 | 41 | 0 | N.D. | | | |
| 21) Trichlorotrifluoroethane | 0.00 | 151 | 0 | N.D. | | | |
| 22) Carbon Disulfide | 8.84 | 76 | 563 | N.D. | | | |
| 23) trans-1,2-Dichloroethene | 0.00 | 61 | 0 | N.D. | | | |
| 24) 1,1-Dichloroethane | 0.00 | 63 | 0 | N.D. | | | |
| 25) Methyl tert-Butyl Ether | 0.00 | 73 | 0 | N.D. | | | |
| 26) Vinyl Acetate | 0.00 | 86 | 0 | N.D. | | | |
| 27) 2-Butanone (MEK) | 0.00 | 72 | 0 | N.D. | | | |
| 28) cis-1,2-Dichloroethene | 0.00 | 61 | 0 | N.D. | | | |
| 29) Diisopropyl Ether | 0.00 | 87 | 0 | N.D. | | | |
| 30) Ethyl Acetate | 0.00 | 61 | 0 | N.D. | | | |
| 31) n-Hexane | 0.00 | 57 | 0 | N.D. | | | |
| 32) Chloroform | 0.00 | 83 | 0 | N.D. | | | |
| 34) Tetrahydrofuran (THF) | 0.00 | 72 | 0 | N.D. | | | |
| 35) Ethyl tert-Butyl Ether | 0.00 | 87 | 0 | N.D. | | | |
| 36) 1,2-Dichloroethane | 0.00 | 62 | 0 | N.D. | | | |
| 38) 1,1,1-Trichloroethane | 0.00 | 97 | 0 | N.D. | | | |
| 39) Isopropyl Acetate | 0.00 | 61 | 0 | N.D. | | | |
| 40) 1-Butanol | 0.00 | 56 | 0 | N.D. | | | |
| 41) Benzene | 13.03 | 78 | 559 | N.D. | | | |
| 42) Carbon Tetrachloride | 0.00 | 117 | 0 | N.D. | | | |
| 43) Cyclohexane | 13.41 | 84 | 901 | N.D. | | | |
| 44) tert-Amyl Methyl Ether | 0.00 | 73 | 0 | N.D. | | | |
| 45) 1,2-Dichloropropane | 0.00 | 63 | 0 | N.D. | | | |
| 46) Bromodichloromethane | 0.00 | 83 | 0 | N.D. | | | |
| 47) Trichloroethene | 0.00 | 130 | 0 | N.D. | | | |
| 48) 1,4-Dioxane | 0.00 | 88 | 0 | N.D. | | | |
| 49) 2,2,4-Trimethylpentane... | 0.00 | 57 | 0 | N.D. | | | |
| 50) Methyl Methacrylate | 0.00 | 100 | 0 | N.D. | | | |

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282203.D Vial: 2
Acq On : 28 Mar 2022 4:42 Operator: WA
Sample : MB R16032822_1000mL Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 28 05:48:17 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

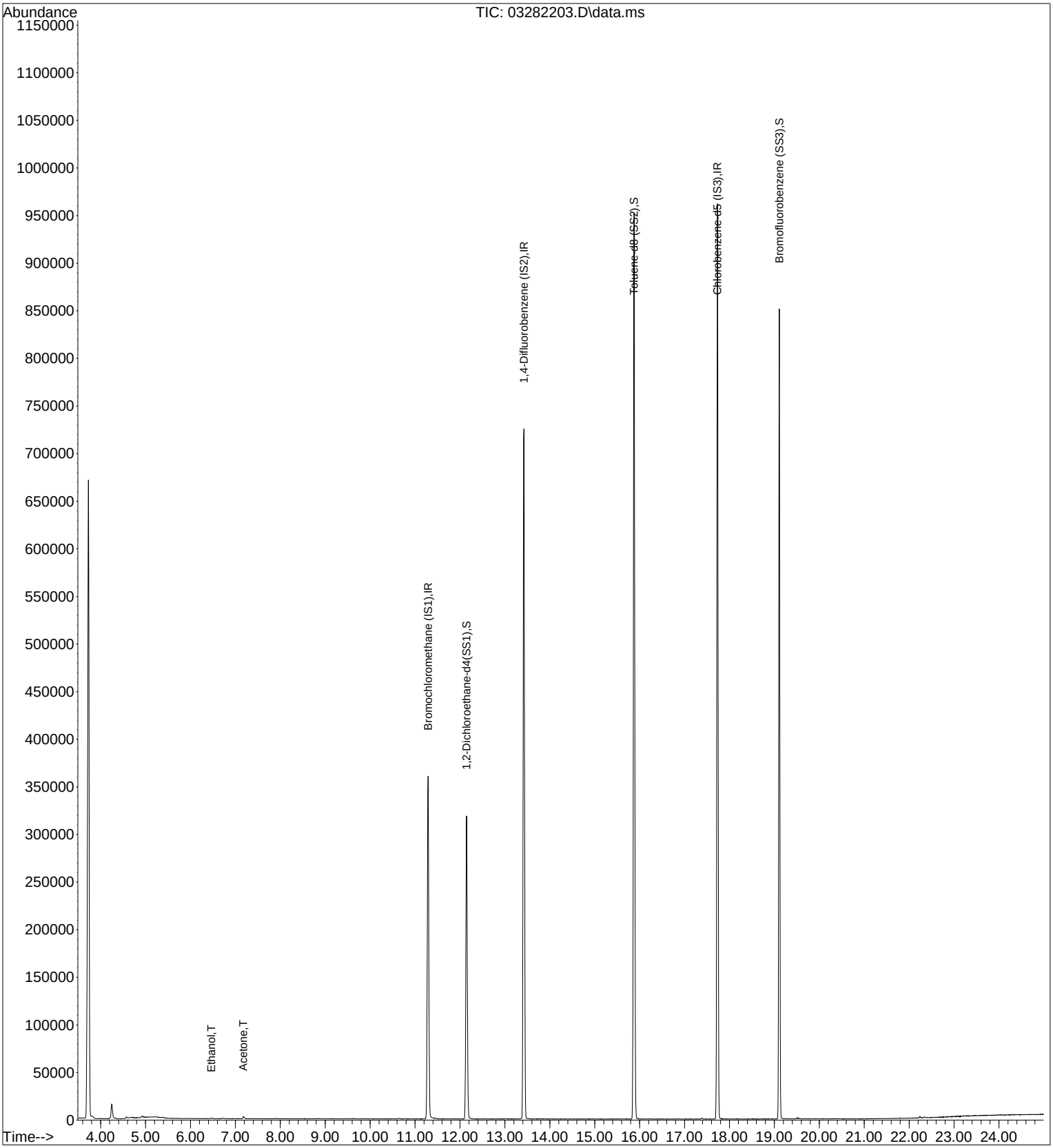
| Internal Standards | R.T. | QIon | Response | Conc Units Dev(Min) |
|---|---|---|---|---|
| 51) n-Heptane | 0.00 | 71 | 0 | N.D. |
| 52) cis-1,3-Dichloropropene | 0.00 | 75 | 0 | N.D. |
| 53) 4-Methyl-2-pentanone | 0.00 | 58 | 0 | N.D. |
| 54) trans-1,3-Dichloropropene | 0.00 | 75 | 0 | N.D. |
| 55) 1,1,2-Trichloroethane | 0.00 | 97 | 0 | N.D. |
| 58) Toluene | 15.97 | 91 | 109 | N.D. |
| 59) 2-Hexanone | 16.23 | 43 | 328 | N.D. |
| 60) Dibromochloromethane | 0.00 | 129 | 0 | N.D. |
| 61) 1,2-Dibromoethane | 0.00 | 107 | 0 | N.D. |
| 62) n-Butyl Acetate | 16.86 | 43 | 257 | N.D. |
| 63) n-Octane | 0.00 | 57 | 0 | N.D. |
| 64) Tetrachloroethene | 0.00 | 166 | 0 | N.D. |
| 65) Chlorobenzene | 0.00 | 112 | 0 | N.D. |
| 66) Ethylbenzene | 0.00 | 91 | 0 | N.D. |
| 67) m- & p-Xylenes | 0.00 | 91 | 0 | N.D. |
| 68) Bromoform | 0.00 | 173 | 0 | N.D. |
| 69) Styrene | 0.00 | 104 | 0 | N.D. |
| 70) o-Xylene | 0.00 | 91 | 0 | N.D. |
| 71) n-Nonane | 0.00 | 43 | 0 | N.D. |
| 72) 1,1,2,2-Tetrachloroethane | 0.00 | 83 | 0 | N.D. |
| 74) Cumene | 19.11 | 105 | 381 | N.D. |
| 75) alpha-Pinene | 0.00 | 93 | 0 | N.D. |
| 76) n-Propylbenzene | 0.00 | 91 | 0 | N.D. |
| 77) 3-Ethyltoluene | 0.00 | 105 | 0 | N.D. |
| 78) 4-Ethyltoluene | 0.00 | 105 | 0 | N.D. |
| 79) 1,3,5-Trimethylbenzene | 0.00 | 105 | 0 | N.D. |
| 80) alpha-Methylstyrene | 0.00 | 118 | 0 | N.D. |
| 81) 2-Ethyltoluene | 0.00 | 105 | 0 | N.D. |
| 82) 1,2,4-Trimethylbenzene | 0.00 | 105 | 0 | N.D. |
| 83) n-Decane | 0.00 | 58 | 0 | N.D. |
| 84) Benzyl Chloride | 0.00 | 91 | 0 | N.D. |
| 85) 1,3-Dichlorobenzene | 20.37 | 146 | 159 | N.D. |
| 86) 1,4-Dichlorobenzene | 20.43 | 146 | 265 | N.D. |
| 87) sec-Butylbenzene | 0.00 | 105 | 0 | N.D. |
| 88) 4-Isopropyltoluene (p-... | 0.00 | 119 | 0 | N.D. |
| 89) 1,2,3-Trimethylbenzene | 0.00 | 105 | 0 | N.D. |
| 90) 1,2-Dichlorobenzene | 0.00 | 146 | 0 | N.D. |
| 91) d-Limonene | 0.00 | 68 | 0 | N.D. |
| 92) 1,2-Dibromo-3-Chloropr... | 0.00 | 157 | 0 | N.D. |
| 93) n-Undecane | 0.00 | 57 | 0 | N.D. |
| 94) 1,2,4-Trichlorobenzene | 22.24 | 180 | 717 | N.D. |
| 95) Naphthalene | 22.34 | 128 | 1477 | N.D. |
| 96) n-Dodecane | 0.00 | 57 | 0 | N.D. |
| 97) Hexachlorobutadiene | 0.00 | 225 | 0 | N.D. |
| 98) Cyclohexanone | 0.00 | 55 | 0 | N.D. |
| 99) tert-Butylbenzene | 0.00 | 119 | 0 | N.D. |
| 100) n-Butylbenzene | 0.00 | 91 | 0 | N.D. |
| 101) 1,1,1,2-Tetrachloroethane | 0.00 | 131 | 0 | N.D. |

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282203.D Vial: 2
Acq On : 28 Mar 2022 4:42 Operator: WA
Sample : MB R16032822_1000mL Inst : GCMS-16
Misc : S35-01102201

Quant Time: Mar 28 05:48:17 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282204.D Vial: 2
Acq On : 28 Mar 2022 5:16 Operator: WA
Sample : LCS R16032822 25ng Inst : GCMS-16
Misc : S35-01102201/S35-03072204 (4/6)

Quant Time: Mar 28 05:48:19 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

WA 3/28/22

| Internal Standards | R.T. | QIon | Response | Conc | Units | | Dev(Min) |
|---|---|---|---|---|---|---|---|
| 1) Bromochloromethane (IS1) | 11.31 | 130 | 157457 | 12.500 | ng | | 0.00 |
| 37) 1,4-Difluorobenzene (IS2) | 13.43 | 114 | 735576 | 12.500 | ng | | 0.00 |
| 56) Chlorobenzene-d5 (IS3) | 17.73 | 54 | 150304 | 12.500 | ng | | 0.00 |
| **System Monitoring Compounds** | | | | | | | |
| 33) 1,2-Dichloroethane-d4(... | 12.16 | 65 | 272532 | 12.600 | ng | | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 100.80% | | | | |
| 57) Toluene-d8 (SS2) | 15.88 | 98 | 796751 | 10.969 | ng | | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 87.76% | | | | |
| 73) Bromofluorobenzene (SS3) | 19.11 | 174 | 299330 | 12.930 | ng | | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 103.44% | | | | |
| **Target Compounds** | | | | | | | Qvalue |
| 2) Propene | 4.17 | 42 | 649703 | 27.086 | ng | | 99 |
| 3) Dichlorodifluoromethan... | 4.33 | 85 | 862922 | 21.775 | ng | | 100 |
| 4) Chloromethane | 4.63 | 50 | 663133 | 23.014 | ng | | 100 |
| 5) 1,2-Dichloro-1,1,2,2-t... | 4.89 | 135 | 513974 | 24.248 | ng | | 100 |
| 6) Vinyl Chloride | 5.05 | 62 | 665854 | 22.516 | ng | | 100 |
| 7) 1,3-Butadiene | 5.32 | 54 | 504964 | 24.757 | ng | | 96 |
| 8) Bromomethane | 5.77 | 94 | 350658 | 21.767 | ng | | 100 |
| 9) Chloroethane | 6.11 | 64 | 301047 | 23.161 | ng | | 100 |
| 10) Ethanol | 6.49 | 45 | 1549036 | 104.454 | ng | | 100 |
| 11) Acetonitrile | 6.74 | 41 | 834608 | 21.067 | ng | | 99 |
| 12) Acrolein | 6.93 | 56 | 600990 | 54.913 | ng | | 99 |
| 13) Acetone | 7.14 | 58 | 1798005 | 121.188 | ng | | 96 |
| 14) Trichlorofluoromethane | 7.40 | 101 | 738432 | 21.914 | ng | | 100 |
| 15) 2-Propanol (Isopropanol) | 7.64 | 45 | 2020093 | 39.946 | ng | | 99 |
| 16) Acrylonitrile | 7.91 | 53 | 1245312 | 47.758 | ng | | 100 |
| 17) 1,1-Dichloroethene | 8.36 | 96 | 417813 | 23.593 | ng | | 97 |
| 18) 2-Methyl-2-Propanol (t... | 8.52 | 59 | 2299088 | 49.299 | ng | | 97 |
| 19) Methylene Chloride | 8.59 | 84 | 454382 | 23.492 | ng | | 92 |
| 20) 3-Chloro-1-propene (Al... | 8.75 | 41 | 605110 | 22.400 | ng | | 96 |
| 21) Trichlorotrifluoroethane | 9.01 | 151 | 376377 | 24.604 | ng | | 98 |
| 22) Carbon Disulfide | 8.85 | 76 | 3292724 | 50.039 | ng | | 100 |
| 23) trans-1,2-Dichloroethene | 9.87 | 61 | 622742 | 23.785 | ng | | 98 |
| 24) 1,1-Dichloroethane | 10.12 | 63 | 768981 | 23.936 | ng | | 100 |
| 25) Methyl tert-Butyl Ether | 10.21 | 73 | 1279706 | 23.929 | ng | | 97 |
| 26) Vinyl Acetate | 10.37 | 86 | 503395 | 134.244 | ng | # | 80 |
| 27) 2-Butanone (MEK) | 10.61 | 72 | 658059 | 48.198 | ng | # | 84 |
| 28) cis-1,2-Dichloroethene | 11.14 | 61 | 600948 | 23.680 | ng | | 98 |
| 29) Diisopropyl Ether | 11.43 | 87 | 876661 | 55.108 | ng | # | 90 |
| 30) Ethyl Acetate | 11.44 | 61 | 529580 | 75.604 | ng | | 92 |
| 31) n-Hexane | 11.42 | 57 | 761963 | 28.652 | ng | | 98 |
| 32) Chloroform | 11.48 | 83 | 794632 | 24.964 | ng | | 100 |
| 34) Tetrahydrofuran (THF) | 11.88 | 72 | 611902 | 49.114 | ng | | 93 |
| 35) Ethyl tert-Butyl Ether | 12.02 | 87 | 1147467 | 56.436 | ng | | 89 |
| 36) 1,2-Dichloroethane | 12.28 | 62 | 577379 | 23.327 | ng | | 100 |
| 38) 1,1,1-Trichloroethane | 12.56 | 97 | 674421 | 22.576 | ng | | 98 |
| 39) Isopropyl Acetate | 12.99 | 61 | 11126 | No Calib | | # | |
| 40) 1-Butanol | 13.01 | 56 | 9391 | No Calib | | # | |
| 41) Benzene | 13.04 | 78 | 1843057 | 24.112 | ng | | 100 |
| 42) Carbon Tetrachloride | 13.20 | 117 | 549436 | 22.608 | ng | | 100 |
| 43) Cyclohexane | 13.33 | 84 | 1512364 | 53.806 | ng | | 93 |
| 44) tert-Amyl Methyl Ether | 13.67 | 73 | 2680939 | 53.727 | ng | | 96 |
| 45) 1,2-Dichloropropane | 13.89 | 63 | 464850 | 24.914 | ng | | 100 |
| 46) Bromodichloromethane | 14.08 | 83 | 633804 | 25.311 | ng | | 100 |
| 47) Trichloroethene | 14.13 | 130 | 504534 | 24.691 | ng | | 94 |
| 48) 1,4-Dioxane | 14.10 | 88 | 402087 | 23.699 | ng | | 95 |
| 49) 2,2,4-Trimethylpentane... | 14.20 | 57 | 1975650 | 26.656 | ng | | 100 |
| 50) Methyl Methacrylate | 14.34 | 100 | 418936 | 52.727 | ng | | 91 |

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282204.D Vial: 2
Acq On : 28 Mar 2022 5:16 Operator: WA
Sample : LCS R16032822 25ng Inst : GCMS-16
Misc : S35-01102201/S35-03072204 (4/6)

Quant Time: Mar 28 05:48:19 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

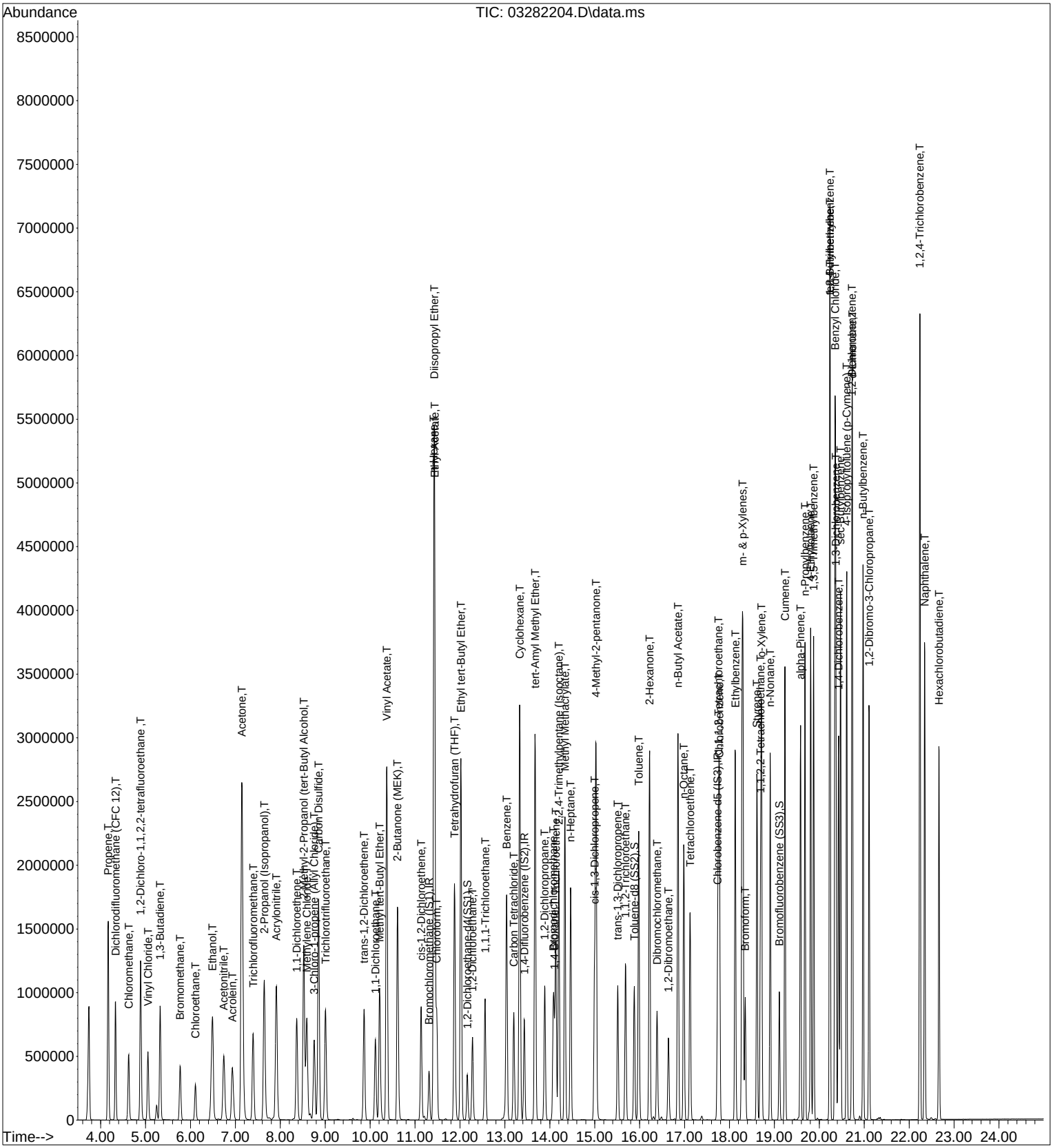
| Internal Standards | R.T. | QIon | Response | Conc Units | | Dev(Min) |
|---|---|---|---|---|---|---|
| 51) n-Heptane | 14.46 | 71 | 494305 | 26.044 ng | | 95 |
| 52) cis-1,3-Dichloropropene | 15.00 | 75 | 763480 | 26.007 ng | | 100 |
| 53) 4-Methyl-2-pentanone | 15.03 | 58 | 950669 | 55.760 ng | | 94 |
| 54) trans-1,3-Dichloropropene | 15.51 | 75 | 668944 | 24.803 ng | | 100 |
| 55) 1,1,2-Trichloroethane | 15.68 | 97 | 451293 | 24.737 ng | | 98 |
| 58) Toluene | 15.98 | 91 | 1919600 | 21.854 ng | | 100 |
| 59) 2-Hexanone | 16.22 | 43 | 2223255 | 44.819 ng | | 97 |
| 60) Dibromochloromethane | 16.39 | 129 | 527040 | 22.635 ng | | 100 |
| 61) 1,2-Dibromoethane | 16.64 | 107 | 509963 | 21.364 ng | | 100 |
| 62) n-Butyl Acetate | 16.85 | 43 | 2516505 | 46.335 ng | | 96 |
| 63) n-Octane | 16.98 | 57 | 430194 | 24.519 ng | | 93 |
| 64) Tetrachloroethene | 17.12 | 166 | 552355 | 23.420 ng | | 100 |
| 65) Chlorobenzene | 17.78 | 112 | 1368901 | 23.555 ng | | 100 |
| 66) Ethylbenzene | 18.13 | 91 | 2292016 | 23.438 ng | | 99 |
| 67) m- & p-Xylenes | 18.29 | 91 | 3673891 | 49.393 ng | | 99 |
| 68) Bromoform | 18.35 | 173 | 471442 | 23.649 ng | | 100 |
| 69) Styrene | 18.61 | 104 | 1452828 | 23.906 ng | | 99 |
| 70) o-Xylene | 18.71 | 91 | 1858465 | 24.837 ng | | 99 |
| 71) n-Nonane | 18.91 | 43 | 1004599 | 25.641 ng | | 94 |
| 72) 1,1,2,2-Tetrachloroethane | 18.69 | 83 | 905610 | 26.127 ng | | 100 |
| 74) Cumene | 19.24 | 105 | 2350196 | 24.148 ng | | 99 |
| 75) alpha-Pinene | 19.58 | 93 | 1222112 | 26.632 ng | | 99 |
| 76) n-Propylbenzene | 19.68 | 91 | 2898968 | 25.097 ng | | 98 |
| 77) 3-Ethyltoluene | 19.81 | 105 | 2384076 | No Calib | | |
| 78) 4-Ethyltoluene | 19.81 | 105 | 2384076 | 25.280 ng | | 99 |
| 79) 1,3,5-Trimethylbenzene | 19.87 | 105 | 1979611 | 25.496 ng | | 99 |
| 80) alpha-Methylstyrene | 19.87 | 118 | 15168 | No Calib | | |
| 81) 2-Ethyltoluene | 19.87 | 105 | 1979611 | No Calib | | |
| 82) 1,2,4-Trimethylbenzene | 20.24 | 105 | 2089745 | 28.205 ng | | 100 |
| 83) n-Decane | 20.23 | 58 | 85489 | No Calib | # | |
| 84) Benzyl Chloride | 20.35 | 91 | 3511302 | 59.141 ng | | 98 |
| 85) 1,3-Dichlorobenzene | 20.37 | 146 | 1307241 | 29.227 ng | | 100 |
| 86) 1,4-Dichlorobenzene | 20.43 | 146 | 1224613 | 26.340 ng | | 100 |
| 87) sec-Butylbenzene | 20.47 | 105 | 2693673 | 26.020 ng | | 99 |
| 88) 4-Isopropyltoluene (p-... | 20.61 | 119 | 2353881 | 26.057 ng | | 99 |
| 89) 1,2,3-Trimethylbenzene | 20.61 | 105 | 87646 | No Calib | # | |
| 90) 1,2-Dichlorobenzene | 20.73 | 146 | 1256171 | 29.788 ng | | 100 |
| 91) d-Limonene | 20.74 | 68 | 805492 | 30.369 ng | | 96 |
| 92) 1,2-Dibromo-3-Chloropr... | 21.11 | 157 | 942839 | 59.041 ng | | 98 |
| 93) n-Undecane | 22.34 | 57 | 877 | No Calib | # | |
| 94) 1,2,4-Trichlorobenzene | 22.24 | 180 | 2056674 | 61.533 ng | | 100 |
| 95) Naphthalene | 22.35 | 128 | 2915397 | 26.462 ng | | 100 |
| 96) n-Dodecane | 22.34 | 57 | 877 | No Calib | # | |
| 97) Hexachlorobutadiene | 22.67 | 225 | 539842 | 26.468 ng | | 100 |
| 98) Cyclohexanone | 18.28 | 55 | 2696 | No Calib | | |
| 99) tert-Butylbenzene | 20.24 | 119 | 2039351 | 27.949 ng | | 98 |
| 100) n-Butylbenzene | 20.97 | 91 | 2234415 | 26.842 ng | | 100 |
| 101) 1,1,1,2-Tetrachloroethane | 17.76 | 131 | 506129 | 24.845 ng | | 98 |

(#) = qualifier out of range (m) = manual integration (+) = signals summed

01118154

Data File : I:\MS16\DATA\2022 03\28\03282204.D Vial: 2
Acq On : 28 Mar 2022 5:16 Operator: WA
Sample : LCS R16032822 25ng Inst : GCMS-16
Misc : S35-01102201/S35-03072204 (4/6)

Quant Time: Mar 28 05:48:19 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282205.D Vial: 2
Acq On : 28 Mar 2022 5:50 Operator: WA
Sample : LCSD R16032722 25ng Inst : GCMS-16
Misc : S35-01102201/S35-03072204 (4/6)

Quant Time: Mar 28 06:54:34 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

WA 3/28/22

| Internal Standards | R.T. | QIon | Response | Conc | Units | | Dev(Min) |
|---|---|---|---|---|---|---|---|
| 1) Bromochloromethane (IS1) | 11.31 | 130 | 181620 | 12.500 | ng | | 0.00 |
| 37) 1,4-Difluorobenzene (IS2) | 13.43 | 114 | 830675 | 12.500 | ng | | 0.00 |
| 56) Chlorobenzene-d5 (IS3) | 17.73 | 54 | 160367 | 12.500 | ng | | 0.00 |
| **System Monitoring Compounds** | | | | | | | |
| 33) 1,2-Dichloroethane-d4(... | 12.16 | 65 | 303606 | 12.169 | ng | | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 97.36% | | | | |
| 57) Toluene-d8 (SS2) | 15.88 | 98 | 881864 | 11.379 | ng | | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 91.04% | | | | |
| 73) Bromofluorobenzene (SS3) | 19.11 | 174 | 329459 | 13.339 | ng | | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 106.72% | | | | |
| **Target Compounds** | | | | | | | Qvalue |
| 2) Propene | 4.17 | 42 | 729577 | 26.370 | ng | | 99 |
| 3) Dichlorodifluoromethan... | 4.33 | 85 | 959392 | 20.989 | ng | | 100 |
| 4) Chloromethane | 4.63 | 50 | 755730 | 22.738 | ng | | 100 |
| 5) 1,2-Dichloro-1,1,2,2-t... | 4.89 | 135 | 571499 | 23.375 | ng | | 100 |
| 6) Vinyl Chloride | 5.05 | 62 | 750247 | 21.994 | ng | | 100 |
| 7) 1,3-Butadiene | 5.33 | 54 | 571729 | 24.302 | ng | | 96 |
| 8) Bromomethane | 5.77 | 94 | 417861 | 22.488 | ng | | 100 |
| 9) Chloroethane | 6.11 | 64 | 352432 | 23.507 | ng | | 100 |
| 10) Ethanol | 6.49 | 45 | 1732536 | 101.285 | ng | | 100 |
| 11) Acetonitrile | 6.74 | 41 | 945533 | 20.692 | ng | | 99 |
| 12) Acrolein | 6.93 | 56 | 673744 | 53.370 | ng | | 100 |
| 13) Acetone | 7.15 | 58 | 1963565 | 114.739 | ng | | 97 |
| 14) Trichlorofluoromethane | 7.40 | 101 | 842310 | 21.671 | ng | | 100 |
| 15) 2-Propanol (Isopropanol) | 7.64 | 45 | 2261406 | 38.769 | ng | | 100 |
| 16) Acrylonitrile | 7.91 | 53 | 1386816 | 46.109 | ng | | 99 |
| 17) 1,1-Dichloroethene | 8.37 | 96 | 475300 | 23.269 | ng | | 98 |
| 18) 2-Methyl-2-Propanol (t... | 8.52 | 59 | 2571191 | 47.799 | ng | | 98 |
| 19) Methylene Chloride | 8.59 | 84 | 506238 | 22.691 | ng | | 94 |
| 20) 3-Chloro-1-propene (Al... | 8.75 | 41 | 678263 | 21.768 | ng | | 96 |
| 21) Trichlorotrifluoroethane | 9.01 | 151 | 429530 | 24.343 | ng | | 96 |
| 22) Carbon Disulfide | 8.85 | 76 | 3631307 | 47.842 | ng | | 100 |
| 23) trans-1,2-Dichloroethene | 9.87 | 61 | 697385 | 23.092 | ng | | 98 |
| 24) 1,1-Dichloroethane | 10.12 | 63 | 862906 | 23.286 | ng | | 100 |
| 25) Methyl tert-Butyl Ether | 10.21 | 73 | 1441912 | 23.375 | ng | | 98 |
| 26) Vinyl Acetate | 10.37 | 86 | 552615 | 127.764 | ng | # | 85 |
| 27) 2-Butanone (MEK) | 10.61 | 72 | 719890 | 45.712 | ng | # | 86 |
| 28) cis-1,2-Dichloroethene | 11.14 | 61 | 672432 | 22.971 | ng | | 98 |
| 29) Diisopropyl Ether | 11.43 | 87 | 939744 | 51.214 | ng | # | 89 |
| 30) Ethyl Acetate | 11.44 | 61 | 566356 | 70.097 | ng | | 92 |
| 31) n-Hexane | 11.42 | 57 | 813021 | 26.505 | ng | | 98 |
| 32) Chloroform | 11.48 | 83 | 872200 | 23.755 | ng | | 100 |
| 34) Tetrahydrofuran (THF) | 11.88 | 72 | 671136 | 46.701 | ng | | 93 |
| 35) Ethyl tert-Butyl Ether | 12.02 | 87 | 1260536 | 53.748 | ng | | 90 |
| 36) 1,2-Dichloroethane | 12.28 | 62 | 639430 | 22.397 | ng | | 100 |
| 38) 1,1,1-Trichloroethane | 12.56 | 97 | 751058 | 22.263 | ng | | 99 |
| 39) Isopropyl Acetate | 12.99 | 61 | 12967 | No Calib | | # | |
| 40) 1-Butanol | 13.01 | 56 | 10683 | No Calib | | # | |
| 41) Benzene | 13.04 | 78 | 2030811 | 23.527 | ng | | 99 |
| 42) Carbon Tetrachloride | 13.20 | 117 | 615533 | 22.428 | ng | | 100 |
| 43) Cyclohexane | 13.33 | 84 | 1629192 | 51.327 | ng | | 94 |
| 44) tert-Amyl Methyl Ether | 13.67 | 73 | 2929693 | 51.990 | ng | | 97 |
| 45) 1,2-Dichloropropane | 13.89 | 63 | 510645 | 24.235 | ng | | 100 |
| 46) Bromodichloromethane | 14.08 | 83 | 696346 | 24.625 | ng | | 100 |
| 47) Trichloroethene | 14.13 | 130 | 558994 | 24.224 | ng | | 94 |
| 48) 1,4-Dioxane | 14.10 | 88 | 440630 | 22.998 | ng | | 95 |
| 49) 2,2,4-Trimethylpentane... | 14.20 | 57 | 2145269 | 25.631 | ng | | 99 |
| 50) Methyl Methacrylate | 14.34 | 100 | 456126 | 50.836 | ng | | 92 |

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282205.D Vial: 2
Acq On : 28 Mar 2022 5:50 Operator: WA
Sample : LCSD R16032722 25ng Inst : GCMS-16
Misc : S35-01102201/S35-03072204 (4/6)

Quant Time: Mar 28 06:54:34 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

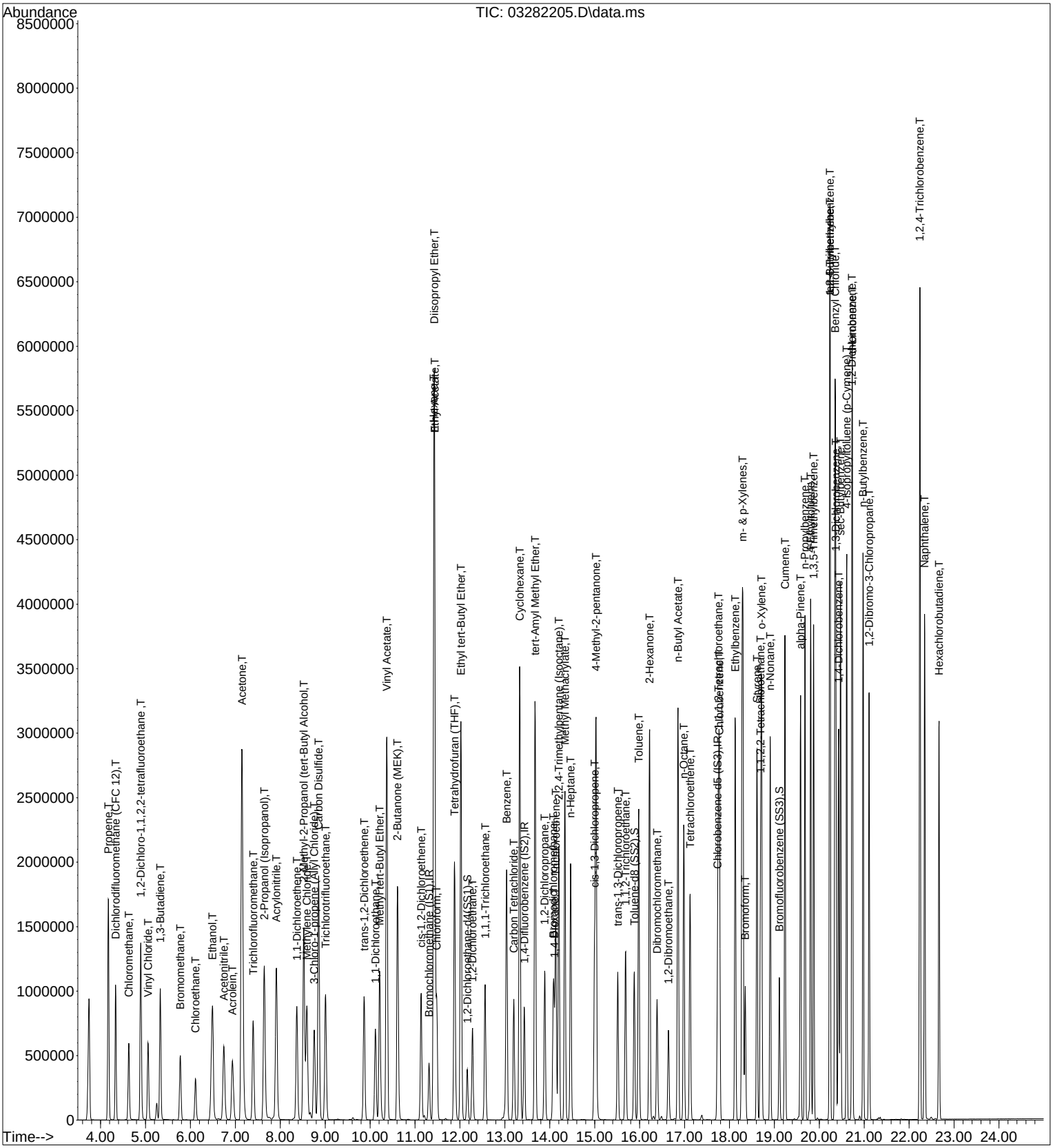
| Internal Standards | R.T. | QIon | Response | Conc Units | | Dev(Min) |
|---|---|---|---|---|---|---|
| 51) n-Heptane | 14.46 | 71 | 536836 | 25.047 ng | | 96 |
| 52) cis-1,3-Dichloropropene | 15.00 | 75 | 837132 | 25.252 ng | | 100 |
| 53) 4-Methyl-2-pentanone | 15.03 | 58 | 1012831 | 52.605 ng | | 95 |
| 54) trans-1,3-Dichloropropene | 15.51 | 75 | 733657 | 24.088 ng | | 100 |
| 55) 1,1,2-Trichloroethane | 15.69 | 97 | 491996 | 23.881 ng | | 99 |
| 58) Toluene | 15.98 | 91 | 2073157 | 22.121 ng | | 100 |
| 59) 2-Hexanone | 16.22 | 43 | 2352228 | 44.443 ng | | 97 |
| 60) Dibromochloromethane | 16.39 | 129 | 575539 | 23.167 ng | | 100 |
| 61) 1,2-Dibromoethane | 16.64 | 107 | 557833 | 21.903 ng | | 100 |
| 62) n-Butyl Acetate | 16.85 | 43 | 2653225 | 45.787 ng | | 97 |
| 63) n-Octane | 16.98 | 57 | 461951 | 24.677 ng | | 93 |
| 64) Tetrachloroethene | 17.12 | 166 | 601594 | 23.907 ng | | 100 |
| 65) Chlorobenzene | 17.78 | 112 | 1467909 | 23.674 ng | | 100 |
| 66) Ethylbenzene | 18.13 | 91 | 2447876 | 23.461 ng | | 99 |
| 67) m- & p-Xylenes | 18.29 | 91 | 3886051 | 48.967 ng | | 99 |
| 68) Bromoform | 18.35 | 173 | 515406 | 24.232 ng | | 100 |
| 69) Styrene | 18.61 | 104 | 1555807 | 23.994 ng | | 99 |
| 70) o-Xylene | 18.71 | 91 | 1958007 | 24.526 ng | | 99 |
| 71) n-Nonane | 18.91 | 43 | 1061649 | 25.397 ng | | 95 |
| 72) 1,1,2,2-Tetrachloroethane | 18.69 | 83 | 961272 | 25.993 ng | | 100 |
| 74) Cumene | 19.24 | 105 | 2501388 | 24.088 ng | | 99 |
| 75) alpha-Pinene | 19.58 | 93 | 1295336 | 26.456 ng | | 99 |
| 76) n-Propylbenzene | 19.68 | 91 | 3044206 | 24.701 ng | | 99 |
| 77) 3-Ethyltoluene | 19.81 | 105 | 2471414 | No Calib | | |
| 78) 4-Ethyltoluene | 19.81 | 105 | 2471400 | 24.562 ng | | 100 |
| 79) 1,3,5-Trimethylbenzene | 19.87 | 105 | 1978277 | 23.880 ng | | 100 |
| 80) alpha-Methylstyrene | 19.87 | 118 | 15412 | No Calib | | |
| 81) 2-Ethyltoluene | 19.87 | 105 | 1978277 | No Calib | | |
| 82) 1,2,4-Trimethylbenzene | 20.24 | 105 | 2107696 | 26.662 ng | | 100 |
| 83) n-Decane | 20.24 | 58 | 85542 | No Calib | # | |
| 84) Benzyl Chloride | 20.35 | 91 | 3539370 | 55.873 ng | | 98 |
| 85) 1,3-Dichlorobenzene | 20.37 | 146 | 1289331 | 27.018 ng | | 100 |
| 86) 1,4-Dichlorobenzene | 20.43 | 146 | 1201343 | 24.218 ng | | 100 |
| 87) sec-Butylbenzene | 20.47 | 105 | 2676137 | 24.228 ng | | 99 |
| 88) 4-Isopropyltoluene (p-... | 20.61 | 119 | 2375231 | 24.643 ng | | 98 |
| 89) 1,2,3-Trimethylbenzene | 20.61 | 105 | 88454 | No Calib | # | |
| 90) 1,2-Dichlorobenzene | 20.73 | 146 | 1255536 | 27.904 ng | | 100 |
| 91) d-Limonene | 20.74 | 68 | 813058 | 28.731 ng | | 95 |
| 92) 1,2-Dibromo-3-Chloropr... | 21.11 | 157 | 946253 | 55.537 ng | | 96 |
| 93) n-Undecane | 22.34 | 57 | 1068 | No Calib | # | |
| 94) 1,2,4-Trichlorobenzene | 22.24 | 180 | 2141576 | 60.053 ng | | 100 |
| 95) Naphthalene | 22.34 | 128 | 3080241 | 26.204 ng | | 100 |
| 96) n-Dodecane | 22.34 | 57 | 936 | No Calib | # | |
| 97) Hexachlorobutadiene | 22.67 | 225 | 573510 | 26.355 ng | | 100 |
| 98) Cyclohexanone | 18.30 | 55 | 2921 | No Calib | | |
| 99) tert-Butylbenzene | 20.24 | 119 | 2049624 | 26.327 ng | | 98 |
| 100) n-Butylbenzene | 20.97 | 91 | 2245215 | 25.279 ng | | 99 |
| 101) 1,1,1,2-Tetrachloroethane | 17.76 | 131 | 542343 | 24.952 ng | | 97 |

(#) = qualifier out of range (m) = manual integration (+) = signals summed

01118157

Data File : I:\MS16\DATA\2022 03\28\03282205.D Vial: 2
Acq On : 28 Mar 2022 5:50 Operator: WA
Sample : LCSD R16032722 25ng Inst : GCMS-16
Misc : S35-01102201/S35-03072204 (4/6)

Quant Time: Mar 28 06:54:34 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M



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Method Path : I:\MS16\METHODS\
Method File : R16012022B.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Fri Jan 21 09:34:58 2022
Response Via : Initial Calibration

Calibration Files
0.1 =01202228.D 0.2 =01202229.D 0.5 =01202230.D 1.0 =01202231.D 5.0 =01202232.D 25 =01202233.D 50 =01202234.D
100 =01202235.D

