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Email correspondence containing Ecology comments and PLP responses pertaining to this annual report is attached at the end of this report along with a summary table of groundwater elevation measurements for 2023-2024 requested by Ecology.

Transmitted via Electronic Mail

February 26, 2025

Ms. Tena Seeds
Washington State Department of Ecology
Toxics Cleanup Program
15700 Dayton Ave N., Shoreline, WA 98133

RE: Long-Term Compliance Monitoring Annual Report
Time Oil Bulk Terminal Site, Facility Site ID #75486194 and Cleanup Site ID #14604
Prospective Purchaser Consent Decree No. 20-2-15215-3 SEA

Dear Ms. Seeds:

As required by Prospective Purchaser Consent Decree (PPCD No. 20-2-15215-3 SEA), Pioneer Engineering & Environmental Services, LLC on behalf of TOC Seattle Terminal 1, LLC submits the attached Long-Term Compliance Monitoring Annual Report for the Time Oil Bulk Terminal Site for the 2024 reporting period.

If you have any questions about this report, please contact me at 773-435-3725.

Sincerely,

Kim Hempel
Project Coordinator
Pioneer Engineering & Environmental Services, LLC

Distribution List:
Doug Ciserella and Mike Ciserella, TOC Seattle Terminal 1, LLC
Bill Joyce and Alexandra Kleeman, Hillis Clark Martin & Peterson P.S.
Jamie Stevens, CRETE Consulting
Kristin Anderson, Floyd|Snider

TIME OIL BULK TERMINAL SITE
PROSPECTIVE PURCHASER CONSENT DECREE NO. 20-2-15215-3 SEA
LONG-TERM COMPLIANCE MONITORING ANNUAL REPORT

This Long-Term Compliance Monitoring Annual Report has been prepared to document the post-remedial construction compliance monitoring items detailed in Section 3 of the Long-Term Compliance Monitoring Plan (LTCMP[1]) for the Time Oil Bulk Terminal Site (Site) for the 2024 reporting period. The LTCMP includes a Groundwater Monitoring Plan (GMP), a Soil and Remedial Element Management Plan (SREMP) and a Vapor Intrusion Assessment and Mitigation Plan (VI Plan). Activities performed in 2024 in accordance with each of these plans are described below.

Summary of Monitoring Activities Performed per the GMP

- The 2024 Groundwater Monitoring Annual Report includes the following required LTCMP items:
  - Monitoring well network updates
  - Summary of quarterly short-term groundwater monitoring activities, data collected, and results
  - Assessment of Compliance with Groundwater Cleanup Standards
  - Indications of Organic Contaminant Degradation
  - Groundwater Flow Patterns
  - Recommendations for Updates to Monitoring Locations or Frequency

  Refer to the 2024 Groundwater Monitoring Annual Report included as Appendix A for a summary of activities and data collected.

Summary of Assessment or Mitigation Activities Performed per the VI Plan

- Construction of the 165,000 sf[2] self-storage building on Lot F (2707 West Commodore Way) continued through 2024 and is expected to be completed in the spring of 2025. This work is being completed by Insite Property Group, the property owner. A 20-mil Drago Wrap vapor intrusion barrier was installed under the entire building concrete slab per the manufacturer's recommendations, which was substantially completed in March 2024.
- No buildings are present on the remaining portions of the site owned by TOC Seattle Terminal 1, LLC; therefore, vapor barriers were not installed and vapor intrusion monitoring was not performed in these areas of the site.

Summary of Inspection and Maintenance Activities Performed per the SREMP

- The site remains undeveloped and routine inspections have not yet been triggered per Section 7 of the SREMP. Visual checks of the property were completed on February 8, February 26, May 15, August 7, and November 20, 2024. The perimeter fencing has been maintained during the reporting period, which limits site access to authorized personnel only. Interim caps/surfaces installed during the remedial action have been observed during groundwater monitoring events and construction oversight with no significant degradation or changes noted.
- Minor vault maintenance was conducted on November 3, 2024 to optimize influent water contact time throughout the permeable reactive barrier (PRB) treatment vault system on the downstream end of the interceptor trench. A discharge overflow pipe was plugged to ensure that captured groundwater, even during high water events, is treated through the system.
- The eastern lot on the Bulk Terminal parcel, hereinafter referred to as Lot F, is currently being developed. The boundaries of Lot F are depicted on Figure A.1 in Appendix A. Work is anticipated to be completed by March 2025. Routine inspections of Lot F will begin 2 years after development.