1/21/22

| | | Compound | 0.1 | 0.2 | 0.5 | 1.0 | 5.0 | 25 | 50 | 100 | Avg | %RSD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1) | IR | Bromochloromethane... | ----------ISTD---------- | | | | | | | | | |
| 2) | T | Propene | 1.942 | 1.872 | 2.173 | 1.657 | 2.346 | 1.885 | 1.726 | 1.632 | 1.904 | 13.13 |
| 3) | T | Dichlorodifluo... | 3.254 | 3.121 | 3.220 | 3.015 | 3.012 | 3.462 | 3.191 | 2.892 | 3.146 | 5.62 |
| 4) | T | Chloromethane | 2.609 | 2.434 | 2.341 | 2.416 | 1.795 | 2.555 | 2.243 | 1.907 | 2.288 | 12.85 |
| 5) | T | 1,2-Dichloro-1... | 1.717 | 1.751 | 1.809 | 1.738 | 1.687 | 1.834 | 1.594 | 1.332 | 1.683 | 9.50 |
| 6) | T | Vinyl Chloride | 2.396 | 2.310 | 2.453 | 2.395 | 2.321 | 2.458 | 2.286 | 2.164 | 2.348 | 4.19 |
| 7) | T | 1,3-Butadiene | 1.527 | 1.439 | 1.560 | 1.537 | 1.566 | 1.894 | 1.788 | 1.643 | 1.619 | 9.28 |
| 8) | T | Bromomethane | 1.292 | 1.209 | 1.276 | 1.161 | 1.140 | 1.410 | 1.375 | 1.369 | 1.279 | 7.98 |
| 9) | T | Chloroethane | 0.989 | 1.010 | 1.031 | 0.975 | 0.963 | 1.127 | 1.096 | 1.065 | 1.032 | 5.75 |
| 10) | T | Ethanol | | 1.435 | 1.352 | 1.119 | 1.121 | 1.209 | 1.089 | 0.915 | 1.177 | 14.75 |
| 11) | T | Acetonitrile | | 3.725 | 3.412 | 2.940 | 2.939 | 3.126 | 2.967 | 2.906 | 3.145 | 9.89 |
| 12) | T | Acrolein | 0.795 | 0.663 | 0.589 | 0.890 | 0.896 | 1.087 | 1.040 | 0.993 | 0.869 | 20.37 |
| 13) | T | Acetone | 1.550 | 1.396 | 1.315 | 1.074 | 1.084 | 1.247 | 1.012 | 0.745 | 1.178 | 21.40 |
| 14) | T | Trichlorofluor... | 2.666 | 2.647 | 2.677 | 2.473 | 2.478 | 2.949 | 2.834 | 2.676 | 2.675 | 6.00 |
| 15) | T | 2-Propanol (Is... | 4.791 | 4.271 | 4.843 | 3.886 | 2.863 | 4.457 | 3.977 | 3.029 | 4.015 | 18.51 |
| 16) | T | Acrylonitrile | 2.483 | 2.085 | 1.962 | 1.881 | 1.917 | 2.258 | 2.099 | 1.876 | 2.070 | 10.26 |
| 17) | T | 1,1-Dichloroet... | 1.450 | 1.333 | 1.321 | 1.234 | 1.254 | 1.583 | 1.551 | 1.522 | 1.406 | 9.80 |
| 18) | T | 2-Methyl-2-Pro... | 3.692 | 3.693 | 3.769 | 3.294 | 3.468 | 4.195 | 3.805 | | 3.702 | 7.64 |
| 19) | T | Methylene Chlo... | 1.643 | 1.526 | 1.474 | 1.376 | 1.406 | 1.683 | 1.633 | 1.542 | 1.535 | 7.34 |
| 20) | T | 3-Chloro-1-pro... | 2.173 | 2.162 | 2.047 | 1.964 | 2.000 | 2.478 | 2.260 | 2.073 | 2.145 | 7.77 |
| 21) | T | Trichlorotrifl... | 1.138 | 1.127 | 1.146 | 1.061 | 1.093 | 1.380 | 1.384 | 1.385 | 1.214 | 11.72 |
| 22) | T | Carbon Disulfide | 5.554 | 5.319 | 5.322 | 4.816 | 4.939 | 6.115 | 5.473 | 4.253 | 5.224 | 10.67 |
| 23) | T | trans-1,2-Dich... | 2.099 | 2.039 | 2.017 | 1.929 | 1.971 | 2.343 | 2.203 | 2.027 | 2.078 | 6.50 |
| 24) | T | 1,1-Dichloroet... | 2.529 | 2.523 | 2.491 | 2.399 | 2.409 | 2.850 | 2.679 | 2.523 | 2.550 | 5.83 |
| 25) | T | Methyl tert-Bu... | 4.062 | 3.999 | 4.022 | 3.815 | 3.954 | 5.002 | 4.756 | 4.355 | 4.246 | 10.00 |
| 26) | T | Vinyl Acetate | | | 0.231 | 0.218 | 0.255 | 0.407 | 0.375 | 0.299 | 0.298 | 26.21 |
| 27) | T | 2-Butanone (MEK) | 1.176 | 1.067 | 1.092 | 0.967 | 1.011 | 1.257 | 1.156 | 0.945 | 1.084 | 10.01 |
| 28) | T | cis-1,2-Dichlo... | 2.042 | 1.965 | 1.951 | 1.900 | 1.907 | 2.275 | 2.127 | 1.950 | 2.015 | 6.41 |
| 29) | T | Diisopropyl Ether | 1.280 | 1.279 | 1.288 | 1.256 | 1.412 | 1.374 | 0.951 | | 1.263 | 11.80 |
| 30) | T | Ethyl Acetate | 0.618 | 0.599 | 0.611 | 0.583 | 0.649 | 0.510 | 0.323 | | 0.556 | 20.05 |
| 31) | T | n-Hexane | 2.479 | 2.388 | 2.405 | 2.353 | 2.542 | 2.175 | 1.498 | 1.050 | 2.111 | 25.62 |
| 32) | T | Chloroform | 2.514 | 2.481 | 2.491 | 2.385 | 2.436 | 2.873 | 2.639 | 2.396 | 2.527 | 6.37 |
| 33) | S | 1,2-Dichloroet... | 1.700 | 1.734 | 1.768 | 1.748 | 1.759 | 1.710 | 1.686 | 1.631 | 1.717 | 2.63 |
| 34) | T | Tetrahydrofura... | 1.078 | 0.971 | 0.970 | 0.905 | 0.933 | 1.148 | 1.059 | 0.849 | 0.989 | 10.00 |
| 35) | T | Ethyl tert-But... | 1.458 | 1.540 | 1.564 | 1.490 | 1.594 | 2.105 | 1.830 | 1.332 | 1.614 | 15.10 |
| 36) | T | 1,2-Dichloroet... | 1.995 | 1.980 | 1.986 | 1.895 | 1.894 | 2.185 | 2.000 | 1.784 | 1.965 | 5.90 |
| 37) | IR | 1,4-Difluorobenzen... | ----------ISTD---------- | | | | | | | | | |
| 38) | T | 1,1,1-Trichlor... | 0.507 | 0.487 | 0.482 | 0.471 | 0.472 | 0.581 | 0.547 | 0.514 | 0.508 | 7.71 |
| 39) | T | Isopropyl Acetate | | | | | | | | | 0.000 | -1.00 |
| 40) | T | 1-Butanol | | | | | | | | | 0.000 | -1.00 |
| 41) | T | Benzene | 1.433 | 1.315 | 1.237 | 1.172 | 1.175 | 1.485 | 1.376 | 1.198 | 1.299 | 9.42 |
| 42) | T | Carbon Tetrach... | 0.374 | 0.379 | 0.378 | 0.368 | 0.384 | 0.489 | 0.475 | 0.456 | 0.413 | 12.40 |

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Method Path : I:\MS16\METHODS\
Method File : R16012022B.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 43) | T | Cyclohexane | 0.481 | 0.467 | 0.461 | 0.450 | 0.479 | 0.620 | 0.511 | 0.353 | 0.478 | | 15.44 |
| 44) | T | tert-Amyl Meth... | 0.874 | 0.852 | 0.840 | 0.817 | 0.849 | 1.068 | 0.872 | 0.613 | 0.848 | | 14.54 |
| 45) | T | 1,2-Dichloropr... | 0.313 | 0.306 | 0.309 | 0.291 | 0.297 | 0.365 | 0.345 | 0.310 | 0.317 | | 7.92 |
| 46) | T | Bromodichlorom... | 0.406 | 0.385 | 0.394 | 0.384 | 0.407 | 0.517 | 0.486 | 0.424 | 0.426 | | 11.61 |
| 47) | T | Trichloroethene | 0.328 | 0.317 | 0.313 | 0.303 | 0.314 | 0.426 | 0.417 | 0.361 | 0.347 | | 14.08 |
| 48) | T | 1,4-Dioxane | 0.310 | 0.285 | 0.281 | 0.260 | 0.273 | 0.333 | 0.316 | 0.248 | 0.288 | | 10.19 |
| 49) | T | 2,2,4-Trimethy... | 1.270 | 1.256 | 1.247 | 1.214 | 1.245 | 1.519 | 1.323 | 1.002 | 1.260 | | 11.24 |
| 50) | T | Methyl Methacr... | 0.125 | 0.120 | 0.123 | 0.118 | 0.131 | 0.178 | 0.162 | 0.123 | 0.135 | | 16.64 |
| 51) | T | n-Heptane | 0.320 | 0.298 | 0.305 | 0.298 | 0.311 | 0.401 | 0.363 | 0.285 | 0.323 | | 12.20 |
| 52) | T | cis-1,3-Dichlo... | 0.446 | 0.450 | 0.453 | 0.446 | 0.477 | 0.624 | 0.587 | 0.507 | 0.499 | | 13.97 |
| 53) | T | 4-Methyl-2-pen... | 0.322 | 0.306 | 0.310 | 0.275 | 0.295 | 0.348 | 0.276 | 0.187 | 0.290 | | 16.56 |
| 54) | T | trans-1,3-Dich... | 0.380 | 0.380 | 0.400 | 0.404 | 0.448 | 0.579 | 0.560 | 0.516 | 0.458 | | 17.86 |
| 55) | T | 1,1,2-Trichlor... | 0.294 | 0.292 | 0.287 | 0.276 | 0.284 | 0.368 | 0.356 | 0.324 | 0.310 | | 11.37 |
| 56) | IR | Chlorobenzene-d5 (... | ----------ISTD---------- | | | | | | | | | | |
| 57) | S | Toluene-d8 (SS2) | 5.988 | 5.886 | 5.873 | 5.849 | 5.922 | 5.958 | 6.243 | 6.605 | 6.041 | | 4.30 |
| 58) | T | Toluene | 7.854 | 6.961 | 6.629 | 6.404 | 6.629 | 8.576 | 8.318 | 7.069 | 7.305 | | 11.39 |
| 59) | T | 2-Hexanone | 5.267 | 4.660 | 4.551 | 4.002 | 4.241 | 4.346 | 3.447 | 2.489 | 4.125 | | 20.45 |
| 60) | T | Dibromochlorom... | 1.619 | 1.548 | 1.582 | 1.544 | 1.746 | 2.406 | 2.508 | 2.538 | 1.936 | | 23.71 |
| 61) | T | 1,2-Dibromoethane | 1.848 | 1.693 | 1.690 | 1.703 | 1.785 | 2.326 | 2.408 | 2.429 | 1.985 | | 17.06 |
| 62) | T | n-Butyl Acetate | 5.745 | 5.051 | 5.000 | 4.358 | 4.612 | 4.831 | 3.835 | 2.702 | 4.517 | | 20.36 |
| 63) | T | n-Octane | 1.486 | 1.361 | 1.388 | 1.337 | 1.423 | 1.789 | 1.619 | 1.270 | 1.459 | | 11.64 |
| 64) | T | Tetrachloroethene | 1.759 | 1.727 | 1.713 | 1.656 | 1.708 | 2.392 | 2.464 | 2.273 | 1.961 | | 17.75 |
| 65) | T | Chlorobenzene | 5.084 | 4.480 | 4.247 | 4.253 | 4.490 | 6.154 | 5.681 | 4.276 | 4.833 | | 15.16 |
| 66) | T | Ethylbenzene | 0.844 | 0.760 | 0.728 | 0.726 | 0.768 | 1.010 | 0.929 | 0.741 | 0.813 | E1 | 12.97 |
| 67) | T | m- & p-Xylenes | 6.785 | 5.958 | 5.623 | 5.651 | 6.083 | 7.895 | 6.642 | 4.850 | 6.186 | | 14.89 |
| 68) | T | Bromoform | | | 1.123 | 1.114 | 1.348 | 2.043 | 2.188 | 2.131 | 1.658 | | 31.13 |
| 69) | T | Styrene | 5.046 | 4.342 | 4.269 | 4.210 | 4.772 | 6.575 | 6.211 | 5.008 | 5.054 | | 17.65 |
| 70) | T | o-Xylene | 6.496 | 5.855 | 5.662 | 5.703 | 6.088 | 7.976 | 6.967 | 5.036 | 6.223 | | 14.69 |
| 71) | T | n-Nonane | 3.582 | 3.352 | 3.307 | 3.262 | 3.450 | 3.927 | 3.083 | 2.103 | 3.258 | | 16.26 |
| 72) | T | 1,1,2,2-Tetrac... | 2.668 | 2.659 | 2.627 | 2.636 | 2.857 | 3.754 | 3.382 | 2.478 | 2.883 | | 15.49 |
| 73) | S | Bromofluoroben... | 1.933 | 1.877 | 1.840 | 1.844 | 1.868 | 1.908 | 1.996 | 2.135 | 1.925 | | 5.15 |
| 74) | T | Cumene | 0.865 | 0.757 | 0.729 | 0.717 | 0.766 | 1.031 | 0.919 | 0.691 | 0.809 | E1 | 14.59 |
| 75) | T | alpha-Pinene | 3.547 | 3.504 | 3.575 | 3.516 | 3.867 | 4.689 | 4.399 | 3.432 | 3.816 | | 12.41 |
| 76) | T | n-Propylbenzene | 1.025 | 0.904 | 0.869 | 0.870 | 0.939 | 1.227 | 1.068 | 0.783 | 0.961 | E1 | 14.63 |
| 77) | T | 3-Ethyltoluene | | | | | | | | | 0.000 | | -1.00 |
| 78) | T | 4-Ethyltoluene | 0.849 | 0.717 | 0.686 | 0.691 | 0.750 | 1.029 | 0.894 | 0.658 | 0.784 | E1 | 16.44 |
| 79) | T | 1,3,5-Trimethy... | 6.520 | 5.849 | 5.690 | 5.699 | 6.248 | 8.450 | 7.527 | 5.673 | 6.457 | | 15.83 |
| 80) | T | alpha-Methylst... | | | | | | | | | 0.000 | | -1.00 |
| 81) | T | 2-Ethyltoluene | | | | | | | | | 0.000 | | -1.00 |
| 82) | T | 1,2,4-Trimethy... | 6.617 | 5.912 | 5.711 | 5.883 | 6.840 | 8.254 | 5.940 | 4.137 | 6.162 | | 18.94 |
| 83) | T | n-Decane | | | | | | | | | 0.000 | | -1.00 |
| 84) | T | Benzyl Chloride | | | 3.148 | 3.984 | 5.405 | 6.979 | 5.173 | | 4.938 | | 29.61 |
| 85) | T | 1,3-Dichlorobe... | 4.195 | 3.221 | 2.965 | 3.301 | 3.663 | 5.161 | 4.233 | 3.019 | 3.720 | | 20.45 |
| 86) | T | 1,4-Dichlorobe... | 4.258 | 3.267 | 2.900 | 3.220 | 3.483 | 5.067 | 4.850 | 3.886 | 3.867 | | 20.55 |
| 87) | T | sec-Butylbenzene | 0.854 | 0.790 | 0.777 | 0.776 | 0.852 | 1.154 | 0.984 | 0.702 | 0.861 | E1 | 16.74 |
| 88) | T | 4-Isopropyltol... | 0.764 | 0.688 | 0.658 | 0.658 | 0.729 | 1.024 | 0.865 | 0.623 | 0.751 | E1 | 17.87 |
| 89) | T | 1,2,3-Trimethy... | | | | | | | | | 0.000 | | -1.00 |
| 90) | T | 1,2-Dichlorobe... | 3.842 | 3.085 | 2.894 | 3.128 | 3.507 | 4.914 | 3.897 | 2.791 | 3.507 | | 20.03 |
| 91) | T | d-Limonene | 2.162 | 2.132 | 2.286 | 2.081 | 2.534 | 3.000 | 2.099 | 1.353 | 2.206 | | 21.03 |
| 92) | T | 1,2-Dibromo-3-... | 1.106 | 1.016 | 1.030 | 1.071 | 1.321 | 1.962 | 1.771 | 1.348 | 1.328 | | 27.00 |
| 93) | T | n-Undecane | | | | | | | | | 0.000 | | -1.00 |
| 94) | T | 1,2,4-Trichlor... | 3.191 | 2.067 | 1.760 | 2.355 | 2.756 | 4.085 | 3.244 | | 2.780 | | 28.69 |

Method Path : I:\MS16\METHODS\
Method File : R16012022B.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 95) | T | Naphthalene | 1.166 | 0.660 | 0.511 | 0.778 | 0.878 | 1.257 | 1.179 | 0.901 | 0.916 | E1 29.11 |
| 96) | T | n-Dodecane | | | | | | | | | 0.000 | -1.00 |
| 97) | T | Hexachlorobuta... | 1.510 | 1.425 | 1.357 | 1.329 | 1.475 | 2.279 | 2.249 | 1.945 | 1.696 | 23.50 |
| 98) | T | Cyclohexanone | | | | | | | | | 0.000 | -1.00 |
| 99) | T | tert-Butylbenzene | 6.548 | 5.897 | 5.758 | 5.724 | 6.607 | 8.037 | 5.823 | 4.152 | 6.068 | 18.02 |
| 100) | T | n-Butylbenzene | 6.972 | 6.257 | 6.114 | 6.393 | 6.987 | 9.248 | 7.847 | 5.567 | 6.923 | 16.81 |
| 101) | T | 1,1,1,2-Tetrac... | 1.554 | 1.487 | 1.490 | 1.475 | 1.622 | 2.225 | 2.065 | 1.638 | 1.694 | 16.99 |

(#) = Out of Range

## Primary Source Standards Concentrations (Working & Initial Calibration)

1ng/L Std. ID:
4ng/L Std. ID: S35-01172211
20ng/L Std. ID: S35-01172210
40ng/L Std. ID:
200ng/L Std. ID:
1000ng/L Std. ID: S35-12292101

1/27/22

| Dilution Factors: | | 1 | 5 | 25 | 50 | 250 | 1000 | Working STD Conc.(ng/L): | 4 | 4 | 4 | 20 | 20 | 1000 | 1000 | 1000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Source Std. | | Primary Working Standards | | | | | Injection (L): | 0.025 | 0.050 | 0.1250 | 0.050 | 0.25 | 0.025 | 0.05 | 0.10 |
| Compounds | mg/m$^3$ | 1000ng/L | 200ng/L | 40ng/L | 20ng/L | 4ng/L | 1ng/L | ICAL Points: | 0.1ng | 0.2ng | 0.5ng | 1ng | 5ng | 25ng | 50ng | 100ng |
| Propene | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| Dichlorodifluoromethane | 1.05 | 1050 | 210 | 42.0 | 21.0 | 4.20 | 1.05 | | 0.105 | 0.210 | 0.525 | 1.05 | 5.25 | 26.25 | 52.5 | 105 |
| Chloromethane | 1.02 | 1020 | 204 | 40.8 | 20.4 | 4.08 | 1.02 | | 0.102 | 0.204 | 0.510 | 1.02 | 5.10 | 25.50 | 51.0 | 102 |
| Freon-114 | 1.08 | 1080 | 216 | 43.2 | 21.6 | 4.32 | 1.08 | | 0.108 | 0.216 | 0.540 | 1.08 | 5.40 | 27.00 | 54.0 | 108 |
| Vinyl Chloride | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| 1,3-Butadiene | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| Bromomethane | 1.02 | 1020 | 204 | 40.8 | 20.4 | 4.08 | 1.02 | | 0.102 | 0.204 | 0.510 | 1.02 | 5.10 | 25.50 | 51.0 | 102 |
| Chloroethane | 1.02 | 1020 | 204 | 40.8 | 20.4 | 4.08 | 1.02 | | 0.102 | 0.204 | 0.510 | 1.02 | 5.10 | 25.50 | 51.0 | 102 |
| Ethanol | 3.62 | 3620 | 724 | 144.8 | 72.4 | 14.48 | 3.62 | | 0.362 | 0.724 | 1.810 | 3.62 | 18.10 | 90.50 | 181.0 | 362 |
| Acetonitrile | 0.93 | 930 | 186 | 37.2 | 18.6 | 3.72 | 0.93 | | 0.093 | 0.186 | 0.465 | 0.93 | 4.65 | 23.25 | 46.5 | 93 |
| Acrolein | 2.00 | 2000 | 400 | 80.0 | 40.0 | 8.00 | 2.00 | | 0.200 | 0.400 | 1.000 | 2.00 | 10.00 | 50.00 | 100.0 | 200 |
| Acetone | 5.19 | 5190 | 1038 | 207.6 | 103.8 | 20.76 | 5.19 | | 0.519 | 1.038 | 2.595 | 5.19 | 25.95 | 129.75 | 259.5 | 519 |
| Trichlorofluoromethane | 1.03 | 1030 | 206 | 41.2 | 20.6 | 4.12 | 1.03 | | 0.103 | 0.206 | 0.515 | 1.03 | 5.15 | 25.75 | 51.5 | 103 |
| Isopropanol | 2.02 | 2020 | 404 | 80.8 | 40.4 | 8.08 | 2.02 | | 0.202 | 0.404 | 1.010 | 2.02 | 10.10 | 50.50 | 101.0 | 202 |
| Acrylonitrile | 2.03 | 2030 | 406 | 81.2 | 40.6 | 8.12 | 2.03 | | 0.203 | 0.406 | 1.015 | 2.03 | 10.15 | 50.75 | 101.5 | 203 |
| 1,1-Dichloroethene | 1.07 | 1070 | 214 | 42.8 | 21.4 | 4.28 | 1.07 | | 0.107 | 0.214 | 0.535 | 1.07 | 5.35 | 26.75 | 53.5 | 107 |
| tert-Butanol | 2.10 | 2100 | 420 | 84.0 | 42.0 | 8.40 | 2.10 | | 0.210 | 0.420 | 1.050 | 2.10 | 10.50 | 52.50 | 105.0 | 210 |
| Methylene Chloride | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| Allyl Chloride | 1.05 | 1050 | 210 | 42.0 | 21.0 | 4.20 | 1.05 | | 0.105 | 0.210 | 0.525 | 1.05 | 5.25 | 26.25 | 52.5 | 105 |
| Trichlorotrifluoroethane | 1.08 | 1080 | 216 | 43.2 | 21.6 | 4.32 | 1.08 | | 0.108 | 0.216 | 0.540 | 1.08 | 5.40 | 27.00 | 54.0 | 108 |
| Carbon Disulfide | 2.10 | 2100 | 420 | 84.0 | 42.0 | 8.40 | 2.10 | | 0.210 | 0.420 | 1.050 | 2.10 | 10.50 | 52.50 | 105.0 | 210 |
| trans-1,2-Dichloroethene | 1.06 | 1060 | 212 | 42.4 | 21.2 | 4.24 | 1.06 | | 0.106 | 0.212 | 0.530 | 1.06 | 5.30 | 26.50 | 53.0 | 106 |
| 1,1-Dichloroethane | 1.05 | 1050 | 210 | 42.0 | 21.0 | 4.20 | 1.05 | | 0.105 | 0.210 | 0.525 | 1.05 | 5.25 | 26.25 | 52.5 | 105 |
| Methyl tert-Butyl Ether | 1.05 | 1050 | 210 | 42.0 | 21.0 | 4.20 | 1.05 | | 0.105 | 0.210 | 0.525 | 1.05 | 5.25 | 26.25 | 52.5 | 105 |
| Vinyl Acetate | 3.40 | 3400 | 680 | 136.0 | 68.0 | 13.60 | 3.40 | | 0.340 | 0.680 | 1.700 | 3.40 | 17.00 | 85.00 | 170.0 | 340 |
| 2-Butanone | 2.06 | 2060 | 412 | 82.4 | 41.2 | 8.24 | 2.06 | | 0.206 | 0.412 | 1.030 | 2.06 | 10.30 | 51.50 | 103.0 | 206 |
| cis-1,2-Dichloroethene | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| Diisopropyl Ether | 2.12 | 2120 | 424 | 84.8 | 42.4 | 8.48 | 2.12 | | 0.212 | 0.424 | 1.060 | 2.12 | 10.60 | 53.00 | 106.0 | 212 |
| Ethyl Acetate | 4.08 | 4080 | 816 | 163.2 | 81.6 | 16.32 | 4.08 | | 0.408 | 0.816 | 2.040 | 4.08 | 20.40 | 102.00 | 204.0 | 408 |
| n-Hexane | 1.05 | 1050 | 210 | 42.0 | 21.0 | 4.20 | 1.05 | | 0.105 | 0.210 | 0.525 | 1.05 | 5.25 | 26.25 | 52.5 | 105 |
| Chloroform | 1.07 | 1070 | 214 | 42.8 | 21.4 | 4.28 | 1.07 | | 0.107 | 0.214 | 0.535 | 1.07 | 5.35 | 26.75 | 53.5 | 107 |
| Tetrahydrofuran | 1.97 | 1970 | 394 | 78.8 | 39.4 | 7.88 | 1.97 | | 0.197 | 0.394 | 0.985 | 1.97 | 9.85 | 49.25 | 98.5 | 197 |
| Ethyl tert-Butyl Ether | 2.10 | 2100 | 420 | 84.0 | 42.0 | 8.40 | 2.10 | | 0.210 | 0.420 | 1.050 | 2.10 | 10.50 | 52.50 | 105.0 | 210 |
| 1,2-Dichloroethane | 1.06 | 1060 | 212 | 42.4 | 21.2 | 4.24 | 1.06 | | 0.106 | 0.212 | 0.530 | 1.06 | 5.30 | 26.50 | 53.0 | 106 |
| 1,1,1-Trichloroethane | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| Benzene | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| Carbon Tetrachloride | 1.05 | 1050 | 210 | 42.0 | 21.0 | 4.20 | 1.05 | | 0.105 | 0.210 | 0.525 | 1.05 | 5.25 | 26.25 | 52.5 | 105 |
| Cyclohexane | 2.07 | 2070 | 414 | 82.8 | 41.4 | 8.28 | 2.07 | | 0.207 | 0.414 | 1.035 | 2.07 | 10.35 | 51.75 | 103.5 | 207 |
| tert-Amyl Methyl Ether | 2.09 | 2090 | 418 | 83.6 | 41.8 | 8.36 | 2.09 | | 0.209 | 0.418 | 1.045 | 2.09 | 10.45 | 52.25 | 104.5 | 209 |
| 1,2-Dichloropropane | 1.03 | 1030 | 206 | 41.2 | 20.6 | 4.12 | 1.03 | | 0.103 | 0.206 | 0.515 | 1.03 | 5.15 | 25.75 | 51.5 | 103 |
| Bromodichloromethane | 1.05 | 1050 | 210 | 42.0 | 21.0 | 4.20 | 1.05 | | 0.105 | 0.210 | 0.525 | 1.05 | 5.25 | 26.25 | 52.5 | 105 |
| Trichloroethene | 1.03 | 1030 | 206 | 41.2 | 20.6 | 4.12 | 1.03 | | 0.103 | 0.206 | 0.515 | 1.03 | 5.15 | 25.75 | 51.5 | 103 |
| 1,4-Dioxane | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| Isooctane | 1.06 | 1060 | 212 | 42.4 | 21.2 | 4.24 | 1.06 | | 0.106 | 0.212 | 0.530 | 1.06 | 5.30 | 26.50 | 53.0 | 106 |
| Methyl Methacrylate | 2.08 | 2080 | 416 | 83.2 | 41.6 | 8.32 | 2.08 | | 0.208 | 0.416 | 1.040 | 2.08 | 10.40 | 52.00 | 104.0 | 208 |
| n-Heptane | 1.05 | 1050 | 210 | 42.0 | 21.0 | 4.20 | 1.05 | | 0.105 | 0.210 | 0.525 | 1.05 | 5.25 | 26.25 | 52.5 | 105 |

## Primary Source Standards Concentrations (Working & Initial Calibration)

| | | | |
|---|---|---|---|
| 1ng/L Std. ID: | | 40ng/L Std. ID: | |
| 4ng/L Std. ID: | S35-01172211 | 200ng/L Std. ID: | |
| 20ng/L Std. ID: | S35-01172210 | 1000ng/L Std. ID: | S35-12292101 |

| Dilution Factors: | | 1 | 5 | 25 | 50 | 250 | 1000 | Working STD Conc.(ng/L): | 4 | 4 | 4 | 20 | 20 | 1000 | 1000 | 1000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Source Std. | | Primary Working Standards | | | | | Injection (L): | 0.025 | 0.050 | 0.1250 | 0.050 | 0.25 | 0.025 | 0.05 | 0.10 |
| Compounds | mg/m$^3$ | 1000ng/L | 200ng/L | 40ng/L | 20ng/L | 4ng/L | 1ng/L | ICAL Points: | 0.1ng | 0.2ng | 0.5ng | 1ng | 5ng | 25ng | 50ng | 100ng |
| cis-1,3-Dichloropropene | 1.05 | 1050 | 210 | 42.0 | 21.0 | 4.20 | 1.05 | | 0.105 | 0.210 | 0.525 | 1.05 | 5.25 | 26.25 | 52.5 | 105 |
| 4-Methyl-2-pentanone | 2.08 | 2080 | 416 | 83.2 | 41.6 | 8.32 | 2.08 | | 0.208 | 0.416 | 1.040 | 2.08 | 10.40 | 52.00 | 104.0 | 208 |
| trans-1,3-Dichloropropene | 1.01 | 1010 | 202 | 40.4 | 20.2 | 4.04 | 1.01 | | 0.101 | 0.202 | 0.505 | 1.01 | 5.05 | 25.25 | 50.5 | 101 |
| 1,1,2-Trichloroethane | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| Toluene | 1.03 | 1030 | 206 | 41.2 | 20.6 | 4.12 | 1.03 | | 0.103 | 0.206 | 0.515 | 1.03 | 5.15 | 25.75 | 51.5 | 103 |
| 2-Hexanone | 2.05 | 2050 | 410 | 82.0 | 41.0 | 8.20 | 2.05 | | 0.205 | 0.410 | 1.025 | 2.05 | 10.25 | 51.25 | 102.5 | 205 |
| Dibromochloromethane | 1.05 | 1050 | 210 | 42.0 | 21.0 | 4.20 | 1.05 | | 0.105 | 0.210 | 0.525 | 1.05 | 5.25 | 26.25 | 52.5 | 105 |
| 1,2-Dibromoethane | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| n-Butyl Acetate | 2.04 | 2040 | 408 | 81.6 | 40.8 | 8.16 | 2.04 | | 0.204 | 0.408 | 1.020 | 2.04 | 10.20 | 51.00 | 102.0 | 204 |
| n-Octane | 1.05 | 1050 | 210 | 42.0 | 21.0 | 4.20 | 1.05 | | 0.105 | 0.210 | 0.525 | 1.05 | 5.25 | 26.25 | 52.5 | 105 |
| Tetrachloroethene | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| Chlorobenzene | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| Ethylbenzene | 1.03 | 1030 | 206 | 41.2 | 20.6 | 4.12 | 1.03 | | 0.103 | 0.206 | 0.515 | 1.03 | 5.15 | 25.75 | 51.5 | 103 |
| m-&p-Xylene | 2.06 | 2060 | 412 | 82.4 | 41.2 | 8.24 | 2.06 | | 0.206 | 0.412 | 1.030 | 2.06 | 10.30 | 51.50 | 103.0 | 206 |
| Bromoform | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| Styrene | 1.03 | 1030 | 206 | 41.2 | 20.6 | 4.12 | 1.03 | | 0.103 | 0.206 | 0.515 | 1.03 | 5.15 | 25.75 | 51.5 | 103 |
| o-Xylene | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| n-Nonane | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| 1,1,2,2-Tetrachloroethane | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| Cumene | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| alpha-Pinene | 1.08 | 1080 | 216 | 43.2 | 21.6 | 4.32 | 1.08 | | 0.108 | 0.216 | 0.540 | 1.08 | 5.40 | 27.00 | 54.0 | 108 |
| n-Propylbenzene | 1.05 | 1050 | 210 | 42.0 | 21.0 | 4.20 | 1.05 | | 0.105 | 0.210 | 0.525 | 1.05 | 5.25 | 26.25 | 52.5 | 105 |
| 4-Ethyltoluene | 1.06 | 1060 | 212 | 42.4 | 21.2 | 4.24 | 1.06 | | 0.106 | 0.212 | 0.530 | 1.06 | 5.30 | 26.50 | 53.0 | 106 |
| 1,3,5-Trimethylbenzene | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| 1,2,4-Trimethylbenzene | 1.03 | 1030 | 206 | 41.2 | 20.6 | 4.12 | 1.03 | | 0.103 | 0.206 | 0.515 | 1.03 | 5.15 | 25.75 | 51.5 | 103 |
| Benzyl Chloride | 2.06 | 2060 | 412 | 82.4 | 41.2 | 8.24 | 2.06 | | 0.206 | 0.412 | 1.030 | 2.06 | 10.30 | 51.50 | 103.0 | 206 |
| 1,3-Dichlorobenzene | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| 1,4-Dichlorobenzene | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| sec-Butylbenzene | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| p-Isopropyltoluene | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| 1,2-Dichlorobenzene | 1.05 | 1050 | 210 | 42.0 | 21.0 | 4.20 | 1.05 | | 0.105 | 0.210 | 0.525 | 1.05 | 5.25 | 26.25 | 52.5 | 105 |
| d-Limonene | 1.05 | 1050 | 210 | 42.0 | 21.0 | 4.20 | 1.05 | | 0.105 | 0.210 | 0.525 | 1.05 | 5.25 | 26.25 | 52.5 | 105 |
| 1,2-Dibromo-3-chloropropane | 2.00 | 2000 | 400 | 80.0 | 40.0 | 8.00 | 2.00 | | 0.200 | 0.400 | 1.000 | 2.00 | 10.00 | 50.00 | 100.0 | 200 |
| 1,2,4-Trichlorobenzene | 2.04 | 2040 | 408 | 81.6 | 40.8 | 8.16 | 2.04 | | 0.204 | 0.408 | 1.020 | 2.04 | 10.20 | 51.00 | 102.0 | 204 |
| Naphthalene | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| Hexachloro-1,3-butadiene | 1.03 | 1030 | 206 | 41.2 | 20.6 | 4.12 | 1.03 | | 0.103 | 0.206 | 0.515 | 1.03 | 5.15 | 25.75 | 51.5 | 103 |
| tert-Butylbenzene | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| n-Butylbenzene | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |
| 1,1,1,2-Tetrachloroethane | 1.04 | 1040 | 208 | 41.6 | 20.8 | 4.16 | 1.04 | | 0.104 | 0.208 | 0.520 | 1.04 | 5.20 | 26.00 | 52.0 | 104 |

Calibration Status Report GCMS-16

01118163

Method : I:\MS16\METHODS\R16012022B.M (RTE Integrator)
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Fri Jan 21 09:34:58 2022
Response via : Initial Calibration

| # | ID | Conc | ISTD Conc | Path\File |
|---|---|---|---|---|
| 1 | 0.1 | 0 | 13 | I:\MS16\DATA\2022_01\20\01202228.D |
| 2 | 0.2 | 0 | 13 | I:\MS16\DATA\2022_01\20\01202229.D |
| 3 | 0.5 | 1 | 13 | I:\MS16\DATA\2022_01\20\01202230.D |
| 4 | 1.0 | 1 | 13 | I:\MS16\DATA\2022_01\20\01202231.D |
| 5 | 5.0 | 5 | 13 | I:\MS16\DATA\2022_01\20\01202232.D |
| 6 | 25 | 26 | 13 | I:\MS16\DATA\2022_01\20\01202233.D |
| 7 | 50 | 52 | 13 | I:\MS16\DATA\2022_01\20\01202234.D |
| 8 | 100 | 104 | 13 | I:\MS16\DATA\2022_01\20\01202235.D |

WA 1/21/22

| # | ID | Update Time | Quant Time | Acquisition Time |
|---|---|---|---|---|
| 1 | 0.1 | Jan 21 06:15 2022 | Jan 21 06:07 2022 | 20 Jan 2022 22:56 |
| 2 | 0.2 | Jan 21 06:21 2022 | Jan 21 06:09 2022 | 20 Jan 2022 23:30 |
| 3 | 0.5 | Jan 21 06:22 2022 | Jan 21 06:10 2022 | 21 Jan 2022 00:04 |
| 4 | 1.0 | Jan 21 06:22 2022 | Jan 21 06:10 2022 | 21 Jan 2022 00:38 |
| 5 | 5.0 | Jan 21 06:22 2022 | Jan 21 06:11 2022 | 21 Jan 2022 1:11 |
| 6 | 25 | Jan 21 06:22 2022 | Jan 21 06:12 2022 | 21 Jan 2022 1:45 |
| 7 | 50 | Jan 21 06:22 2022 | Jan 21 06:13 2022 | 21 Jan 2022 2:19 |
| 8 | 100 | Jan 21 06:22 2022 | Jan 21 06:14 2022 | 21 Jan 2022 2:53 |

R16012022B.M Fri Jan 21 14:14:23 2022

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 01\20\01202228.D Vial: 12
Acq On : 20 Jan 2022 22:56 Operator: WA
Sample : 0.1ng R16012022 ICAL Std Inst : GCMS-16
Misc : S35-01102201/S35-01172211 (2/16)

Quant Time: Jan 21 06:07:08 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 06:02:16 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

WA 1/21/22

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) Bromochloromethane (IS1) | 11.30 | 130 | 177131 | 12.500 | ng | -0.03 |
| 37) 1,4-Difluorobenzene (IS2) | 13.43 | 114 | 807052 | 12.500 | ng | -0.01 |
| 56) Chlorobenzene-d5 (IS3) | 17.73 | 54 | 145679 | 12.500 | ng | 0.00 |

System Monitoring Compounds

| | | | | | | |
|---|---|---|---|---|---|---|
| 33) 1,2-Dichloroethane-d4(... | 12.15 | 65 | 301095 | 12.766 | ng | -0.02 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 102.16% | | | |
| 57) Toluene-d8 (SS2) | 15.88 | 98 | 872384 | 12.505 | ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 100.08% | | | |
| 73) Bromofluorobenzene (SS3) | 19.12 | 174 | 281525 | 11.869 | ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 94.96% | | | |

Target Compounds

| | | | | | | | Qvalue |
|---|---|---|---|---|---|---|---|
| 2) Propene | 4.21 | 42 | 2862 | 0.087 | ng | | 97 |
| 3) Dichlorodifluoromethan... | 4.36 | 85 | 4841 | 0.112 | ng | | 96 |
| 4) Chloromethane | 4.64 | 50 | 3771 | 0.136 | ng | | 99 |
| 5) 1,2-Dichloro-1,1,2,2-t... | 4.91 | 135 | 2627 | 0.111 | ng | | 92 |
| 6) Vinyl Chloride | 5.07 | 62 | 3531 | 0.100 | ng | | 94 |
| 7) 1,3-Butadiene | 5.35 | 54 | 2251 | 0.104 | ng | | 89 |
| 8) Bromomethane | 5.77 | 94 | 1868 | 0.094 | ng | | 95 |
| 9) Chloroethane | 6.12 | 64 | 1429 | 0.092 | ng | | 87 |
| 10) Ethanol | 6.45 | 45 | 11165 | 0.651 | ng | | 93 |
| 11) Acetonitrile | 6.73 | 41 | 6845 | 0.140 | ng | | 92 |
| 12) Acrolein | 6.94 | 56 | 2253 | 0.161 | ng | | 99 |
| 13) Acetone | 7.17 | 58 | 11402 | 0.692 | ng | # | 77 |
| 14) Trichlorofluoromethane | 7.41 | 101 | 3891 | 0.098 | ng | | 100 |
| 15) 2-Propanol (Isopropanol) | 7.67 | 45 | 13713 | 0.283 | ng | | 95 |
| 16) Acrylonitrile | 7.89 | 53 | 7143 | 0.236 | ng | | 100 |
| 17) 1,1-Dichloroethene | 8.36 | 96 | 2198 | 0.092 | ng | | 98 |
| 18) 2-Methyl-2-Propanol (t... | 8.59 | 59 | 10987 | 0.216 | ng | | 84 |
| 19) Methylene Chloride | 8.57 | 84 | 2422 | 0.105 | ng | | 93 |
| 20) 3-Chloro-1-propene (Al... | 8.74 | 41 | 3233 | 0.104 | ng | | 85 |
| 21) Trichlorotrifluoroethane | 9.01 | 151 | 1741 | 0.097 | ng | | 96 |
| 22) Carbon Disulfide | 8.85 | 76 | 16528 | 0.212 | ng | | 99 |
| 23) trans-1,2-Dichloroethene | 9.85 | 61 | 3153 | 0.095 | ng | | 99 |
| 24) 1,1-Dichloroethane | 10.11 | 63 | 3763 | 0.092 | ng | | 100 |
| 25) Methyl tert-Butyl Ether | 10.25 | 73 | 6044 | 0.104 | ng | | 98 |
| 26) Vinyl Acetate | 10.37 | 86 | 984 | 0.255 | ng | # | 8 |
| 27) 2-Butanone (MEK) | 10.64 | 72 | 3434 | 0.232 | ng | # | 69 |
| 28) cis-1,2-Dichloroethene | 11.12 | 61 | 3010 | 0.093 | ng | | 96 |
| 29) Diisopropyl Ether | 11.44 | 87 | 3846 | 0.200 | ng | # | 1 |
| 30) Ethyl Acetate | 11.44 | 61 | 3574 | 0.423 | ng | | 89 |
| 31) n-Hexane | 11.42 | 57 | 3689 | 0.113 | ng | # | 95 |
| 32) Chloroform | 11.46 | 83 | 3812 | 0.095 | ng | | 98 |
| 34) Tetrahydrofuran (THF) | 11.91 | 72 | 3008 | 0.209 | ng | # | 87 |
| 35) Ethyl tert-Butyl Ether | 12.04 | 87 | 4339 | 0.195 | ng | # | 83 |
| 36) 1,2-Dichloroethane | 12.27 | 62 | 2997 | 0.098 | ng | | 96 |
| 38) 1,1,1-Trichloroethane | 12.55 | 97 | 3405 | 0.098 | ng | | 97 |
| 39) Isopropyl Acetate | 0.00 | 61 | 0 | N.D. | | | |
| 40) 1-Butanol | 0.00 | 56 | 0 | N.D. | d | | |
| 41) Benzene | 13.03 | 78 | 9625 | 0.103 | ng | | 99 |
| 42) Carbon Tetrachloride | 13.20 | 117 | 2538 | 0.090 | ng | | 97 |
| 43) Cyclohexane | 13.33 | 84 | 6434 | 0.199 | ng | | 90 |
| 44) tert-Amyl Methyl Ether | 13.69 | 73 | 11795 | 0.208 | ng | | 89 |
| 45) 1,2-Dichloropropane | 13.89 | 63 | 2081 | 0.097 | ng | | 91 |
| 46) Bromodichloromethane | 14.07 | 83 | 2752 | 0.095 | ng | | 97 |
| 47) Trichloroethene | 14.13 | 130 | 2179 | 0.087 | ng | | 99 |
| 48) 1,4-Dioxane | 14.12 | 88 | 2084 | 0.100 | ng | | 92 |
| 49) 2,2,4-Trimethylpentane... | 14.20 | 57 | 8691 | 0.098 | ng | | 87 |
| 50) Methyl Methacrylate | 14.34 | 100 | 1680 | 0.176 | ng | # | 75 |

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 01\20\01202228.D Vial: 12
Acq On : 20 Jan 2022 22:56 Operator: WA
Sample : 0.1ng R16012022 ICAL Std Inst : GCMS-16
Misc : S35-01102201/S35-01172211 (2/16)

Quant Time: Jan 21 06:07:08 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 06:02:16 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

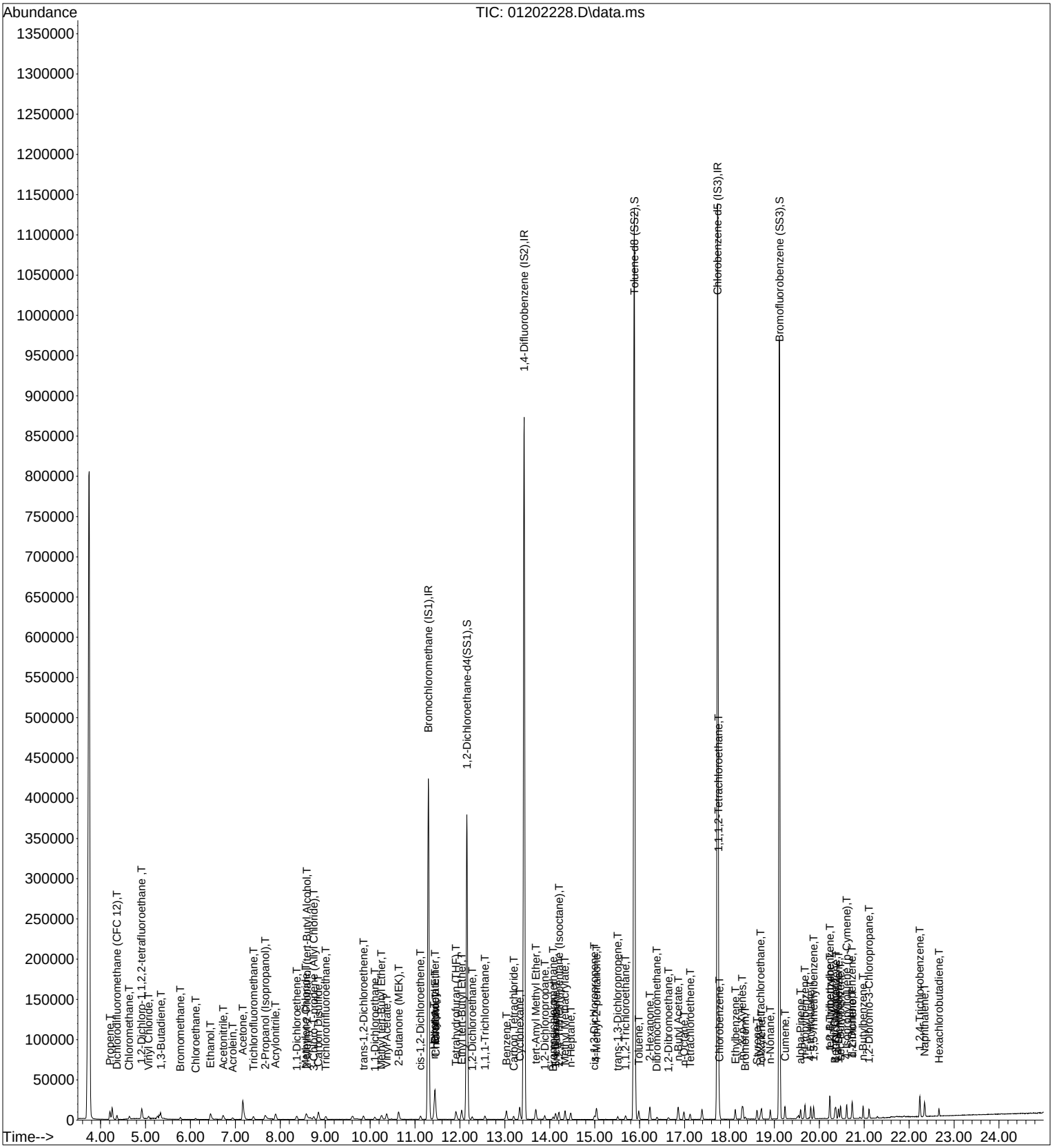
| Internal Standards | R.T. | QIon | Response | Conc Units | | Dev(Min) |
|---|---|---|---|---|---|---|
| 51) n-Heptane | 14.47 | 71 | 2171 | 0.095 ng | | 94 |
| 52) cis-1,3-Dichloropropene | 14.99 | 75 | 3024 | 0.092 ng | | 99 |
| 53) 4-Methyl-2-pentanone | 15.04 | 58 | 4319 | 0.216 ng | | 76 |
| 54) trans-1,3-Dichloropropene | 15.51 | 75 | 2480 | 0.083 ng | | 97 |
| 55) 1,1,2-Trichloroethane | 15.68 | 97 | 1974 | 0.094 ng | | 98 |
| 58) Toluene | 15.98 | 91 | 9428 | 0.105 ng | | 97 |
| 59) 2-Hexanone | 16.23 | 43 | 12583 | 0.257 ng | | 88 |
| 60) Dibromochloromethane | 16.38 | 129 | 1981 | 0.086 ng | | 99 |
| 61) 1,2-Dibromoethane | 16.64 | 107 | 2240 | 0.090 ng | | 98 |
| 62) n-Butyl Acetate | 16.86 | 43 | 13658 | 0.253 ng | | 91 |
| 63) n-Octane | 16.99 | 57 | 1818 | 0.099 ng | | 89 |
| 64) Tetrachloroethene | 17.12 | 166 | 2132 | 0.083 ng | | 98 |
| 65) Chlorobenzene | 17.78 | 112 | 6162 | 0.104 ng | | 99 |
| 66) Ethylbenzene | 18.13 | 91 | 10136 | 0.095 ng | | 96 |
| 67) m- & p-Xylenes | 18.28 | 91 | 16290 | 0.199 ng | | 91 |
| 68) Bromoform | 18.35 | 173 | 1418 | 0.078 ng | | 92 |
| 69) Styrene | 18.61 | 104 | 6057 | 0.097 ng | | 97 |
| 70) o-Xylene | 18.71 | 91 | 7873 | 0.102 ng | | 92 |
| 71) n-Nonane | 18.91 | 43 | 4341 | 0.105 ng | | 85 |
| 72) 1,1,2,2-Tetrachloroethane | 18.69 | 83 | 3234 | 0.089 ng | | 97 |
| 74) Cumene | 19.24 | 105 | 10490 | 0.106 ng | | 96 |
| 75) alpha-Pinene | 19.58 | 93 | 4465 | 0.095 ng | | 91 |
| 76) n-Propylbenzene | 19.68 | 91 | 12545 | 0.105 ng | | 93 |
| 77) 3-Ethyltoluene | 0.00 | 105 | 0 | N.D. d | | |
| 78) 4-Ethyltoluene | 19.81 | 105 | 10489 | 0.103 ng | | 94 |
| 79) 1,3,5-Trimethylbenzene | 19.87 | 105 | 7903 | 0.094 ng | | 93 |
| 80) alpha-Methylstyrene | 0.00 | 118 | 0 | N.D. | | |
| 81) 2-Ethyltoluene | 0.00 | 105 | 0 | N.D. d | | |
| 82) 1,2,4-Trimethylbenzene | 20.24 | 105 | 7943 | 0.104 ng | | 93 |
| 83) n-Decane | 0.00 | 58 | 0 | N.D. d | | |
| 84) Benzyl Chloride | 20.35 | 91 | 8312 | 0.151 ng | | 88 |
| 85) 1,3-Dichlorobenzene | 20.37 | 146 | 5084 | 0.113 ng | | 100 |
| 86) 1,4-Dichlorobenzene | 20.43 | 146 | 5161 | 0.110 ng | | 97 |
| 87) sec-Butylbenzene | 20.47 | 105 | 10346 | 0.096 ng | | 94 |
| 88) 4-Isopropyltoluene (p-... | 20.61 | 119 | 9264 | 0.096 ng | | 92 |
| 89) 1,2,3-Trimethylbenzene | 0.00 | 105 | 0 | N.D. d | | |
| 90) 1,2-Dichlorobenzene | 20.73 | 146 | 4702 | 0.110 ng | | 100 |
| 91) d-Limonene | 20.74 | 68 | 2646 | 0.089 ng | | 90 |
| 92) 1,2-Dibromo-3-Chloropr... | 21.11 | 157 | 2578 | 0.152 ng | # | 40 |
| 93) n-Undecane | 0.00 | 57 | 0 | N.D. d | | |
| 94) 1,2,4-Trichlorobenzene | 22.24 | 180 | 7586 | 0.211 ng | | 100 |
| 95) Naphthalene | 22.34 | 128 | 14134 | 0.125 ng | | 99 |
| 96) n-Dodecane | 0.00 | 57 | 0 | N.D. d | | |
| 97) Hexachlorobutadiene | 22.67 | 225 | 1813 | 0.082 ng | | 98 |
| 98) Cyclohexanone | 0.00 | 55 | 0 | N.D. d | | |
| 99) tert-Butylbenzene | 20.24 | 119 | 7936 | 0.105 ng | | 97 |
| 100) n-Butylbenzene | 20.97 | 91 | 8451 | 0.098 ng | | 94 |
| 101) 1,1,1,2-Tetrachloroethane | 17.76 | 131 | 1883 | 0.090 ng | | 94 |

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 01\20\01202228.D Vial: 12
Acq On : 20 Jan 2022 22:56 Operator: WA
Sample : 0.1ng R16012022 ICAL Std Inst : GCMS-16
Misc : S35-01102201/S35-01172211 (2/16)

Quant Time: Jan 21 06:07:08 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 06:02:16 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 01\20\01202229.D Vial: 12
Acq On : 20 Jan 2022 23:30 Operator: WA
Sample : 0.2ng R16012022 ICAL Std Inst : GCMS-16
Misc : S35-01102201/S35-01172211 (2/16)

Quant Time: Jan 21 06:09:10 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 06:02:16 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

WA 1/21/22

| Internal Standards | R.T. | QIon | Response | Conc | Units | | Dev(Min) |
|---|---|---|---|---|---|---|---|
| 1) Bromochloromethane (IS1) | 11.30 | 130 | 164864 | 12.500 | ng | | -0.03 |
| 37) 1,4-Difluorobenzene (IS2) | 13.43 | 114 | 756154 | 12.500 | ng | | -0.01 |
| 56) Chlorobenzene-d5 (IS3) | 17.73 | 54 | 139104 | 12.500 | ng | | 0.00 |
| **System Monitoring Compounds** | | | | | | | |
| 33) 1,2-Dichloroethane-d4(... | 12.15 | 65 | 285834 | 13.021 | ng | | -0.02 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 104.16% | | | | |
| 57) Toluene-d8 (SS2) | 15.88 | 98 | 818757 | 12.292 | ng | | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 98.32% | | | | |
| 73) Bromofluorobenzene (SS3) | 19.11 | 174 | 261159 | 11.531 | ng | | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 92.24% | | | | |
| **Target Compounds** | | | | | | | Qvalue |
| 2) Propene | 4.20 | 42 | 5136 | 0.167 | ng | | 99 |
| 3) Dichlorodifluoromethan... | 4.36 | 85 | 8644 | 0.215 | ng | | 98 |
| 4) Chloromethane | 4.64 | 50 | 6550 | 0.254 | ng | | 98 |
| 5) 1,2-Dichloro-1,1,2,2-t... | 4.91 | 135 | 4988 | 0.226 | ng | | 98 |
| 6) Vinyl Chloride | 5.07 | 62 | 6336 | 0.192 | ng | | 98 |
| 7) 1,3-Butadiene | 5.34 | 54 | 3949 | 0.196 | ng | | 92 |
| 8) Bromomethane | 5.77 | 94 | 3252 | 0.176 | ng | | 97 |
| 9) Chloroethane | 6.11 | 64 | 2718 | 0.187 | ng | | 97 |
| 10) Ethanol | 6.45 | 45 | 13702 | 0.859 | ng | | 92 |
| 11) Acetonitrile | 6.73 | 41 | 9137 | 0.201 | ng | | 96 |
| 12) Acrolein | 6.93 | 56 | 3497 | 0.268 | ng | | 98 |
| 13) Acetone | 7.16 | 58 | 19111 | 1.247 | ng | # | 77 |
| 14) Trichlorofluoromethane | 7.40 | 101 | 7193 | 0.194 | ng | | 100 |
| 15) 2-Propanol (Isopropanol) | 7.65 | 45 | 22759 | 0.504 | ng | | 89 |
| 16) Acrylonitrile | 7.89 | 53 | 11165 | 0.396 | ng | | 99 |
| 17) 1,1-Dichloroethene | 8.36 | 96 | 3761 | 0.168 | ng | | 94 |
| 18) 2-Methyl-2-Propanol (t... | 8.58 | 59 | 20458 | 0.432 | ng | | 89 |
| 19) Methylene Chloride | 8.57 | 84 | 4186 | 0.196 | ng | | 95 |
| 20) 3-Chloro-1-propene (Al... | 8.74 | 41 | 5987 | 0.208 | ng | | 91 |
| 21) Trichlorotrifluoroethane | 9.01 | 151 | 3212 | 0.192 | ng | | 97 |
| 22) Carbon Disulfide | 8.85 | 76 | 29467 | 0.405 | ng | | 100 |
| 23) trans-1,2-Dichloroethene | 9.85 | 61 | 5700 | 0.184 | ng | | 100 |
| 24) 1,1-Dichloroethane | 10.10 | 63 | 6988 | 0.184 | ng | | 99 |
| 25) Methyl tert-Butyl Ether | 10.25 | 73 | 11075 | 0.204 | ng | | 98 |
| 26) Vinyl Acetate | 10.37 | 86 | 1819 | 0.507 | ng | # | 29 |
| 27) 2-Butanone (MEK) | 10.63 | 72 | 5798 | 0.420 | ng | # | 68 |
| 28) cis-1,2-Dichloroethene | 11.13 | 61 | 5391 | 0.179 | ng | | 98 |
| 29) Diisopropyl Ether | 11.44 | 87 | 7154 | 0.400 | ng | # | 7 |
| 30) Ethyl Acetate | 11.44 | 61 | 6451 | 0.820 | ng | | 89 |
| 31) n-Hexane | 11.42 | 57 | 6613 | 0.219 | ng | # | 97 |
| 32) Chloroform | 11.47 | 83 | 7002 | 0.187 | ng | | 98 |
| 34) Tetrahydrofuran (THF) | 11.91 | 72 | 5047 | 0.377 | ng | # | 87 |
| 35) Ethyl tert-Butyl Ether | 12.03 | 87 | 8530 | 0.412 | ng | # | 87 |
| 36) 1,2-Dichloroethane | 12.27 | 62 | 5535 | 0.194 | ng | | 99 |
| 38) 1,1,1-Trichloroethane | 12.55 | 97 | 6127 | 0.188 | ng | | 97 |
| 39) Isopropyl Acetate | 0.00 | 61 | 0 | N.D. | d | | |
| 40) 1-Butanol | 0.00 | 56 | 0 | N.D. | d | | |
| 41) Benzene | 13.03 | 78 | 16544 | 0.189 | ng | | 100 |
| 42) Carbon Tetrachloride | 13.19 | 117 | 4812 | 0.183 | ng | | 98 |
| 43) Cyclohexane | 13.33 | 84 | 11692 | 0.386 | ng | | 91 |
| 44) tert-Amyl Methyl Ether | 13.69 | 73 | 21535 | 0.405 | ng | | 93 |
| 45) 1,2-Dichloropropane | 13.89 | 63 | 3817 | 0.190 | ng | | 99 |
| 46) Bromodichloromethane | 14.07 | 83 | 4892 | 0.180 | ng | | 99 |
| 47) Trichloroethene | 14.13 | 130 | 3948 | 0.168 | ng | | 98 |
| 48) 1,4-Dioxane | 14.12 | 88 | 3591 | 0.183 | ng | | 90 |
| 49) 2,2,4-Trimethylpentane... | 14.20 | 57 | 16112 | 0.193 | ng | | 90 |
| 50) Methyl Methacrylate | 14.34 | 100 | 3013 | 0.337 | ng | # | 81 |

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 01\20\01202229.D Vial: 12
Acq On : 20 Jan 2022 23:30 Operator: WA
Sample : 0.2ng R16012022 ICAL Std Inst : GCMS-16
Misc : S35-01102201/S35-01172211 (2/16)

Quant Time: Jan 21 06:09:10 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 06:02:16 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

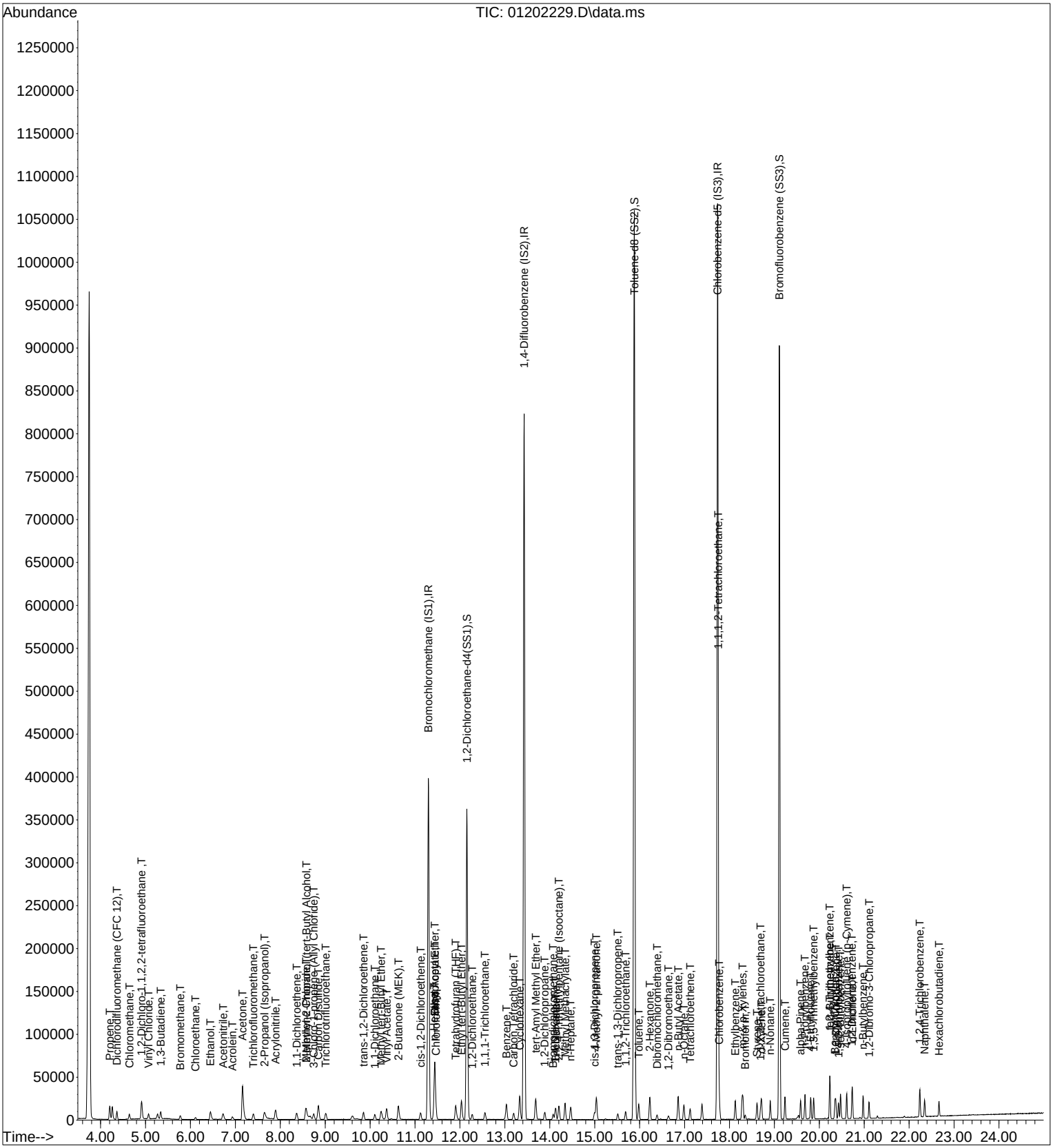
| Internal Standards | R.T. | QIon | Response | Conc Units | | Dev(Min) |
|---|---|---|---|---|---|---|
| 51) n-Heptane | 14.46 | 71 | 3782 | 0.177 ng | | 92 |
| 52) cis-1,3-Dichloropropene | 15.00 | 75 | 5717 | 0.187 ng | | 99 |
| 53) 4-Methyl-2-pentanone | 15.03 | 58 | 7700 | 0.410 ng | | 79 |
| 54) trans-1,3-Dichloropropene | 15.51 | 75 | 4647 | 0.165 ng | | 99 |
| 55) 1,1,2-Trichloroethane | 15.69 | 97 | 3673 | 0.187 ng | | 99 |
| 58) Toluene | 15.98 | 91 | 15958 | 0.187 ng | | 98 |
| 59) 2-Hexanone | 16.23 | 43 | 21262 | 0.454 ng | | 88 |
| 60) Dibromochloromethane | 16.39 | 129 | 3618 | 0.165 ng | | 98 |
| 61) 1,2-Dibromoethane | 16.64 | 107 | 3918 | 0.165 ng | | 100 |
| 62) n-Butyl Acetate | 16.86 | 43 | 22935 | 0.445 ng | | 92 |
| 63) n-Octane | 16.99 | 57 | 3181 | 0.182 ng | | 95 |
| 64) Tetrachloroethene | 17.12 | 166 | 3998 | 0.162 ng | | 100 |
| 65) Chlorobenzene | 17.77 | 112 | 10369 | 0.183 ng | | 99 |
| 66) Ethylbenzene | 18.13 | 91 | 17430 | 0.170 ng | | 96 |
| 67) m- & p-Xylenes | 18.29 | 91 | 27317 | 0.349 ng | | 93 |
| 68) Bromoform | 18.35 | 173 | 2477 | 0.143 ng | | 94 |
| 69) Styrene | 18.61 | 104 | 9953 | 0.168 ng | | 97 |
| 70) o-Xylene | 18.71 | 91 | 13553 | 0.183 ng | | 96 |
| 71) n-Nonane | 18.91 | 43 | 7759 | 0.196 ng | | 87 |
| 72) 1,1,2,2-Tetrachloroethane | 18.69 | 83 | 6154 | 0.178 ng | | 98 |
| 74) Cumene | 19.24 | 105 | 17520 | 0.185 ng | | 96 |
| 75) alpha-Pinene | 19.58 | 93 | 8423 | 0.187 ng | | 95 |
| 76) n-Propylbenzene | 19.68 | 91 | 21125 | 0.185 ng | | 94 |
| 77) 3-Ethyltoluene | 0.00 | 105 | 0 | N.D. d | | |
| 78) 4-Ethyltoluene | 19.81 | 105 | 16927 | 0.174 ng | | 97 |
| 79) 1,3,5-Trimethylbenzene | 19.87 | 105 | 13538 | 0.168 ng | | 94 |
| 80) alpha-Methylstyrene | 0.00 | 118 | 0 | N.D. | | |
| 81) 2-Ethyltoluene | 0.00 | 105 | 0 | N.D. d | | |
| 82) 1,2,4-Trimethylbenzene | 20.23 | 105 | 13554 | 0.185 ng | | 96 |
| 83) n-Decane | 0.00 | 58 | 0 | N.D. d | | |
| 84) Benzyl Chloride | 20.35 | 91 | 13684 | 0.261 ng | | 90 |
| 85) 1,3-Dichlorobenzene | 20.37 | 146 | 7456 | 0.174 ng | | 98 |
| 86) 1,4-Dichlorobenzene | 20.43 | 146 | 7563 | 0.170 ng | | 99 |
| 87) sec-Butylbenzene | 20.47 | 105 | 18295 | 0.178 ng | | 96 |
| 88) 4-Isopropyltoluene (p-... | 20.61 | 119 | 15935 | 0.172 ng | | 94 |
| 89) 1,2,3-Trimethylbenzene | 0.00 | 105 | 0 | N.D. d | | |
| 90) 1,2-Dichlorobenzene | 20.73 | 146 | 7209 | 0.176 ng | | 97 |
| 91) d-Limonene | 20.74 | 68 | 4982 | 0.175 ng | | 95 |
| 92) 1,2-Dibromo-3-Chloropr... | 21.11 | 157 | 4522 | 0.279 ng | # | 48 |
| 93) n-Undecane | 0.00 | 57 | 0 | N.D. | | |
| 94) 1,2,4-Trichlorobenzene | 22.24 | 180 | 9384 | 0.274 ng | | 98 |
| 95) Naphthalene | 22.34 | 128 | 15288 | 0.141 ng | | 98 |
| 96) n-Dodecane | 0.00 | 57 | 0 | N.D. d | | |
| 97) Hexachlorobutadiene | 22.67 | 225 | 3267 | 0.155 ng | | 95 |
| 98) Cyclohexanone | 0.00 | 55 | 0 | N.D. d | | |
| 99) tert-Butylbenzene | 20.24 | 119 | 13650 | 0.189 ng | | 99 |
| 100) n-Butylbenzene | 20.97 | 91 | 14483 | 0.176 ng | | 95 |
| 101) 1,1,1,2-Tetrachloroethane | 17.75 | 131 | 3441 | 0.172 ng | | 96 |

(#) = qualifier out of range (m) = manual integration (+) = signals summed

01118169

Data File : I:\MS16\DATA\2022 01\20\01202229.D Vial: 12
Acq On : 20 Jan 2022 23:30 Operator: WA
Sample : 0.2ng R16012022 ICAL Std Inst : GCMS-16
Misc : S35-01102201/S35-01172211 (2/16)

Quant Time: Jan 21 06:09:10 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 06:02:16 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 01\20\01202230.D Vial: 12
Acq On : 21 Jan 2022 00:04 Operator: WA
Sample : 0.5ng R16012022 ICAL Std Inst : GCMS-16
Misc : S35-01102201/S35-01172211 (2/16)

Quant Time: Jan 21 06:10:10 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 06:02:16 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

WA 1/21/22

| Internal Standards | R.T. | QIon | Response | Conc | Units | | Dev(Min) |
|---|---|---|---|---|---|---|---|
| 1) Bromochloromethane (IS1) | 11.30 | 130 | 157739 | 12.500 | ng | | -0.02 |
| 37) 1,4-Difluorobenzene (IS2) | 13.43 | 114 | 736604 | 12.500 | ng | | -0.01 |
| 56) Chlorobenzene-d5 (IS3) | 17.73 | 54 | 136638 | 12.500 | ng | | 0.00 |

System Monitoring Compounds

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 33) 1,2-Dichloroethane-d4(... | 12.15 | 65 | 278939 | 13.281 | ng | | -0.02 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 106.24% | | | | |
| 57) Toluene-d8 (SS2) | 15.88 | 98 | 802410 | 12.264 | ng | | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 98.08% | | | | |
| 73) Bromofluorobenzene (SS3) | 19.11 | 174 | 251400 | 11.301 | ng | | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 90.40% | | | | |

Target Compounds

| | | | | | | | Qvalue |
|---|---|---|---|---|---|---|---|
| 2) Propene | 4.19 | 42 | 14258 | 0.486 | ng | | 98 |
| 3) Dichlorodifluoromethan... | 4.35 | 85 | 21331 | 0.555 | ng | | 99 |
| 4) Chloromethane | 4.63 | 50 | 15065 | 0.611 | ng | | 99 |
| 5) 1,2-Dichloro-1,1,2,2-t... | 4.91 | 135 | 12329 | 0.583 | ng | | 98 |
| 6) Vinyl Chloride | 5.06 | 62 | 16095 | 0.511 | ng | | 100 |
| 7) 1,3-Butadiene | 5.33 | 54 | 10234 | 0.530 | ng | | 99 |
| 8) Bromomethane | 5.76 | 94 | 8210 | 0.464 | ng | | 99 |
| 9) Chloroethane | 6.10 | 64 | 6637 | 0.478 | ng | | 100 |
| 10) Ethanol | 6.44 | 45 | 30890 | 2.023 | ng | | 88 |
| 11) Acetonitrile | 6.72 | 41 | 20024 | 0.461 | ng | | 99 |
| 12) Acrolein | 6.93 | 56 | 7432 | 0.596 | ng | | 98 |
| 13) Acetone | 7.15 | 58 | 43049 | 2.935 | ng | # | 75 |
| 14) Trichlorofluoromethane | 7.39 | 101 | 17399 | 0.490 | ng | | 99 |
| 15) 2-Propanol (Isopropanol) | 7.62 | 45 | 61720 | 1.429 | ng | | 92 |
| 16) Acrylonitrile | 7.89 | 53 | 25136 | 0.932 | ng | | 98 |
| 17) 1,1-Dichloroethene | 8.36 | 96 | 8915 | 0.417 | ng | | 95 |
| 18) 2-Methyl-2-Propanol (t... | 8.58 | 59 | 49938 | 1.103 | ng | | 92 |
| 19) Methylene Chloride | 8.57 | 84 | 9674 | 0.473 | ng | | 94 |
| 20) 3-Chloro-1-propene (Al... | 8.74 | 41 | 13559 | 0.491 | ng | | 93 |
| 21) Trichlorotrifluoroethane | 9.01 | 151 | 7812 | 0.487 | ng | | 98 |
| 22) Carbon Disulfide | 8.84 | 76 | 70521 | 1.014 | ng | | 99 |
| 23) trans-1,2-Dichloroethene | 9.85 | 61 | 13489 | 0.456 | ng | | 97 |
| 24) 1,1-Dichloroethane | 10.11 | 63 | 16506 | 0.455 | ng | | 100 |
| 25) Methyl tert-Butyl Ether | 10.23 | 73 | 26648 | 0.514 | ng | | 98 |
| 26) Vinyl Acetate | 10.37 | 86 | 4964 | 1.445 | ng | # | 55 |
| 27) 2-Butanone (MEK) | 10.62 | 72 | 14198 | 1.075 | ng | # | 75 |
| 28) cis-1,2-Dichloroethene | 11.12 | 61 | 12805 | 0.445 | ng | | 96 |
| 29) Diisopropyl Ether | 11.43 | 87 | 17233 | 1.007 | ng | # | 6 |
| 30) Ethyl Acetate | 11.44 | 61 | 15720 | 2.090 | ng | | 91 |
| 31) n-Hexane | 11.42 | 57 | 15935 | 0.550 | ng | # | 97 |
| 32) Chloroform | 11.47 | 83 | 16820 | 0.469 | ng | | 99 |
| 34) Tetrahydrofuran (THF) | 11.89 | 72 | 12063 | 0.943 | ng | # | 89 |
| 35) Ethyl tert-Butyl Ether | 12.03 | 87 | 20721 | 1.045 | ng | # | 85 |
| 36) 1,2-Dichloroethane | 12.27 | 62 | 13282 | 0.486 | ng | | 99 |
| 38) 1,1,1-Trichloroethane | 12.56 | 97 | 14757 | 0.466 | ng | | 98 |
| 39) Isopropyl Acetate | 0.00 | 61 | 0 | N.D. | d | | |
| 40) 1-Butanol | 0.00 | 56 | 0 | N.D. | d | | |
| 41) Benzene | 13.03 | 78 | 37898 | 0.444 | ng | | 100 |
| 42) Carbon Tetrachloride | 13.20 | 117 | 11680 | 0.456 | ng | | 100 |
| 43) Cyclohexane | 13.33 | 84 | 28102 | 0.952 | ng | | 90 |
| 44) tert-Amyl Methyl Ether | 13.68 | 73 | 51705 | 0.998 | ng | | 93 |
| 45) 1,2-Dichloropropane | 13.89 | 63 | 9374 | 0.478 | ng | | 99 |
| 46) Bromodichloromethane | 14.07 | 83 | 12200 | 0.462 | ng | | 100 |
| 47) Trichloroethene | 14.13 | 130 | 9499 | 0.416 | ng | | 99 |
| 48) 1,4-Dioxane | 14.12 | 88 | 8605 | 0.450 | ng | | 93 |
| 49) 2,2,4-Trimethylpentane... | 14.20 | 57 | 38951 | 0.479 | ng | | 91 |
| 50) Methyl Methacrylate | 14.34 | 100 | 7556 | 0.868 | ng | # | 85 |

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 01\20\01202230.D Vial: 12
Acq On : 21 Jan 2022 00:04 Operator: WA
Sample : 0.5ng R16012022 ICAL Std Inst : GCMS-16
Misc : S35-01102201/S35-01172211 (2/16)

Quant Time: Jan 21 06:10:10 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 06:02:16 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

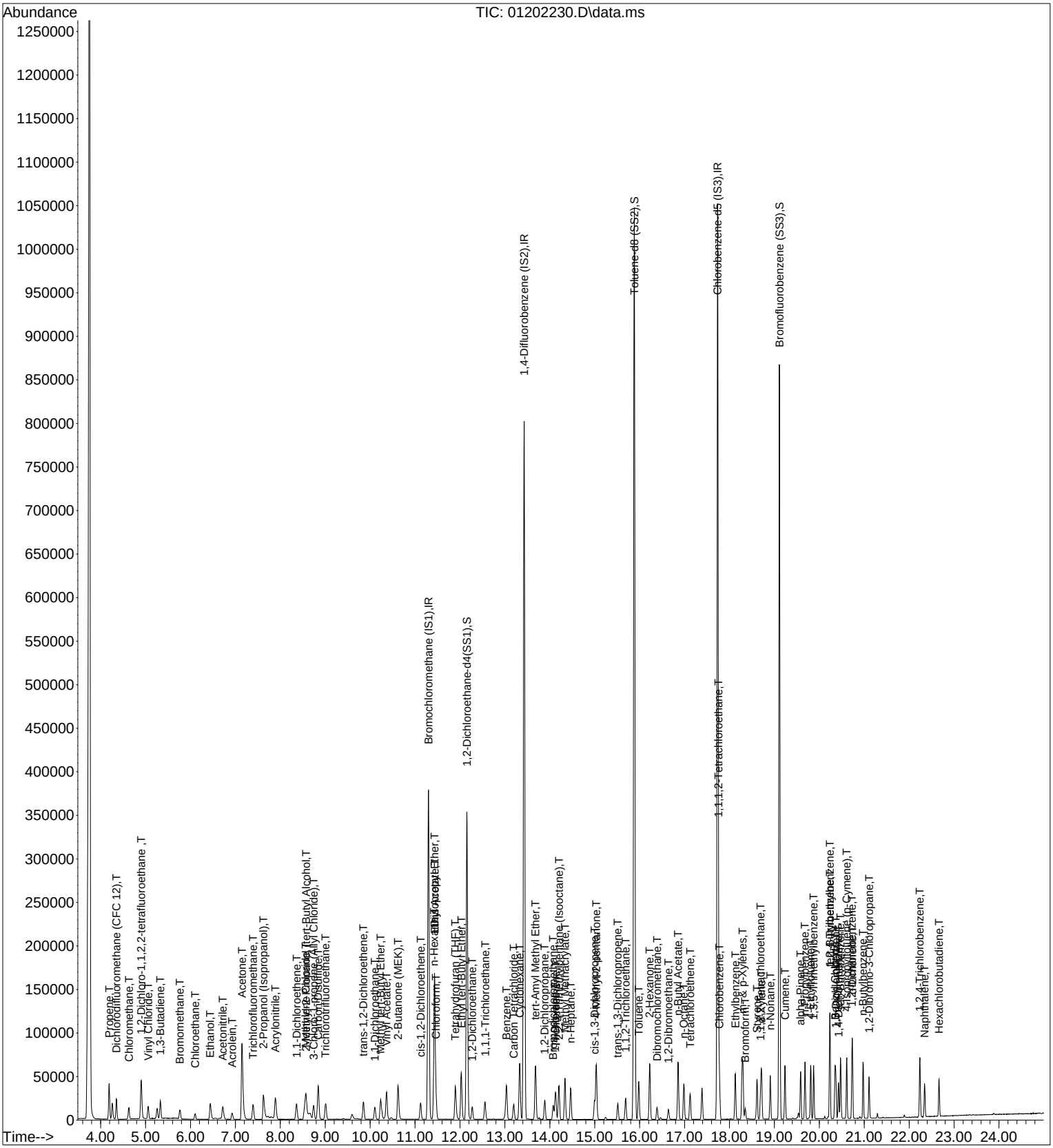
| Internal Standards | R.T. | QIon | Response | Conc Units | | Dev(Min) |
|---|---|---|---|---|---|---|
| 51) n-Heptane | 14.47 | 71 | 9422 | 0.452 ng | | 96 |
| 52) cis-1,3-Dichloropropene | 15.00 | 75 | 14024 | 0.470 ng | | 99 |
| 53) 4-Methyl-2-pentanone | 15.03 | 58 | 19003 | 1.040 ng | | 81 |
| 54) trans-1,3-Dichloropropene | 15.51 | 75 | 11893 | 0.434 ng | | 99 |
| 55) 1,1,2-Trichloroethane | 15.69 | 97 | 8784 | 0.460 ng | | 99 |
| 58) Toluene | 15.98 | 91 | 37317 | 0.445 ng | | 99 |
| 59) 2-Hexanone | 16.22 | 43 | 50995 | 1.109 ng | | 89 |
| 60) Dibromochloromethane | 16.39 | 129 | 9081 | 0.421 ng | | 99 |
| 61) 1,2-Dibromoethane | 16.64 | 107 | 9609 | 0.411 ng | | 99 |
| 62) n-Butyl Acetate | 16.85 | 43 | 55752 | 1.102 ng | | 92 |
| 63) n-Octane | 16.98 | 57 | 7967 | 0.463 ng | | 91 |
| 64) Tetrachloroethene | 17.12 | 166 | 9736 | 0.402 ng | | 100 |
| 65) Chlorobenzene | 17.78 | 112 | 24140 | 0.434 ng | | 99 |
| 66) Ethylbenzene | 18.13 | 91 | 40965 | 0.407 ng | | 98 |
| 67) m- & p-Xylenes | 18.29 | 91 | 63306 | 0.823 ng | | 95 |
| 68) Bromoform | 18.35 | 173 | 6382 | 0.374 ng | | 100 |
| 69) Styrene | 18.61 | 104 | 24030 | 0.412 ng | | 97 |
| 70) o-Xylene | 18.71 | 91 | 32185 | 0.443 ng | | 95 |
| 71) n-Nonane | 18.91 | 43 | 18800 | 0.484 ng | | 88 |
| 72) 1,1,2,2-Tetrachloroethane | 18.69 | 83 | 14931 | 0.440 ng | | 98 |
| 74) Cumene | 19.24 | 105 | 41455 | 0.445 ng | | 96 |
| 75) alpha-Pinene | 19.58 | 93 | 21105 | 0.477 ng | | 95 |
| 76) n-Propylbenzene | 19.68 | 91 | 49856 | 0.444 ng | | 94 |
| 77) 3-Ethyltoluene | 0.00 | 105 | 0 | N.D. d | | |
| 78) 4-Ethyltoluene | 19.81 | 105 | 39763 | 0.417 ng | | 96 |
| 79) 1,3,5-Trimethylbenzene | 19.87 | 105 | 32341 | 0.410 ng | | 96 |
| 80) alpha-Methylstyrene | 0.00 | 118 | 0 | N.D. d | | |
| 81) 2-Ethyltoluene | 0.00 | 105 | 0 | N.D. d | | |
| 82) 1,2,4-Trimethylbenzene | 20.24 | 105 | 32152 | 0.447 ng | | 98 |
| 83) n-Decane | 0.00 | 58 | 0 | N.D. d | | |
| 84) Benzyl Chloride | 20.35 | 91 | 35448 | 0.688 ng | | 91 |
| 85) 1,3-Dichlorobenzene | 20.37 | 146 | 16856 | 0.401 ng | | 99 |
| 86) 1,4-Dichlorobenzene | 20.43 | 146 | 16483 | 0.376 ng | | 99 |
| 87) sec-Butylbenzene | 20.47 | 105 | 44143 | 0.438 ng | | 96 |
| 88) 4-Isopropyltoluene (p-... | 20.61 | 119 | 37403 | 0.411 ng | | 95 |
| 89) 1,2,3-Trimethylbenzene | 0.00 | 105 | 0 | N.D. d | | |
| 90) 1,2-Dichlorobenzene | 20.73 | 146 | 16608 | 0.414 ng | | 99 |
| 91) d-Limonene | 20.74 | 68 | 13117 | 0.469 ng | | 92 |
| 92) 1,2-Dibromo-3-Chloropr... | 21.11 | 157 | 11261 | 0.707 ng | # | 55 |
| 93) n-Undecane | 0.00 | 57 | 0 | N.D. d | | |
| 94) 1,2,4-Trichlorobenzene | 22.24 | 180 | 19624 | 0.582 ng | | 100 |
| 95) Naphthalene | 22.34 | 128 | 29060 | 0.273 ng | | 98 |
| 96) n-Dodecane | 0.00 | 57 | 0 | N.D. d | | |
| 97) Hexachlorobutadiene | 22.67 | 225 | 7641 | 0.370 ng | | 99 |
| 98) Cyclohexanone | 0.00 | 55 | 0 | N.D. d | | |
| 99) tert-Butylbenzene | 20.24 | 119 | 32728 | 0.462 ng | | 99 |
| 100) n-Butylbenzene | 20.97 | 91 | 34750 | 0.429 ng | | 96 |
| 101) 1,1,1,2-Tetrachloroethane | 17.76 | 131 | 8470 | 0.430 ng | | 100 |

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 01\20\01202230.D Vial: 12
Acq On : 21 Jan 2022 00:04 Operator: WA
Sample : 0.5ng R16012022 ICAL Std Inst : GCMS-16
Misc : S35-01102201/S35-01172211 (2/16)

Quant Time: Jan 21 06:10:10 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 06:02:16 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

01118173

Data File : I:\MS16\DATA\2022 01\20\01202231.D Vial: 15
Acq On : 21 Jan 2022 00:38 Operator: WA
Sample : 1.0ng R16012022 ICAL Std Inst : GCMS-16
Misc : S35-01102201/S35-01172210 (2/16)

Quant Time: Jan 21 06:10:58 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 06:02:16 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

WA 1/21/22

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) Bromochloromethane (IS1) | 11.30 | 130 | 157109 | 12.500 | ng | -0.02 |
| 37) 1,4-Difluorobenzene (IS2) | 13.43 | 114 | 722531 | 12.500 | ng | -0.01 |
| 56) Chlorobenzene-d5 (IS3) | 17.73 | 54 | 133393 | 12.500 | ng | 0.00 |

System Monitoring Compounds

| | | | | | | |
|---|---|---|---|---|---|---|
| 33) 1,2-Dichloroethane-d4(... | 12.16 | 65 | 274625 | 13.128 | ng | -0.01 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 105.04% | | | |
| 57) Toluene-d8 (SS2) | 15.88 | 98 | 780241 | 12.215 | ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 97.68% | | | |
| 73) Bromofluorobenzene (SS3) | 19.12 | 174 | 246012 | 11.328 | ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 90.64% | | | |

Target Compounds

| | | | | | | | Qvalue |
|---|---|---|---|---|---|---|---|
| 2) Propene | 4.19 | 42 | 21664 | 0.741 | ng | | 97 |
| 3) Dichlorodifluoromethan... | 4.35 | 85 | 39792 | 1.039 | ng | | 100 |
| 4) Chloromethane | 4.63 | 50 | 30975 | 1.262 | ng | | 99 |
| 5) 1,2-Dichloro-1,1,2,2-t... | 4.91 | 135 | 23591 | 1.121 | ng | | 100 |
| 6) Vinyl Chloride | 5.05 | 62 | 31308 | 0.998 | ng | | 100 |
| 7) 1,3-Butadiene | 5.33 | 54 | 20092 | 1.044 | ng | | 98 |
| 8) Bromomethane | 5.76 | 94 | 14878 | 0.844 | ng | | 99 |
| 9) Chloroethane | 6.10 | 64 | 12498 | 0.903 | ng | | 100 |
| 10) Ethanol | 6.44 | 45 | 50925 | 3.349 | ng | | 97 |
| 11) Acetonitrile | 6.72 | 41 | 34364 | 0.794 | ng | | 99 |
| 12) Acrolein | 6.92 | 56 | 22362 | 1.800 | ng | | 99 |
| 13) Acetone | 7.14 | 58 | 70055 | 4.795 | ng | # | 71 |
| 14) Trichlorofluoromethane | 7.40 | 101 | 32021 | 0.905 | ng | | 99 |
| 15) 2-Propanol (Isopropanol) | 7.62 | 45 | 98666 | 2.293 | ng | | 93 |
| 16) Acrylonitrile | 7.89 | 53 | 47985 | 1.787 | ng | | 100 |
| 17) 1,1-Dichloroethene | 8.36 | 96 | 16602 | 0.780 | ng | | 92 |
| 18) 2-Methyl-2-Propanol (t... | 8.52 | 59 | 86936 | 1.928 | ng | | 93 |
| 19) Methylene Chloride | 8.57 | 84 | 17985 | 0.882 | ng | | 93 |
| 20) 3-Chloro-1-propene (Al... | 8.74 | 41 | 25915 | 0.943 | ng | | 96 |
| 21) Trichlorotrifluoroethane | 9.01 | 151 | 14402 | 0.902 | ng | | 96 |
| 22) Carbon Disulfide | 8.85 | 76 | 127108 | 1.835 | ng | | 99 |
| 23) trans-1,2-Dichloroethene | 9.85 | 61 | 25699 | 0.873 | ng | | 98 |
| 24) 1,1-Dichloroethane | 10.11 | 63 | 31658 | 0.877 | ng | | 100 |
| 25) Methyl tert-Butyl Ether | 10.23 | 73 | 50341 | 0.975 | ng | | 99 |
| 26) Vinyl Acetate | 10.37 | 86 | 9335 | 2.729 | ng | # | 42 |
| 27) 2-Butanone (MEK) | 10.62 | 72 | 25037 | 1.903 | ng | # | 74 |
| 28) cis-1,2-Dichloroethene | 11.12 | 61 | 24830 | 0.866 | ng | | 96 |
| 29) Diisopropyl Ether | 11.43 | 87 | 33467 | 1.964 | ng | # | 12 |
| 30) Ethyl Acetate | 11.43 | 61 | 29874 | 3.987 | ng | | 89 |
| 31) n-Hexane | 11.42 | 57 | 31051 | 1.077 | ng | | 98 |
| 32) Chloroform | 11.47 | 83 | 32072 | 0.898 | ng | | 100 |
| 34) Tetrahydrofuran (THF) | 11.89 | 72 | 22399 | 1.757 | ng | # | 90 |
| 35) Ethyl tert-Butyl Ether | 12.03 | 87 | 39335 | 1.992 | ng | # | 84 |
| 36) 1,2-Dichloroethane | 12.27 | 62 | 25248 | 0.928 | ng | | 100 |
| 38) 1,1,1-Trichloroethane | 12.55 | 97 | 28293 | 0.910 | ng | | 98 |
| 39) Isopropyl Acetate | 0.00 | 61 | 0 | N.D. | d | | |
| 40) 1-Butanol | 0.00 | 56 | 0 | N.D. | d | | |
| 41) Benzene | 13.03 | 78 | 70442 | 0.842 | ng | | 99 |
| 42) Carbon Tetrachloride | 13.20 | 117 | 22363 | 0.890 | ng | | 99 |
| 43) Cyclohexane | 13.33 | 84 | 53834 | 1.860 | ng | | 90 |
| 44) tert-Amyl Methyl Ether | 13.68 | 73 | 98652 | 1.941 | ng | | 94 |
| 45) 1,2-Dichloropropane | 13.89 | 63 | 17354 | 0.902 | ng | | 100 |
| 46) Bromodichloromethane | 14.08 | 83 | 23336 | 0.900 | ng | | 99 |
| 47) Trichloroethene | 14.13 | 130 | 18059 | 0.806 | ng | | 99 |
| 48) 1,4-Dioxane | 14.12 | 88 | 15654 | 0.835 | ng | | 90 |
| 49) 2,2,4-Trimethylpentane... | 14.20 | 57 | 74397 | 0.932 | ng | | 93 |
| 50) Methyl Methacrylate | 14.34 | 100 | 14170 | 1.660 | ng | # | 86 |

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 01\20\01202231.D Vial: 15
Acq On : 21 Jan 2022 00:38 Operator: WA
Sample : 1.0ng R16012022 ICAL Std Inst : GCMS-16
Misc : S35-01102201/S35-01172210 (2/16)

Quant Time: Jan 21 06:10:58 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 06:02:16 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