[1] Long-Term Compliance Monitoring Plan, Prepared by CRETE Consulting, February 10, 2023.

Anticipated 2025 Activities

- Development at Lot F started in October 2023 and is anticipated to be completed by March 2025. Vapor sampling will be conducted following the completion of the building in accordance with the Vapor Intrusion Assessment and Mitigation Plan (Appendix C of the LTCMP). Results of the vapor sampling will be provided to Ecology in the quarterly progress report following the sampling event and will be summarized in the 2025 Long-Term Compliance Monitoring Annual Report.
- Additional shoring (soldier pile and/or ecology blocks) will be installed along the south property line and north property line (ecology blocks only) of the remainder of the Bulk Terminal parcel, and the ASKO parcel to facilitate grading and cap installation as required by the PPCD. A stormwater detention system will be installed on the far western portion of the ASKO parcel as required by Seattle Department of Construction and Inspections (SDCI). Permanent fencing and lighting will also be installed following shoring and grading work. No other property modifications are currently anticipated in 2025.
- Quarterly groundwater monitoring will continue as described in Appendix A.
- Quarterly progress reports will provide Ecology with periodic updates regarding redevelopment plans and other Site activities.
- The next Long-Term Compliance Monitoring Annual Report will be submitted on or by March 1, 2026.

Appendices

- Appendix A – Groundwater Monitoring Annual Report

END LONG-TERM COMPLIANCE MONITORING ANNUAL REPORT

Long-Term Compliance Monitoring Annual Report

Time Oil Bulk Terminal

Appendix A
2024 Groundwater Monitoring Annual Report

LIMITATIONS

This report has been prepared for the exclusive use of TOC Seattle Terminal 1, LLC, their authorized agents, and regulatory agencies. It has been prepared following the described methods and information available at the time of the work. No other party should use this report for any purpose other than that originally intended, unless Floyd|Snider agrees in advance to such reliance in writing. The information contained herein should not be utilized for any purpose or project except the one originally intended. Under no circumstances shall this document be altered, updated, or revised without written authorization of Floyd|Snider.

The interpretations and conclusions contained in this report are based in part on previous site characterization data collected by others and Floyd|Snider cannot assure the accuracy of this information.

Long-Term Compliance Monitoring Annual Report
Appendix A: 2024 Groundwater Monitoring Annual Report

This document was prepared for
TOC Seattle Terminal 1, LLC
under the supervision of:

Name: Pamela Osterhout
Date: 2/26/2025

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List of Abbreviations

Abbreviation	Definition
AOC	Area of Concern
ASKO	ASKO Hydraulic
bgs	Below ground surface
BNSF	BNSF Railway Company
CAA	Cleanup action area
CAP	Cleanup Action Plan
CPOC	Conditional point of compliance
CUL	Cleanup level
cVOC	Chlorinated volatile organic compound
DCE	*cis*-1,2-dichloroethene
DO	Dissolved oxygen
DRO	Diesel-range organics
Ecology	Washington State Department of Ecology
EDR	Engineering Design Report
GMAR	Groundwater Monitoring Annual Report
GMP	Groundwater Monitoring Plan
GRO	Gasoline-range organics
IHS	Indicator hazardous substance
ISS	In situ solidification and stabilization
LTCMP	Long-Term Compliance Monitoring Plan
µg/L	Micrograms per liter
mg/L	Milligrams per liter
MNA	Monitored natural attenuation
O&M	Operation and maintenance
ORO	Oil-range organics
ORP	Oxidation–reduction potential
penta	Pentachlorophenol
POC	Point of compliance