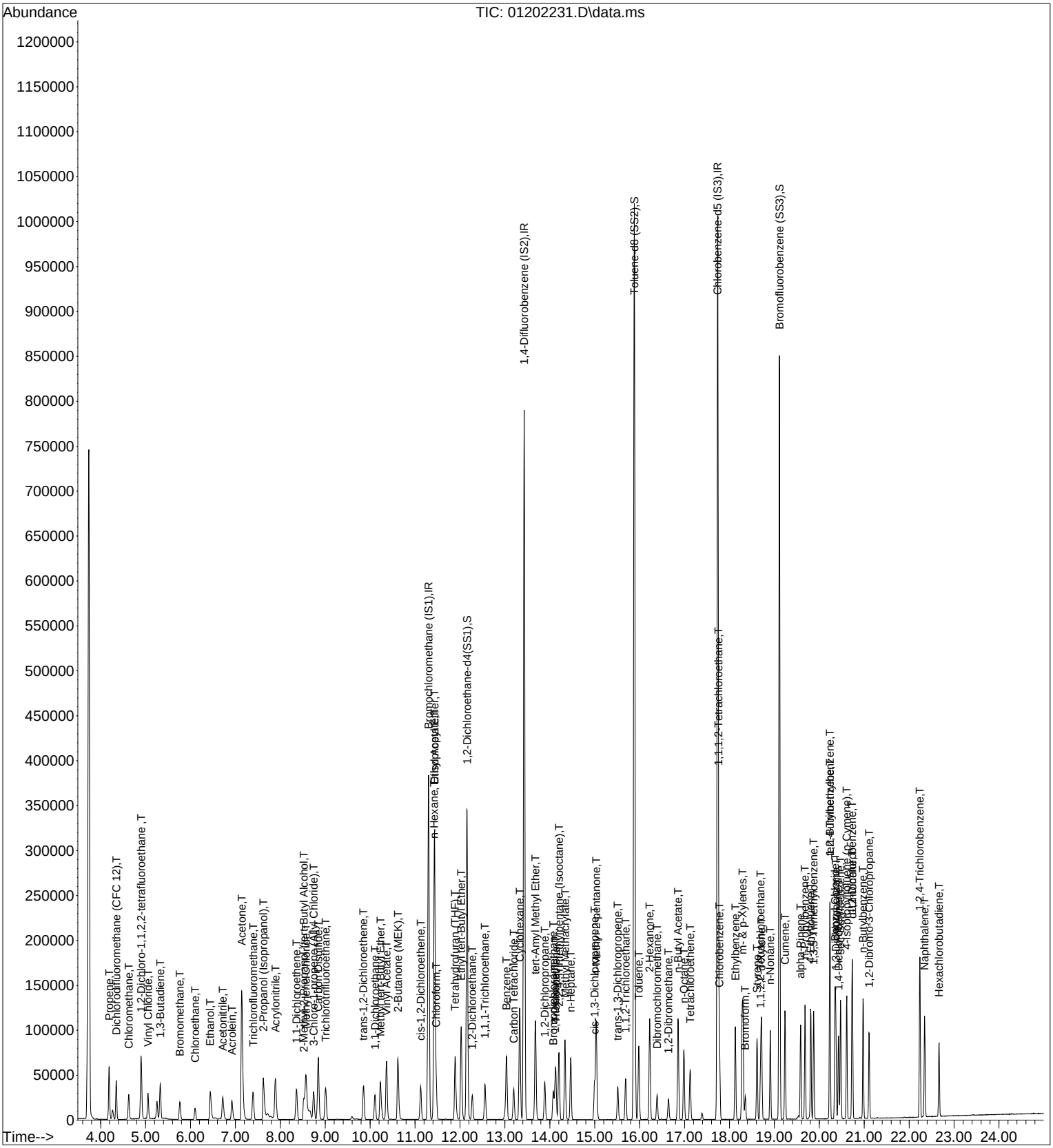
| Internal Standards | R.T. | QIon | Response | Conc Units | | Dev(Min) |
|---|---|---|---|---|---|---|
| 51) n-Heptane | 14.47 | 71 | 18101 | 0.885 ng | | 95 |
| 52) cis-1,3-Dichloropropene | 15.00 | 75 | 27078 | 0.925 ng | | 99 |
| 53) 4-Methyl-2-pentanone | 15.03 | 58 | 33107 | 1.847 ng | | 81 |
| 54) trans-1,3-Dichloropropene | 15.51 | 75 | 23576 | 0.877 ng | | 100 |
| 55) 1,1,2-Trichloroethane | 15.69 | 97 | 16570 | 0.884 ng | | 99 |
| 58) Toluene | 15.98 | 91 | 70385 | 0.860 ng | | 99 |
| 59) 2-Hexanone | 16.22 | 43 | 87548 | 1.950 ng | | 90 |
| 60) Dibromochloromethane | 16.39 | 129 | 17306 | 0.822 ng | | 100 |
| 61) 1,2-Dibromoethane | 16.64 | 107 | 18896 | 0.828 ng | | 99 |
| 62) n-Butyl Acetate | 16.85 | 43 | 94873 | 1.920 ng | | 92 |
| 63) n-Octane | 16.99 | 57 | 14982 | 0.892 ng | | 92 |
| 64) Tetrachloroethene | 17.12 | 166 | 18382 | 0.778 ng | | 99 |
| 65) Chlorobenzene | 17.78 | 112 | 47203 | 0.870 ng | | 100 |
| 66) Ethylbenzene | 18.13 | 91 | 79820 | 0.813 ng | | 97 |
| 67) m- & p-Xylenes | 18.29 | 91 | 124228 | 1.654 ng | | 95 |
| 68) Bromoform | 18.35 | 173 | 12362 | 0.743 ng | | 100 |
| 69) Styrene | 18.61 | 104 | 46278 | 0.813 ng | | 98 |
| 70) o-Xylene | 18.71 | 91 | 63295 | 0.892 ng | | 95 |
| 71) n-Nonane | 18.91 | 43 | 36206 | 0.954 ng | | 88 |
| 72) 1,1,2,2-Tetrachloroethane | 18.69 | 83 | 29258 | 0.883 ng | | 99 |
| 74) Cumene | 19.24 | 105 | 79588 | 0.875 ng | | 96 |
| 75) alpha-Pinene | 19.58 | 93 | 40519 | 0.938 ng | | 97 |
| 76) n-Propylbenzene | 19.68 | 91 | 97467 | 0.889 ng | | 96 |
| 77) 3-Ethyltoluene | 0.00 | 105 | 0 | N.D. d | | |
| 78) 4-Ethyltoluene | 19.81 | 105 | 78126 | 0.838 ng | | 96 |
| 79) 1,3,5-Trimethylbenzene | 19.87 | 105 | 63252 | 0.820 ng | | 95 |
| 80) alpha-Methylstyrene | 0.00 | 118 | 0 | N.D. d | | |
| 81) 2-Ethyltoluene | 0.00 | 105 | 0 | N.D. d | | |
| 82) 1,2,4-Trimethylbenzene | 20.24 | 105 | 64664 | 0.922 ng | | 97 |
| 83) n-Decane | 0.00 | 58 | 0 | N.D. d | | |
| 84) Benzyl Chloride | 20.35 | 91 | 87574 | 1.740 ng | | 92 |
| 85) 1,3-Dichlorobenzene | 20.37 | 146 | 36632 | 0.892 ng | | 100 |
| 86) 1,4-Dichlorobenzene | 20.43 | 146 | 35740 | 0.835 ng | | 99 |
| 87) sec-Butylbenzene | 20.47 | 105 | 86133 | 0.876 ng | | 96 |
| 88) 4-Isopropyltoluene (p-... | 20.61 | 119 | 73045 | 0.823 ng | | 96 |
| 89) 1,2,3-Trimethylbenzene | 0.00 | 105 | 0 | N.D. d | | |
| 90) 1,2-Dichlorobenzene | 20.73 | 146 | 35045 | 0.894 ng | | 100 |
| 91) d-Limonene | 20.74 | 68 | 23320 | 0.855 ng | | 91 |
| 92) 1,2-Dibromo-3-Chloropr... | 21.11 | 157 | 22852 | 1.470 ng | # | 59 |
| 93) n-Undecane | 0.00 | 57 | 0 | N.D. | | |
| 94) 1,2,4-Trichlorobenzene | 22.24 | 180 | 51277 | 1.559 ng | | 99 |
| 95) Naphthalene | 22.34 | 128 | 86305 | 0.831 ng | | 99 |
| 96) n-Dodecane | 0.00 | 57 | 0 | N.D. d | | |
| 97) Hexachlorobutadiene | 22.67 | 225 | 14613 | 0.725 ng | | 99 |
| 98) Cyclohexanone | 0.00 | 55 | 0 | N.D. d | | |
| 99) tert-Butylbenzene | 20.24 | 119 | 63527 | 0.918 ng | | 98 |
| 100) n-Butylbenzene | 20.97 | 91 | 70950 | 0.898 ng | | 96 |
| 101) 1,1,1,2-Tetrachloroethane | 17.76 | 131 | 16365 | 0.851 ng | | 98 |

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 01\20\01202231.D Vial: 15
Acq On : 21 Jan 2022 00:38 Operator: WA
Sample : 1.0ng R16012022 ICAL Std Inst : GCMS-16
Misc : S35-01102201/S35-01172210 (2/16)

Quant Time: Jan 21 06:10:58 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 06:02:16 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 01\20\01202232.D Vial: 15
Acq On : 21 Jan 2022 1:11 Operator: WA
Sample : 5.0ng R16012022 ICAL Std Inst : GCMS-16
Misc : S35-01102201/S35-01172210 (2/16)

Quant Time: Jan 21 06:11:54 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 06:02:16 2022 1/21/22
Response via : Initial Calibration
DataAcq Meth:TO15.M

| Internal Standards | R.T. | QIon | Response | Conc | Units | | Dev(Min) |
|---|---|---|---|---|---|---|---|
| 1) Bromochloromethane (IS1) | 11.31 | 130 | 158024 | 12.500 | ng | | -0.02 |
| 37) 1,4-Difluorobenzene (IS2) | 13.43 | 114 | 734829 | 12.500 | ng | | 0.00 |
| 56) Chlorobenzene-d5 (IS3) | 17.73 | 54 | 135428 | 12.500 | ng | | 0.00 |

| System Monitoring Compounds | | | | | | | |
|---|---|---|---|---|---|---|---|
| 33) 1,2-Dichloroethane-d4(... | 12.16 | 65 | 277963 | 13.210 | ng | | -0.01 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 105.68% | | | | |
| 57) Toluene-d8 (SS2) | 15.88 | 98 | 802019 | 12.367 | ng | | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 98.96% | | | | |
| 73) Bromofluorobenzene (SS3) | 19.12 | 174 | 253002 | 11.474 | ng | | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 91.76% | | | | |

| Target Compounds | | | | | | | Qvalue |
|---|---|---|---|---|---|---|---|
| 2) Propene | 4.17 | 42 | 154241 | 5.248 | ng | | 98 |
| 3) Dichlorodifluoromethan... | 4.34 | 85 | 199937 | 5.188 | ng | | 100 |
| 4) Chloromethane | 4.62 | 50 | 115746 | 4.689 | ng | | 99 |
| 5) 1,2-Dichloro-1,1,2,2-t... | 4.90 | 135 | 115157 | 5.439 | ng | | 100 |
| 6) Vinyl Chloride | 5.05 | 62 | 152545 | 4.835 | ng | | 100 |
| 7) 1,3-Butadiene | 5.32 | 54 | 102922 | 5.319 | ng | | 95 |
| 8) Bromomethane | 5.76 | 94 | 73503 | 4.144 | ng | | 100 |
| 9) Chloroethane | 6.11 | 64 | 62057 | 4.460 | ng | | 100 |
| 10) Ethanol | 6.46 | 45 | 256530 | 16.774 | ng | | 100 |
| 11) Acetonitrile | 6.73 | 41 | 172773 | 3.967 | ng | | 100 |
| 12) Acrolein | 6.93 | 56 | 113221 | 9.061 | ng | | 99 |
| 13) Acetone | 7.14 | 58 | 355665 | 24.203 | ng | # | 78 |
| 14) Trichlorofluoromethane | 7.40 | 101 | 161351 | 4.534 | ng | | 100 |
| 15) 2-Propanol (Isopropanol) | 7.63 | 45 | 365581 | 8.448 | ng | | 96 |
| 16) Acrylonitrile | 7.90 | 53 | 245923 | 9.104 | ng | | 99 |
| 17) 1,1-Dichloroethene | 8.36 | 96 | 84798 | 3.960 | ng | | 93 |
| 18) 2-Methyl-2-Propanol (t... | 8.51 | 59 | 460293 | 10.150 | ng | | 95 |
| 19) Methylene Chloride | 8.58 | 84 | 92454 | 4.510 | ng | | 94 |
| 20) 3-Chloro-1-propene (Al... | 8.75 | 41 | 132718 | 4.801 | ng | | 96 |
| 21) Trichlorotrifluoroethane | 9.01 | 151 | 74642 | 4.647 | ng | | 97 |
| 22) Carbon Disulfide | 8.85 | 76 | 655570 | 9.411 | ng | | 99 |
| 23) trans-1,2-Dichloroethene | 9.86 | 61 | 132076 | 4.460 | ng | | 96 |
| 24) 1,1-Dichloroethane | 10.11 | 63 | 159895 | 4.401 | ng | | 100 |
| 25) Methyl tert-Butyl Ether | 10.22 | 73 | 262425 | 5.051 | ng | | 100 |
| 26) Vinyl Acetate | 10.37 | 86 | 54828 | 15.937 | ng | # | 55 |
| 27) 2-Butanone (MEK) | 10.61 | 72 | 131640 | 9.948 | ng | # | 79 |
| 28) cis-1,2-Dichloroethene | 11.13 | 61 | 125351 | 4.344 | ng | | 96 |
| 29) Diisopropyl Ether | 11.43 | 87 | 189214 | 11.038 | ng | # | 35 |
| 30) Ethyl Acetate | 11.43 | 61 | 167290 | 22.198 | ng | | 91 |
| 31) n-Hexane | 11.42 | 57 | 168689 | 5.815 | ng | | 98 |
| 32) Chloroform | 11.48 | 83 | 164741 | 4.588 | ng | | 99 |
| 34) Tetrahydrofuran (THF) | 11.88 | 72 | 116168 | 9.060 | ng | # | 91 |
| 35) Ethyl tert-Butyl Ether | 12.03 | 87 | 211623 | 10.657 | ng | # | 87 |
| 36) 1,2-Dichloroethane | 12.28 | 62 | 126897 | 4.637 | ng | | 99 |
| 38) 1,1,1-Trichloroethane | 12.56 | 97 | 144388 | 4.568 | ng | | 98 |
| 39) Isopropyl Acetate | 0.00 | 61 | 0 | N.D. | d | | |
| 40) 1-Butanol | 0.00 | 56 | 0 | N.D. | d | | |
| 41) Benzene | 13.04 | 78 | 359258 | 4.223 | ng | | 100 |
| 42) Carbon Tetrachloride | 13.20 | 117 | 118400 | 4.635 | ng | | 100 |
| 43) Cyclohexane | 13.33 | 84 | 291262 | 9.895 | ng | | 93 |
| 44) tert-Amyl Methyl Ether | 13.68 | 73 | 521463 | 10.086 | ng | | 95 |
| 45) 1,2-Dichloropropane | 13.89 | 63 | 89898 | 4.595 | ng | | 100 |
| 46) Bromodichloromethane | 14.08 | 83 | 125613 | 4.763 | ng | | 99 |
| 47) Trichloroethene | 14.13 | 130 | 95005 | 4.170 | ng | | 100 |
| 48) 1,4-Dioxane | 14.11 | 88 | 83301 | 4.368 | ng | | 94 |
| 49) 2,2,4-Trimethylpentane... | 14.20 | 57 | 387747 | 4.778 | ng | | 94 |
| 50) Methyl Methacrylate | 14.34 | 100 | 79956 | 9.207 | ng | | 88 |

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 01\20\01202232.D Vial: 15
Acq On : 21 Jan 2022 1:11 Operator: WA
Sample : 5.0ng R16012022 ICAL Std Inst : GCMS-16
Misc : S35-01102201/S35-01172210 (2/16)

Quant Time: Jan 21 06:11:54 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 06:02:16 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

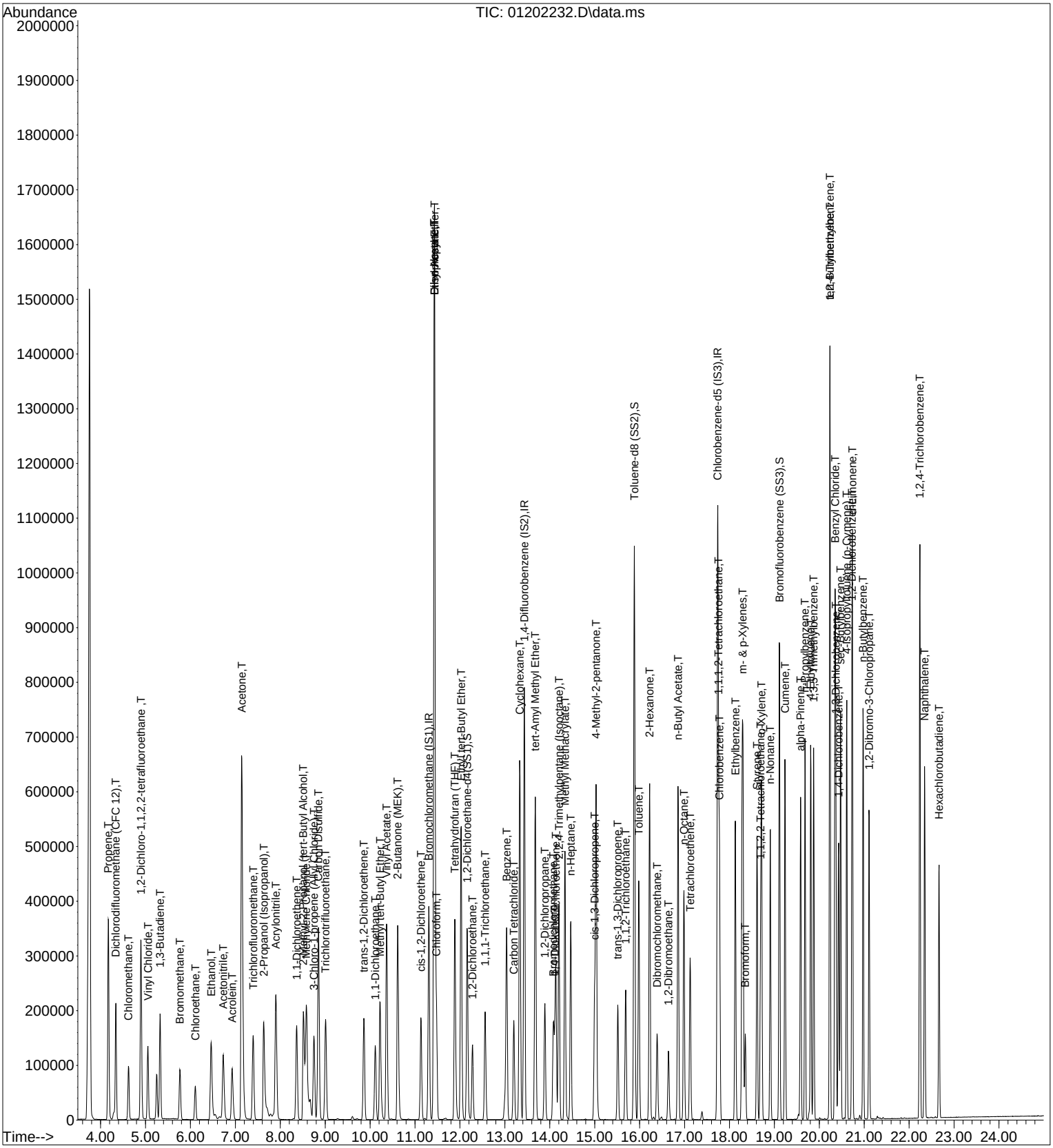
| Internal Standards | R.T. | QIon | Response | Conc Units | | Dev(Min) |
|---|---|---|---|---|---|---|
| 51) n-Heptane | 14.47 | 71 | 95911 | 4.611 ng | | 97 |
| 52) cis-1,3-Dichloropropene | 15.00 | 75 | 147235 | 4.945 ng | | 100 |
| 53) 4-Methyl-2-pentanone | 15.03 | 58 | 180136 | 9.880 ng | | 85 |
| 54) trans-1,3-Dichloropropene | 15.51 | 75 | 132963 | 4.862 ng | | 100 |
| 55) 1,1,2-Trichloroethane | 15.69 | 97 | 86716 | 4.550 ng | | 99 |
| 58) Toluene | 15.98 | 91 | 369849 | 4.450 ng | | 99 |
| 59) 2-Hexanone | 16.22 | 43 | 470967 | 10.333 ng | | 91 |
| 60) Dibromochloromethane | 16.39 | 129 | 99299 | 4.648 ng | | 100 |
| 61) 1,2-Dibromoethane | 16.64 | 107 | 100545 | 4.341 ng | | 100 |
| 62) n-Butyl Acetate | 16.85 | 43 | 509669 | 10.162 ng | | 94 |
| 63) n-Octane | 16.99 | 57 | 80952 | 4.745 ng | | 93 |
| 64) Tetrachloroethene | 17.12 | 166 | 96247 | 4.013 ng | | 100 |
| 65) Chlorobenzene | 17.78 | 112 | 252940 | 4.592 ng | | 100 |
| 66) Ethylbenzene | 18.13 | 91 | 428719 | 4.303 ng | | 97 |
| 67) m- & p-Xylenes | 18.29 | 91 | 678804 | 8.901 ng | | 96 |
| 68) Bromoform | 18.35 | 173 | 75958 | 4.496 ng | | 100 |
| 69) Styrene | 18.61 | 104 | 266261 | 4.607 ng | | 98 |
| 70) o-Xylene | 18.71 | 91 | 342985 | 4.764 ng | | 96 |
| 71) n-Nonane | 18.91 | 43 | 194356 | 5.044 ng | | 90 |
| 72) 1,1,2,2-Tetrachloroethane | 18.69 | 83 | 160934 | 4.786 ng | | 100 |
| 74) Cumene | 19.24 | 105 | 431414 | 4.670 ng | | 97 |
| 75) alpha-Pinene | 19.58 | 93 | 226243 | 5.160 ng | | 97 |
| 76) n-Propylbenzene | 19.68 | 91 | 534208 | 4.802 ng | | 96 |
| 77) 3-Ethyltoluene | 0.00 | 105 | 0 | N.D. d | | |
| 78) 4-Ethyltoluene | 19.81 | 105 | 430662 | 4.552 ng | | 97 |
| 79) 1,3,5-Trimethylbenzene | 19.87 | 105 | 352003 | 4.497 ng | | 96 |
| 80) alpha-Methylstyrene | 0.00 | 118 | 0 | N.D. d | | |
| 81) 2-Ethyltoluene | 0.00 | 105 | 0 | N.D. d | | |
| 82) 1,2,4-Trimethylbenzene | 20.24 | 105 | 381665 | 5.359 ng | | 98 |
| 83) n-Decane | 0.00 | 58 | 0 | N.D. d | | |
| 84) Benzyl Chloride | 20.35 | 91 | 603125 | 11.803 ng | | 93 |
| 85) 1,3-Dichlorobenzene | 20.37 | 146 | 206351 | 4.951 ng | | 100 |
| 86) 1,4-Dichlorobenzene | 20.43 | 146 | 196239 | 4.518 ng | | 100 |
| 87) sec-Butylbenzene | 20.47 | 105 | 479790 | 4.804 ng | | 97 |
| 88) 4-Isopropyltoluene (p-... | 20.61 | 119 | 410764 | 4.559 ng | | 97 |
| 89) 1,2,3-Trimethylbenzene | 0.00 | 105 | 0 | N.D. d | | |
| 90) 1,2-Dichlorobenzene | 20.73 | 146 | 199464 | 5.014 ng | | 100 |
| 91) d-Limonene | 20.74 | 68 | 144109 | 5.202 ng | | 93 |
| 92) 1,2-Dibromo-3-Chloropr... | 21.11 | 157 | 143109 | 9.067 ng | # | 73 |
| 93) n-Undecane | 0.00 | 57 | 0 | N.D. d | | |
| 94) 1,2,4-Trichlorobenzene | 22.24 | 180 | 304521 | 9.117 ng | | 99 |
| 95) Naphthalene | 22.34 | 128 | 494408 | 4.688 ng | | 99 |
| 96) n-Dodecane | 0.00 | 57 | 0 | N.D. d | | |
| 97) Hexachlorobutadiene | 22.67 | 225 | 82315 | 4.024 ng | | 100 |
| 98) Cyclohexanone | 0.00 | 55 | 0 | N.D. d | | |
| 99) tert-Butylbenzene | 20.24 | 119 | 372202 | 5.297 ng | | 98 |
| 100) n-Butylbenzene | 20.97 | 91 | 393619 | 4.908 ng | | 97 |
| 101) 1,1,1,2-Tetrachloroethane | 17.76 | 131 | 91381 | 4.682 ng | | 100 |

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 01\20\01202232.D Vial: 15
Acq On : 21 Jan 2022 1:11 Operator: WA
Sample : 5.0ng R16012022 ICAL Std Inst : GCMS-16
Misc : S35-01102201/S35-01172210 (2/16)

Quant Time: Jan 21 06:11:54 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 06:02:16 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 01\20\01202233.D Vial: 13
Acq On : 21 Jan 2022 1:45 Operator: WA
Sample : 25ng R16012022 ICAL Std Inst : GCMS-16
Misc : S35-01102201/S35-12292101 (1/28)

Quant Time: Jan 21 06:12:45 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 06:02:16 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

WA 1/21/22

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) Bromochloromethane (IS1) | 11.32 | 130 | 165518 | 12.500 | ng | 0.00 |
| 37) 1,4-Difluorobenzene (IS2) | 13.44 | 114 | 761136 | 12.500 | ng | 0.00 |
| 56) Chlorobenzene-d5 (IS3) | 17.74 | 54 | 139337 | 12.500 | ng | 0.00 |
| **System Monitoring Compounds** | | | | | | |
| 33) 1,2-Dichloroethane-d4(... | 12.17 | 65 | 283017 | 12.842 | ng | 0.00 |
| Spiked Amount 12.500 Range 70 - 130 Recovery = 102.72% | | | | | | |
| 57) Toluene-d8 (SS2) | 15.89 | 98 | 830173 | 12.442 | ng | 0.00 |
| Spiked Amount 12.500 Range 70 - 130 Recovery = 99.52% | | | | | | |
| 73) Bromofluorobenzene (SS3) | 19.12 | 174 | 265904 | 11.721 | ng | 0.00 |
| Spiked Amount 12.500 Range 70 - 130 Recovery = 93.76% | | | | | | |
| **Target Compounds** | | | | | | Qvalue |
| 2) Propene | 4.17 | 42 | 649115 | 21.085 | ng | 100 |
| 3) Dichlorodifluoromethan... | 4.33 | 85 | 1203479 | 29.817 | ng | 100 |
| 4) Chloromethane | 4.63 | 50 | 862651 | 33.364 | ng | 100 |
| 5) 1,2-Dichloro-1,1,2,2-t... | 4.90 | 135 | 655836 | 29.576 | ng | 100 |
| 6) Vinyl Chloride | 5.06 | 62 | 846290 | 25.607 | ng | 100 |
| 7) 1,3-Butadiene | 5.33 | 54 | 651932 | 32.166 | ng | 100 |
| 8) Bromomethane | 5.78 | 94 | 475939 | 25.617 | ng | 100 |
| 9) Chloroethane | 6.12 | 64 | 380548 | 26.109 | ng | 100 |
| 10) Ethanol | 6.50 | 45 | 1448544 | 90.429 | ng | 100 |
| 11) Acetonitrile | 6.75 | 41 | 962388 | 21.097 | ng | 100 |
| 12) Acrolein | 6.95 | 56 | 719392 | 54.966 | ng | 100 |
| 13) Acetone | 7.16 | 58 | 2142116 | 139.172 | ng | 100 |
| 14) Trichlorofluoromethane | 7.41 | 101 | 1005464 | 26.977 | ng | 100 |
| 15) 2-Propanol (Isopropanol) | 7.66 | 45 | 2980166 | 65.748 | ng | 100 |
| 16) Acrylonitrile | 7.92 | 53 | 1517266 | 53.625 | ng | 100 |
| 17) 1,1-Dichloroethene | 8.38 | 96 | 560644 | 24.996 | ng | 100 |
| 18) 2-Methyl-2-Propanol (t... | 8.53 | 59 | 2916330 | 61.396 | ng | 100 |
| 19) Methylene Chloride | 8.60 | 84 | 579420 | 26.983 | ng | 100 |
| 20) 3-Chloro-1-propene (Al... | 8.77 | 41 | 861494 | 29.755 | ng | 100 |
| 21) Trichlorotrifluoroethane | 9.02 | 151 | 493462 | 29.329 | ng | 100 |
| 22) Carbon Disulfide | 8.86 | 76 | 4251164 | 58.263 | ng | 100 |
| 23) trans-1,2-Dichloroethene | 9.88 | 61 | 822110 | 26.504 | ng | 100 |
| 24) 1,1-Dichloroethane | 10.12 | 63 | 990772 | 26.039 | ng | 100 |
| 25) Methyl tert-Butyl Ether | 10.22 | 73 | 1738726 | 31.952 | ng | 100 |
| 26) Vinyl Acetate | 10.38 | 86 | 458358 | 127.199 | ng | 100 |
| 27) 2-Butanone (MEK) | 10.62 | 72 | 857361 | 61.858 | ng | 100 |
| 28) cis-1,2-Dichloroethene | 11.14 | 61 | 783190 | 25.915 | ng | 100 |
| 29) Diisopropyl Ether | 11.43 | 87 | 964044 | 53.693 | ng | 100 |
| 30) Ethyl Acetate | 11.45 | 61 | 689355 | 87.331 | ng | 100 |
| 31) n-Hexane | 11.42 | 57 | 755959 | 24.881 | ng | 100 |
| 32) Chloroform | 11.49 | 83 | 1017687 | 27.060 | ng | 100 |
| 34) Tetrahydrofuran (THF) | 11.89 | 72 | 748592 | 55.740 | ng | 100 |
| 35) Ethyl tert-Butyl Ether | 12.03 | 87 | 1463573 | 70.363 | ng | 100 |
| 36) 1,2-Dichloroethane | 12.29 | 62 | 766853 | 26.753 | ng | 100 |
| 38) 1,1,1-Trichloroethane | 12.57 | 97 | 919870 | 28.094 | ng | 100 |
| 39) Isopropyl Acetate | 0.00 | 61 | 0 | N.D. | d | |
| 40) 1-Butanol | 0.00 | 56 | 0 | N.D. | d | |
| 41) Benzene | 13.04 | 78 | 2351495 | 26.688 | ng | 100 |
| 42) Carbon Tetrachloride | 13.20 | 117 | 782331 | 29.564 | ng | 100 |
| 43) Cyclohexane | 13.34 | 84 | 1953371 | 64.067 | ng | 100 |
| 44) tert-Amyl Methyl Ether | 13.68 | 73 | 3399477 | 63.480 | ng | 100 |
| 45) 1,2-Dichloropropane | 13.90 | 63 | 572791 | 28.266 | ng | 100 |
| 46) Bromodichloromethane | 14.08 | 83 | 826955 | 30.275 | ng | 100 |
| 47) Trichloroethene | 14.14 | 130 | 668139 | 28.313 | ng | 100 |
| 48) 1,4-Dioxane | 14.11 | 88 | 527500 | 26.706 | ng | 100 |
| 49) 2,2,4-Trimethylpentane... | 14.21 | 57 | 2451310 | 29.165 | ng | 100 |
| 50) Methyl Methacrylate | 14.34 | 100 | 564430 | 62.751 | ng | 100 |

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 01\20\01202233.D Vial: 13
Acq On : 21 Jan 2022 1:45 Operator: WA
Sample : 25ng R16012022 ICAL Std Inst : GCMS-16
Misc : S35-01102201/S35-12292101 (1/28)

Quant Time: Jan 21 06:12:45 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 06:02:16 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

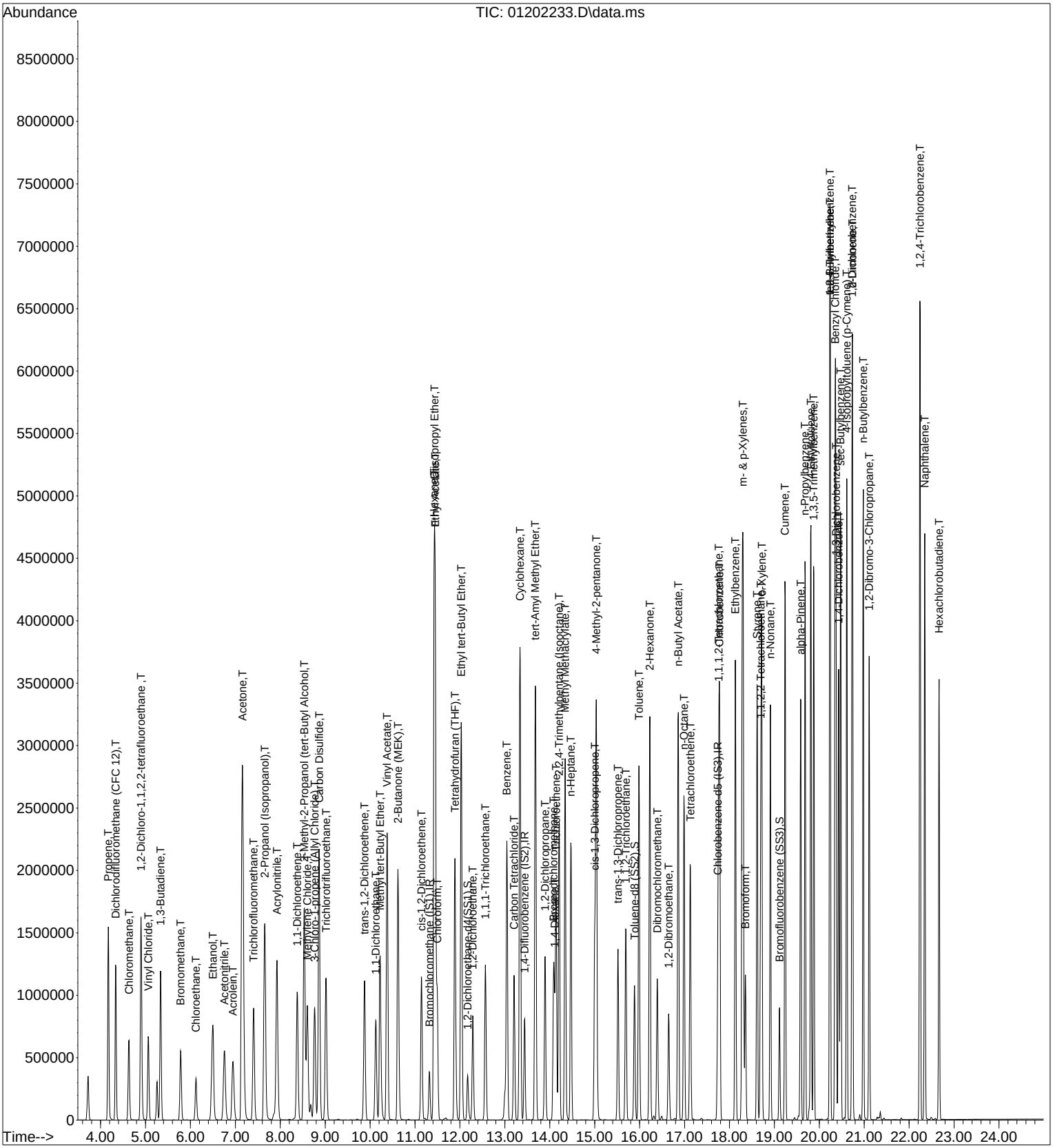
| Internal Standards | R.T. | QIon | Response | Conc Units | Dev(Min) |
|---|---|---|---|---|---|
| 51) n-Heptane | 14.47 | 71 | 640531 | 29.732 ng | 100 |
| 52) cis-1,3-Dichloropropene | 15.00 | 75 | 997798 | 32.355 ng | 100 |
| 53) 4-Methyl-2-pentanone | 15.03 | 58 | 1101045 | 58.303 ng | 100 |
| 54) trans-1,3-Dichloropropene | 15.52 | 75 | 890810 | 31.448 ng | 100 |
| 55) 1,1,2-Trichloroethane | 15.69 | 97 | 583204 | 29.540 ng | 100 |
| 58) Toluene | 15.99 | 91 | 2461558 | 28.787 ng | 100 |
| 59) 2-Hexanone | 16.23 | 43 | 2482716 | 52.940 ng | 100 |
| 60) Dibromochloromethane | 16.39 | 129 | 703923 | 32.025 ng | 100 |
| 61) 1,2-Dibromoethane | 16.65 | 107 | 674053 | 28.286 ng | 100 |
| 62) n-Butyl Acetate | 16.86 | 43 | 2746265 | 53.221 ng | 100 |
| 63) n-Octane | 16.99 | 57 | 523543 | 29.826 ng | 100 |
| 64) Tetrachloroethene | 17.13 | 166 | 693134 | 28.087 ng | 100 |
| 65) Chlorobenzene | 17.78 | 112 | 1783614 | 31.474 ng | 100 |
| 66) Ethylbenzene | 18.13 | 91 | 2897820 | 28.267 ng | 100 |
| 67) m- & p-Xylenes | 18.30 | 91 | 4532083 | 57.762 ng | 100 |
| 68) Bromoform | 18.36 | 173 | 592179 | 34.067 ng | 100 |
| 69) Styrene | 18.61 | 104 | 1887298 | 31.739 ng | 100 |
| 70) o-Xylene | 18.72 | 91 | 2311656 | 31.205 ng | 100 |
| 71) n-Nonane | 18.91 | 43 | 1138241 | 28.711 ng | 100 |
| 72) 1,1,2,2-Tetrachloroethane | 18.70 | 83 | 1088113 | 31.454 ng | 100 |
| 74) Cumene | 19.24 | 105 | 2986862 | 31.422 ng | 100 |
| 75) alpha-Pinene | 19.59 | 93 | 1411258 | 31.286 ng | 100 |
| 76) n-Propylbenzene | 19.68 | 91 | 3589845 | 31.364 ng | 100 |
| 77) 3-Ethyltoluene | 0.00 | 105 | 0 | N.D. d | |
| 78) 4-Ethyltoluene | 19.81 | 105 | 3041047 | 31.240 ng | 100 |
| 79) 1,3,5-Trimethylbenzene | 19.87 | 105 | 2449046 | 30.410 ng | 100 |
| 80) alpha-Methylstyrene | 0.00 | 118 | 0 | N.D. d | |
| 81) 2-Ethyltoluene | 0.00 | 105 | 0 | N.D. d | |
| 82) 1,2,4-Trimethylbenzene | 20.24 | 105 | 2369052 | 32.328 ng | 100 |
| 83) n-Decane | 0.00 | 58 | 0 | N.D. d | |
| 84) Benzyl Chloride | 20.35 | 91 | 4006206 | 76.200 ng | 100 |
| 85) 1,3-Dichlorobenzene | 20.37 | 146 | 1495673 | 34.881 ng | 100 |
| 86) 1,4-Dichlorobenzene | 20.43 | 146 | 1468615 | 32.862 ng | 100 |
| 87) sec-Butylbenzene | 20.47 | 105 | 3343720 | 32.541 ng | 100 |
| 88) 4-Isopropyltoluene (p-... | 20.61 | 119 | 2968848 | 32.029 ng | 100 |
| 89) 1,2,3-Trimethylbenzene | 0.00 | 105 | 0 | N.D. d | |
| 90) 1,2-Dichlorobenzene | 20.73 | 146 | 1437730 | 35.129 ng | 100 |
| 91) d-Limonene | 20.74 | 68 | 877784 | 30.796 ng | 100 |
| 92) 1,2-Dibromo-3-Chloropr... | 21.11 | 157 | 1093542 | 67.338 ng | 100 |
| 93) n-Undecane | 0.00 | 57 | 0 | N.D. d | |
| 94) 1,2,4-Trichlorobenzene | 22.24 | 180 | 2322353 | 67.577 ng | 100 |
| 95) Naphthalene | 22.35 | 128 | 3642811 | 33.574 ng | 100 |
| 96) n-Dodecane | 0.00 | 57 | 0 | N.D. d | |
| 97) Hexachlorobutadiene | 22.67 | 225 | 654150 | 31.081 ng | 100 |
| 98) Cyclohexanone | 0.00 | 55 | 0 | N.D. d | |
| 99) tert-Butylbenzene | 20.24 | 119 | 2329398 | 32.220 ng | 100 |
| 100) n-Butylbenzene | 20.98 | 91 | 2680155 | 32.484 ng | 100 |
| 101) 1,1,1,2-Tetrachloroethane | 17.76 | 131 | 644751 | 32.107 ng | 100 |

(#) = qualifier out of range (m) = manual integration (+) = signals summed

01118181

Data File : I:\MS16\DATA\2022 01\20\01202233.D Vial: 13
Acq On : 21 Jan 2022 1:45 Operator: WA
Sample : 25ng R16012022 ICAL Std Inst : GCMS-16
Misc : S35-01102201/S35-12292101 (1/28)

Quant Time: Jan 21 06:12:45 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 06:02:16 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 01\20\01202234.D Vial: 13
Acq On : 21 Jan 2022 2:19 Operator: WA
Sample : 50ng R16012022 ICAL Std Inst : GCMS-16
Misc : S35-01102201/S35-12292101 (1/28)

Quant Time: Jan 21 06:13:32 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS) 1/21/22
QLast Update : Fri Jan 21 06:02:16 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

| Internal Standards | R.T. | QIon | Response | Conc | Units | | Dev(Min) |
|---|---|---|---|---|---|---|---|
| 1) Bromochloromethane (IS1) | 11.33 | 130 | 175140 | 12.500 | ng | | 0.00 |
| 37) 1,4-Difluorobenzene (IS2) | 13.44 | 114 | 808697 | 12.500 | ng | | 0.00 |
| 56) Chlorobenzene-d5 (IS3) | 17.74 | 54 | 141175 | 12.500 | ng | | 0.00 |
| **System Monitoring Compounds** | | | | | | | |
| 33) 1,2-Dichloroethane-d4(... | 12.18 | 65 | 295357 | 12.665 | ng | | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 101.36% | | | | |
| 57) Toluene-d8 (SS2) | 15.89 | 98 | 881347 | 13.037 | ng | | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 104.32% | | | | |
| 73) Bromofluorobenzene (SS3) | 19.12 | 174 | 281775 | 12.259 | ng | | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 98.08% | | | | |
| **Target Compounds** | | | | | | | Qvalue |
| 2) Propene | 4.17 | 42 | 1257485 | 38.603 | ng | | 98 |
| 3) Dichlorodifluoromethan... | 4.34 | 85 | 2347360 | 54.962 | ng | | 99 |
| 4) Chloromethane | 4.63 | 50 | 1602868 | 58.586 | ng | | 100 |
| 5) 1,2-Dichloro-1,1,2,2-t... | 4.90 | 135 | 1206168 | 51.406 | ng | | 100 |
| 6) Vinyl Chloride | 5.07 | 62 | 1665326 | 47.621 | ng | | 100 |
| 7) 1,3-Butadiene | 5.34 | 54 | 1302567 | 60.738 | ng | | 97 |
| 8) Bromomethane | 5.79 | 94 | 982271 | 49.965 | ng | | 100 |
| 9) Chloroethane | 6.13 | 64 | 782846 | 50.759 | ng | | 100 |
| 10) Ethanol | 6.52 | 45 | 2762728 | 162.994 | ng | | 100 |
| 11) Acetonitrile | 6.77 | 41 | 1933119 | 40.048 | ng | | 100 |
| 12) Acrolein | 6.96 | 56 | 1456659 | 105.183 | ng | | 100 |
| 13) Acetone | 7.17 | 58 | 3680348 | 225.974 | ng | | 96 |
| 14) Trichlorofluoromethane | 7.41 | 101 | 2044843 | 51.850 | ng | | 100 |
| 15) 2-Propanol (Isopropanol) | 7.67 | 45 | 5627765 | 117.337 | ng | | 99 |
| 16) Acrylonitrile | 7.94 | 53 | 2985134 | 99.708 | ng | | 100 |
| 17) 1,1-Dichloroethene | 8.38 | 96 | 1162743 | 48.992 | ng | | 94 |
| 18) 2-Methyl-2-Propanol (t... | 8.55 | 59 | 5597965 | 111.376 | ng | | 98 |
| 19) Methylene Chloride | 8.61 | 84 | 1189667 | 52.358 | ng | | 94 |
| 20) 3-Chloro-1-propene (Al... | 8.77 | 41 | 1662538 | 54.267 | ng | | 96 |
| 21) Trichlorotrifluoroethane | 9.02 | 151 | 1047029 | 58.811 | ng | | 96 |
| 22) Carbon Disulfide | 8.86 | 76 | 8051663 | 104.286 | ng | | 100 |
| 23) trans-1,2-Dichloroethene | 9.88 | 61 | 1636257 | 49.854 | ng | | 96 |
| 24) 1,1-Dichloroethane | 10.13 | 63 | 1970284 | 48.936 | ng | | 99 |
| 25) Methyl tert-Butyl Ether | 10.22 | 73 | 3498560 | 60.761 | ng | | 99 |
| 26) Vinyl Acetate | 10.39 | 86 | 892937 | 234.186 | ng | # | 76 |
| 27) 2-Butanone (MEK) | 10.63 | 72 | 1667565 | 113.703 | ng | # | 86 |
| 28) cis-1,2-Dichloroethene | 11.15 | 61 | 1549810 | 48.464 | ng | | 96 |
| 29) Diisopropyl Ether | 11.43 | 87 | 1412031 | 74.324 | ng | # | 84 |
| 30) Ethyl Acetate | 11.46 | 61 | 922279 | 110.420 | ng | | 96 |
| 31) n-Hexane | 11.42 | 57 | 1101774 | 34.270 | ng | | 98 |
| 32) Chloroform | 11.50 | 83 | 1978444 | 49.716 | ng | | 100 |
| 34) Tetrahydrofuran (THF) | 11.89 | 72 | 1461524 | 102.846 | ng | | 92 |
| 35) Ethyl tert-Butyl Ether | 12.03 | 87 | 2691675 | 122.296 | ng | | 93 |
| 36) 1,2-Dichloroethane | 12.29 | 62 | 1485554 | 48.978 | ng | | 99 |
| 38) 1,1,1-Trichloroethane | 12.57 | 97 | 1841091 | 52.923 | ng | | 99 |
| 39) Isopropyl Acetate | 0.00 | 61 | 0 | N.D. | d | | |
| 40) 1-Butanol | 0.00 | 56 | 0 | N.D. | d | | |
| 41) Benzene | 13.05 | 78 | 4630541 | 49.463 | ng | | 100 |
| 42) Carbon Tetrachloride | 13.21 | 117 | 1614161 | 57.412 | ng | | 100 |
| 43) Cyclohexane | 13.34 | 84 | 3420166 | 105.578 | ng | | 95 |
| 44) tert-Amyl Methyl Ether | 13.68 | 73 | 5894454 | 103.596 | ng | | 98 |
| 45) 1,2-Dichloropropane | 13.90 | 63 | 1149366 | 53.382 | ng | | 100 |
| 46) Bromodichloromethane | 14.09 | 83 | 1649731 | 56.844 | ng | | 100 |
| 47) Trichloroethene | 14.14 | 130 | 1387863 | 55.353 | ng | | 100 |
| 48) 1,4-Dioxane | 14.11 | 88 | 1064123 | 50.706 | ng | | 96 |
| 49) 2,2,4-Trimethylpentane... | 14.21 | 57 | 4535699 | 50.791 | ng | | 98 |
| 50) Methyl Methacrylate | 14.35 | 100 | 1090993 | 114.158 | ng | | 91 |

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 01\20\01202234.D Vial: 13
Acq On : 21 Jan 2022 2:19 Operator: WA
Sample : 50ng R16012022 ICAL Std Inst : GCMS-16
Misc : S35-01102201/S35-12292101 (1/28)

Quant Time: Jan 21 06:13:32 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 06:02:16 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

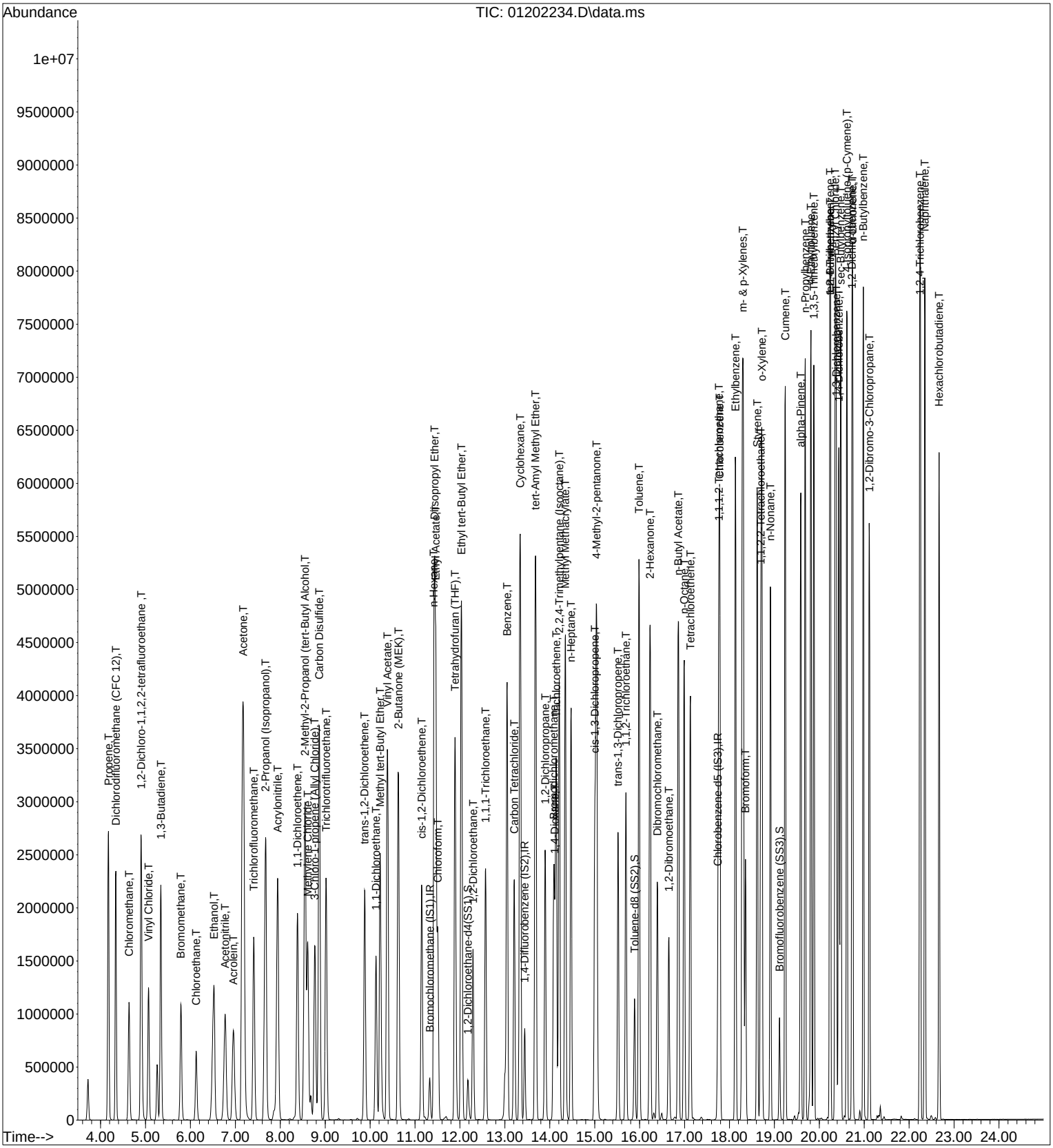
| Internal Standards | R.T. | QIon | Response | Conc Units | Dev(Min) |
|---|---|---|---|---|---|
| 51) n-Heptane | 14.47 | 71 | 1233061 | 53.871 ng | 97 |
| 52) cis-1,3-Dichloropropene | 15.00 | 75 | 1992661 | 60.814 ng | 100 |
| 53) 4-Methyl-2-pentanone | 15.04 | 58 | 1855324 | 92.467 ng | 92 |
| 54) trans-1,3-Dichloropropene | 15.52 | 75 | 1828541 | 60.756 ng | 99 |
| 55) 1,1,2-Trichloroethane | 15.69 | 97 | 1196130 | 57.023 ng | 99 |
| 58) Toluene | 15.99 | 91 | 4838156 | 55.844 ng | 99 |
| 59) 2-Hexanone | 16.23 | 43 | 3990189 | 83.978 ng | 96 |
| 60) Dibromochloromethane | 16.39 | 129 | 1486946 | 66.769 ng | 100 |
| 61) 1,2-Dibromoethane | 16.65 | 107 | 1414055 | 58.567 ng | 100 |
| 62) n-Butyl Acetate | 16.86 | 43 | 4417948 | 84.502 ng | 96 |
| 63) n-Octane | 16.99 | 57 | 959768 | 53.966 ng | 95 |
| 64) Tetrachloroethene | 17.13 | 166 | 1446931 | 57.870 ng | 99 |
| 65) Chlorobenzene | 17.78 | 112 | 3336582 | 58.112 ng | 100 |
| 66) Ethylbenzene | 18.13 | 91 | 5403991 | 52.027 ng | 98 |
| 67) m- & p-Xylenes | 18.30 | 91 | 7726456 | 97.193 ng | 99 |
| 68) Bromoform | 18.36 | 173 | 1285102 | 72.968 ng | 100 |
| 69) Styrene | 18.62 | 104 | 3612663 | 59.964 ng | 100 |
| 70) o-Xylene | 18.72 | 91 | 4091411 | 54.510 ng | 99 |
| 71) n-Nonane | 18.91 | 43 | 1810689 | 45.078 ng | 93 |
| 72) 1,1,2,2-Tetrachloroethane | 18.70 | 83 | 1985985 | 56.661 ng | 99 |
| 74) Cumene | 19.24 | 105 | 5396815 | 56.037 ng | 99 |
| 75) alpha-Pinene | 19.59 | 93 | 2683134 | 58.707 ng | 99 |
| 76) n-Propylbenzene | 19.69 | 91 | 6331589 | 54.597 ng | 98 |
| 77) 3-Ethyltoluene | 0.00 | 105 | 0 | N.D. d | |
| 78) 4-Ethyltoluene | 19.81 | 105 | 5349686 | 54.240 ng | 99 |
| 79) 1,3,5-Trimethylbenzene | 19.88 | 105 | 4420694 | 54.177 ng | 100 |
| 80) alpha-Methylstyrene | 0.00 | 118 | 0 | N.D. d | |
| 81) 2-Ethyltoluene | 0.00 | 105 | 0 | N.D. d | |
| 82) 1,2,4-Trimethylbenzene | 20.24 | 105 | 3455162 | 46.536 ng | 99 |
| 83) n-Decane | 0.00 | 58 | 0 | N.D. d | |
| 84) Benzyl Chloride | 20.35 | 91 | 6017284 | 112.962 ng | 99 |
| 85) 1,3-Dichlorobenzene | 20.38 | 146 | 2485772 | 57.216 ng | 100 |
| 86) 1,4-Dichlorobenzene | 20.43 | 146 | 2848592 | 62.910 ng | 100 |
| 87) sec-Butylbenzene | 20.48 | 105 | 5776648 | 55.487 ng | 98 |
| 88) 4-Isopropyltoluene (p-... | 20.62 | 119 | 5081474 | 54.107 ng | 99 |
| 89) 1,2,3-Trimethylbenzene | 0.00 | 105 | 0 | N.D. d | |
| 90) 1,2-Dichlorobenzene | 20.73 | 146 | 2310504 | 55.718 ng | 100 |
| 91) d-Limonene | 20.74 | 68 | 1244333 | 43.087 ng | 93 |
| 92) 1,2-Dibromo-3-Chloropr... | 21.12 | 157 | 1999934 | 121.549 ng | 94 |
| 93) n-Undecane | 0.00 | 57 | 0 | N.D. d | |
| 94) 1,2,4-Trichlorobenzene | 22.24 | 180 | 3737105 | 107.329 ng | 100 |
| 95) Naphthalene | 22.35 | 128 | 6926045 | 63.003 ng | 100 |
| 96) n-Dodecane | 0.00 | 57 | 0 | N.D. d | |
| 97) Hexachlorobutadiene | 22.67 | 225 | 1307897 | 61.334 ng | 100 |
| 98) Cyclohexanone | 0.00 | 55 | 0 | N.D. d | |
| 99) tert-Butylbenzene | 20.24 | 119 | 3419985 | 46.689 ng | 100 |
| 100) n-Butylbenzene | 20.98 | 91 | 4608267 | 55.126 ng | 99 |
| 101) 1,1,1,2-Tetrachloroethane | 17.76 | 131 | 1212569 | 59.597 ng | 100 |

(#) = qualifier out of range (m) = manual integration (+) = signals summed

01118184

Data File : I:\MS16\DATA\2022 01\20\01202234.D Vial: 13
Acq On : 21 Jan 2022 2:19 Operator: WA
Sample : 50ng R16012022 ICAL Std Inst : GCMS-16
Misc : S35-01102201/S35-12292101 (1/28)

Quant Time: Jan 21 06:13:32 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 06:02:16 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 01\20\01202235.D Vial: 13
Acq On : 21 Jan 2022 2:53 Operator: WA
Sample : 100ng R16012022 ICAL Std Inst : GCMS-16
Misc : S35-01102201/S35-12292101 (1/28)

Quant Time: Jan 21 06:14:40 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 06:02:16 2022 WA 1/21/22
Response via : Initial Calibration
DataAcq Meth:TO15.M

| Internal Standards | R.T. | QIon | Response | Conc | Units | | Dev(Min) |
|---|---|---|---|---|---|---|---|
| 1) Bromochloromethane (IS1) | 11.34 | 130 | 186684 | 12.500 | ng | | 0.02 |
| 37) 1,4-Difluorobenzene (IS2) | 13.45 | 114 | 842354 | 12.500 | ng | | 0.00 |
| 56) Chlorobenzene-d5 (IS3) | 17.74 | 54 | 138632 | 12.500 | ng | | 0.00 |
| **System Monitoring Compounds** | | | | | | | |
| 33) 1,2-Dichloroethane-d4(... | 12.19 | 65 | 304540 | 12.252 | ng | | 0.02 |
| Spiked Amount 12.500 Range 70 - 130 Recovery = 98.00% | | | | | | | |
| 57) Toluene-d8 (SS2) | 15.89 | 98 | 915732 | 13.794 | ng | | 0.00 |
| Spiked Amount 12.500 Range 70 - 130 Recovery = 110.32% | | | | | | | |
| 73) Bromofluorobenzene (SS3) | 19.12 | 174 | 296005 | 13.114 | ng | | 0.00 |
| Spiked Amount 12.500 Range 70 - 130 Recovery = 104.88% | | | | | | | |
| **Target Compounds** | | | | | | | Qvalue |
| 2) Propene | 4.19 | 42 | 2534146 | 72.984 | ng | | 98 |
| 3) Dichlorodifluoromethan... | 4.36 | 85 | 4535582 | 99.630 | ng | | 99 |
| 4) Chloromethane | 4.65 | 50 | 2904328 | 99.591 | ng | | 99 |
| 5) 1,2-Dichloro-1,1,2,2-t... | 4.91 | 135 | 2148073 | 85.887 | ng | | 100 |
| 6) Vinyl Chloride | 5.08 | 62 | 3360562 | 90.155 | ng | | 99 |
| 7) 1,3-Butadiene | 5.36 | 54 | 2551934 | 111.637 | ng | | 94 |
| 8) Bromomethane | 5.80 | 94 | 2086188 | 99.555 | ng | | 100 |
| 9) Chloroethane | 6.14 | 64 | 1622388 | 98.689 | ng | | 99 |
| 10) Ethanol | 6.57 | 45 | 4947730 | 273.853 | ng | | 100 |
| 11) Acetonitrile | 6.81 | 41 | 4036375 | 78.451 | ng | | 99 |
| 12) Acrolein | 6.98 | 56 | 2964718 | 200.839 | ng | | 100 |
| 13) Acetone | 7.20 | 58 | 5770942 | 332.425 | ng | | 97 |
| 14) Trichlorofluoromethane | 7.42 | 101 | 4115907 | 97.912 | ng | | 99 |
| 15) 2-Propanol (Isopropanol) | 7.70 | 45 | 9138869 | 178.760 | ng | | 99 |
| 16) Acrylonitrile | 7.97 | 53 | 5686207 | 178.183 | ng | | 99 |
| 17) 1,1-Dichloroethene | 8.40 | 96 | 2432093 | 96.140 | ng | | 89 |
| 18) 2-Methyl-2-Propanol (t... | 8.58 | 59 | 9875238 | 184.327 | ng | | 98 |
| 19) Methylene Chloride | 8.63 | 84 | 2395364 | 98.903 | ng | | 85 |
| 20) 3-Chloro-1-propene (Al... | 8.78 | 41 | 3250880 | 99.551 | ng | | 92 |
| 21) Trichlorotrifluoroethane | 9.03 | 151 | 2234620 | 117.756 | ng | | 91 |
| 22) Carbon Disulfide | 8.88 | 76 | 13338007 | 162.073 | ng | | 99 |
| 23) trans-1,2-Dichloroethene | 9.89 | 61 | 3208850 | 91.722 | ng | | 92 |
| 24) 1,1-Dichloroethane | 10.14 | 63 | 3956927 | 92.202 | ng | | 99 |
| 25) Methyl tert-Butyl Ether | 10.23 | 73 | 6829453 | 111.275 | ng | | 99 |
| 26) Vinyl Acetate | 10.40 | 86 | 1518491 | 373.620 | ng | # | 57 |
| 27) 2-Butanone (MEK) | 10.65 | 72 | 2906130 | 185.902 | ng | # | 74 |
| 28) cis-1,2-Dichloroethene | 11.16 | 61 | 3028897 | 88.860 | ng | | 91 |
| 29) Diisopropyl Ether | 11.45 | 87 | 1784244 | 88.108 | ng | | 98 |
| 30) Ethyl Acetate | 11.47 | 61 | 1294848 | 145.439 | ng | | 92 |
| 31) n-Hexane | 11.42 | 57 | 1646783 | 48.055 | ng | # | 96 |
| 32) Chloroform | 11.53 | 83 | 3829507 | 90.280 | ng | | 100 |
| 34) Tetrahydrofuran (THF) | 11.90 | 72 | 2497502 | 164.879 | ng | # | 82 |
| 35) Ethyl tert-Butyl Ether | 12.04 | 87 | 4176505 | 178.025 | ng | # | 87 |
| 36) 1,2-Dichloroethane | 12.30 | 62 | 2823816 | 87.343 | ng | | 99 |
| 38) 1,1,1-Trichloroethane | 12.58 | 97 | 3603985 | 99.459 | ng | | 98 |
| 39) Isopropyl Acetate | 0.00 | 61 | 0 | N.D. | d | | |
| 40) 1-Butanol | 0.00 | 56 | 0 | N.D. | d | | |
| 41) Benzene | 13.06 | 78 | 8392897 | 86.070 | ng | | 99 |
| 42) Carbon Tetrachloride | 13.21 | 117 | 3229142 | 110.264 | ng | | 100 |
| 43) Cyclohexane | 13.35 | 84 | 4921858 | 145.863 | ng | | 93 |
| 44) tert-Amyl Methyl Ether | 13.69 | 73 | 8626558 | 145.556 | ng | | 97 |
| 45) 1,2-Dichloropropane | 13.90 | 63 | 2149891 | 95.862 | ng | | 100 |
| 46) Bromodichloromethane | 14.09 | 83 | 3001677 | 99.295 | ng | | 100 |
| 47) Trichloroethene | 14.15 | 130 | 2503683 | 95.866 | ng | | 100 |
| 48) 1,4-Dioxane | 14.12 | 88 | 1734975 | 79.369 | ng | | 92 |
| 49) 2,2,4-Trimethylpentane... | 14.22 | 57 | 7157041 | 76.943 | ng | | 98 |
| 50) Methyl Methacrylate | 14.35 | 100 | 1723847 | 173.171 | ng | # | 84 |

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 01\20\01202235.D Vial: 13
Acq On : 21 Jan 2022 2:53 Operator: WA
Sample : 100ng R16012022 ICAL Std Inst : GCMS-16
Misc : S35-01102201/S35-12292101 (1/28)

Quant Time: Jan 21 06:14:40 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 06:02:16 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

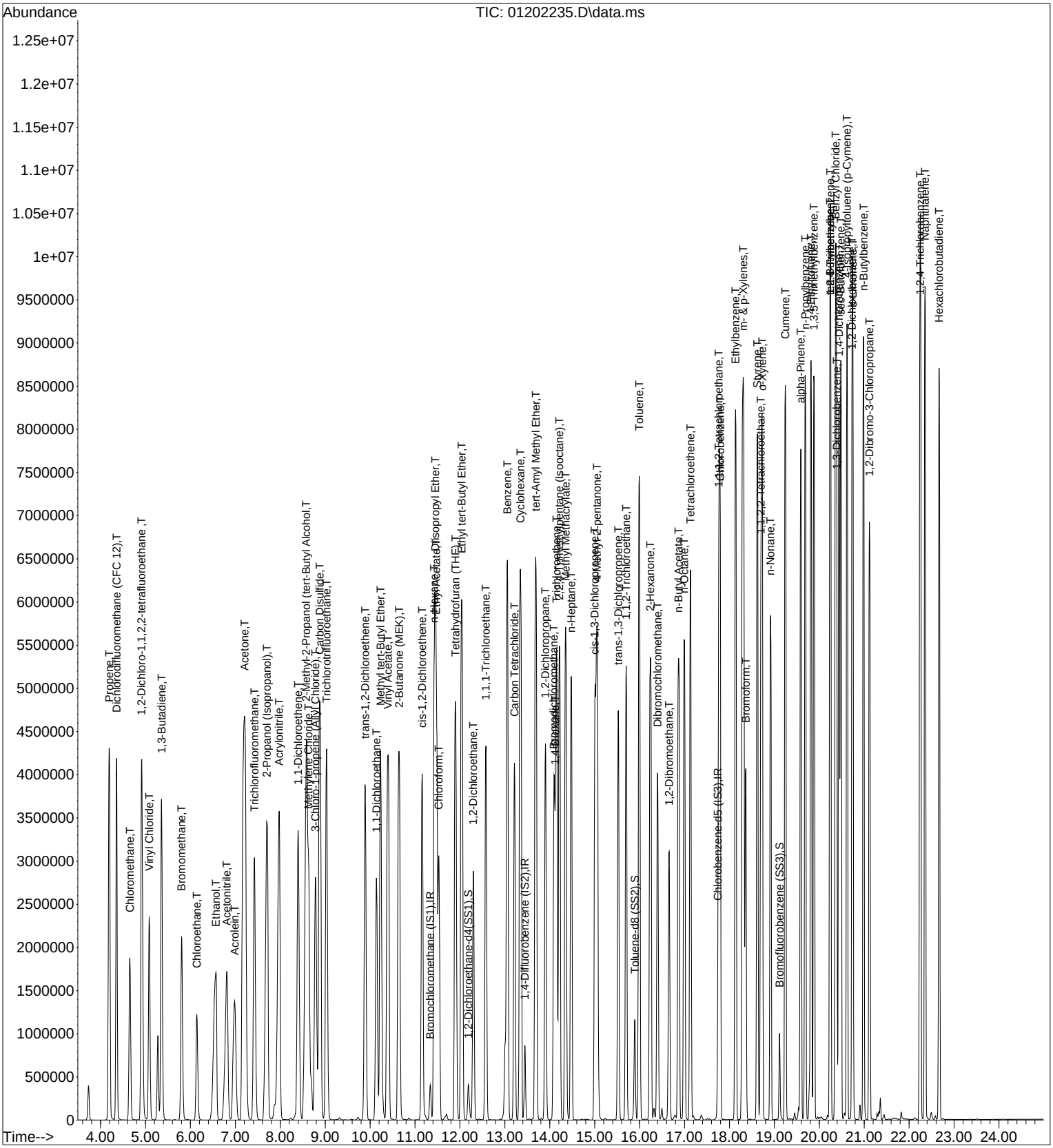
| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 51) n-Heptane | 14.48 | 71 | 2016385 | 84.573 | ng | 95 |
| 52) cis-1,3-Dichloropropene | 15.00 | 75 | 3590171 | 105.190 | ng | 99 |
| 53) 4-Methyl-2-pentanone | 15.05 | 58 | 2616128 | 125.174 | ng | 86 |
| 54) trans-1,3-Dichloropropene | 15.52 | 75 | 3508799 | 111.927 | ng | 99 |
| 55) 1,1,2-Trichloroethane | 15.70 | 97 | 2273231 | 104.042 | ng | 98 |
| 58) Toluene | 15.99 | 91 | 8075180 | 94.918 | ng | 99 |
| 59) 2-Hexanone | 16.24 | 43 | 5659812 | 121.301 | ng | 94 |
| 60) Dibromochloromethane | 16.40 | 129 | 2955664 | 135.153 | ng | 99 |
| 61) 1,2-Dibromoethane | 16.66 | 107 | 2801588 | 118.163 | ng | 100 |
| 62) n-Butyl Acetate | 16.87 | 43 | 6112236 | 119.053 | ng | 95 |
| 63) n-Octane | 16.99 | 57 | 1478657 | 84.667 | ng | 90 |
| 64) Tetrachloroethene | 17.13 | 166 | 2621263 | 106.760 | ng | 99 |
| 65) Chlorobenzene | 17.80 | 112 | 4932500 | 87.483 | ng | 99 |
| 66) Ethylbenzene | 18.14 | 91 | 8459655 | 82.939 | ng | 97 |
| 67) m- & p-Xylenes | 18.31 | 91 | 11080149 | 141.937 | ng | 96 |
| 68) Bromoform | 18.36 | 173 | 2457776 | 142.111 | ng | 100 |
| 69) Styrene | 18.62 | 104 | 5721077 | 96.702 | ng | 99 |
| 70) o-Xylene | 18.73 | 91 | 5808539 | 78.807 | ng | 100 |
| 71) n-Nonane | 18.91 | 43 | 2425384 | 61.489 | ng | 86 |
| 72) 1,1,2,2-Tetrachloroethane | 18.70 | 83 | 2858578 | 83.053 | ng | 100 |
| 74) Cumene | 19.24 | 105 | 7972363 | 84.298 | ng | 99 |
| 75) alpha-Pinene | 19.59 | 93 | 4111244 | 91.604 | ng | 99 |
| 76) n-Propylbenzene | 19.69 | 91 | 9122524 | 80.107 | ng | 96 |
| 77) 3-Ethyltoluene | 0.00 | 105 | 0 | N.D. | d | |
| 78) 4-Ethyltoluene | 19.81 | 105 | 7730850 | 79.820 | ng | 98 |
| 79) 1,3,5-Trimethylbenzene | 19.88 | 105 | 6543877 | 81.668 | ng | 99 |
| 80) alpha-Methylstyrene | 0.00 | 118 | 0 | N.D. | d | |
| 81) 2-Ethyltoluene | 0.00 | 105 | 0 | N.D. | d | |
| 82) 1,2,4-Trimethylbenzene | 20.25 | 105 | 4725331 | 64.810 | ng | 100 |
| 83) n-Decane | 0.00 | 58 | 0 | N.D. | d | |
| 84) Benzyl Chloride | 20.36 | 91 | 7811181 | 149.328 | ng | 98 |
| 85) 1,3-Dichlorobenzene | 20.39 | 146 | 3482737 | 81.634 | ng | 100 |
| 86) 1,4-Dichlorobenzene | 20.44 | 146 | 4482046 | 100.800 | ng | 99 |
| 87) sec-Butylbenzene | 20.48 | 105 | 8096661 | 79.198 | ng | 96 |
| 88) 4-Isopropyltoluene (p-... | 20.62 | 119 | 7181399 | 77.870 | ng | 98 |
| 89) 1,2,3-Trimethylbenzene | 0.00 | 105 | 0 | N.D. | d | |
| 90) 1,2-Dichlorobenzene | 20.73 | 146 | 3250514 | 79.825 | ng | 100 |
| 91) d-Limonene | 20.75 | 68 | 1575854 | 55.568 | ng | 88 |
| 92) 1,2-Dibromo-3-Chloropr... | 21.12 | 157 | 2990027 | 185.057 | ng | 93 |
| 93) n-Undecane | 0.00 | 57 | 0 | N.D. | d | |
| 94) 1,2,4-Trichlorobenzene | 22.25 | 180 | 5475964 | 160.153 | ng | 99 |
| 95) Naphthalene | 22.35 | 128 | 10388287 | 96.230 | ng | 99 |
| 96) n-Dodecane | 0.00 | 57 | 0 | N.D. | d | |
| 97) Hexachlorobutadiene | 22.67 | 225 | 2221301 | 106.079 | ng | 100 |
| 98) Cyclohexanone | 0.00 | 55 | 0 | N.D. | d | |
| 99) tert-Butylbenzene | 20.24 | 119 | 4789225 | 66.580 | ng | 100 |
| 100) n-Butylbenzene | 20.98 | 91 | 6421503 | 78.226 | ng | 97 |
| 101) 1,1,1,2-Tetrachloroethane | 17.76 | 131 | 1888810 | 94.536 | ng | 99 |

(#) = qualifier out of range (m) = manual integration (+) = signals summed

01118187

Data File : I:\MS16\DATA\2022 01\20\01202235.D Vial: 13
Acq On : 21 Jan 2022 2:53 Operator: WA
Sample : 100ng R16012022 ICAL Std Inst : GCMS-16
Misc : S35-01102201/S35-12292101 (1/28)

Quant Time: Jan 21 06:14:40 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 06:02:16 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 01\20\01202237.D Vial: 16
Acq On : 21 Jan 2022 4:01 Operator: WA
Sample : 25ng R16012022 ICV Std Inst : GCMS-16
Misc : S35-01102201/S35-12272103 (1/26)

Quant Time: Jan 21 14:55:05 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 09:34:58 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

1/21/22

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) Bromochloromethane (IS1) | 11.32 | 130 | 180934 | 12.500 | ng | -0.02 |
| 37) 1,4-Difluorobenzene (IS2) | 13.44 | 114 | 831947 | 12.500 | ng | 0.00 |
| 56) Chlorobenzene-d5 (IS3) | 17.74 | 54 | 145900 | 12.500 | ng | 0.00 |

System Monitoring Compounds

| | | | | | | |
|---|---|---|---|---|---|---|
| 33) 1,2-Dichloroethane-d4(... | 12.18 | 65 | 304651 | 12.258 | ng | -0.01 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 98.08% | | | |
| 57) Toluene-d8 (SS2) | 15.89 | 98 | 895914 | 12.707 | ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 101.68% | | | |
| 73) Bromofluorobenzene (SS3) | 19.11 | 174 | 281957 | 12.548 | ng | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 100.40% | | | |

Target Compounds

| | | | | | | | Qvalue |
|---|---|---|---|---|---|---|---|
| 2) Propene | 4.18 | 42 | 729437 | 26.465 | ng | | 99 |
| 3) Dichlorodifluoromethan... | 4.34 | 85 | 1116474 | 24.518 | ng | | 100 |
| 4) Chloromethane | 4.64 | 50 | 717879 | 21.681 | ng | | 100 |
| 5) 1,2-Dichloro-1,1,2,2-t... | 4.91 | 135 | 612874 | 25.162 | ng | | 100 |
| 6) Vinyl Chloride | 5.07 | 62 | 806286 | 23.727 | ng | | 100 |
| 7) 1,3-Butadiene | 5.34 | 54 | 588004 | 25.088 | ng | | 94 |
| 8) Bromomethane | 5.79 | 94 | 466470 | 25.199 | ng | | 100 |
| 9) Chloroethane | 6.13 | 64 | 371665 | 24.883 | ng | | 100 |
| 10) Ethanol | 6.51 | 45 | 1714794 | 100.628 | ng | | 100 |
| 11) Acetonitrile | 6.76 | 41 | 918303 | 20.172 | ng | | 100 |
| 12) Acrolein | 6.95 | 56 | 641980 | 51.047 | ng | | 100 |
| 13) Acetone | 7.17 | 58 | 1994191 | 116.971 | ng | | 100 |
| 14) Trichlorofluoromethane | 7.41 | 101 | 967652 | 24.990 | ng | | 100 |
| 15) 2-Propanol (Isopropanol) | 7.66 | 45 | 2473531 | 42.566 | ng | | 100 |
| 16) Acrylonitrile | 7.93 | 53 | 1382859 | 46.152 | ng | | 100 |
| 17) 1,1-Dichloroethene | 8.38 | 96 | 526204 | 25.859 | ng | | 99 |
| 18) 2-Methyl-2-Propanol (t... | 8.54 | 59 | 2678526 | 49.983 | ng | | 99 |
| 19) Methylene Chloride | 8.61 | 84 | 544026 | 24.477 | ng | | 98 |
| 20) 3-Chloro-1-propene (Al... | 8.77 | 41 | 723188 | 23.298 | ng | | 99 |
| 21) Trichlorotrifluoroethane | 9.02 | 151 | 467601 | 26.601 | ng | | 98 |
| 22) Carbon Disulfide | 8.86 | 76 | 3837533 | 50.751 | ng | | 100 |
| 23) trans-1,2-Dichloroethene | 9.88 | 61 | 755822 | 25.122 | ng | | 99 |
| 24) 1,1-Dichloroethane | 10.13 | 63 | 942481 | 25.529 | ng | | 100 |
| 25) Methyl tert-Butyl Ether | 10.22 | 73 | 1522507 | 24.775 | ng | | 100 |
| 26) Vinyl Acetate | 10.38 | 86 | 598756 | 138.956 | ng | # | 88 |
| 27) 2-Butanone (MEK) | 10.62 | 72 | 782345 | 49.866 | ng | | 99 |
| 28) cis-1,2-Dichloroethene | 11.15 | 61 | 719976 | 24.689 | ng | | 99 |
| 29) Diisopropyl Ether | 11.44 | 87 | 967845 | 52.945 | ng | # | 79 |
| 30) Ethyl Acetate | 11.45 | 61 | 520299 | 64.641 | ng | | 100 |
| 31) n-Hexane | 11.42 | 57 | 769934 | 25.195 | ng | | 100 |
| 32) Chloroform | 11.49 | 83 | 954116 | 26.085 | ng | | 100 |
| 34) Tetrahydrofuran (THF) | 11.89 | 72 | 723732 | 50.552 | ng | | 98 |
| 35) Ethyl tert-Butyl Ether | 12.03 | 87 | 1295624 | 55.454 | ng | | 99 |
| 36) 1,2-Dichloroethane | 12.29 | 62 | 709526 | 24.947 | ng | | 100 |
| 38) 1,1,1-Trichloroethane | 12.57 | 97 | 872266 | 25.817 | ng | | 99 |
| 39) Isopropyl Acetate | 13.00 | 61 | 14057 | No Calib | | # | |
| 40) 1-Butanol | 13.01 | 56 | 13816 | No Calib | | # | |
| 41) Benzene | 13.04 | 78 | 2202273 | 25.474 | ng | | 100 |
| 42) Carbon Tetrachloride | 13.20 | 117 | 720305 | 26.206 | ng | | 100 |
| 43) Cyclohexane | 13.34 | 84 | 1788209 | 56.250 | ng | | 100 |
| 44) tert-Amyl Methyl Ether | 13.68 | 73 | 3060636 | 54.231 | ng | | 100 |
| 45) 1,2-Dichloropropane | 13.90 | 63 | 535825 | 25.391 | ng | | 100 |
| 46) Bromodichloromethane | 14.08 | 83 | 776164 | 27.406 | ng | | 100 |
| 47) Trichloroethene | 14.14 | 130 | 628393 | 27.190 | ng | | 100 |
| 48) 1,4-Dioxane | 14.11 | 88 | 492932 | 25.688 | ng | | 100 |
| 49) 2,2,4-Trimethylpentane... | 14.21 | 57 | 2191668 | 26.145 | ng | | 100 |
| 50) Methyl Methacrylate | 14.34 | 100 | 519686 | 57.831 | ng | | 100 |

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 01\20\01202237.D Vial: 16
Acq On : 21 Jan 2022 4:01 Operator: WA
Sample : 25ng R16012022 ICV Std Inst : GCMS-16
Misc : S35-01102201/S35-12272103 (1/26)

Quant Time: Jan 21 14:55:05 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 09:34:58 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

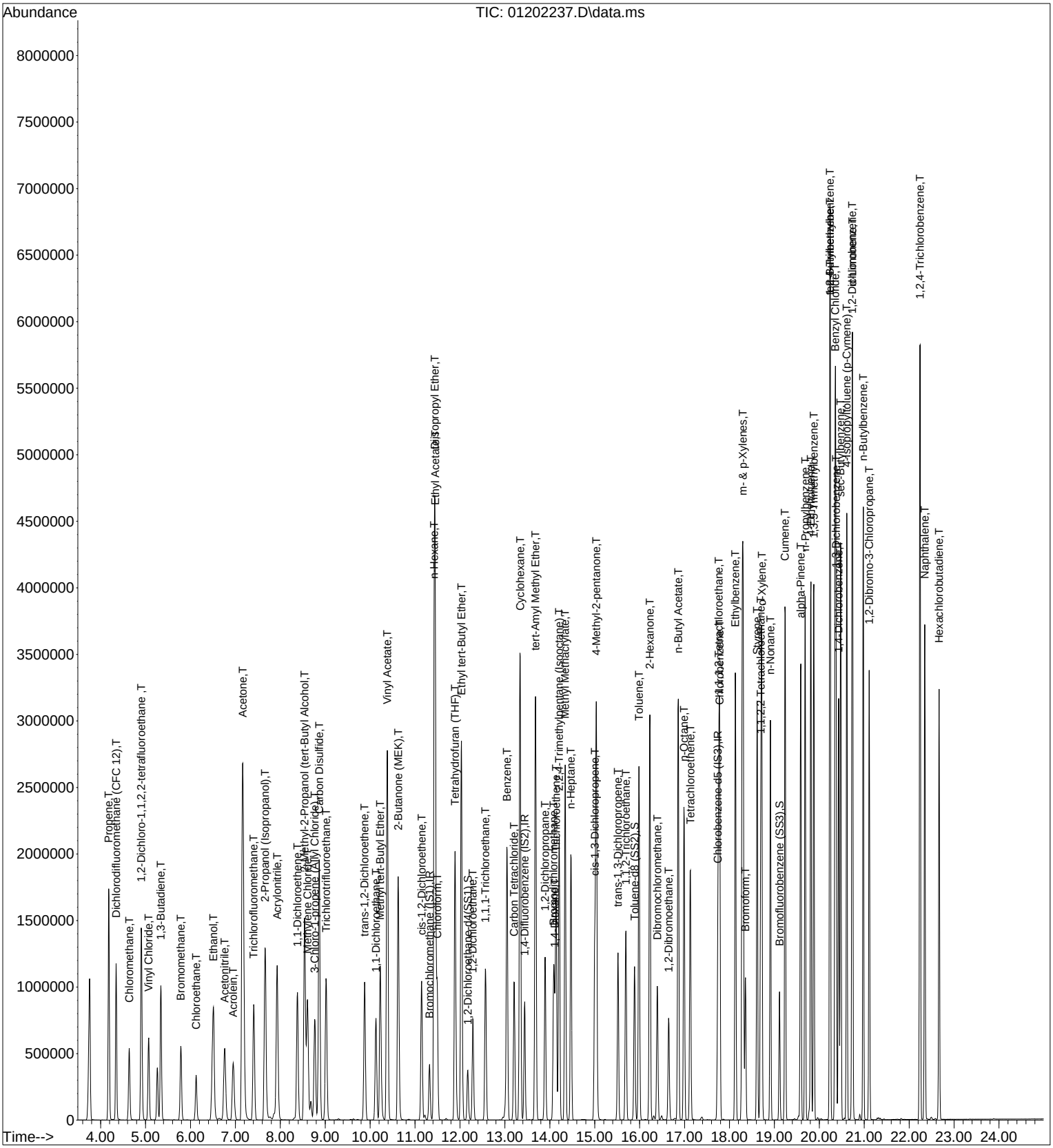
| Internal Standards | R.T. | QIon | Response | Conc Units | | Dev(Min) |
|---|---|---|---|---|---|---|
| 51) n-Heptane | 14.47 | 71 | 579447 | 26.993 ng | | 100 |
| 52) cis-1,3-Dichloropropene | 15.00 | 75 | 919759 | 27.701 ng | | 100 |
| 53) 4-Methyl-2-pentanone | 15.03 | 58 | 1025350 | 53.174 ng | | 100 |
| 54) trans-1,3-Dichloropropene | 15.52 | 75 | 823152 | 26.985 ng | | 100 |
| 55) 1,1,2-Trichloroethane | 15.69 | 97 | 542159 | 26.276 ng | | 100 |
| 58) Toluene | 15.99 | 91 | 2290888 | 26.869 ng | | 100 |
| 59) 2-Hexanone | 16.23 | 43 | 2311412 | 48.003 ng | | 100 |
| 60) Dibromochloromethane | 16.39 | 129 | 644762 | 28.527 ng | | 100 |
| 61) 1,2-Dibromoethane | 16.65 | 107 | 618717 | 26.703 ng | | 100 |
| 62) n-Butyl Acetate | 16.86 | 43 | 2608705 | 49.483 ng | | 100 |
| 63) n-Octane | 16.99 | 57 | 471385 | 27.678 ng | | 100 |
| 64) Tetrachloroethene | 17.13 | 166 | 648168 | 28.311 ng | | 100 |
| 65) Chlorobenzene | 17.78 | 112 | 1613933 | 28.609 ng | | 100 |
| 66) Ethylbenzene | 18.13 | 91 | 2675449 | 28.185 ng | | 100 |
| 67) m- & p-Xylenes | 18.30 | 91 | 4182772 | 57.933 ng | | 100 |
| 68) Bromoform | 18.36 | 173 | 543798 | 28.102 ng | | 100 |
| 69) Styrene | 18.61 | 104 | 1694543 | 28.725 ng | | 100 |
| 70) o-Xylene | 18.72 | 91 | 2125399 | 29.262 ng | | 99 |
| 71) n-Nonane | 18.91 | 43 | 1034743 | 27.208 ng | | 100 |
| 72) 1,1,2,2-Tetrachloroethane | 18.70 | 83 | 996064 | 29.604 ng | | 100 |
| 74) Cumene | 19.24 | 105 | 2701172 | 28.592 ng | | 99 |
| 75) alpha-Pinene | 19.59 | 93 | 1435746 | 32.232 ng | | 100 |
| 76) n-Propylbenzene | 19.69 | 91 | 3214002 | 28.665 ng | | 100 |
| 77) 3-Ethyltoluene | 19.81 | 105 | 2692792 | No Calib | | |
| 78) 4-Ethyltoluene | 19.81 | 105 | 2692792 | 29.416 ng | | 100 |
| 79) 1,3,5-Trimethylbenzene | 19.88 | 105 | 2255544 | 29.927 ng | | 99 |
| 80) alpha-Methylstyrene | 19.88 | 118 | 17239 | No Calib | | |
| 81) 2-Ethyltoluene | 19.88 | 105 | 2255553 | No Calib | | |
| 82) 1,2,4-Trimethylbenzene | 20.24 | 105 | 2225697 | 30.946 ng | | 100 |
| 83) n-Decane | 20.24 | 58 | 79159 | No Calib | # | |
| 84) Benzyl Chloride | 20.35 | 91 | 3737955 | 64.859 ng | | 100 |
| 85) 1,3-Dichlorobenzene | 20.37 | 146 | 1351385 | 31.126 ng | | 100 |
| 86) 1,4-Dichlorobenzene | 20.43 | 146 | 1296181 | 28.721 ng | | 100 |
| 87) sec-Butylbenzene | 20.47 | 105 | 3008151 | 29.935 ng | | 100 |
| 88) 4-Isopropyltoluene (p-... | 20.61 | 119 | 2640655 | 30.114 ng | | 100 |
| 89) 1,2,3-Trimethylbenzene | 20.61 | 105 | 98545 | No Calib | # | |
| 90) 1,2-Dichlorobenzene | 20.73 | 146 | 1292812 | 31.582 ng | | 100 |
| 91) d-Limonene | 20.74 | 68 | 836357 | 32.485 ng | | 99 |
| 92) 1,2-Dibromo-3-Chloropr... | 21.11 | 157 | 992596 | 64.033 ng | | 99 |
| 93) n-Undecane | 22.25 | 57 | 454 | No Calib | # | |
| 94) 1,2,4-Trichlorobenzene | 22.24 | 180 | 2032336 | 62.640 ng | | 100 |
| 95) Naphthalene | 22.35 | 128 | 2879308 | 26.923 ng | | 100 |
| 96) n-Dodecane | 22.34 | 57 | 1496 | No Calib | # | |
| 97) Hexachlorobutadiene | 22.67 | 225 | 593693 | 29.987 ng | | 100 |
| 98) Cyclohexanone | 18.30 | 55 | 3109 | No Calib | | |
| 99) tert-Butylbenzene | 20.24 | 119 | 2183765 | 30.832 ng | | 100 |
| 100) n-Butylbenzene | 20.98 | 91 | 2409625 | 29.820 ng | | 100 |
| 101) 1,1,1,2-Tetrachloroethane | 17.76 | 131 | 584411 | 29.553 ng | | 100 |

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 01\20\01202237.D Vial: 16
Acq On : 21 Jan 2022 4:01 Operator: WA
Sample : 25ng R16012022 ICV Std Inst : GCMS-16
Misc : S35-01102201/S35-12272103 (1/26)

Quant Time: Jan 21 14:55:05 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jan 21 09:34:58 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M



# Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

WA 1/21/22

Data File Name: **01202237.D**
Data File Path: **I:\MS16\DATA\2022_01\20**
Operator: **WA**
Date Acquired: **1/21/2022** **4:01**

Acq. Method File: **TO15.M**
Sample Name: **25ng R16012022 ICV Std**
Misc Info: **S35-01102201/S35-12272103 (**
Instrument Name: **GCMS-16**

| # | Compound Name | Ret. Time | Amt. (ng) | Spike Amt.(ng) | % Rec. | Lower Limit | Upper Limit | * OR Fail | ICV/AZ 70-130% |
|---|---|---|---|---|---|---|---|---|---|
| 2) | Propene | 4.18 | 26.5 | 25.75 | 103 | 56 | 128 | * | * |
| 3) | Dichlorodifluoromethane (CFC 1 | 4.34 | 24.5 | 26.00 | 94 | 71 | 112 | * | * |
| 4) | Chloromethane | 4.64 | 21.7 | 25.75 | 84 | 53 | 126 | * | * |
| 5) | 1,2-Dichloro-1,1,2,2-tetrafluoroet | 4.91 | 25.2 | 26.00 | 97 | 62 | 121 | * | * |
| 6) | Vinyl Chloride | 5.07 | 23.7 | 26.00 | 91 | 63 | 123 | * | * |
| 7) | 1,3-Butadiene | 5.34 | 25.1 | 25.75 | 97 | 63 | 135 | * | * |
| 8) | Bromomethane | 5.79 | 25.2 | 25.75 | 98 | 71 | 112 | * | * |
| 9) | Chloroethane | 6.13 | 24.9 | 25.75 | 97 | 66 | 117 | * | * |
| 10) | Ethanol | 6.51 | 101 | 104.00 | 97 | 57 | 117 | * | * |
| 11) | Acetonitrile | 6.76 | 20.2 | 25.25 | 80 | 59 | 131 | * | * |
| 12) | Acrolein | 6.95 | 51.0 | 52.00 | 98 | 71 | 123 | * | * |
| 13) | Acetone | 7.17 | 117 | 128.00 | 91 | 60 | 117 | * | * |
| 14) | Trichlorofluoromethane | 7.41 | 25.0 | 25.25 | 99 | 71 | 114 | * | * |
| 15) | 2-Propanol (Isopropanol) | 7.66 | 42.6 | 50.00 | 85 | 61 | 124 | * | * |
| 16) | Acrylonitrile | 7.93 | 46.2 | 50.25 | 92 | 65 | 130 | * | * |
| 17) | 1,1-Dichloroethene | 8.38 | 25.9 | 26.25 | 99 | 74 | 114 | * | * |
| 18) | 2-Methyl-2-Propanol (tert-Butyl Alc | 8.54 | 50.0 | 51.00 | 98 | 56 | 135 | * | * |
| 19) | Methylene Chloride | 8.61 | 24.5 | 26.00 | 94 | 75 | 112 | * | * |
| 20) | 3-Chloro-1-propene (Allyl Chloric | 8.77 | 23.3 | 25.50 | 91 | 57 | 127 | * | * |
| 21) | Trichlorotrifluoroethane | 9.02 | 26.6 | 27.00 | 99 | 73 | 114 | * | * |
| 22) | Carbon Disulfide | 8.86 | 50.8 | 51.75 | 98 | 70 | 113 | * | * |
| 23) | trans-1,2-Dichloroethene | 9.88 | 25.1 | 26.00 | 97 | 76 | 119 | * | * |
| 24) | 1,1-Dichloroethane | 10.13 | 25.5 | 26.75 | 95 | 70 | 114 | * | * |
| 25) | Methyl tert-Butyl Ether | 10.22 | 24.8 | 25.75 | 96 | 72 | 118 | * | * |
| 26) | Vinyl Acetate | 10.38 | 139 | 117.75 | 118 | 56 | 137 | * | * |
| 27) | 2-Butanone (MEK) | 10.62 | 49.9 | 51.00 | 98 | 74 | 121 | * | * |
| 28) | cis-1,2-Dichloroethene | 11.15 | 24.7 | 25.75 | 96 | 73 | 117 | * | * |
| 29) | Diisopropyl Ether | 11.44 | 52.9 | 52.25 | 101 | 58 | 124 | * | * |
| 30) | Ethyl Acetate | 11.45 | 64.6 | 72.50 | 89 | 59 | 161 | * | * |
| 31) | n-Hexane | 11.42 | 25.2 | 26.00 | 97 | 55 | 130 | * | * |
| 32) | Chloroform | 11.49 | 26.1 | 26.25 | 99 | 71 | 114 | * | * |
| 34) | Tetrahydrofuran (THF) | 11.89 | 50.6 | 50.50 | 100 | 73 | 114 | * | * |
| 35) | Ethyl tert-Butyl Ether | 12.03 | 55.5 | 51.75 | 107 | 76 | 119 | * | * |
| 36) | 1,2-Dichloroethane | 12.29 | 24.9 | 26.25 | 95 | 71 | 119 | * | * |
| 38) | 1,1,1-Trichloroethane | 12.57 | 25.8 | 26.00 | 99 | 73 | 119 | * | * |
| 41) | Benzene | 13.04 | 25.5 | 26.00 | 98 | 72 | 113 | * | * |
| 42) | Carbon Tetrachloride | 13.20 | 26.2 | 25.25 | 104 | 67 | 123 | * | * |
| 43) | Cyclohexane | 13.34 | 56.3 | 51.50 | 109 | 70 | 119 | * | * |
| 44) | tert-Amyl Methyl Ether | 13.68 | 54.2 | 51.50 | 105 | 74 | 120 | * | * |
| 45) | 1,2-Dichloropropane | 13.90 | 25.4 | 25.75 | 99 | 70 | 118 | * | * |
| 46) | Bromodichloromethane | 14.08 | 27.4 | 26.00 | 105 | 74 | 119 | * | * |
| 47) | Trichloroethene | 14.14 | 27.2 | 25.50 | 107 | 74 | 115 | * | * |
| 48) | 1,4-Dioxane | 14.11 | 25.7 | 25.75 | 100 | 77 | 124 | * | * |
| 49) | 2,2,4-Trimethylpentane (Isooctane) | 14.21 | 26.1 | 26.25 | 99 | 65 | 120 | * | * |

## Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: **01202237.D** **TO15.M**
Data File Path: **I:\MS16\DATA\2022_01\20** Sample Name: **25ng R16012022 ICV Std**
Operator: **WA** Misc Info: **S35-01102201/S35-12272103 (**
Date Acquired: **1/21/2022 4:01** Instrument Name: **GCMS-16**

| # | Compound Name | Ret. Time | Amt. (ng) | Spike Amt.(ng) | % Rec. | Lower Limit | Upper Limit | * OR Fail | ICV/AZ 70-130% |
|---|---|---|---|---|---|---|---|---|---|
| **50)** | **Methyl Methacrylate** | **14.34** | **57.8** | **51.25** | 113 | **78** | **126** | * | * |
| **51)** | **n-Heptane** | **14.47** | **27.0** | **25.75** | 105 | **70** | **119** | * | * |
| **52)** | **cis-1,3-Dichloropropene** | **15.00** | **27.7** | **26.00** | 107 | **81** | **126** | * | * |
| **53)** | **4-Methyl-2-pentanone** | **15.03** | **53.2** | **51.50** | 103 | **73** | **129** | * | * |
| **54)** | **trans-1,3-Dichloropropene** | **15.52** | **27.0** | **25.00** | 108 | **80** | **127** | * | * |
| **55)** | **1,1,2-Trichloroethane** | **15.69** | **26.3** | **26.00** | 101 | **78** | **117** | * | * |
| **58)** | **Toluene** | **15.99** | **26.9** | **25.75** | 104 | **70** | **118** | * | * |
| **59)** | **2-Hexanone** | **16.23** | **48.0** | **50.75** | 95 | **74** | **132** | * | * |
| **60)** | **Dibromochloromethane** | **16.39** | **28.5** | **26.25** | 109 | **69** | **137** | * | * |
| **61)** | **1,2-Dibromoethane** | **16.65** | **26.7** | **26.00** | 103 | **76** | **128** | * | * |
| **62)** | **n-Butyl Acetate** | **16.86** | **49.5** | **50.75** | 98 | **75** | **134** | * | * |
| **63)** | **n-Octane** | **16.99** | **27.7** | **26.00** | 107 | **68** | **120** | * | * |
| **64)** | **Tetrachloroethene** | **17.13** | **28.3** | **26.50** | 107 | **63** | **130** | * | * |
| **65)** | **Chlorobenzene** | **17.78** | **28.6** | **25.75** | 111 | **70** | **118** | * | * |
| **66)** | **Ethylbenzene** | **18.13** | **28.2** | **25.75** | 110 | **71** | **123** | * | * |
| **67)** | **m- & p-Xylenes** | **18.30** | **57.9** | **52.00** | 111 | **67** | **127** | * | * |
| **68)** | **Bromoform** | **18.36** | **28.1** | **26.25** | 107 | **65** | **149** | * | * |
| **69)** | **Styrene** | **18.61** | **28.7** | **25.25** | 114 | **76** | **132** | * | * |
| **70)** | **o-Xylene** | **18.72** | **29.3** | **26.00** | 113 | **69** | **124** | * | * |
| **71)** | **n-Nonane** | **18.91** | **27.2** | **26.00** | 105 | **64** | **127** | * | * |
| **72)** | **1,1,2,2-Tetrachloroethane** | **18.70** | **29.6** | **26.00** | 114 | **69** | **128** | * | * |
| **74)** | **Cumene** | **19.24** | **28.6** | **25.75** | 111 | **69** | **125** | * | * |
| **75)** | **alpha-Pinene** | **19.59** | **32.2** | **26.25** | 123 | **68** | **129** | * | * |
| **76)** | **n-Propylbenzene** | **19.69** | **28.7** | **26.00** | 110 | **70** | **127** | * | * |
| **78)** | **4-Ethyltoluene** | **19.81** | **29.4** | **26.00** | **113** | **69** | **127** | * | * |
| **79)** | **1,3,5-Trimethylbenzene** | **19.88** | **29.9** | **26.00** | **115** | **66** | **129** | * | * |
| **82)** | **1,2,4-Trimethylbenzene** | **20.24** | **30.9** | **25.75** | **120** | **63** | **142** | * | * |
| **84)** | **Benzyl Chloride** | **20.35** | **64.9** | **52.00** | **125** | **73** | **145** | * | * |
| **85)** | **1,3-Dichlorobenzene** | **20.37** | **31.1** | **26.00** | **120** | **67** | **136** | * | * |
| **86)** | **1,4-Dichlorobenzene** | **20.43** | **28.7** | **26.25** | **109** | **63** | **134** | * | * |
| 87) | sec-Butylbenzene | 20.47 | 29.9 | 25.50 | **117** | 68 | 130 | * | * |
| 88) | 4-Isopropyltoluene (p-Cymene) | 20.61 | 30.1 | 25.75 | **117** | 60 | 139 | * | * |
| **90)** | **1,2-Dichlorobenzene** | **20.73** | **31.6** | **26.25** | **120** | **64** | **139** | * | * |
| **91)** | **d-Limonene** | **20.74** | **32.5** | **25.75** | **126** | **63** | **137** | * | * |
| **92)** | **1,2-Dibromo-3-Chloropropane** | **21.11** | **64.0** | **50.50** | **127** | **72** | **145** | * | * |
| **94)** | **1,2,4-Trichlorobenzene** | **22.24** | **62.6** | **52.50** | **119** | **62** | **154** | * | * |
| **95)** | **Naphthalene** | **22.35** | **26.9** | **26.25** | **102** | **62** | **156** | * | * |
| **97)** | **Hexachlorobutadiene** | **22.67** | **30.0** | **26.50** | **113** | 55 | 142 | * | * |
| 99) | tert-Butylbenzene | 20.24 | 30.8 | 25.75 | 120 | 61 | 140 | * | * |
| 100) | n-Butylbenzene | 20.98 | 29.8 | 26.00 | 115 | 70 | 131 | * | * |
| 101) | 1,1,1,2-Tetrachloroethane | 17.76 | 29.6 | 25.75 | 115 | 70 | 130 | * | * |

**Bold = 75 Compound List**
*** = Pass**

# Evaluate Continuing Calibration Report

01118193

Data File : I:\MS16\DATA\2022 03\28\03282201.D  Vial: 2
Acq On : 28 Mar 2022 3:34  Operator: WA
Sample : CCV R16032822 25ng  Inst : GCMS-16
Misc : S35-01102201/S35-03212204 (4/20)

Quant Time: Mar 28 05:48:13 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

WA 3/28/22

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
Max. RRF Dev : 30% Max. Rel. Area : 200%

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) |
|---|---|---|---|---|---|---|---|
| 1 | IR | Bromochloromethane (IS1) | 1.000 | 1.000 | 0.0 | 98 | 0.00 |
| 2 | T | Propene | 1.904 | 1.643 | 13.7 | 86 | 0.00 |
| 3 | T | Dichlorodifluoromethane (CF | 3.146 | 2.195 | 30.2# | 62 | 0.00 |
| 4 | T | Chloromethane | 2.288 | 1.771 | 22.6 | 68 | 0.00 |
| 5 | T | 1,2-Dichloro-1,1,2,2-tetraf | 1.683 | 1.432 | 14.9 | 77 | 0.00 |
| 6 | T | Vinyl Chloride | 2.348 | 1.858 | 20.9 | 74 | 0.00 |
| 7 | T | 1,3-Butadiene | 1.619 | 1.424 | 12.0 | 74 | 0.00 |
| 8 | T | Bromomethane | 1.279 | 1.050 | 17.9 | 73 | 0.00 |
| 9 | T | Chloroethane | 1.032 | 0.902 | 12.6 | 79 | 0.00 |
| 10 | T | Ethanol | 1.177 | 1.068 | 9.3 | 87 | 0.00 |
| 11 | T | Acetonitrile | 3.145 | 2.768 | 12.0 | 87 | 0.00 |
| 12 | T | Acrolein | 0.869 | 0.901 | -3.7 | 82 | 0.00 |
| 13 | T | Acetone | 1.178 | 1.083 | 8.1 | 86 | 0.00 |
| 14 | T | Trichlorofluoromethane | 2.675 | 2.277 | 14.9 | 76 | 0.00 |
| 15 | T | 2-Propanol (Isopropanol) | 4.015 | 2.953 | 26.5 | 65 | 0.00 |
| 16 | T | Acrylonitrile | 2.070 | 1.978 | 4.4 | 86 | 0.00 |
| 17 | T | 1,1-Dichloroethene | 1.406 | 1.253 | 10.9 | 78 | 0.00 |
| 18 | T | 2-Methyl-2-Propanol (tert-B | 3.702 | 3.475 | 6.1 | 82 | 0.00 |
| 19 | T | Methylene Chloride | 1.535 | 1.415 | 7.8 | 83 | 0.00 |
| 20 | T | 3-Chloro-1-propene (Allyl C | 2.145 | 1.977 | 7.8 | 79 | 0.00 |
| 21 | T | Trichlorotrifluoroethane | 1.214 | 1.142 | 5.9 | 81 | 0.00 |
| 22 | T | Carbon Disulfide | 5.224 | 5.121 | 2.0 | 82 | 0.00 |
| 23 | T | trans-1,2-Dichloroethene | 2.078 | 1.935 | 6.9 | 81 | 0.00 |
| 24 | T | 1,1-Dichloroethane | 2.550 | 2.341 | 8.2 | 81 | 0.00 |
| 25 | T | Methyl tert-Butyl Ether | 4.246 | 4.082 | 3.9 | 80 | 0.00 |
| 26 | T | Vinyl Acetate | 0.298 | 0.309 | -3.7 | 75 | 0.00 |
| 27 | T | 2-Butanone (MEK) | 1.084 | 1.032 | 4.8 | 81 | 0.00 |
| 28 | T | cis-1,2-Dichloroethene | 2.015 | 1.884 | 6.5 | 82 | 0.00 |
| 29 | T | Diisopropyl Ether | 1.263 | 1.307 | -3.5 | 94 | 0.00 |
| 30 | T | Ethyl Acetate | 0.556 | 0.558 | -0.4 | 108 | 0.00 |
| 31 | T | n-Hexane | 2.111 | 2.229 | -5.6 | 101 | 0.00 |
| 32 | T | Chloroform | 2.527 | 2.397 | 5.1 | 82 | 0.00 |
| 33 | S | 1,2-Dichloroethane-d4(SS1) | 1.717 | 1.716 | 0.1 | 99 | 0.00 |
| 34 | T | Tetrahydrofuran (THF) | 0.989 | 0.970 | 1.9 | 83 | 0.00 |
| 35 | T | Ethyl tert-Butyl Ether | 1.614 | 1.798 | -11.4 | 84 | 0.00 |
| 36 | T | 1,2-Dichloroethane | 1.965 | 1.765 | 10.2 | 80 | 0.00 |
| 37 | IR | 1,4-Difluorobenzene (IS2) | 1.000 | 1.000 | 0.0 | 100 | 0.00 |
| 38 | T | 1,1,1-Trichloroethane | 0.508 | 0.455 | 10.4 | 78 | 0.00 |
| 39 | T | Isopropyl Acetate | 0.000 | 0.000 | 0.0 | 0# | 0.00 |
| 40 | T | 1-Butanol | 0.000 | 0.000 | 0.0 | 0# | 0.00 |
| 41 | T | Benzene | 1.299 | 1.217 | 6.3 | 82 | 0.00 |
| 42 | T | Carbon Tetrachloride | 0.413 | 0.386 | 6.5 | 79 | 0.00 |
| 43 | T | Cyclohexane | 0.478 | 0.507 | -6.1 | 82 | 0.00 |
| 44 | T | tert-Amyl Methyl Ether | 0.848 | 0.896 | -5.7 | 84 | 0.00 |
| 45 | T | 1,2-Dichloropropane | 0.317 | 0.311 | 1.9 | 85 | 0.00 |
| 46 | T | Bromodichloromethane | 0.426 | 0.421 | 1.2 | 82 | 0.00 |
| 47 | T | Trichloroethene | 0.347 | 0.335 | 3.5 | 79 | 0.00 |
| 48 | T | 1,4-Dioxane | 0.288 | 0.272 | 5.6 | 82 | 0.00 |
| 49 | T | 2,2,4-Trimethylpentane (Iso | 1.260 | 1.321 | -4.8 | 87 | 0.00 |
| 50 | T | Methyl Methacrylate | 0.135 | 0.142 | -5.2 | 80 | 0.00 |
| 51 | T | n-Heptane | 0.323 | 0.331 | -2.5 | 83 | 0.00 |
| 52 | T | cis-1,3-Dichloropropene | 0.499 | 0.506 | -1.4 | 81 | 0.00 |
| 53 | T | 4-Methyl-2-pentanone | 0.290 | 0.317 | -9.3 | 91 | 0.00 |
| 54 | T | trans-1,3-Dichloropropene | 0.458 | 0.463 | -1.1 | 80 | 0.00 |
| 55 | T | 1,1,2-Trichloroethane | 0.310 | 0.302 | 2.6 | 82 | 0.00 |

# Evaluate Continuing Calibration Report

Data File : I:\MS16\DATA\2022 03\28\03282201.D Vial: 2
Acq On : 28 Mar 2022 3:34 Operator: WA
Sample : CCV R16032822 25ng Inst : GCMS-16
Misc : S35-01102201/S35-03212204 (4/20)

Quant Time: Mar 28 05:48:13 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
Max. RRF Dev : 30% Max. Rel. Area : 200%

| | | Compound | AvgRF | CCRF | %Dev | Area% | Dev(min) |
|---|---|---|---|---|---|---|---|
| 56 | IR | Chlorobenzene-d5 (IS3) | 1.000 | 1.000 | 0.0 | 111 | 0.00 |
| 57 | S | Toluene-d8 (SS2) | 6.041 | 5.373 | 11.1 | 100 | 0.00 |
| 58 | T | Toluene | 7.305 | 6.347 | 13.1 | 82 | 0.00 |
| 59 | T | 2-Hexanone | 4.125 | 3.674 | 10.9 | 94 | 0.00 |
| 60 | T | Dibromochloromethane | 1.936 | 1.791 | 7.5 | 83 | 0.00 |
| 61 | T | 1,2-Dibromoethane | 1.985 | 1.718 | 13.5 | 82 | 0.00 |
| 62 | T | n-Butyl Acetate | 4.517 | 4.083 | 9.6 | 94 | 0.00 |
| 63 | T | n-Octane | 1.459 | 1.424 | 2.4 | 88 | 0.00 |
| 64 | T | Tetrachloroethene | 1.961 | 1.823 | 7.0 | 85 | 0.00 |
| 65 | T | Chlorobenzene | 4.833 | 4.510 | 6.7 | 81 | 0.00 |
| 66 | T | Ethylbenzene | 8.133 | 7.525 | 7.5 | 83 | 0.00 |
| 67 | T | m- & p-Xylenes | 6.186 | 5.961 | 3.6 | 84 | 0.00 |
| 68 | T | Bromoform | 1.658 | 1.582 | 4.6 | 86 | 0.00 |
| 69 | T | Styrene | 5.054 | 4.808 | 4.9 | 81 | 0.00 |
| 70 | T | o-Xylene | 6.223 | 5.997 | 3.6 | 83 | 0.00 |
| 71 | T | n-Nonane | 3.258 | 3.262 | -0.1 | 92 | 0.00 |
| 72 | T | 1,1,2,2-Tetrachloroethane | 2.883 | 2.932 | -1.7 | 87 | 0.00 |
| 73 | S | Bromofluorobenzene (SS3) | 1.925 | 2.014 | -4.6 | 117 | 0.00 |
| 74 | T | Cumene | 8.094 | 7.750 | 4.3 | 83 | 0.00 |
| 75 | T | alpha-Pinene | 3.816 | 3.934 | -3.1 | 93 | 0.00 |
| 76 | T | n-Propylbenzene | 9.606 | 9.461 | 1.5 | 86 | 0.00 |
| 77 | T | 3-Ethyltoluene | 0.000 | 0.000 | 0.0 | 0# | 0.00 |
| 78 | T | 4-Ethyltoluene | 7.843 | 7.719 | 1.6 | 83 | 0.00 |
| 79 | T | 1,3,5-Trimethylbenzene | 6.457 | 6.399 | 0.9 | 84 | 0.00 |
| 80 | T | alpha-Methylstyrene | 0.000 | 0.000 | 0.0 | 0# | 0.00 |
| 81 | T | 2-Ethyltoluene | 0.000 | 0.000 | 0.0 | 0# | 0.00 |
| 82 | T | 1,2,4-Trimethylbenzene | 6.162 | 6.735 | -9.3 | 90 | 0.00 |
| 83 | T | n-Decane | 0.000 | 0.000 | 0.0 | 0# | 0.00 |
| 84 | T | Benzyl Chloride | 4.938 | 5.638 | -14.2 | 90 | 0.00 |
| 85 | T | 1,3-Dichlorobenzene | 3.720 | 4.156 | -11.7 | 89 | 0.00 |
| 86 | T | 1,4-Dichlorobenzene | 3.867 | 3.888 | -0.5 | 85 | 0.00 |
| 87 | T | sec-Butylbenzene | 8.610 | 8.930 | -3.7 | 86 | 0.00 |
| 88 | T | 4-Isopropyltoluene (p-Cymen | 7.513 | 7.833 | -4.3 | 85 | 0.00 |
| 89 | T | 1,2,3-Trimethylbenzene | 0.000 | 0.000 | 0.0 | 0# | 0.05 |
| 90 | T | 1,2-Dichlorobenzene | 3.507 | 4.026 | -14.8 | 91 | 0.00 |
| 91 | T | d-Limonene | 2.206 | 2.563 | -16.2 | 95 | 0.00 |
| 92 | T | 1,2-Dibromo-3-Chloropropane | 1.328 | 1.588 | -19.6 | 90 | 0.00 |
| 93 | T | n-Undecane | 0.000 | 0.000 | 0.0 | 0# | 0.08 |
| 94 | T | 1,2,4-Trichlorobenzene | 2.780 | 3.168 | -14.0 | 86 | 0.00 |
| 95 | T | Naphthalene | 9.162 | 8.510 | 7.1 | 75 | 0.00 |
| 96 | T | n-Dodecane | 0.000 | 0.000 | 0.0 | 0# | 0.00 |
| 97 | T | Hexachlorobutadiene | 1.696 | 1.820 | -7.3 | 89 | 0.00 |
| 98 | T | Cyclohexanone | 0.000 | 0.000 | 0.0 | 0# | 0.00 |
| 99 | T | tert-Butylbenzene | 6.068 | 6.605 | -8.8 | 91 | 0.00 |
| 100 | T | n-Butylbenzene | 6.923 | 7.250 | -4.7 | 87 | 0.00 |
| 101 | T | 1,1,1,2-Tetrachloroethane | 1.694 | 1.694 | 0.0 | 84 | 0.00 |

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282201.D Vial: 2
Acq On : 28 Mar 2022 3:34 Operator: WA
Sample : CCV R16032822 25ng Inst : GCMS-16
Misc : S35-01102201/S35-03212204 (4/20)

Quant Time: Mar 28 05:48:13 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

WA 3/28/22

| Internal Standards | R.T. | QIon | Response | Conc | Units | | Dev(Min) |
|---|---|---|---|---|---|---|---|
| 1) Bromochloromethane (IS1) | 11.32 | 130 | 162964 | 12.500 | ng | | 0.00 |
| 37) 1,4-Difluorobenzene (IS2) | 13.43 | 114 | 762910 | 12.500 | ng | | 0.00 |
| 56) Chlorobenzene-d5 (IS3) | 17.73 | 54 | 154533 | 12.500 | ng | | 0.00 |
| **System Monitoring Compounds** | | | | | | | |
| 33) 1,2-Dichloroethane-d4(... | 12.16 | 65 | 279679 | 12.494 | ng | | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 99.92% | | | | |
| 57) Toluene-d8 (SS2) | 15.88 | 98 | 830284 | 11.118 | ng | | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 88.96% | | | | |
| 73) Bromofluorobenzene (SS3) | 19.11 | 174 | 311299 | 13.079 | ng | | 0.00 |
| Spiked Amount 12.500 | Range 70 - 130 | | Recovery = 104.64% | | | | |
| **Target Compounds** | | | | | | | Qvalue |
| 2) Propene | 4.17 | 42 | 556848 | 22.431 | ng | | 97 |
| 3) Dichlorodifluoromethan... | 4.33 | 85 | 751112 | 18.313 | ng | | 100 |
| 4) Chloromethane | 4.63 | 50 | 588732 | 19.741 | ng | | 100 |
| 5) 1,2-Dichloro-1,1,2,2-t... | 4.89 | 135 | 503962 | 22.972 | ng | | 100 |
| 6) Vinyl Chloride | 5.06 | 62 | 629833 | 20.578 | ng | | 100 |
| 7) 1,3-Butadiene | 5.33 | 54 | 482764 | 22.869 | ng | | 95 |
| 8) Bromomethane | 5.77 | 94 | 348970 | 20.931 | ng | | 100 |
| 9) Chloroethane | 6.12 | 64 | 299712 | 22.279 | ng | | 100 |
| 10) Ethanol | 6.49 | 45 | 1260099 | 82.099 | ng | | 100 |
| 11) Acetonitrile | 6.75 | 41 | 838886 | 20.460 | ng | | 99 |
| 12) Acrolein | 6.93 | 56 | 587637 | 51.878 | ng | | 100 |
| 13) Acetone | 7.15 | 58 | 1832426 | 119.334 | ng | | 98 |
| 14) Trichlorofluoromethane | 7.40 | 101 | 764376 | 21.917 | ng | | 100 |
| 15) 2-Propanol (Isopropanol) | 7.64 | 45 | 1944384 | 37.150 | ng | | 100 |
| 16) Acrylonitrile | 7.91 | 53 | 1308422 | 48.483 | ng | | 99 |
| 17) 1,1-Dichloroethene | 8.37 | 96 | 437011 | 23.844 | ng | | 98 |
| 18) 2-Methyl-2-Propanol (t... | 8.52 | 59 | 2378450 | 49.277 | ng | | 98 |
| 19) Methylene Chloride | 8.60 | 84 | 479616 | 23.959 | ng | | 94 |
| 20) 3-Chloro-1-propene (Al... | 8.76 | 41 | 676513 | 24.197 | ng | | 98 |
| 21) Trichlorotrifluoroethane | 9.01 | 151 | 401975 | 25.389 | ng | | 97 |
| 22) Carbon Disulfide | 8.85 | 76 | 3505301 | 51.469 | ng | | 100 |
| 23) trans-1,2-Dichloroethene | 9.87 | 61 | 668488 | 24.670 | ng | | 98 |
| 24) 1,1-Dichloroethane | 10.12 | 63 | 801238 | 24.097 | ng | | 100 |
| 25) Methyl tert-Butyl Ether | 10.21 | 73 | 1396847 | 25.236 | ng | | 98 |
| 26) Vinyl Acetate | 10.37 | 86 | 342731 | 88.310 | ng | # | 74 |
| 27) 2-Butanone (MEK) | 10.61 | 72 | 692793 | 49.028 | ng | # | 87 |
| 28) cis-1,2-Dichloroethene | 11.14 | 61 | 638557 | 24.311 | ng | | 99 |
| 29) Diisopropyl Ether | 11.43 | 87 | 903311 | 54.864 | ng | # | 66 |
| 30) Ethyl Acetate | 11.44 | 61 | 741367 | 102.263 | ng | | 92 |
| 31) n-Hexane | 11.42 | 57 | 762966 | 27.720 | ng | | 99 |
| 32) Chloroform | 11.48 | 83 | 835786 | 25.370 | ng | | 100 |
| 34) Tetrahydrofuran (THF) | 11.88 | 72 | 623007 | 48.315 | ng | | 93 |
| 35) Ethyl tert-Butyl Ether | 12.02 | 87 | 1230716 | 58.484 | ng | | 91 |
| 36) 1,2-Dichloroethane | 12.28 | 62 | 609894 | 23.808 | ng | | 100 |
| 38) 1,1,1-Trichloroethane | 12.56 | 97 | 721508 | 23.287 | ng | | 99 |
| 39) Isopropyl Acetate | 12.99 | 61 | 37263 | No Calib | | # | |
| 40) 1-Butanol | 13.00 | 56 | 21377 | No Calib | | | |
| 41) Benzene | 13.04 | 78 | 1931989 | 24.370 | ng | | 99 |
| 42) Carbon Tetrachloride | 13.20 | 117 | 618747 | 24.548 | ng | | 100 |
| 43) Cyclohexane | 13.33 | 84 | 1602757 | 54.979 | ng | | 94 |
| 44) tert-Amyl Methyl Ether | 13.67 | 73 | 2855934 | 55.183 | ng | | 97 |
| 45) 1,2-Dichloropropane | 13.89 | 63 | 488569 | 25.247 | ng | | 100 |
| 46) Bromodichloromethane | 14.08 | 83 | 674919 | 25.988 | ng | | 100 |
| 47) Trichloroethene | 14.13 | 130 | 527139 | 24.873 | ng | | 94 |
| 48) 1,4-Dioxane | 14.10 | 88 | 431856 | 24.542 | ng | | 96 |
| 49) 2,2,4-Trimethylpentane... | 14.20 | 57 | 2136791 | 27.797 | ng | | 99 |
| 50) Methyl Methacrylate | 14.34 | 100 | 449584 | 54.557 | ng | | 93 |

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2022 03\28\03282201.D Vial: 2
Acq On : 28 Mar 2022 3:34 Operator: WA
Sample : CCV R16032822 25ng Inst : GCMS-16
Misc : S35-01102201/S35-03212204 (4/20)

Quant Time: Mar 28 05:48:13 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

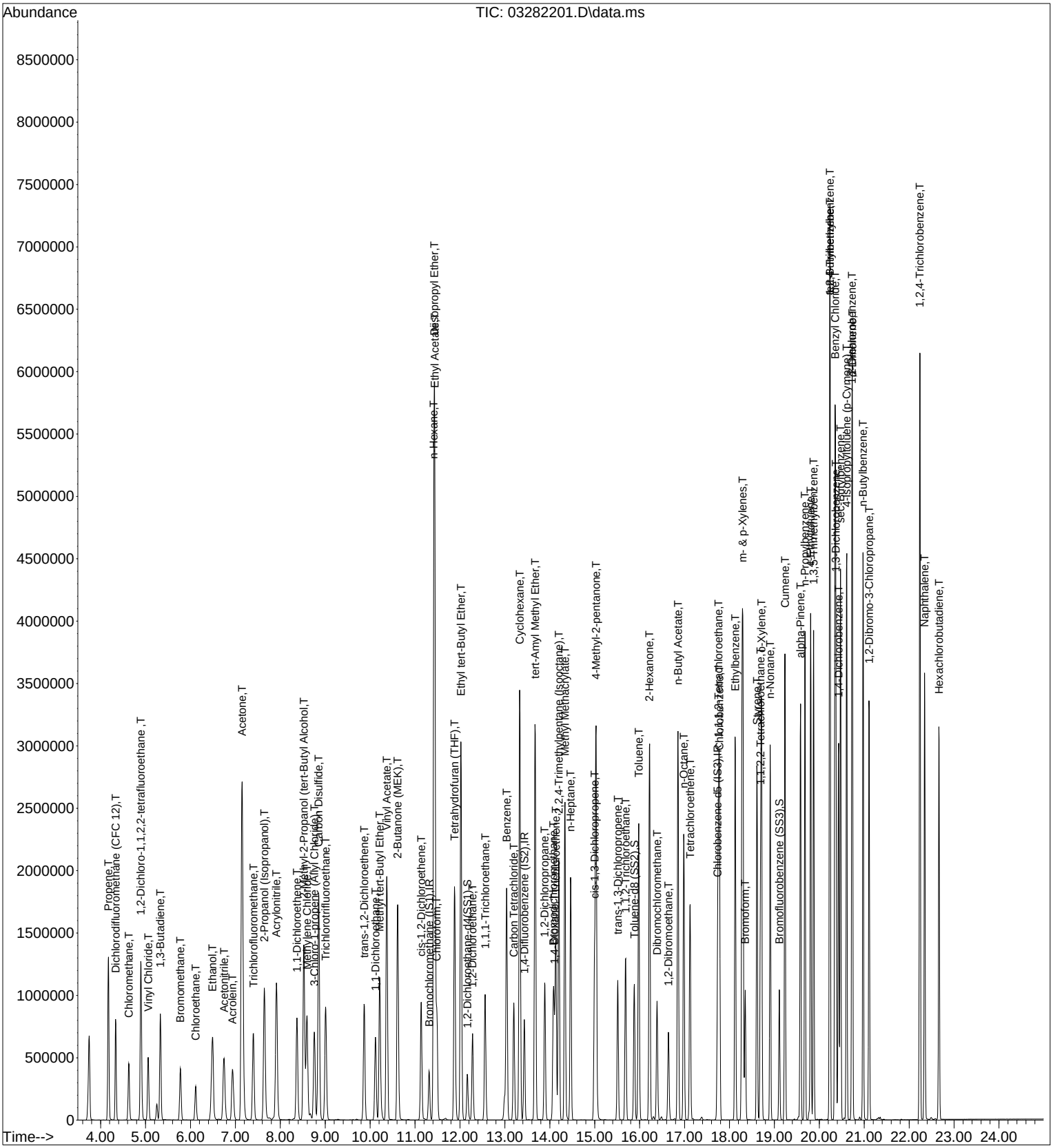
| Internal Standards | R.T. | QIon | Response | Conc Units | | Dev(Min) |
|---|---|---|---|---|---|---|
| 51) n-Heptane | 14.46 | 71 | 529809 | 26.914 ng | | 95 |
| 52) cis-1,3-Dichloropropene | 15.00 | 75 | 809868 | 26.599 ng | | 100 |
| 53) 4-Methyl-2-pentanone | 15.03 | 58 | 1006132 | 56.899 ng | | 95 |
| 54) trans-1,3-Dichloropropene | 15.51 | 75 | 713338 | 25.501 ng | | 100 |
| 55) 1,1,2-Trichloroethane | 15.69 | 97 | 478667 | 25.298 ng | | 98 |
| 58) Toluene | 15.98 | 91 | 2020452 | 22.373 ng | | 100 |
| 59) 2-Hexanone | 16.22 | 43 | 2328002 | 45.646 ng | | 98 |
| 60) Dibromochloromethane | 16.39 | 129 | 581333 | 24.284 ng | | 100 |
| 61) 1,2-Dibromoethane | 16.64 | 107 | 552153 | 22.499 ng | | 100 |
| 62) n-Butyl Acetate | 16.85 | 43 | 2574560 | 46.107 ng | | 97 |
| 63) n-Octane | 16.98 | 57 | 462062 | 25.615 ng | | 93 |
| 64) Tetrachloroethene | 17.12 | 166 | 585927 | 24.163 ng | | 99 |
| 65) Chlorobenzene | 17.78 | 112 | 1449519 | 24.259 ng | | 100 |
| 66) Ethylbenzene | 18.13 | 91 | 2395481 | 23.826 ng | | 99 |
| 67) m- & p-Xylenes | 18.29 | 91 | 3794979 | 49.625 ng | | 99 |
| 68) Bromoform | 18.35 | 173 | 508426 | 24.807 ng | | 100 |
| 69) Styrene | 18.61 | 104 | 1530458 | 24.494 ng | | 99 |
| 70) o-Xylene | 18.71 | 91 | 1927600 | 25.056 ng | | 99 |
| 71) n-Nonane | 18.91 | 43 | 1048403 | 26.027 ng | | 95 |
| 72) 1,1,2,2-Tetrachloroethane | 18.69 | 83 | 942323 | 26.442 ng | | 100 |
| 74) Cumene | 19.24 | 105 | 2491038 | 24.894 ng | | 99 |
| 75) alpha-Pinene | 19.58 | 93 | 1313041 | 27.830 ng | | 100 |
| 76) n-Propylbenzene | 19.68 | 91 | 3070285 | 25.853 ng | | 99 |
| 77) 3-Ethyltoluene | 19.81 | 105 | 2528912 | No Calib | | |
| 78) 4-Ethyltoluene | 19.81 | 105 | 2528912 | 26.082 ng | | 100 |
| 79) 1,3,5-Trimethylbenzene | 19.87 | 105 | 2056979 | 25.768 ng | | 99 |
| 80) alpha-Methylstyrene | 19.87 | 118 | 15940 | No Calib | | |
| 81) 2-Ethyltoluene | 19.87 | 105 | 2056979 | No Calib | | |
| 82) 1,2,4-Trimethylbenzene | 20.24 | 105 | 2143914 | 28.144 ng | | 100 |
| 83) n-Decane | 20.23 | 58 | 87444 | No Calib | # | |
| 84) Benzyl Chloride | 20.35 | 91 | 3589711 | 58.807 ng | | 98 |
| 85) 1,3-Dichlorobenzene | 20.37 | 146 | 1335710 | 29.047 ng | | 99 |
| 86) 1,4-Dichlorobenzene | 20.43 | 146 | 1249595 | 26.142 ng | | 99 |
| 87) sec-Butylbenzene | 20.47 | 105 | 2870515 | 26.969 ng | | 99 |
| 88) 4-Isopropyltoluene (p-... | 20.61 | 119 | 2517753 | 27.108 ng | | 99 |
| 89) 1,2,3-Trimethylbenzene | 20.61 | 105 | 93394 | No Calib | # | |
| 90) 1,2-Dichlorobenzene | 20.73 | 146 | 1306485 | 30.133 ng | | 100 |
| 91) d-Limonene | 20.74 | 68 | 831750 | 30.501 ng | | 96 |
| 92) 1,2-Dibromo-3-Chloropr... | 21.11 | 157 | 981575 | 59.785 ng | | 98 |
| 93) n-Undecane | 22.34 | 57 | 3004 | No Calib | # | |
| 94) 1,2,4-Trichlorobenzene | 22.24 | 180 | 1997201 | 58.119 ng | | 100 |
| 95) Naphthalene | 22.34 | 128 | 2735234 | 24.147 ng | | 100 |
| 96) n-Dodecane | 22.34 | 57 | 3004 | No Calib | # | |
| 97) Hexachlorobutadiene | 22.67 | 225 | 579458 | 27.633 ng | | 100 |
| 98) Cyclohexanone | 18.28 | 55 | 3010 | No Calib | | |
| 99) tert-Butylbenzene | 20.24 | 119 | 2122982 | 28.299 ng | | 98 |
| 100) n-Butylbenzene | 20.97 | 91 | 2330310 | 27.227 ng | | 99 |
| 101) 1,1,1,2-Tetrachloroethane | 17.76 | 131 | 544588 | 26.001 ng | | 98 |

(#) = qualifier out of range (m) = manual integration (+) = signals summed

01118197

Data File : I:\MS16\DATA\2022 03\28\03282201.D Vial: 2
Acq On : 28 Mar 2022 3:34 Operator: WA
Sample : CCV R16032822 25ng Inst : GCMS-16
Misc : S35-01102201/S35-03212204 (4/20)

Quant Time: Mar 28 05:48:13 2022
Quant Method : I:\MS16\METHODS\R16012022B.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Jan 27 06:34:43 2022
Response via : Initial Calibration
DataAcq Meth:TO15.M

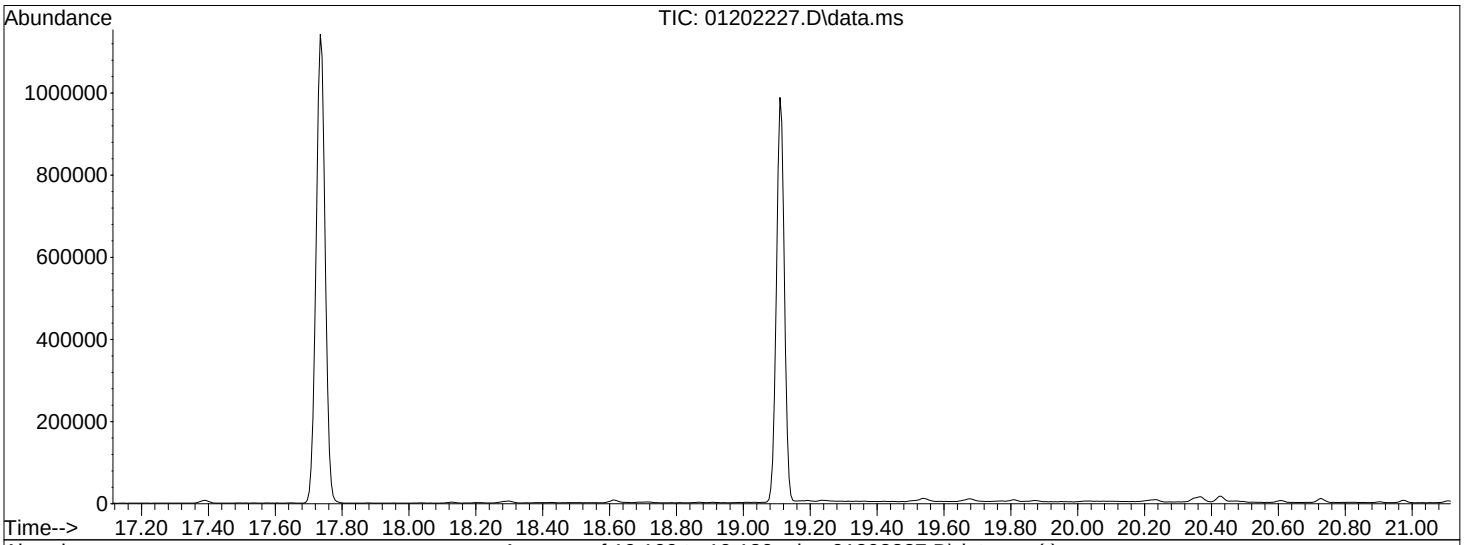


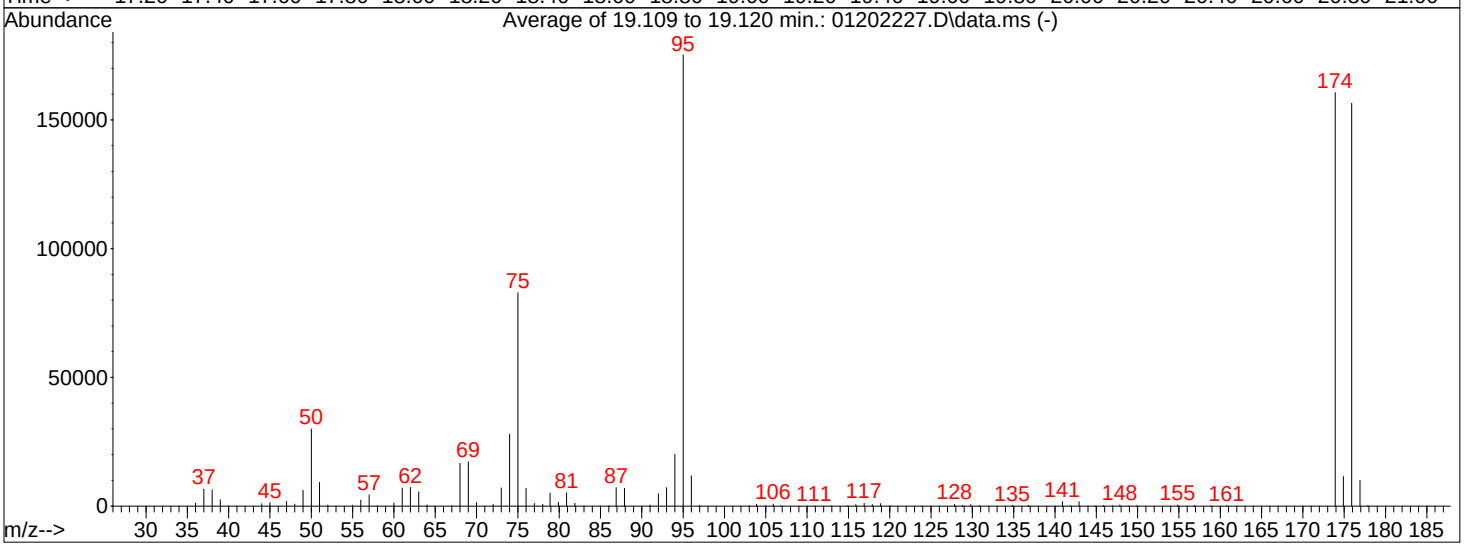
01118198

Data Path : I:\MS16\DATA\2022 01\20\
Data File : 01202227.D
Acq On : 20 Jan 2022 22:22
Operator : WA
Sample : R16012022 BFB Std
Misc : S35-01102201
ALS Vial : 2 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS16\METHODS\R16012022B.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Fri Jan 21 09:34:58 2022




AutoFind: Scans 2841, 2842, 2843; Background Corrected with Scan 2832

| Target Mass | Rel. to Mass | Lower Limit% | Upper Limit% | Rel. Abn% | Raw Abn | Result Pass/Fail |
|---|---|---|---|---|---|---|
| 50 | 95 | 8 | 40 | 17.1 | 29944 | PASS |
| 75 | 95 | 30 | 66 | 47.3 | 82880 | PASS |
| 95 | 95 | 100 | 100 | 100.0 | 175296 | PASS |
| 96 | 95 | 5 | 9 | 6.7 | 11808 | PASS |
| 173 | 174 | 0.00 | 2 | 0.0 | 0 | PASS |
| 174 | 95 | 50 | 120 | 91.6 | 160619 | PASS |
| 175 | 174 | 4 | 9 | 7.2 | 11495 | PASS |
| 176 | 174 | 93 | 101 | 97.4 | 156456 | PASS |
| 177 | 176 | 5 | 9 | 6.4 | 10001 | PASS |

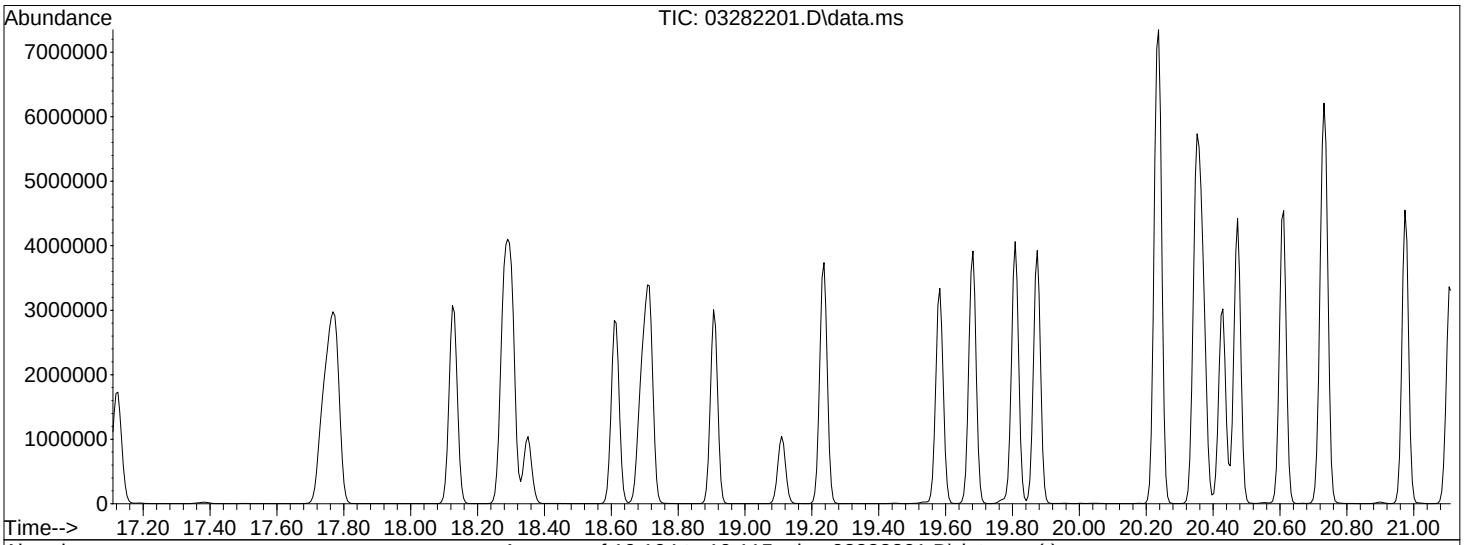
WA 1/21/22

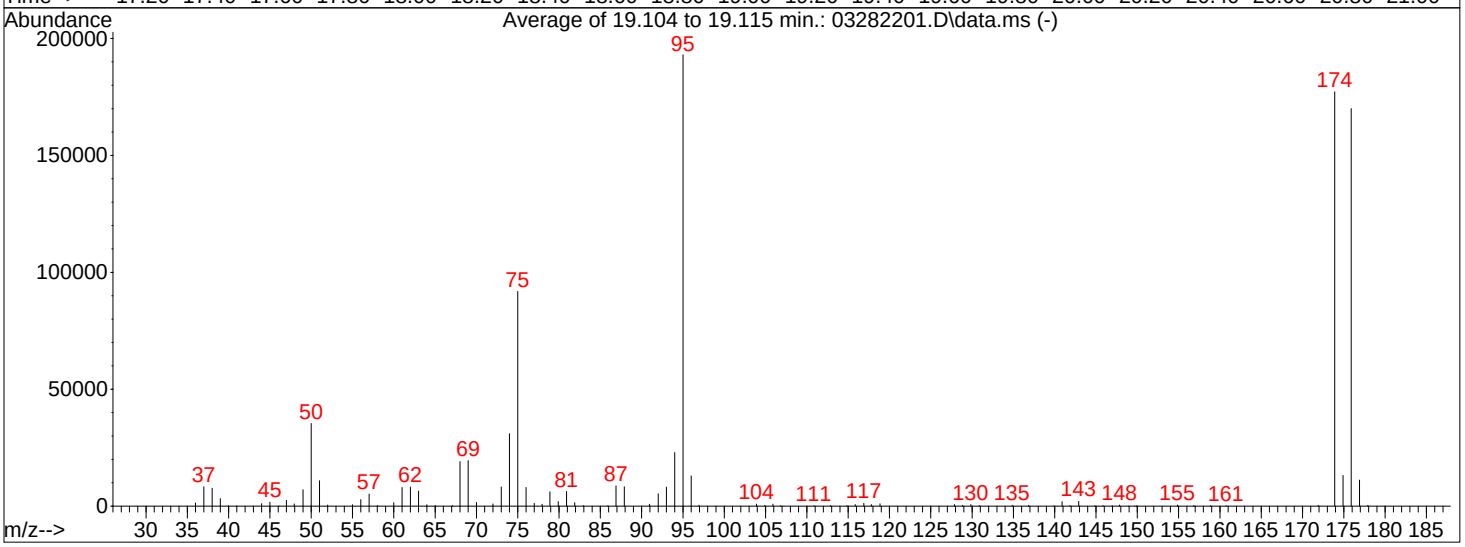
01118199

Data Path : I:\MS16\DATA\2022 03\28\
Data File : 03282201.D
Acq On : 28 Mar 2022 3:34
Operator : WA
Sample : CCV R16032822 25ng
Misc : S35-01102201/S35-03212204 (4/20)
ALS Vial : 2 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS16\METHODS\R16012022B.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Thu Jan 27 06:34:43 2022