Abbreviation	Definition
PRB	Permeable reactive barrier
Property	The four parcels identified as “Bulk Terminal,” “ASKO,” “East Waterfront,” and “West Waterfront”
Regenesis	Regenesis Remediation Services
REL	Remediation level
ROW	Right-of-way
Site	Time Oil Bulk Terminal Site
TCE	Trichloroethene
TOCST	TOC Seattle Terminal 1, LLC
TPH	Total petroleum hydrocarbons
WBZ	Water-bearing zone
ZVI	Zero-valent iron

1.0 Introduction

This Groundwater Monitoring Annual Report (GMAR) was prepared at the request of TOC Seattle Terminal 1, LLC (TOCST) to fulfill requirements of the Prospective Purchaser Consent Decree (No 20-2-15215-3 SEA). The GMAR presents the results of post-cleanup action groundwater monitoring completed in 2024 in accordance with the Groundwater Monitoring Plan (GMP; Floyd|Snider 2023), which was presented as Appendix A to the Long-Term Compliance Monitoring Plan (LTCMP; Crete 2023) for the Time Oil Bulk Terminal Site (Site). The LTCMP for the Site was approved by the Washington State Department of Ecology (Ecology) in a letter dated February 14, 2023. This GMAR is presented as an appendix to the Long-Term Compliance Monitoring Annual Report for the Site.

The Site refers to the location of the former Time Oil Company Seattle Terminal facility located on W. Commodore Way in Seattle, Washington. For the purposes of this document, the Property is defined as the four separate upland parcels within the Site commonly identified as the Bulk Terminal, ASKO Hydraulic (ASKO), East Waterfront, and West Waterfront. A cleanup action was performed in 2021 in accordance with the Cleanup Action Plan (CAP; Ecology 2020) for the Site.

This GMAR provides an evaluation of compliance with Site groundwater cleanup levels (CULs) for indicator hazardous substances (IHSs; arsenic, gasoline-range organics [GRO], total diesel-range organics [DRO] and oil-range organics [ORO], benzene, trichloroethene [TCE], vinyl chloride, and pentachlorophenol [penta]) specified in the CAP at the applicable point of compliance (POC). Cleanup standards are defined as a CUL combined with a POC where the CUL applies. A conditional POC (CPOC) was established at the downgradient edge of the Upland Area of Concern (AOC) and within the W. Commodore Way right-of-way (ROW), as shown on Figure A.1.

1.1 CLEANUP ACTION SUMMARY

Remedial action construction was completed at the Site between July and December 2021 and included removal or in situ solidification and stabilization (ISS) of contaminated soil acting as a source of IHSs to groundwater in designated cleanup action areas (CAAs) and focused in situ groundwater treatment as shown on Figure A.1. Those activities, which are documented in the Remedial Action Completion Report Phase 1 (Crete 2022), were designed to remove source soil contributing to groundwater contamination in three water-bearing zones (WBZs) at the Site, including a perched WBZ (encountered only on ASKO and the upgradient BNSF Railway Company [BNSF] parcel), shallow WBZ, and intermediate WBZ.

The goals of source soil removal for the cleanup action were determined based on the AOC in which each CAA was located. In the upgradient Upland AOC, comprising the Bulk Terminal, ASKO, and the adjacent W. Commodore Way ROW, the cleanup action was designed to achieve remediation levels (RELs) in soil to meet CULs long-term in groundwater at the CPOC. In the downgradient Shoreline AOC, comprising the East Waterfront, the cleanup action was designed to achieve CULs in soil to meet CULs in all groundwater downgradient of the CPOC in a shorter time frame.

The cleanup action encompassed multiple CAAs, summarized as follows.