AutoFind: Scans 2840, 2841, 2842; Background Corrected with Scan 2832

WA 3/28/22

| Target Mass | Rel. to Mass | Lower Limit% | Upper Limit% | Rel. Abn% | Raw Abn | Result Pass/Fail |
|---|---|---|---|---|---|---|
| 50 | 95 | 8 | 40 | 18.3 | 35373 | PASS |
| 75 | 95 | 30 | 66 | 47.6 | 91811 | PASS |
| 95 | 95 | 100 | 100 | 100.0 | 193024 | PASS |
| 96 | 95 | 5 | 9 | 6.7 | 12971 | PASS |
| 173 | 174 | 0.00 | 2 | 0.0 | 0 | PASS |
| 174 | 95 | 50 | 120 | 91.8 | 177195 | PASS |
| 175 | 174 | 4 | 9 | 7.4 | 13159 | PASS |
| 176 | 174 | 93 | 101 | 96.0 | 170027 | PASS |
| 177 | 176 | 5 | 9 | 6.6 | 11175 | PASS |

# Injection Log

Directory: J:\MS16\DATA\2022_01\20\

| | Date/Time | File Name | Sample ID | Misc Info | Operator | Vial | Comment |
|---|---|---|---|---|---|---|---|
| **27** | 1/20/22 22:22 | 01202227.D | R16012022_BFB Std | S35-01102201 | WA | 2 | *Pass* |
| **28** | 1/20/22 22:56 | 01202228.D | 0.1ng R16012022 ICAL Std | S35-01102201/S35-01172211 (2/16) | WA | 12 | *R16012022B.M* |
| **30** | 1/20/22 23:30 | 01202229.D | 0.2ng R16012022 ICAL Std | S35-01102201/S35-01172211 (2/16) | WA | 12 | |
| **32** | 1/21/22 0:04 | 01202230.D | 0.5ng R16012022 ICAL Std | S35-01102201/S35-01172211 (2/16) | WA | 12 | |
| **34** | 1/21/22 0:38 | 01202231.D | 1.0ng R16012022 ICAL Std | S35-01102201/S35-01172210 (2/16) | WA | 15 | |
| **35** | 1/21/22 1:11 | 01202232.D | 5.0ng R16012022 ICAL Std | S35-01102201/S35-01172210 (2/16) | WA | 15 | |
| **36** | 1/21/22 1:45 | 01202233.D | 25ng R16012022 ICAL Std | S35-01102201/S35-12292101 (1/28) | WA | 13 | |
| **38** | 1/21/22 2:19 | 01202234.D | 50ng R16012022 ICAL Std | S35-01102201/S35-12292101 (1/28) | WA | 13 | |
| **39** | 1/21/22 2:53 | 01202235.D | 100ng R16012022 ICAL Std | S35-01102201/S35-12292101 (1/28) | WA | 13 | |
| **40** | 1/21/22 3:27 | 01202236.D | Blank | S35-01102201 | WA | 2 | |
| **41** | 1/21/22 4:01 | 01202237.D | 25ng R16012022 ICV Std | S35-01102201/S35-12272103 (1/26) | WA | 16 | *Pass* |
| **42** | 1/21/22 4:34 | 01202238.D | 25ng R16012022_ICV Std | S35-01102201/S35-12292101 (1/28) | WA | 2 | *Pass* |

*R16012022B.M : good for low level compounds, ranges from 0.1ng --> 100ng; except: EtOH from 1ng -->362ng, Acetonitrile, tBA, DIPE, 1,2,4-TCB from 0.2ng --> 100ng; Vinyl Ac from 2.5ng --> 340ng; Ethyl Ac from 0.4ng --> 200ng; Bromoform from 1.0ng --> 200ng and Benzyl-Cl: 1ng --> 100ng*

*1/21/22*

# Injection Log

01118201

Directory: I:\MS16\DATA\2022_03\28\

| | Date/Time | File Name | Sample ID | Misc Info | Operator | Vial | *Comment* |
|---|---|---|---|---|---|---|---|
| 1 | 3/28/22 3:34 | 03282201.D | CCV R16032822_25ng | S35-01102201/S35-03212204 (4/20) | WA | 2 | *Passed* |
| 2 | 3/28/22 4:08 | 03282202.D | LOQ R16032822_0.8ng | S35-01102201/S35-03082207 (4/7) | WA | 16 | |
| 3 | 3/28/22 4:42 | 03282203.D | MB R16032822_1000mL | S35-01102201 | WA | 2 | *Passed* |
| 4 | 3/28/22 5:16 | 03282204.D | LCS R16032822_25ng | S35-01102201/S35-03072204 (4/6) | WA | 2 | *Passed* |
| 5 | 3/28/22 5:50 | 03282205.D | LCSD R16032722_25ng | S35-01102201/S35-03072204 (4/6) | WA | 2 | *Passed* |
| 6 | 3/28/22 6:24 | 03282206.D | LOD_MDL 0.3ng | S35-01102201/S35-03082207 (4/7) | WA | 16 | *Passed* |
| 7 | 3/28/22 6:58 | 03282207.D | MDL 0.16ng | S35-01102201/S35-03082207 (4/7) | WA | 16 | |
| 8 | 3/28/22 7:32 | 03282208.D | MDL 0.10ng | S35-01102201/S35-03082207 (4/7) | WA | 18 | |
| 9 | 3/28/22 9:05 | 03282209.D | P2201106-016dil (100mL) | S35-01102201 | TZ/MT | 1 | *not used* |
| 10 | 3/28/22 9:48 | 03282210.D | P2201116-001 (1000mL) | S35-01102201 | TZ/MT | 3 | |
| 11 | 3/28/22 10:22 | 03282211.D | P2201166-001 (10mL) | S35-01102201 | TZ/MT | 5 | *over diluted* |
| 12 | 3/28/22 11:13 | 03282212.D | P2201166-001 (50mL) | S35-01102201 | TZ/MT | 5 | |
| 13 | 3/28/22 11:47 | 03282213.D | P2201166-002 (50mL) | S35-01102201 | TZ/MT | 6 | |
| 14 | 3/28/22 12:21 | 03282214.D | P2201166-003 (1000mL) | S35-01102201 | TZ/MT | 7 | |
| 15 | 3/28/22 12:54 | 03282215.D | P2201166-004 (1000mL) | S35-01102201 | TZ/MT | 8 | |
| 16 | 3/28/22 13:28 | 03282216.D | P2201166-001dil (15mL) | S35-01102201 | TZ/MT | 5 | |
| 17 | 3/28/22 14:02 | 03282217.D | P2201166-003dil (100mL) | S35-01102201 | TZ/MT | 7 | |
| 18 | 3/28/22 14:42 | 03282218.D | P2201166-002dil (15mL) | S35-01102201 | TZ/MT | 6 | |
| 19 | 3/28/22 15:47 | 03282219.D | P2201103-001 (35mL) | S35-01102201 | TZ/MT | 1 | |
| 20 | 3/28/22 16:53 | 03282220.D | P2201103-002 (1000mL) | S35-01102201 | TZ/MT | 1 | *need dil* |
| 21 | 3/28/22 17:27 | 03282221.D | P2201103-003 (1000mL) | S35-01102201 | TZ/MT | 3 | |
| 22 | 3/28/22 18:01 | 03282222.D | P2201103-004 (30mL) | S35-01102201 | TZ/MT | 4 | *over diluted* |
| 23 | 3/28/22 18:34 | 03282223.D | P2201103-005 (250mL) | S35-01102201 | TZ/MT | 5 | *over diluted* |
| 24 | 3/28/22 19:08 | 03282224.D | P2201103-006 (40mL) | S35-01102201 | TZ/MT | 6 | |
| 25 | 3/28/22 19:42 | 03282225.D | P2201103-007 (1000mL) | S35-01102201 | TZ/MT | 7 | |
| 26 | 3/28/22 20:16 | 03282226.D | P2201103-008 (1000mL) | S35-01102201 | TZ/MT | 8 | |
| 27 | 3/28/22 20:50 | 03282227.D | P2201103-009 (40mL) | S35-01102201 | TZ/MT | 9 | |
| 28 | 3/28/22 21:24 | 03282228.D | P2201103-010 (1000mL) | S35-01102201 | TZ/MT | 10 | |
| 29 | 3/28/22 21:58 | 03282229.D | P2201103-010dil (100mL) | S35-01102201 | TZ/MT | 10 | |
| 30 | 3/28/22 22:32 | 03282230.D | P2201103-011 (1000mL) | S35-01102201 | TZ/MT | 11 | |
| 31 | 3/28/22 23:06 | 03282231.D | P2201103-012 (80mL) | S35-01102201 | TZ/MT | 12 | |
| 32 | 3/28/22 23:40 | 03282232.D | P2201103-013 (1000mL) | S35-01102201 | TZ/MT | 13 | |
| 33 | 3/29/22 0:14 | 03282233.D | P2201103-014 (300mL) | S35-01102201 | TZ/MT | 14 | |
| 34 | 3/29/22 0:48 | 03282234.D | P2201103-015 (1000mL) | S35-01102201 | TZ/MT | 15 | |
| 35 | 3/29/22 1:22 | 03282235.D | Std check 5ng | S35-01102201/S35-03212204 (4/20) | TZ/MT | 2 | |
| 36 | 3/29/22 1:55 | 03282236.D | CCVend R16032822_25ng | S35-01102201/S35-03212204 (4/20) | TZ/MT | 2 | *Passed* |
| | *CCV : dichlorodifluoromethane out low (LOD pass)* | | | | | | |
| | | | | | | WA 3/29/22 | |
| | | | | | | | |

# APPENDIX F
# PROTOCOL FOR DISCHARGING GWTP EFFLUENT

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**MEMORANDUM**

**DATE:** August 28, 2017

**PROJECT NAME:** Remediation of Multiple Sites, Longhorn Army Ammunition Plant, Karnack, TX

| | | |
|---|---|---|
| **TO:** | Richard Mayer | Senior Project Engineer<br>US Environmental Protection Agency<br>Federal Facilities Section (6PD-F) |
| | April Palmie | Project and Grant Manager<br>Superfund Section, Remediation Division<br>Texas Commission on Environmental Quality |
| **FROM:** | Rose M. Zeiler, Ph.D. | Longhorn AAP Site Manager |

**SUBJECT:** **Protocol for Discharging GWTP Effluent**
**Longhorn Army Ammunition Plant, Karnack, TX**
**(Contract: W912DY-09-D-0059, Task Order DS01)**

## INTRODUCTION

The purpose of this memo is to document the protocol for discharging Longhorn Army Ammunition Plant groundwater treatment plant (GWTP) effluent to Harrison Bayou, the INF-Pond, or LHAAP-18/24.

The GWTP is designed to:

- Extract groundwater from LHAAP-18/24 and LHAAP-16 for hydraulic control;
- Remove metals by pH adjustment, polymer addition, and gravity separation;
- Remove volatile organic compounds (VOCs) by air stripping;
- Remove perchlorate in a fluidized bed reactor (FBR) and an ion exchange scavenger system; and
- Discharge the effluent continuously.

## DISCHARGE CRITERIA

The discharge criteria established for discharge to Harrison Bayou are:

| Parameter | Discharge Criteria (µg/L) | |
|---|---|---|
| | Daily Average | Daily Maximum |
| **Volatiles** | | |
| 1,1,1-Trichloroethane | 3,417 | 7,230 |
| 1,1,2-Trichloroethane | 102.5 | 216.9 |
| 1,1-Dichloroethane | 6,633 | 14,032 |
| 1,1-Dichloroethene | 119 | 253 |
| 1,2-Dichloroethane | 85 | 181 |
| Acetone | 1,132 | 2,395 |
| Benzene | 85 | 181 |
| Carbon Tetrachloride | 85 | 181 |
| Chlorobenzene | 22,300 | 47,180 |
| Chloroform | 1,708 | 3,615 |
| Ethylbenzene | 26,954 | 57,025 |
| Xylenes | 39.5 | 83.6 |
| Methylene Chloride | 803 | 1,699 |
| Styrene | 2,829 | 5,987 |
| Tetrachloroethene | 85.4 | 180.7 |
| Toluene | 1,980 | 4,189 |
| Trichloroethene | 85 | 181 |
| Vinyl Chloride | 34 | 72 |
| **Anions** | | |
| Chloride | * | * |
| Sulfate | * | * |
| Perchlorate** | 278 | 589 |
| **Metals** | | |
| Aluminum | 777 | 1,644 |
| Arsenic | 365 | 772 |
| Barium | 1,000 | 2,000 |
| Cadmium | 1.6 | 3.4 |
| Chromium, Total | 355 | 752 |
| Chromium, Hexavalent | 58 | 124 |
| Cobalt | 5,433 | 11,495 |
| Iron | 1,132 | 2,395 |
| Lead | 2.2 | 4.6 |
| Nickel | 87 | 184 |
| Manganese | 7,323 | 15,494 |
| Silver | 1.4 | 3 |
| Selenium | 5.7 | 12 |
| Vanadium | 1,698 | 3,592 |
| Zinc | 146 | 310 |
| **Other** | | |
| Hexachlorobenzene | 0.22 | 0.47 |
| 1,4-Dioxane | | 134.2 |
| Oil and Grease | | 15 |
| Chemical Oxygen Demand | | 200 |

* - Based upon flow in Harrison Bayou
** - Discharge criteria, when diverted to the INF Pond, is 17 µg/L

## PROTOCOL FOR DISCHARGING GWTP EFFLUENT

In accordance with the *Sampling and Analysis Plan, Groundwater Treatment Plant and Well Fields* (SAP) Table 2-2, indicator parameters for the FBR, such as temperature, pH and oxidation reduction potential (ORP), are monitored in real time to predict FBR performance and perchlorate removal. Based upon these indicator parameters, the operator of the GWTP can make adjustments such as:

- Bring the ion exchange system online;
- Increase or decrease the addition rate of electron donor (acetic acid);
- Increase or decrease the nutrient addition rate (urea or phosphoric acid); or
- Increase or decrease the FBR recirculation rate

Samples of the GWTP effluent are collected weekly, analyzed for perchlorate, nutrients (ammonia-nitrogen and ortho-phosphate), total organic carbon (TOC), chloride, and sulfate, with the results received from the laboratory 14 days later. Other parameters (e.g. Record of Decision metals and volatiles) are collected and analyzed in GWTP effluent samples according to the frequencies listed in Table 2-1 of the SAP.

As shown in Figure 1, groundwater is continuously extracted, treated, and discharged. If Harrison Bayou is flowing and indicator parameters are within their historical optimal ranges, then the ion exchange vessels can be bypassed and the GWTP effluent sample will be collected after the FBR. If Harrison Bayou is not flowing or the indicator parameters are not within historical optimal ranges, then the ion exchange vessels will be put on line, and the GWTP effluent sample will be collected between the lead and lag ion exchange vessel. Professional judgement may also be used as to when to bring the ion exchange vessels online, such as after a power outage or during anticipated cold temperatures when the FBR has historically not performed optimally.

If a parameter is measured in the effluent at a concentration above the discharge criteria, then a confirmation sample and an effluent sample after the lag ion exchange vessel will be collected and analyzed for the parameter with a 24-hour turnaround time. Corrective measures (e.g. increased nutrient or electron donor addition rates, bring ion exchange vessels on line) will be implemented as appropriate to bring the parameter back within the discharge criteria. ***If an upset condition in the FBR leads to high concentrations of perchlorate going into the lead ion exchange vessel and breaking through at the sample location between the vessels, the lag vessel will still remove perchlorate before it is discharged to Harrison Bayou, the INF Pond, or LHAAP-18/24.*** It is estimated that the lag ion exchange vessel can remove all of the perchlorate from two weeks of typical groundwater extraction at a concentration of 920 μg/L. If the residual perchlorate concentration after the FBR and lead ion exchange vessel is only 600 μg/L, the lag ion exchange vessel could last almost 2.5 years before perchlorate would be detected in the discharged effluent.

If a parameter exceeds the discharge criteria by more than 40% (see Appendix A-2, SAP, Section 7c of Monitoring and Reporting Requirements) or reaches 920 μg/L of perchlorate, then the GWTP will be put into full recycle mode (no discharge) until the parameter is below the discharge criteria again. Appendix A-2 of the SAP requires GWTP data to be provided to TCEQ monthly including a list of noncompliance(s), if applicable.

### *Discharge to Harrison Bayou*

As shown in Figure 1, the GWTP effluent will be discharged to Harrison Bayou as long as it has a measurable flow. The flowrate in Harrison Bayou is estimated by measuring the height of water with a staff gauge and velocity in feet/sec at intervals along the width as described in the Installation-Wide Work Plan, Standard Operating Procedures, Attachment 18 – Water Depth and Velocity Measurements (AECOM, July 2014).

The allowable flow rate of GWTP effluent that can be discharged to Harrison Bayou is given by:

$$QE \leq \frac{QS\ (CC - CA)}{(CE - CC)}$$

where $Q_E$ = GWTP effluent flow $Q_S$ = Harrison Bayou flow

$C_C$ = Criteria concentration (100 mg/L for chloride, 50 mg/L for sulfate)

$C_A$ = Ambient concentration = 10 mg/L

$C_E$ = Chloride or sulfate concentration in GWTP effluent

The allowable GWTP effluent flow will be the lower of the calculated values given the measured concentrations of chloride and sulfate in the discharge stream. For each day that GWTP effluent is discharged to Harrison Bayou, the measured Harrison Bayou flow, the allowable effluent flow, and the actual effluent flow are recorded.

### *Discharge to INF Pond*

If Harrison Bayou is not flowing, then GWTP effluent will be discharged to the Intermediate-Range Nuclear Forces (INF) Pond for temporary storage until Harrison Bayou flow resumes. Perchlorate concentration detected in the effluent must be 17 µg/L or less, when this occurs.

The INF Pond has a flexible membrane liner protected by a soil cover with a gravity discharge pipe (and valve) to Harrison Bayou. The INF Pond has a nominal capacity of 3 million gallons with a staff gage to measure the height of water stored in the pond. The GWTP operator maintains the INF Pond by visually inspecting for erosion, vegetative growth including tree growth along the anchor trench, and liner integrity and making necessary repairs. Periodically, accumulated debris must be removed from the influent and effluent piping to the INF Pond.

Prior to discharging to the INF Pond, a lead and lag ion exchange vessel will be brought online. The GWTP Operator will also confirm that the discharge valve is closed, will record the reading on the effluent totalizer, and will record the height of water using the staff gage. The GWTP Operator will then configure valves and pumps to direct GWTP effluent to the INF Pond. The height of water in the INF Pond and totalizer reading will be recorded at the beginning and end of each shift for the duration of active discharge. When the height of water in the pond reaches 3 feet below the height of the berm (freeboard), the GWTP Operator will stop discharging to the INF Pond and TCEQ will be notified. After the TCEQ acknowledges the INF Pond level, GWTP effluent may be discharged to the INF Pond again until 2 feet of freeboard is reached. The GWTP Operator will stop discharging to the INF Pond and TCEQ will be notified again. After the TCEQ acknowledges 2 feet of freeboard in the INF Pond,GWTP effluent may be discharged again until 1 foot of freeboard remains. No additional GWTP effluent can be accepted at the INF Pond until greater than 1 foot of freeboard is measured.

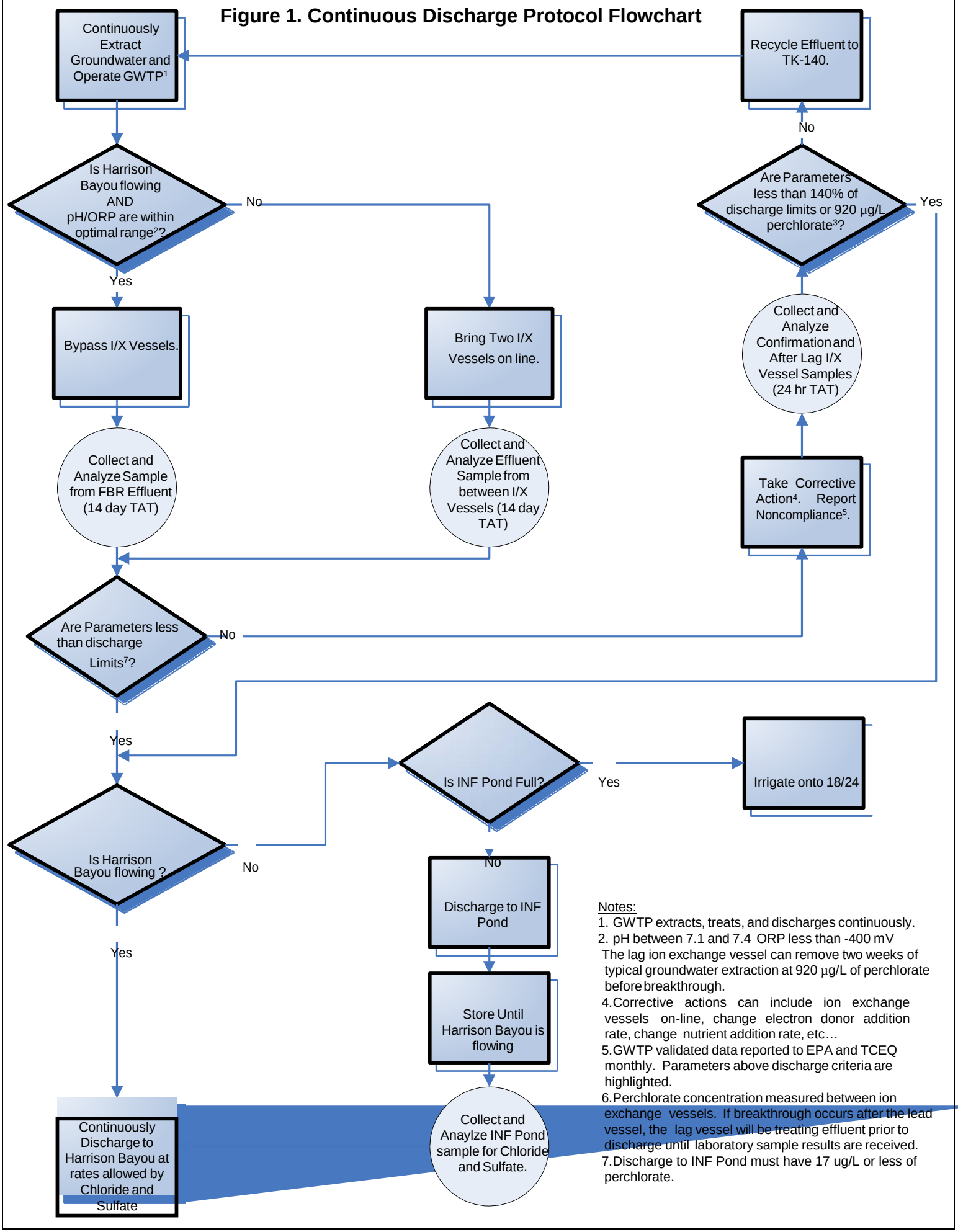
As soon as flow in Harrison Bayou returns, stored GWTP effluent from the INF Pond will be discharged. As with direct discharges from the GWTP to Harrison Bayou, the allowable flowrate of effluent from the INF Pond is calculated based upon the chloride and sulfate concentrations in the pond and the flow in Harrison Bayou. If effluent from the INF Pond and the GWTP are discharged simultaneously, total flow of both streams together should not exceed the calculated discharge level for either discharge location. For each day that INF Pond contents are discharged to Harrison Bayou, the measured Harrison Bayou flow, the allowable effluent flow, and the actual effluent flow are recorded.

### *Irrigation onto LHAAP-18/24*

If Harrison Bayou is not flowing and the INF Pond has less than 1 foot of freeboard, then GWTP effluent will be irrigated onto LHAAP-18/24 using one of the three main sprinkler lines. To avoid pooling and runoff of irrigation water, only one line will be used for half a day at a time, with a separate line being used the second half of the day. If needed, the irrigation will occur 5 days a week for 8 hours each day (using 3 sprinklers in each line). If conditions are wet due to rain events, irrigation will not be conducted to avoid ponding and potential runoff, the GWTP will be put into recycle mode, and groundwater extraction will be interrupted if storage space is not available.

While irrigating, site inspections will be performed to ensure pooling and runoff are not occurring. During the irrigation activities, inspections will be performed twice a day, once approximately three hours and again approximately six hours into the 8-hour irrigation shift. The system will be inspected to ensure that the sprinkler heads are operating properly and not leaking large amounts of water. If ponding or runoff is observed, irrigation at that sprinkler line will cease, and irrigation at another sprinkler line will be started if possible. Volumes of GWTP effluent and twice daily inspections will be recorded daily and reported monthly until flow resumes in Harrison Bayou or greater than 1 foot of freeboard is available in the INF Pond.

# Figure 1. Continuous Discharge Protocol Flowchart




Notes:

1. GWTP extracts, treats, and discharges continuously.
2. pH between 7.1 and 7.4 ORP less than -400 mV
The lag ion exchange vessel can remove two weeks of typical groundwater extraction at 920 µg/L of perchlorate before breakthrough.
4. Corrective actions can include ion exchange vessels on-line, change electron donor addition rate, change nutrient addition rate, etc…
5. GWTP validated data reported to EPA and TCEQ monthly. Parameters above discharge criteria are highlighted.
6. Perchlorate concentration measured between ion exchange vessels. If breakthrough occurs after the lead vessel, the lag vessel will be treating effluent prior to discharge until laboratory sample results are received.
7. Discharge to INF Pond must have 17 ug/L or less of perchlorate.

# APPENDIX G
# AIR DATA TABLES, PID READINGS, AND CALIBRATION LOGS

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# Appendix G Table 1. Ambient Air Data - March 2022
## Longhorn Army Ammunition Plant
## Groundwater Treatment Plant

| Pollutant | CAS # | Short Term ESL March 2012 | AMCVs (Short Term Health) | GWTP Ambient Air Concentrations (1) | | Status (3) | Downwind Ambient Air Concentrations (2) | | Status (3) |
|---|---|---|---|---|---|---|---|---|---|
| | | µg/m$^3$ | µg/m$^3$ | µg/m$^3$ | | | µg/m$^3$ | | |
| 1,1-Dichloroethane | 75-34-3 | 4,000 | 4,047 | 0.68 | U | PASS | 0.75 | U | PASS |
| 1,1-Dichloroethene | 75-35-4 | 210 | 714 | 0.70 | U | PASS | 0.76 | U | PASS |
| 1,2-Dichloroethane | 107-06-2 | 160 | 162 | 0.68 | U | PASS | 0.75 | U | PASS |
| Acetone | 67-64-1 | 5,900 | NA | **150** | | PASS | 7.3 | U | PASS |
| Benzene | 71-43-2 | 170 | 575 | **1.4** | | PASS | 0.71 | U | PASS |
| Carbon disulfide | 75-15-0 | 30 | NA | 1.4 | U | PASS | 1.6 | U | PASS |
| Chloroform | 67-66-3 | 100 | 98 | 0.70 | U | PASS | 0.76 | U | PASS |
| cis-1,2-Dichloroethene | 156-59-2 | 7,900 | NA | 0.67 | U | PASS | 0.73 | U | PASS |
| Methylene chloride | 75-09-2 | 3,600 | 12,158 | **15** | | PASS | 0.73 | U | PASS |
| Tetrachloroethene | 127-18-4 | 2,000 | 6,782 | 0.67 | U | PASS | 0.73 | U | PASS |
| trans-1,2-Dichloroethene | 156-60-5 | 7,900 | NA | 0.68 | U | PASS | 0.75 | U | PASS |
| Trichloroethene | 79-01-6 | 540 | 537 | **1.3** | | PASS | 0.73 | U | PASS |
| Vinyl chloride | 75-01-4 | 20,000 | 66,460 | 0.67 | U | PASS | 0.73 | U | PASS |
| n-Hexane | 110-54-3 | 5,300 | 6,336 | **7.6** | | PASS | **2.5** | | PASS |
| Styrene | 100-42-5 | 110 | 21,725 | 0.65 | U | PASS | 0.71 | U | PASS |
| Toluene | 108-88-3 | 640 | 15,074 | **10.0** | | PASS | 0.73 | U | PASS |
| Ethylbenzene | 100-41-4 | 740 | 86,844 | **0.90** | | PASS | 0.73 | U | PASS |
| m,p-Xylenes | 179601-23-1 | 180 | 7,382 | **3.5** | | PASS | 1.6 | U | PASS |
| o-Xylene | 95-47-6 | 1,600 | 7,382 | **1.3** | | PASS | 0.73 | U | PASS |
| 1,3-Dichlorobenzene | 541-73-1 | 720 | NA | 0.67 | U | PASS | 0.73 | U | PASS |
| Propene (C3 H6) | 115-07-1 | Asphyxiant | Asphyxiant | **50.0** | | NA | **1.0** | | NA |
| Dichlorodifluoromethane (CFC 12) | 75-71-8 | 50,000 | 49,452 | **2.1** | **J** | PASS | **2.2** | **J** | PASS |
| Ethanol | 64-17-5 | 18,800 | NA | **180** | | PASS | 7.1 | U | PASS |
| Trichlorofluoromethane (CFC 11) | 75-69-4 | 28,000 | 56,184 | **1.2** | | PASS | **1.2** | | PASS |
| Trichlorotrifluoroethane (CFC 113) | 76-13-1 | 38,000 | NA | **0.73** | | PASS | 0.76 | U | PASS |
| alpha-Pinene | 80-56-8 | 60 | 3,499 | 0.70 | U | PASS | 0.76 | U | PASS |
| d-Limonene | 5989-27-5 | 1,100 | NA | **1.8** | | PASS | 0.71 | U | PASS |

**Notes:**

(1) Sample collected over an 8-hour period on March 7, 2022, between 6:15 AM and 2:15 PM

(2) Sample collected over a 24-hour period beginning on March 7, 2022, at 7:00 AM and ending on March 8, 2022 at 7:00 AM

(3) Status based on comparison of air sample result to Air Monitoring Comparison Values (AMCVs). When there is no AMCV value for a chemical, the air sample concentration is compared to the short-term Effects Screening Level (ESL).

CAS # = Chemical Abstracts Service Number

GWTP = Groundwater Treatment Plant

U = non-detect

J = estimated result

µg/m$^3$ = micrograms per cubic meter

g/mole = gram/mole

mol/m3 = mole per cubic meter

# Appendix G Table 2. Emission Stack Air Data - March 2022
## Longhorn Army Ammunition Plant
## Groundwater Treatment Plant

| Pollutant | CAS # | Measured Air Stripper Stack Concentrations (1) | | Air Stripper Emission Rates (2) | | Air Stripper Emission Rates (2a) | | Allowable Annual Emission (3) | Status (4) | TLV (L) | TLV Reference | Compliance section | Distance Downwind to nearest off-site Receptor (D) | (K) conversion value | Allowable Maximum Hourly Emission Limit at Nearest off-site Receptor (6)(7) (E) = L/K | Status (8) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | µg/m$^3$ | | lb/hr | | tpy | | tpy | | mg/m$^3$ | | | feet | | lb/hr | |
| 1,1-Dichloroethane | 75-34-3 | 13 | U | 1.07E-04 | U | 6.93E-05 | U | 5 | PASS | 405 | ACGIH List | 30 TAC 106.533(f)(1)(A)(ii) | 2,000 | 14 | 1.0 | PASS |
| 1,1-Dichloroethene | 75-35-4 | **28** | | 4.59E-04 | | 2.98E-04 | | 5 | PASS | 20 | ACGIH List | 30 TAC 106.533(f)(1)(A)(ii) | 2,000 | 14 | 1.4 | PASS |
| 1,2-Dichloroethane | 107-06-2 | **55** | | 9.02E-04 | | 5.86E-04 | | 5 | PASS | 40 | ACGIH List | 30 TAC 106.533(f)(1)(A)(ii) | 2,000 | 14 | 2.9 | PASS |
| Acetone | 67-64-1 | 130 | U | 1.07E-03 | U | 6.93E-04 | U | 5 | PASS | 590 | 106.262 List | 30 TAC 106.533(f)(1)(A)(ii) | 2,000 | 14 | 1.0 | PASS |
| Benzene | 71-43-2 | 13 | U | 1.07E-04 | U | 6.93E-05 | U | 5 | PASS | 3 | 106.262 List | 30 TAC 106.533(f)(1)(A)(ii) | 2,000 | 14 | 0.21 | PASS |
| Carbon disulfide | 75-15-0 | 28 | U | 2.30E-04 | U | 1.49E-04 | U | 5 | PASS | 31 | ACGIH List | 30 TAC 106.533(f)(1)(A)(ii) | 2,000 | 14 | 2.2 | PASS |
| Chloroform | 67-66-3 | **15** | | 2.46E-04 | | 1.60E-04 | | 5 | PASS | 10 | 106.262 List | 30 TAC 106.533(f)(1)(A)(ii) | 2,000 | 14 | 0.71 | PASS |
| cis-1,2-Dichloroethene | 156-59-2 | **1,600** | | 2.62E-02 | | 1.71E-02 | | 5 | PASS | 793 | ACGIH List | 30 TAC 106.533(f)(1)(A)(ii) | 2,000 | 14 | 1.0 | PASS |
| Methylene chloride | 75-09-2 | **110** | | 1.80E-03 | | 1.17E-03 | | 5 | PASS | 26 | 106.262 List | 30 TAC 106.533(f)(1)(A)(ii) | 2,000 | 14 | 1.9 | PASS |
| Tetrachloroethene | 127-18-4 | 13 | U | 1.07E-04 | U | 6.93E-05 | U | 5 | PASS | 33.5 | 106.262 List | 30 TAC 106.533(f)(1)(A)(ii) | 2,000 | 14 | 2.4 | PASS |
| trans-1,2-Dichloroethene | 156-60-5 | 13 | U | 1.07E-04 | U | 6.93E-05 | U | 5 | PASS | 793 | ACGIH List | 30 TAC 106.533(f)(1)(A)(ii) | 2,000 | 14 | 1.0 | PASS |
| Trichloroethene | 79-01-6 | **7,400** | | 1.21E-01 | | 7.89E-02 | | 5 | PASS | 135 | 106.262 List | 30 TAC 106.533(f)(1)(A)(ii) | 2,000 | 14 | 6.0 | PASS |
| Vinyl chloride | 75-01-4 | **33** | | 5.41E-04 | | 3.52E-04 | | 5 | PASS | 2 | 106.262 List | 30 TAC 106.533(f)(1)(A)(ii) | 2,000 | 14 | 0.14 | PASS |
| n-Hexane | 110-54-3 | 13 | U | 1.07E-04 | U | 6.93E-05 | U | 5 | PASS | 1,800 | ACGIH List | 30 TAC 106.533(f)(1)(A)(ii) | 2,000 | 14 | 1.0 | PASS |
| Styrene | 100-42-5 | 13 | U | 1.07E-04 | U | 6.93E-05 | U | 5 | PASS | 21 | 106.262 List | 30 TAC 106.533(f)(1)(A)(ii) | 2,000 | 14 | 1.5 | PASS |
| Toluene | 108-88-3 | 13 | U | 1.07E-04 | U | 6.93E-05 | U | 5 | PASS | 188 | ACGIH List | 30 TAC 106.533(f)(1)(A)(ii) | 2,000 | 14 | 6.0 | PASS |
| Ethylbenzene | 100-41-4 | 13 | U | 1.07E-04 | U | 6.93E-05 | U | 5 | PASS | 434 | ACGIH List | 30 TAC 106.533(f)(1)(A)(ii) | 2,000 | 14 | 1.0 | PASS |
| m,p-Xylenes | 179601-23-1 | 28 | U | 2.30E-04 | U | 1.49E-04 | U | 5 | PASS | 434 | ACGIH List | 30 TAC 106.533(f)(1)(A)(ii) | 2,000 | 14 | 1.0 | PASS |
| o-Xylene | 95-47-6 | 13 | U | 1.07E-04 | U | 6.93E-05 | U | 5 | PASS | 434 | ACGIH List | 30 TAC 106.533(f)(1)(A)(ii) | 2,000 | 14 | 1.0 | PASS |
| 1,3-Dichlorobenzene | 541-73-1 | 13 | U | 1.07E-04 | U | 6.93E-05 | U | 5 | PASS | (5) | -- | 30 TAC 106.533(f)(1)(A)(i) | 2,000 | 14 | 1.0 | PASS |
| Propene (C3 H6) | 115-07-1 | 13 | U | 1.07E-04 | U | 6.93E-05 | U | 5 | PASS | (5) | -- | 30 TAC 106.533(f)(1)(A)(i) | 2,000 | 14 | 6.0 | PASS |
| Dichlorodifluoromethane (CFC 12) | 75-71-8 | 13 | UJ | 2.13E-04 | | 1.39E-04 | | 5 | PASS | 4,950 | ACGIH List | 30 TAC 106.533(f)(1)(A)(ii) | 2,000 | 14 | 1.0 | PASS |
| Ethanol | 64-17-5 | 130 | U | 1.07E-03 | U | 6.93E-04 | U | 5 | PASS | 1,880 | ACGIH List | 30 TAC 106.533(f)(1)(A)(ii) | 2,000 | 14 | 1.0 | PASS |
| Trichlorofluoromethane (CFC 11) | 75-69-4 | 13 | U | 1.07E-04 | U | 6.93E-05 | U | 5 | PASS | 5,620 | ACGIH List | 30 TAC 106.533(f)(1)(A)(ii) | 2,000 | 14 | 1.0 | PASS |
| Trichlorotrifluoroethane (CFC 113) | 76-13-1 | **1,600** | | 2.62E-02 | | 1.71E-02 | | 5 | PASS | 7,670 | ACGIH List | 30 TAC 106.533(f)(1)(A)(ii) | 2,000 | 14 | 1.0 | PASS |
| alpha-Pinene | 80-56-8 | 14 | U | 1.15E-04 | U | 7.46E-05 | U | 5 | PASS | (5) | -- | 30 TAC 106.533(f)(1)(A)(i) | 2,000 | 14 | 1.0 | PASS |
| d-Limonene | 5989-27-5 | 13 | U | 1.07E-04 | U | 6.93E-05 | U | 5 | PASS | (5) | -- | 30 TAC 106.533(f)(1)(A)(i) | 2,000 | 14 | 1.0 | PASS |
| | | TOTAL | | 0.182 | | | | | | | | | | | | |

Notes:
(1) Sample collected on March 7, 2022. The higher value of the sample or duplicate is reported.
(2) Based on a blower flow rate of 4,390 cubic feet per minute (cfm). Note that plant operates less than or equal to 25 hours per week. 1/2 of detection limit was used for estimating mass rate
(2a) Based on operation of 25 hours per week, 52 weeks per year.
(3) Per 30TAC 106.533(f)(1)(B)
(4) Based on comparing the calculated air stripper stack sample emission rate in tons per year (tpy) to the allowable annual emission limit per chemical of 5 tpy.
(5) No Threshold Limit Values (TLVs) for these chemicals
(6) The maximum hourly limit allowed by 30 Texas Administrative Code (TAC) 106.262, per pollutant, is 6 pounds per hour (lb/hr) per "Figure 1: 30 TAC 106.262(a)". The E value was overridden with 6 lb/hr when the calculated E was higher.
(7) The maximum hourly emission rate allowed by 30 TAC 106.261(a)(3) for chemicals with a limit value (L) greater than 200 mg/m$^3$ is 1 lb/hr.
(8) Based on comparing the calculated air stripper stack sample emission rate in lb/hr to the allowable maximum emission limit per chemical based on distance downwind to nearest off-site receptor.
CAS # = Chemical Abstracts Service Number
mg/m$^3$ = milligrams per cubic meter
µg/m$^3$ = micrograms per cubic meter
ACGIH = American Conference of Governmental Industrial Hygienists
U = non-detect

**Appendix G Table 3. PID Readings - 1st Quarter 2022**
**Longhorn Army Ammunition Plant**
**Groundwater Treatment Plant**

| Date | Time | Location | Air Flow Rate at Blower | Instrument ID | Person Collecting | PID Reading | Weather Conditions |
|---|---|---|---|---|---|---|---|
| 1/5/2022 | 8:00 | Outside GWTP Office | 3160 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Clear 41$^{o}$F |
| 1/5/2022 | 8:00 | Downwind | 3160 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Clear 41$^{o}$F |
| 1/5/2022 | 8:00 | Stripper | 3160 ACFM | MiniRAE 3000 | Kennie Moore | Max. 22.3 ppm Steady State 6.1 ppm | Clear 41$^{o}$F |
| 1/5/2022 | 11:30 | Outside GWTP Office | 3073 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Clear 63$^{o}$F |
| 1/5/2022 | 11:30 | Downwind | 3073 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Clear 63$^{o}$F |
| 1/5/2022 | 11:30 | Stripper | 3073 ACFM | MiniRAE 3000 | Kennie Moore | Max. 21.7 ppm Steady State 5.3 ppm | Clear 63$^{o}$F |
| 1/6/2022 | 8:00 | Outside GWTP Office | 3255 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Clear 46$^{o}$F |
| 1/6/2022 | 8:00 | Downwind | 3255 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Clear 46$^{o}$F |
| 1/6/2022 | 8:00 | Stripper | 3255 ACFM | MiniRAE 3000 | Kennie Moore | Max. 22.9 ppm Steady State 6.7 ppm | Clear 46$^{o}$F |
| 1/6/2022 | 10:00 | Outside GWTP Office | 3036 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Clear 46$^{o}$F |
| 1/6/2022 | 10:00 | Downwind | 3036 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Clear 46$^{o}$F |
| 1/6/2022 | 10:00 | Stripper | 3036 ACFM | MiniRAE 3000 | Kennie Moore | Max. 21.7 ppm Steady State 5.9 ppm | Clear 46$^{o}$F |
| 1/10/2022 | 8:00 | Outside GWTP Office | 3162 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Clear 42$^{o}$F |
| 1/10/2022 | 8:00 | Downwind | 3162 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Clear 42$^{o}$F |
| 1/10/2022 | 8:00 | Stripper | 3162 ACFM | MiniRAE 3000 | Kennie Moore | Max. 21.6 ppm Steady State 6.1 ppm | Clear 42$^{o}$F |
| 1/10/2022 | 14:00 | Outside GWTP Office | 3026 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Clear 52$^{o}$F |
| 1/10/2022 | 14:00 | Downwind | 3026 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Clear 52$^{o}$F |
| 1/10/2022 | 14:00 | Stripper | 3026 ACFM | MiniRAE 3000 | Kennie Moore | Max. 20.7 ppm Steady State 5.7 ppm | Clear 52$^{o}$F |
| 1/13/2022 | 8:00 | Outside GWTP Office | 3233 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Clear 35$^{o}$F |
| 1/13/2022 | 8:00 | Downwind | 3233 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Clear 35$^{o}$F |
| 1/13/2022 | 8:00 | Stripper | 3233 ACFM | MiniRAE 3000 | Kennie Moore | Max. 21.9 ppm Steady State 6.7 ppm | Clear 35$^{o}$F |
| 1/13/2022 | 10:30 | Outside GWTP Office | 3061 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Clear 60$^{o}$F |
| 1/13/2022 | 10:30 | Downwind | 3061 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Clear 60$^{o}$F |
| 1/13/2022 | 10:30 | Stripper | 3061 ACFM | MiniRAE 3000 | Kennie Moore | Max. 20.6 ppm Steady State 5.9 ppm | Clear 60$^{o}$F |
| 1/18/2022 | 8:00 | Outside GWTP Office | 3256 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Clear 37$^{o}$F |
| 1/18/2022 | 8:00 | Downwind | 3256 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Clear 37$^{o}$F |
| 1/18/2022 | 8:00 | Stripper | 3256 ACFM | MiniRAE 3000 | Kennie Moore | Max. 22.6 ppm Steady State 6.3 ppm | Clear 37$^{o}$F |
| 1/18/2022 | 14:00 | Outside GWTP Office | 3073 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Clear 66$^{o}$F |
| 1/18/2022 | 14:00 | Downwind | 3073 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Clear 66$^{o}$F |
| 1/18/2022 | 14:00 | Stripper | 3073 ACFM | MiniRAE 3000 | Kennie Moore | Max. 21.7 ppm Steady State 5.6 ppm | Clear 66$^{o}$F |
| 1/20/2022 | 8:00 | Outside GWTP Office | 3163 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Clear 34$^{o}$F |
| 1/20/2022 | 8:00 | Downwind | 3163 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Clear 34$^{o}$F |
| 1/20/2022 | 8:00 | Stripper | 3163 ACFM | MiniRAE 3000 | Kennie Moore | Max. 22.3 ppm Steady State 6.9 ppm | Clear 34$^{o}$F |
| 1/20/2022 | 12:00 | Outside GWTP Office | 3090 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Clear 37$^{o}$F |
| 1/20/2022 | 12:00 | Downwind | 3090 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Clear 37$^{o}$F |
| 1/20/2022 | 12:00 | Stripper | 3090 ACFM | MiniRAE 3000 | Kennie Moore | Max. 21.1 ppm Steady State 5.3 ppm | Clear 37$^{o}$F |
| 1/24/2022 | 8:00 | Outside GWTP Office | 3217 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | Cloudy 38$^{o}$F |