- In CAA-1 and CAA-2 on the Bulk Terminal, excavation and ISS were conducted to address soil with GRO, total DRO+ORO, and benzene exceeding RELs and contributing to groundwater contamination in the shallow WBZ. Limited petroleum impacts to groundwater in the intermediate WBZ were also present in the W. Commodore Way ROW downgradient of CAA-2. An oxygen-releasing compound (ORC-A) was applied in the northeast and northwest corners of CAA-2 after excavation.
- In CAA-3, located between the Bulk Terminal and ASKO, excavation was conducted to address soil with GRO, total DRO+ORO, benzene, and TCE exceeding RELs. Soil contamination in this CAA was shallow and did not appear to contribute to groundwater contamination.
- In CAA-4 on ASKO, soil with TCE exceeding RELs and contributing to groundwater contamination in the perched, shallow, and intermediate WBZs was addressed by ISS. An in situ groundwater treatment barrier of trademarked colloidal biomatrix (PlumeStop) mixed with sulfidated microscale zero-valent iron (ZVI) was injected along the northern boundary of ASKO, downgradient of CAA-4. Groundwater from the perched WBZ flowing onto ASKO from the upgradient BNSF parcel that has elevated concentrations of chlorinated volatile organic compounds (cVOCs) is additionally treated via an interceptor trench and permeable reactive barrier (PRB) wall amended with ZVI. The treated perched groundwater is infiltrated through an on-Property gravity well and discharged into the shallow WBZ.
- In CAA-5 on ASKO, shallow soil with arsenic, GRO, and total DRO+ORO exceeding CULs and contributing to groundwater contamination in the perched WBZ was removed via excavation.
- In CAA-6 on the East Waterfront, soil with GRO, total DRO+ORO, and benzene exceeding CULs and contributing to groundwater contamination in the shallow WBZ was removed via excavation.
- In CAA-7 on the East Waterfront, soil with arsenic exceeding CULs and contributing to limited contamination in the shallow WBZ was removed via excavation.

Monitored natural attenuation (MNA) is a component of the cleanup action and is expected to occur in the dissolved-phase organic contaminant plumes remaining after completion of remedial action construction. The areas where MNA is expected to occur include the following:

- Within and downgradient of groundwater plumes where soil contaminant source removal was performed via excavation
- Adjacent to and downgradient of areas where soil source contamination was immobilized with ISS
- Downgradient of areas where bio-amendments or in situ groundwater treatment were used to accelerate biodegradation of organic contaminants

The final component of the cleanup action will include installation of a cap and implementation of institutional controls on the Upland AOC in conjunction with property redevelopment to provide a protective barrier to remaining contamination.

1.2 PROPERTY REDEVELOPMENT STATUS

Redevelopment is in progress for a portion of the Bulk Terminal on Lot F. Redevelopment began on Lot F (refer to Figure A.1) on October 30, 2023, with a projected completion by March 2025. The redevelopment of Lot F includes grading, installation of underground utilities, and construction of a multistory public storage building with a sub-slab vapor barrier.

Redevelopment of the ASKO parcel and the remaining portions of the Bulk Terminal parcel is planned to begin in March or April 2025 and includes shoring, installation of a stormwater detention facility, grading, and installation of a 12-inch gravel cap on Lots A through E and Lot G. Impacts to the monitoring well network and modifications to the network to accommodate the upcoming ASKO parcel and Bulk Terminal parcel redevelopment are discussed in further detail in Section 2.0. Locations of the in-progress and pending redevelopment features are shown on Figure A.1.

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2.0 Monitoring Well Network Updates

An established monitoring well network is used to assess performance of the cleanup action and compliance with the CULs for groundwater specified in the CAP. This network includes monitoring wells located at the CPOC and downgradient of the CPOC to measure compliance with cleanup standards, wells upgradient of the CPOC to measure and quantify the effects of remediation, and sentinel wells to monitor the nature and extent of contaminants in groundwater when CULs have not been achieved at the CPOC or to evaluate plume boundary conditions.

The network of monitoring wells was updated in 2024 to decommission wells that had previously been damaged during remedial construction, and to improve monitoring coverage of shallow WBZ groundwater.

Two replacement monitoring wells, 01MW53R and 01MW58R, were installed in February 2024 on the ASKO parcel. The well 01MW53R was installed to replace 01MW53, which was a low-producing CPOC well that often went dry during low-flow sampling. Monitoring well 01MW53R was installed 10 feet south and with a deeper screened interval (7 to 17 feet below ground surface [bgs]) compared to 01MW53 (6 to 16 feet bgs) to allow more connectivity with the shallow WBZ that