**Appendix G Table 3. PID Readings - 1st Quarter 2022**
**Longhorn Army Ammunition Plant**
**Groundwater Treatment Plant**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1/24/2022 | 8:00 | Downwind | 3217 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Cloudy 38°F |
| 1/24/2022 | 8:00 | Stripper | 3217 ACFM | MiniRAE 3000 | Kennie Moore | Max. 23.8 ppm | Steady State 7.1 ppm | Cloudy 38°F |
| 2/1/2022 | 8:00 | Outside GWTP Office | 3245 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Cloudy 57°F |
| 2/1/2022 | 8:00 | Downwind | 3245 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Cloudy 57°F |
| 2/1/2022 | 8:00 | Stripper | 3245 ACFM | MiniRAE 3000 | Kennie Moore | Max. 22.3 ppm | Steady State 5.9 ppm | Cloudy 57°F |
| 2/1/2022 | 14:00 | Outside GWTP Office | 3035 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Cloudy 69°F |
| 2/1/2022 | 14:00 | Downwind | 3035 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Cloudy 69°F |
| 2/1/2022 | 14:00 | Stripper | 3035 ACFM | MiniRAE 3000 | Kennie Moore | Max. 24.1 ppm | Steady State 7.3 ppm | Cloudy 69°F |
| 2/3/2022 | 8:00 | Outside GWTP Office | 3245 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Rain 35°F |
| 2/3/2022 | 8:00 | Downwind | 3245 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Rain 35°F |
| 2/3/2022 | 8:00 | Stripper | 3245 ACFM | MiniRAE 3000 | Kennie Moore | Max. 23.3 ppm | Steady State 6.7 ppm | Rain 35°F |
| 2/9/2022 | 8:00 | Outside GWTP Office | 3364 ACFM | MiniRAE 3000 | Scott Beesinger | 0.0 ppm | | Clear 37°F |
| 2/9/2022 | 8:00 | Downwind | 3364 ACFM | MiniRAE 3000 | Scott Beesinger | 0.0 ppm | | Clear 37°F |
| 2/9/2022 | 8:00 | Stripper | 3364 ACFM | MiniRAE 3000 | Scott Beesinger | Max. 23.3 ppm | Steady State 6.5 ppm | Clear 37°F |
| 2/9/2022 | 14:00 | Outside GWTP Office | 3071 ACFM | MiniRAE 3000 | Scott Beesinger | 0.0 ppm | | Clear 66°F |
| 2/9/2022 | 14:00 | Downwind | 3071 ACFM | MiniRAE 3000 | Scott Beesinger | 0.0 ppm | | Clear 66°F |
| 2/9/2022 | 14:00 | Stripper | 3071 ACFM | MiniRAE 3000 | Scott Beesinger | Max. 21.2 ppm | Steady State 5.4 ppm | Clear 66°F |
| 2/14/2022 | 8:00 | Outside GWTP Office | 3263 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 41°F |
| 2/14/2022 | 8:00 | Downwind | 3263 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 41°F |
| 2/14/2022 | 8:00 | Stripper | 3263 ACFM | MiniRAE 3000 | Kennie Moore | Max. 22.3 ppm | Steady State 6.4 ppm | Clear 41°F |
| 2/14/2022 | 13:00 | Outside GWTP Office | 3048 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 67°F |
| 2/14/2022 | 13:00 | Downwind | 3048 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 67°F |
| 2/14/2022 | 13:00 | Stripper | 3048 ACFM | MiniRAE 3000 | Kennie Moore | Max. 21.6 ppm | Steady State 5.7 ppm | Clear 67°F |
| 2/17/2022 | 8:00 | Outside GWTP Office | 3223 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Rain 67°F |
| 2/17/2022 | 8:00 | Downwind | 3223 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Rain 67°F |
| 2/17/2022 | 8:00 | Stripper | 3223 ACFM | MiniRAE 3000 | Kennie Moore | Max. 23.1 ppm | Steady State 6.7 ppm | Rain 67°F |
| 2/17/2022 | 12:00 | Outside GWTP Office | 3072 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Rain 62°F |
| 2/17/2022 | 12:00 | Downwind | 3072 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Rain 62°F |
| 2/17/2022 | 12:00 | Stripper | 3072 ACFM | MiniRAE 3000 | Kennie Moore | Max. 22.3 ppm | Steady State 5.3 ppm | Rain 62°F |
| 2/22/2022 | 8:00 | Outside GWTP Office | 3263 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Cloudy 73°F |
| 2/22/2022 | 8:00 | Downwind | 3263 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Cloudy 73°F |
| 2/22/2022 | 8:00 | Stripper | 3263 ACFM | MiniRAE 3000 | Kennie Moore | Max. 22.6 ppm | Steady State 6.3 ppm | Cloudy 73°F |
| 2/22/2022 | 14:00 | Outside GWTP Office | 3049 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Cloudy 68°F |
| 2/22/2022 | 14:00 | Downwind | 3049 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Cloudy 68°F |
| 2/22/2022 | 14:00 | Stripper | 3049 ACFM | MiniRAE 3000 | Kennie Moore | Max. 21.4 ppm | Steady State 5.6 ppm | Cloudy 68°F |
| 2/24/2022 | 8:00 | Outside GWTP Office | 3156 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Rain 36°F |
| 2/24/2022 | 8:00 | Downwind | 3156 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Rain 36°F |

**Appendix G Table 3. PID Readings - 1st Quarter 2022**
**Longhorn Army Ammunition Plant**
**Groundwater Treatment Plant**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2/24/2022 | 8:00 | Stripper | 3156 ACFM | MiniRAE 3000 | Kennie Moore | Max. 22.6 ppm | Steady State 6.1 ppm | Rain 36°F |
| 2/28/2022 | 8:00 | Outside GWTP Office | 3263 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 28°F |
| 2/28/2022 | 8:00 | Downwind | 3263 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 28°F |
| 2/28/2022 | 8:00 | Stripper | 3263 ACFM | MiniRAE 3000 | Kennie Moore | Max. 22.9 ppm | Steady State 6.7 ppm | Clear 28°F |
| 2/28/2022 | 12:00 | Outside GWTP Office | 3049 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 59°F |
| 2/28/2022 | 12:00 | Downwind | 3049 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 59°F |
| 2/28/2022 | 12:00 | Stripper | 3049 ACFM | MiniRAE 3000 | Kennie Moore | Max. 21.7 ppm | Steady State 5.3 ppm | Clear 59°F |
| 3/3/2022 | 14:00 | Outside GWTP Office | 3246 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 77°F |
| 3/3/2022 | 14:00 | Downwind | 3246 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 77°F |
| 3/3/2022 | 14:00 | Stripper | 3246 ACFM | MiniRAE 3000 | Kennie Moore | Max. 22.3 ppm | Steady State 6.1 ppm | Clear 77°F |
| 3/7/2022 | 8:00 | Outside GWTP Office | 3165 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Cloudy 44°F |
| 3/7/2022 | 8:00 | Downwind | 3165 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Cloudy 44°F |
| 3/7/2022 | 8:00 | Stripper | 3165 ACFM | MiniRAE 3000 | Kennie Moore | Max. 22.6 ppm | Steady State 6.1 ppm | Cloudy 44°F |
| 3/7/2022 | 14:00 | Outside GWTP Office | 3077 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Cloudy 49°F |
| 3/7/2022 | 14:00 | Downwind | 3077 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Cloudy 49°F |
| 3/7/2022 | 14:00 | Stripper | 3077 ACFM | MiniRAE 3000 | Kennie Moore | Max. 23.9 ppm | Steady State 7.0 ppm | Cloudy 49°F |
| 3/11/2022 | 8:00 | Outside GWTP Office | 3161 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Rain 42°F |
| 3/11/2022 | 8:00 | Downwind | 3161 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Rain 42°F |
| 3/11/2022 | 8:00 | Stripper | 3161 ACFM | MiniRAE 3000 | Kennie Moore | Max. 22.1 ppm | Steady State 6.3 ppm | Rain 42°F |
| 3/11/2022 | 10:00 | Outside GWTP Office | 3010 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Rain 50°F |
| 3/11/2022 | 10:00 | Downwind | 3010 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Rain 50°F |
| 3/11/2022 | 10:00 | Stripper | 3010 ACFM | MiniRAE 3000 | Kennie Moore | Max. 21.3 ppm | Steady State 5.4 ppm | Rain 50°F |
| 3/14/2022 | 8:00 | Outside GWTP Office | 3198 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Cloudy 51°F |
| 3/14/2022 | 8:00 | Downwind | 3198 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Cloudy 51°F |
| 3/14/2022 | 8:00 | Stripper | 3198 ACFM | MiniRAE 3000 | Kennie Moore | Max. 21.5 ppm | Steady State 5.9 ppm | Cloudy 51°F |
| 3/14/2022 | 14:00 | Outside GWTP Office | 3071 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Cloudy 67°F |
| 3/14/2022 | 14:00 | Downwind | 3071 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Cloudy 67°F |
| 3/14/2022 | 14:00 | Stripper | 3071 ACFM | MiniRAE 3000 | Kennie Moore | Max. 23.6 ppm | Steady State 6.7 ppm | Cloudy 67°F |
| 3/17/2022 | 14:00 | Outside GWTP Office | 3090 ACFM | MiniRAE 3000 | Scott Beesinger | 0.0 ppm | | Clear 76°F |
| 3/17/2022 | 14:00 | Downwind | 3090 ACFM | MiniRAE 3000 | Scott Beesinger | 0.0 ppm | | Clear 76°F |
| 3/17/2022 | 14:00 | Stripper | 3090 ACFM | MiniRAE 3000 | Scott Beesinger | Max. 24.1 ppm | Steady State 7.1 ppm | Clear 76°F |
| 3/21/2022 | 8:00 | Outside GWTP Office | 3171 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Cloudy 58°F |
| 3/21/2022 | 8:00 | Downwind | 3171 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Cloudy 58°F |
| 3/21/2022 | 8:00 | Stripper | 3171 ACFM | MiniRAE 3000 | Kennie Moore | Max. 21.9 ppm | Steady State 5.5 ppm | Cloudy 58°F |
| 3/21/2022 | 14:00 | Outside GWTP Office | 3045 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Rain 63°F |
| 3/21/2022 | 14:00 | Downwind | 3045 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Rain 63°F |
| 3/21/2022 | 14:00 | Stripper | 3045 ACFM | MiniRAE 3000 | Kennie Moore | Max. 23.0 ppm | Steady State 5.9 ppm | Rain 63°F |

**Appendix G Table 3. PID Readings - 1st Quarter 2022**
**Longhorn Army Ammunition Plant**
**Groundwater Treatment Plant**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3/24/2022 | 8:00 | Outside GWTP Office | 3177 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 38°F |
| 3/24/2022 | 8:00 | Downwind | 3177 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 38°F |
| 3/24/2022 | 8:00 | Stripper | 3177 ACFM | MiniRAE 3000 | Kennie Moore | Max. 20.3 ppm | Steady State 5.0 ppm | Clear 38°F |
| 3/24/2022 | 11:00 | Outside GWTP Office | 3084 ACFM | MiniRAE 3000 | Scott Beesinger | 0.0 ppm | | Clear 55°F |
| 3/24/2022 | 11:00 | Downwind | 3084 ACFM | MiniRAE 3000 | Scott Beesinger | 0.0 ppm | | Clear 55°F |
| 3/24/2022 | 11:00 | Stripper | 3084 ACFM | MiniRAE 3000 | Scott Beesinger | Max. 22.7 ppm | Steady State 5.6 ppm | Clear 55°F |
| 3/28/2022 | 8:00 | Outside GWTP Office | 3197 ACFM | MiniRAE 3000 | Scott Beesinger | 0.0 ppm | | Cloudy 56°F |
| 3/28/2022 | 8:00 | Downwind | 3197 ACFM | MiniRAE 3000 | Scott Beesinger | 0.0 ppm | | Cloudy 56°F |
| 3/28/2022 | 8:00 | Stripper | 3197 ACFM | MiniRAE 3000 | Scott Beesinger | Max. 22.1 ppm | Steady State 6.1 ppm | Cloudy 56°F |
| 3/28/2022 | 14:00 | Outside GWTP Office | 2910 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 78°F |
| 3/28/2022 | 14:00 | Downwind | 2910 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Rain 63°F |
| 3/28/2022 | 14:00 | Stripper | 2910 ACFM | MiniRAE 3000 | Kennie Moore | Max. 24.4 ppm | Steady State 7.3 ppm | Rain 63°F |
| 3/31/2022 | 8:00 | Outside GWTP Office | 3063 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 42°F |
| 3/31/2022 | 8:00 | Downwind | 3063 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 42°F |
| 3/31/2022 | 8:00 | Stripper | 3063 ACFM | MiniRAE 3000 | Kennie Moore | Max. 21.9 ppm | Steady State 6.2 ppm | Clear 42°F |
| 3/31/2022 | 10:00 | Outside GWTP Office | 2861 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 55°F |
| 3/31/2022 | 10:00 | Downwind | 2861 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 55°F |
| 3/31/2022 | 10:00 | Stripper | 2861 ACFM | MiniRAE 3000 | Kennie Moore | Max. 20.4 ppm | Steady State 5.1 ppm | Clear 55°F |
| 4/4/2022 | 8:00 | Outside GWTP Office | 3021 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 52°F |
| 4/4/2022 | 8:00 | Downwind | 3021 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 52°F |
| 4/4/2022 | 8:00 | Stripper | 3021 ACFM | MiniRAE 3000 | Kennie Moore | Max. 22.8 ppm | Steady State 6.7 ppm | Clear 52°F |
| 4/4/2022 | 12:00 | Outside GWTP Office | 2869 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 76°F |
| 4/4/2022 | 12:00 | Downwind | 2869 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 76°F |
| 4/4/2022 | 12:00 | Stripper | 2861 ACFM | MiniRAE 3000 | Kennie Moore | Max. 21.3 ppm | Steady State 5.6 ppm | Clear 76°F |
| 4/7/2022 | 8:00 | Outside GWTP Office | 3065 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 55°F |
| 4/7/2022 | 8:00 | Downwind | 3065 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 55°F |
| 4/7/2022 | 8:00 | Stripper | 3065 ACFM | MiniRAE 3000 | Kennie Moore | Max. 23.6 ppm | Steady State 6.6 ppm | Clear 55°F |
| 4/7/2022 | 10:00 | Outside GWTP Office | 2896 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 59°F |
| 4/7/2022 | 10:00 | Downwind | 2896 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 59°F |
| 4/7/2022 | 10:00 | Stripper | 2896 ACFM | MiniRAE 3000 | Kennie Moore | Max. 22.1 ppm | Steady State 5.4 ppm | Clear 59°F |
| 4/11/2022 | 8:00 | Outside GWTP Office | 3063 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 67°F |
| 4/11/2022 | 8:00 | Downwind | 3063 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 67°F |
| 4/11/2022 | 8:00 | Stripper | 3063 ACFM | MiniRAE 3000 | Kennie Moore | Max. 22.7 ppm | Steady State 6.3 ppm | Clear 67°F |
| 4/11/2022 | 13:00 | Outside GWTP Office | 2869 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 82°F |

**Appendix G Table 3. PID Readings - 1st Quarter 2022**
**Longhorn Army Ammunition Plant**
**Groundwater Treatment Plant**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4/11/2022 | 13:00 | Downwind | 2869 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 82°F |
| 4/11/2022 | 13:00 | Stripper | 2869 ACFM | MiniRAE 3000 | Kennie Moore | Max. 21.1 ppm | Steady State 5.4 ppm | Clear 82°F |
| 4/14/2022 | 8:00 | Outside GWTP Office | 3192 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 57°F |
| 4/14/2022 | 8:00 | Downwind | 3192 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 57°F |
| 4/14/2022 | 8:00 | Stripper | 3192 ACFM | MiniRAE 3000 | Kennie Moore | Max. 23.3 ppm | Steady State 6.5 ppm | Clear 57°F |
| 4/14/2022 | 10:00 | Outside GWTP Office | 3057 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 64°F |
| 4/14/2022 | 10:00 | Downwind | 3057 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 64°F |
| 4/14/2022 | 10:00 | Stripper | 3057 ACFM | MiniRAE 3000 | Kennie Moore | Max. 21.7 ppm | Steady State 5.2 ppm | Clear 64°F |
| 4/18/2022 | 11:00 | Outside GWTP Office | 3157 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 60°F |
| 4/18/2022 | 11:00 | Downwind | 3157 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 60°F |
| 4/18/2022 | 11:00 | Stripper | 3157 ACFM | MiniRAE 3000 | Kennie Moore | Max. 23.1 ppm | Steady State 5.9 ppm | Clear 60°F |
| 4/18/2022 | 15:00 | Outside GWTP Office | 2949 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 72°F |
| 4/18/2022 | 15:00 | Downwind | 2949 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 72°F |
| 4/18/2022 | 15:00 | Stripper | 2949 ACFM | MiniRAE 3000 | Kennie Moore | Max. 21.6 ppm | Steady State 5.2 ppm | Clear 72°F |
| 4/21/2022 | 8:00 | Outside GWTP Office | 3072 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 72°F |
| 4/21/2022 | 8:00 | Downwind | 3072 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 72°F |
| 4/21/2022 | 8:00 | Stripper | 3072 ACFM | MiniRAE 3000 | Kennie Moore | Max. 24.7 ppm | Steady State 7.2 ppm | Clear 72°F |
| 4/21/2022 | 10:00 | Outside GWTP Office | 2866 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 73°F |
| 4/21/2022 | 10:00 | Downwind | 2866 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 73°F |
| 4/21/2022 | 10:00 | Stripper | 2866 ACFM | MiniRAE 3000 | Kennie Moore | Max. 23.1 ppm | Steady State 6.2 ppm | Clear 73°F |
| 4/25/2022 | 8:00 | Outside GWTP Office | 3074 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Rain 65°F |
| 4/25/2022 | 8:00 | Downwind | 3074 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Rain 65°F |
| 4/25/2022 | 8:00 | Stripper | 3074 ACFM | MiniRAE 3000 | Kennie Moore | Max. 22.9 ppm | Steady State 5.9 ppm | Rain 65°F |
| 4/25/2022 | 14:00 | Outside GWTP Office | 2800 ACFM | MiniRAE 3000 | Scott Beesinger | 0.0 ppm | | Cloudy 68°F |
| 4/25/2022 | 14:00 | Downwind | 2800 ACFM | MiniRAE 3000 | Scott Beesinger | 0.0 ppm | | Cloudy 68°F |
| 4/25/2022 | 14:00 | Stripper | 2800 ACFM | MiniRAE 3000 | Scott Beesinger | Max. 24.2 ppm | Steady State 6.7 ppm | Cloudy 68°F |
| 4/28/2022 | 8:00 | Outside GWTP Office | 3067 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 60°F |
| 4/28/2022 | 8:00 | Downwind | 3067 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 60°F |
| 4/28/2022 | 8:00 | Stripper | 3067 ACFM | MiniRAE 3000 | Kennie Moore | Max. 22.2 ppm | Steady State 5.5 ppm | Clear 60°F |
| 4/28/2022 | 12:00 | Outside GWTP Office | 2808 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 76°F |
| 4/28/2022 | 12:00 | Downwind | 2808 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Clear 76°F |
| 4/28/2022 | 12:00 | Stripper | 2808 ACFM | MiniRAE 3000 | Kennie Moore | Max. 23.4 ppm | Steady State 5.9 ppm | Clear 76°F |
| 5/2/2022 | 8:00 | Outside GWTP Office | 3074 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Rain 65°F |
| 5/2/2022 | 8:00 | Downwind | 3074 ACFM | MiniRAE 3000 | Kennie Moore | 0.0 ppm | | Rain 65°F |
| 5/2/2022 | 8:00 | Stripper | 3074 ACFM | MiniRAE 3000 | Kennie Moore | Max. 22.9 ppm | Steady State 5.9 ppm | Rain 65°F |
| 5/2/2022 | 14:00 | Outside GWTP Office | 2800 ACFM | MiniRAE 3000 | Scott Beesinger | 0.0 ppm | | Cloudy 68°F |
| 5/2/2022 | 14:00 | Downwind | 2800 ACFM | MiniRAE 3000 | Scott Beesinger | 0.0 ppm | | Cloudy 68°F |
| 5/2/2022 | 14:00 | Stripper | 2800 ACFM | MiniRAE 3000 | Scott Beesinger | Max. 24.2 ppm | Steady State 6.7 ppm | Cloudy 68°F |

# EQUIPMENT CALIBRATION DAILY LOG

Date: 1/5/22

Project Number: NW01312.0150

Project Name: LHAAP-GWTP

Recorded By: Scott Baessinger

## PID

Model: Mini RAE 3000

Bulb: ~~10.6 mev~~ 11.8

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | | | | | Time: 0620 | Time: | Time: |
| | | | | | Initials: SB | Initials: | Initials: |
| First Point Calibration | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: TO ZERO SB | Value: | Value: |
| Second Point Calibration | Vapor conc. (ppm) | 100 ppm (isobutylene) | 11/12/22 | SBH-250-100-20 | Value: SB | Value: | Value: |

## COMB. GAS/$O_2$ METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| First Point Calibration | O2 (%) | | | | Value: | Value: | Value: |
| | % LEL Pentane | | | | Value: | Value: | Value: |

## WATER QUALITY METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| First Point Calibration (Auto) | pH | 4.00 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 4.49 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 0 | | | Value: | Value: | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 6.86 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |
| Third Point Calibration | pH | 9.18 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |

Additional Remarks:

# EQUIPMENT CALIBRATION DAILY LOG

Date: 1/6/22

Project Number: NW01312.0150

Project Name: LHAAP-GWTP

Recorded By: Scott Beasinger

## PID

Model: Mini RAE 3000

Equipment ID #:

Bulb: ~~10.6~~ 11.8 mev

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: 0630 | Time: | Time: |
| | | | | | Initials: SB | Initials: | Initials: |
| | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: TO ZERO SB | Value: | Value: |
| Second Point Calibration | Vapor conc. (ppm) | 100 ppm (isobutylene) | 11/12/22 | JBH-250-100-20 | Value: SB | Value: | Value: |

## COMB. GAS/$O_2$ METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | O2 (%) | | | | Value: | Value: | Value: |
| | % LEL Pentane | | | | Value: | Value: | Value: |

## WATER QUALITY METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration (Auto) | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | pH | 4.00 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 4.49 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 0 | | | Value: | Value: | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 6.86 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |
| Third Point Calibration | pH | 9.18 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |

Additional Remarks:

# EQUIPMENT CALIBRATION DAILY LOG

Date: 11/10/22

Project Number: NW01312.0150

Project Name: LHAAP-GWTP

Recorded By: Scott Baggsinger

## PID

Model: Mini RAE 3000

Equipment ID #:

Bulb: ~~10.6~~ 11.8 mev

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: 0640 | Time: | Time: |
| | | | | | Initials: SB | Initials: | Initials: |
| | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: TO ZERO SB | Value: | Value: |
| Second Point Calibration | Vapor conc. (ppm) | 100 ppm (isobutylene) | 11/12/22 | SBH-250-100-20 | Value: SB | Value: | Value: |

## COMB. GAS/$O_2$ METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | O2 (%) | | | | Value: | Value: | Value: |
| | % LEL Pentane | | | | Value: | Value: | Value: |

## WATER QUALITY METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration (Auto) | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | pH | 4.00 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 4.49 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 0 | | | Value: | Value: | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 6.86 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |
| Third Point Calibration | pH | 9.18 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |

Additional Remarks:

# EQUIPMENT CALIBRATION DAILY LOG

Date: 1/13/20

Project Number: NW01312.0150

Project Name: LHAAP-GWTP

Recorded By: Scott Baggsinger

## PID

Model: Mini RAE 3000

Equipment ID #:

Bulb: 10.6 mev 11-8

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Time: 0625<br>Initials: SB<br>Value: TO ZERO SB | Time:<br>Initials:<br>Value: | Time:<br>Initials:<br>Value: |
| Second Point Calibration | Vapor conc. (ppm) | 100 ppm (isobutylene) | 11/12/22 | SBH-250-100-20 | Value: SB | Value: | Value: |

## COMB. GAS/$O_2$ METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | O2 (%) | | | | Time:<br>Initials:<br>Value: | Time:<br>Initials:<br>Value: | Time:<br>Initials:<br>Value: |
| | % LEL Pentane | | | | Value: | Value: | Value: |

## WATER QUALITY METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration (Auto) | pH | 4.00 | | | Time:<br>Initials:<br>Value: | Time:<br>Initials:<br>Value: | Time:<br>Initials:<br>Value: |
| | Conductivity (mS/cm) | 4.49 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 0 | | | Value: | Value: | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 6.86 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |
| Third Point Calibration | pH | 9.18 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |

Additional Remarks:

# EQUIPMENT CALIBRATION DAILY LOG

Date: 11/18/22

Project Number: NW01312.0150

Project Name: LHAAP-GWTP

Recorded By: Scott Baggsinger

## PID

Model: Mini Rae 3000

Equipment ID #:

Bulb: 10.6 mev 11.8

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: 0615 | Time: | Time: |
| | | | | | Initials: SB | Initials: | Initials: |
| | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: TO ZERO SB | Value: | Value: |
| Second Point Calibration | Vapor conc. (ppm) | 100 ppm (isobutylene) | 11/12/22 | SBH-250-100-20 | Value: SB | Value: | Value: |

## COMB. GAS/$O_2$ METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | O2 (%) | | | | Value: | Value: | Value: |
| | % LEL Pentane | | | | Value: | Value: | Value: |

## WATER QUALITY METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration (Auto) | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | pH | 4.00 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 4.49 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 0 | | | Value: | Value: | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 9.86 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |
| Third Point Calibration | pH | 9.18 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |

Additional Remarks:

01118224

# EQUIPMENT CALIBRATION DAILY LOG

Date: 11/20/22

Project Number: NW01312.0150

Project Name: LHAAP-GWTP

Recorded By: Scott Baessinger

## PID

Model: Mini RAE 3000

Equipment ID #:

Bulb: 10.6 eV 11.8

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: 0645 | Time: | Time: |
| | | | | | Initials: SB | Initials: | Initials: |
| | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: TO ZERO SB | Value: | Value: |
| Second Point Calibration | Vapor conc. (ppm) | 100 ppm (isobutylene) | 11/12/22 | SBH-250-100-20 | Value: SB | Value: | Value: |

## COMB. GAS/$O_2$ METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | O2 (%) | | | | Value: | Value: | Value: |
| | % LEL Pentane | | | | Value: | Value: | Value: |

## WATER QUALITY METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration (Auto) | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | pH | 4.00 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 4.49 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 0 | | | Value: | Value: | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 6.86 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |
| Third Point Calibration | pH | 9.18 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |

Additional Remarks:

01118225

# EQUIPMENT CALIBRATION DAILY LOG

Date: 1/24/22

Project Number: NW01312.0150

Project Name: LHAAP-GWTP

Recorded By: Scott Baggsinger

| PID | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| Equipment ID #: | | | | | | | |
| Model: mini RAE 3000 | | | | | | | |
| Bulb: 10.6 mev 11.8 | | | | | | | |
| First Point Calibration | | | | | Time: 0630 | Time: | Time: |
| | | | | | Initials: SB | Initials: | Initials: |
| | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: TO ZERO SB | Value: | Value: |
| Second Point Calibration | Vapor conc. (ppm) | 100 ppm (isobutylene) | 11/12/22 | JBH-250-100-20 | Value: SB | Value: | Value: |

| COMB. GAS/$O_2$ METER | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| Equipment ID #: | | | | | | | |
| Model: | | | | | | | |
| First Point Calibration | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | O2 (%) | | | | Value: | Value: | Value: |
| | % LEL Pentane | | | | Value: | Value: | Value: |

| WATER QUALITY METER | Parameter | Standard | Exp. Date | Lot# | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| Equipment ID #: | | | | | | | |
| Model: | | | | | | | |
| First Point Calibration (Auto) | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | pH | 4.00 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 4.49 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 0 | | | Value: | Value: | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 6.86 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |
| Third Point Calibration | pH | 9.18 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |

Additional Remarks:

# EQUIPMENT CALIBRATION DAILY LOG

Date: 2/1/22

Project Number: NW01312.0150

Project Name: LHAAP-GWTP

Recorded By: Scott Baessinger

## PID

Model: Mini Rae 3000

Bulb: ~~10.6 mev~~ 11.8

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: 0620 | Time: | Time: |
| | | | | | Initials: SB | Initials: | Initials: |
| | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: TO ZERO SB | Value: | Value: |
| Second Point Calibration | Vapor conc. (ppm) | 100 ppm (isobutylene) | 11/12/22 | JBH-250-100-20 | Value: SB | Value: | Value: |

## COMB. GAS/$O_2$ METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | O2 (%) | | | | Value: | Value: | Value: |
| | % LEL Pentane | | | | Value: | Value: | Value: |

## WATER QUALITY METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| First Point Calibration (Auto) | pH | 4.00 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 4.49 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 0 | | | Value: | Value: | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 6.86 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |
| Third Point Calibration | pH | 9.18 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |

Additional Remarks:

# EQUIPMENT CALIBRATION DAILY LOG

Date: 2/3/22

Project Number: NW01312.0150

Project Name: LHAAP-GWTP

Recorded By: Scott Baggsinger

## PID

Model: mini RAE 3000

Equipment ID #:

Bulb: ~~10.6~~ 11.8 mev

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: 0615 | Time: | Time: |
| | | | | | Initials: SB | Initials: | Initials: |
| | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: TO ZERO SB | Value: | Value: |
| Second Point Calibration | Vapor conc. (ppm) | 100 ppm (isobutylene) | 11/12/22 | JBH-250-100-20 | Value: SB | Value: | Value: |

## COMB. GAS/$O_2$ METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | $O_2$ (%) | | | | Value: | Value: | Value: |
| | % LEL Pentane | | | | Value: | Value: | Value: |

## WATER QUALITY METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration (Auto) | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | pH | 4.00 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 4.49 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 0 | | | Value: | Value: | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 6.86 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |
| Third Point Calibration | pH | 9.18 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |

Additional Remarks:

# EQUIPMENT CALIBRATION DAILY LOG

Date: 2/9/22

Project Number: NW01312.0150

Project Name: LHAAP-GWTP

Recorded By: Scott Bassinger

## PID

Model: Mini RAE 3000

Bulb: 10.6 eV 11.8

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: 0630 | Time: | Time: |
| | | | | | Initials: SB | Initials: | Initials: |
| | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: TO ZERO SB | Value: | Value: |
| Second Point Calibration | Vapor conc. (ppm) | 100 ppm (Isobutylene) | 11/12/22 | JBH-250-100-20 | Value: SB | Value: | Value: |

## COMB. GAS/$O_2$ METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | O2 (%) | | | | Value: | Value: | Value: |
| | % LEL Pentane | | | | Value: | Value: | Value: |

## WATER QUALITY METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration (Auto) | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | pH | 4.00 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 4.49 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 0 | | | Value: | Value: | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 6.86 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |
| Third Point Calibration | pH | 9.18 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |

Additional Remarks:

01118229

# EQUIPMENT CALIBRATION DAILY LOG

Date: 2/14/22

Project Number: NW01312.0150

Project Name: LHAAP - GWTP

Recorded By: Kennie Moore

| | | | | | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| PID | Model: Mini Rae 3000 | | Bulb: ~~10.6~~ meV 11.8 | | | | |
| | Equipment ID #: | | | | | | |
| | Parameter | Standard | Exp. Date | Lot# | Time: 0635 | Time: | Time: |
| First Point Calibration | | | | | Initials: KM | Initials: K | Initials: |
| | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: To Zero KM | Value: | Value: |
| Second Point Calibration | Vapor conc. (ppm) | 100 ppm (isobutylene) | 11/12/22 | JBH-250-100-20 | Value: KM | Value: | Value: |

| | | | | | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| COMB. GAS/$O_2$ METER | Model: | | | | | | |
| | Equipment ID #: | | | | | | |
| | Parameter | Standard | Exp. Date | Lot# | Time: | Time: | Time: |
| First Point Calibration | | | | | Initials: | Initials: | Initials: |
| | O2 (%) | | | | Value: | Value: | Value: |
| | % LEL Pentane | | | | Value: | Value: | Value: |

| | | | | | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| WATER QUALITY METER | Model: | | | | | | |
| | Equipment ID #: | | | | | | |
| | Parameter | Standard | Exp. Date | Lot# | Time: | Time: | Time: |
| First Point Calibration (Auto) | | | | | Initials: | Initials: | Initials: |
| | pH | 4.00 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 4.49 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 0 | | | Value: | Value: | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 6.86 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |
| Third Point Calibration | pH | 9.18 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |

Additional Remarks:

# EQUIPMENT CALIBRATION DAILY LOG

Date: 2/17/22

Project Number: NW01312.0150

Project Name: LHAAP - GWTP

Recorded By: Kennie Moore

## PID

Model: Mini Rae 3000

Equipment ID #:

Bulb: ~~10.6~~ meV 11.8

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Time: 0640<br>Initials: KM<br>Value: To Zero KM | Time:<br>Initials: K<br>Value: | Time:<br>Initials:<br>Value: |
| Second Point Calibration | Vapor conc. (ppm) | 100 ppm (isobutylene) | 11/12/22 | JBH-250-100-20 | Value: KM | Value: | Value: |

## COMB. GAS/$O_2$ METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | O2 (%) | | | | Time:<br>Initials:<br>Value: | Time:<br>Initials:<br>Value: | Time:<br>Initials:<br>Value: |
| | % LEL Pentane | | | | Value: | Value: | Value: |

## WATER QUALITY METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration (Auto) | pH | 4.00 | | | Time:<br>Initials:<br>Value: | Time:<br>Initials:<br>Value: | Time:<br>Initials:<br>Value: |
| | Conductivity (mS/cm) | 4.49 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 0 | | | Value: | Value: | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 6.86 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |
| Third Point Calibration | pH | 9.18 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |

Additional Remarks:

# EQUIPMENT CALIBRATION DAILY LOG

Date: 2/22/22

Project Number: NWO 1312.0150

Project Name: LHAAP - GWTP

Recorded By: Kennie Moore

## PID

Model: MiniRae 3000

Equipment ID #:

Bulb: ~~10.6~~ mev 11.8

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: 0625 | Time: | Time: |
| | | | | | Initials: KM | Initials: K | Initials: |
| | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: To Zero KM | Value: | Value: |
| Second Point Calibration | Vapor conc. (ppm) | 100 ppm (isobutylene) | 11/12/22 | JBH-250-100-20 | Value: KM | Value: | Value: |

## COMB. GAS/$O_2$ METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | O2 (%) | | | | Value: | Value: | Value: |
| | % LEL Pentane | | | | Value: | Value: | Value: |

## WATER QUALITY METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| First Point Calibration (Auto) | pH | 4.06 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 4.49 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 0 | | | Value: | Value: | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 6.86 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |
| Third Point Calibration | pH | 9.18 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |

Additional Remarks:

01118232

# EQUIPMENT CALIBRATION DAILY LOG

Date: 2/24/22

Project Number: NW01312.0150

Project Name: LHAAP - GWTP

Recorded By: Kennie Moore

| PID | | | | | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| Model: Mini Rae 3000 | | Bulb: ~~10.6~~ eV 11.8 | | | | | |
| Equipment ID #: | | | | | | | |
| | Parameter | Standard | Exp. Date | Lot# | Time: 0635 | Time: | Time: |
| First Point Calibration | | | | | Initials: KM | Initials: K | Initials: |
| | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: To Zero KM | Value: | Value: |
| Second Point Calibration | Vapor conc. (ppm) | 100 ppm (isobutylene) | 11/12/22 | JBH-250-100-20 | Value: KM | Value: | Value: |

| COMB. GAS/$O_2$ METER | | | | | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| Model: | | | | | | | |
| Equipment ID #: | | | | | | | |
| | Parameter | Standard | Exp. Date | Lot# | Time: | Time: | Time: |
| First Point Calibration | | | | | Initials: | Initials: | Initials: |
| | O2 (%) | | | | Value: | Value: | Value: |
| | % LEL Pentane | | | | Value: | Value: | Value: |

| WATER QUALITY METER | | | | | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| Model: | | | | | | | |
| Equipment ID #: | | | | | | | |
| | Parameter | Standard | Exp. Date | Lot# | Time: | Time: | Time: |
| First Point Calibration (Auto) | | | | | Initials: | Initials: | Initials: |
| | pH | 4.06 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 4.49 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 0 | | | Value: | Value: | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 6.86 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |
| Third Point Calibration | pH | 9.18 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |

Additional Remarks:

# EQUIPMENT CALIBRATION DAILY LOG

Date: 2/28/22

Project Number: NW01312.0150

Project Name: LHAAP - GWTP

Recorded By: Kennie Moore

## PID

Model: Mini Rae 3000

Bulb: ~~10.6~~ meV 11.8

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | | | | | Time: 0625 | Time: | Time: |
| | | | | | Initials: KM | Initials: K | Initials: |
| First Point Calibration | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: To Zero KM | Value: | Value: |
| Second Point Calibration | Vapor conc. (ppm) | 100 ppm (isobutylene) | 11/12/22 | JBH-250-100-20 | Value: KM | Value: | Value: |

## COMB. GAS/$O_2$ METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| First Point Calibration | O2 (%) | | | | Value: | Value: | Value: |
| | % LEL Pentane | | | | Value: | Value: | Value: |

## WATER QUALITY METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| First Point Calibration (Auto) | pH | 4.00 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 4.49 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 0 | | | Value: | Value: | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 6.86 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |
| Third Point Calibration | pH | 9.18 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |

Additional Remarks:

01118234

# EQUIPMENT CALIBRATION DAILY LOG

Date: 3/3/22

Project Number: NW01312.0150

Project Name: LHAAP - GWTP

Recorded By: Kennie Moore

## PID

Model: Mini Rae 3000

Equipment ID #:

Bulb: ~~10.6~~ meV 11.8

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Time: 0645<br>Initials: KM<br>Value: To Zero KM | Time:<br>Initials: K<br>Value: | Time:<br>Initials:<br>Value: |
| Second Point Calibration | Vapor conc. (ppm) | 100 ppm (isobutylene) | 11/12/22 | JBH-250-100-20 | Value: KM | Value: | Value: |

## COMB. GAS/$O_2$ METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | O2 (%) | | | | Time:<br>Initials:<br>Value: | Time:<br>Initials:<br>Value: | Time:<br>Initials:<br>Value: |
| | % LEL Pentane | | | | Value: | Value: | Value: |

## WATER QUALITY METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration (Auto) | pH | 4.00 | | | Time:<br>Initials:<br>Value: | Time:<br>Initials:<br>Value: | Time:<br>Initials:<br>Value: |
| | Conductivity (mS/cm) | 4.49 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 0 | | | Value: | Value: | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 9.86 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |
| Third Point Calibration | pH | 9.18 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |

Additional Remarks:

# EQUIPMENT CALIBRATION DAILY LOG

Date: 3/7/22

Project Number: NW01312.0150

Project Name: LHAAP-GWTP

Recorded By: Kennie Moore

## PID

Model: MiniRae 3000

Equipment ID #:

Bulb: ~~10.6~~ mev 11.8

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: 0640 | Time: | Time: |
| | | | | | Initials: KM | Initials: K | Initials: |
| | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: To Zero KM | Value: | Value: |
| Second Point Calibration | Vapor conc. (ppm) | 100 ppm (isobutylene) | 11/12/22 | JBH-250-100-20 | Value: KM | Value: | Value: |

## COMB. GAS/$O_2$ METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | O2 (%) | | | | Value: | Value: | Value: |
| | % LEL Pentane | | | | Value: | Value: | Value: |

## WATER QUALITY METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration (Auto) | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | pH | 4.06 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 4.49 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 0 | | | Value: | Value: | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 6.86 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |
| Third Point Calibration | pH | 9.18 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |

Additional Remarks:

01118236

# EQUIPMENT CALIBRATION DAILY LOG

Date: 3/11/22

Project Number: NW01312.0150

Project Name: LHAAP-GWTP

Recorded By: Scott Baesinger

## PID

Model: mini RAE 3000

Bulb: ~~[illegible]~~ 11.8 mev

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | | | | | Time: 0635 | Time: | Time: |
| | | | | | Initials: SB | Initials: | Initials: |
| First Point Calibration | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: TO ZERO SB | Value: | Value: |
| Second Point Calibration | Vapor conc. (ppm) | 100 ppm (isobutylene) | 11/12/22 | SBH-250-100-20 | Value: SB | Value: | Value: |

## COMB. GAS/$O_2$ METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| First Point Calibration | O2 (%) | | | | Value: | Value: | Value: |
| | % LEL Pentane | | | | Value: | Value: | Value: |

## WATER QUALITY METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| First Point Calibration (Auto) | pH | 4.00 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 4.49 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 0 | | | Value: | Value: | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 6.86 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |
| Third Point Calibration | pH | 9.18 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |

Additional Remarks:

# EQUIPMENT CALIBRATION DAILY LOG

Date: 3/14/22

Project Number: NW01312.0150

Project Name: LHAAP-GWTP

Recorded By: Scott Baggsinger

## PID

Model: Mini RAE 3000

Equipment ID #:

Bulb: 10.6 mev 11.8

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: 0650 | Time: | Time: |
| | | | | | Initials: SB | Initials: | Initials: |
| | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: TO ZERO SB | Value: | Value: |
| Second Point Calibration | Vapor conc. (ppm) | 100 ppm (isobutylene) | 11/12/22 | JBH-250-100-20 | Value: SB | Value: | Value: |

## COMB. GAS/$O_2$ METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | O2 (%) | | | | Value: | Value: | Value: |
| | % LEL Pentane | | | | Value: | Value: | Value: |

## WATER QUALITY METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration (Auto) | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | pH | 4.00 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 4.49 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 0 | | | Value: | Value: | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 6.86 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |
| Third Point Calibration | pH | 9.18 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |

Additional Remarks:

01118238

# EQUIPMENT CALIBRATION DAILY LOG

Date: 3/17/22

Project Number: NW01312.0150

Project Name: LHAAP-GWTP

Recorded By: Scott Baessinger

| | | | | | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| PID | Model: Mini RAE 3000 | | Bulb: 11.8 | | | | |
| | Equipment ID #: | | | | | | |
| | Parameter | Standard | Exp. Date | Lot# | | | |
| First Point Calibration | | | | | Time: 0645 | Time: | Time: |
| | | | | | Initials: SB | Initials: | Initials: |
| | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: TO ZERO SB | Value: | Value: |
| Second Point Calibration | Vapor conc. (ppm) | 100 ppm (isobutylene) | 11/12/22 | SBH-250-100-20 | Value: SB | Value: | Value: |

| | | | | | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| COMB. GAS/$O_2$ METER | Model: | | | | | | |
| | Equipment ID #: | | | | | | |
| | Parameter | Standard | Exp. Date | Lot# | | | |
| First Point Calibration | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | O2 (%) | | | | Value: | Value: | Value: |
| | % LEL Pentane | | | | Value: | Value: | Value: |

| | | | | | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| WATER QUALITY METER | Model: | | | | | | |
| | Equipment ID #: | | | | | | |
| | Parameter | Standard | Exp. Date | Lot# | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| First Point Calibration (Auto) | pH | 4.00 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 4.49 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 0 | | | Value: | Value: | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 6.86 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |
| Third Point Calibration | pH | 9.18 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |

Additional Remarks:

# EQUIPMENT CALIBRATION DAILY LOG

Date: 3/21/22

Project Number: NW01312.0150

Project Name: LHAAP-GWTP

Recorded By: Scott Bassinger

## PID

Model: Mini RAE 3000

Equipment ID #:

Bulb: 10.6 mev 11.8

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: 0630 | Time: | Time: |
| | | | | | Initials: SB | Initials: | Initials: |
| | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: TO ZERO SB | Value: | Value: |
| Second Point Calibration | Vapor conc. (ppm) | 100 ppm (isobutylene) | 11/12/22 | SBH-250-100-20 | Value: SB | Value: | Value: |

## COMB. GAS/$O_2$ METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | O2 (%) | | | | Value: | Value: | Value: |
| | % LEL Pentane | | | | Value: | Value: | Value: |

## WATER QUALITY METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration (Auto) | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | pH | 4.00 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 4.49 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 0 | | | Value: | Value: | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 6.86 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |
| Third Point Calibration | pH | 9.18 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |

Additional Remarks:

# EQUIPMENT CALIBRATION DAILY LOG

Date: 3/24/22

Project Number: NW01312.0150

Project Name: LHAAP-GWTP

Recorded By: Scott Baessinger

## PID

Model: Mini RAE 3000

Bulb: 10.6 eV 11.8

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: 0620 | Time: | Time: |
| | | | | | Initials: SB | Initials: | Initials: |
| | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: TO ZERO SB | Value: | Value: |
| Second Point Calibration | Vapor conc. (ppm) | 100 ppm (isobutylene) | 11/12/22 | SBH-250-100-20 | Value: SB | Value: | Value: |

## COMB. GAS/$O_2$ METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | O2 (%) | | | | Value: | Value: | Value: |
| | % LEL Pentane | | | | Value: | Value: | Value: |

## WATER QUALITY METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration (Auto) | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | pH | 4.00 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 4.49 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 0 | | | Value: | Value: | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 6.86 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |
| Third Point Calibration | pH | 9.18 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |

Additional Remarks:

# EQUIPMENT CALIBRATION DAILY LOG

Date: 3/28/22

Project Number: NW01312.0150

Project Name: LHAAP-GWTP

Recorded By: Scott Beasinger

## PID

Model: Mini RAE 3000

Bulb: 11.8 mev

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: 0640 | Time: | Time: |
| | | | | | Initials: SB | Initials: | Initials: |
| | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: TO ZERO SB | Value: | Value: |
| Second Point Calibration | Vapor conc. (ppm) | 100 ppm (isobutylene) | 11/12/22 | JBH-250-100-20 | Value: SB | Value: | Value: |

## COMB. GAS/$O_2$ METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | O2 (%) | | | | Value: | Value: | Value: |
| | % LEL Pentane | | | | Value: | Value: | Value: |

## WATER QUALITY METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration (Auto) | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | pH | 4.00 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 4.49 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 0 | | | Value: | Value: | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 6.86 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |
| Third Point Calibration | pH | 9.18 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |

Additional Remarks:

01118242

# EQUIPMENT CALIBRATION DAILY LOG

Date: 3/31/22

Project Number: NWO1312.0150

Project Name: LHAAP - GWTP

Recorded By: Kennie Moore

## PID

Model: Mini Rae 3000

Equipment ID #:

Bulb: ~~10.6~~ meV 11.8

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: 0625 | Time: | Time: |
| | | | | | Initials: KM | Initials: K | Initials: |
| | Vapor conc. (ppm) | 0.0 (ambient air) | NA | NA | Value: To Zero KM | Value: | Value: |
| Second Point Calibration | Vapor conc. (ppm) | 100 ppm (isobutylene) | 11/12/22 | JBH-250-100-20 | Value: KM | Value: | Value: |

## COMB. GAS/$O_2$ METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration | Evening Check | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | O2 (%) | | | | Value: | Value: | Value: |
| | % LEL Pentane | | | | Value: | Value: | Value: |

## WATER QUALITY METER

Model:

Equipment ID #:

| | Parameter | Standard | Exp. Date | Lot# | Morning Calibration/Check | Evening Check (one point only) | Additional Calib./Check (if necessary) |
|---|---|---|---|---|---|---|---|
| First Point Calibration (Auto) | | | | | Time: | Time: | Time: |
| | | | | | Initials: | Initials: | Initials: |
| | pH | 4.00 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 4.49 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 0 | | | Value: | Value: | Value: |
| | DO (mg/L) | 8.9-9.1 (ambient air) | NA | NA | Value: | Value: | Value: |
| Second Point Calibration | pH | 6.86 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |
| Third Point Calibration | pH | 9.18 | | | Value: | Value: | Value: |
| | Conductivity (mS/cm) | 53.7 | | | Value: | Value: | Value: |
| | Turbidity (NTU) | 100 | | | Value: | Value: | Value: |

Additional Remarks: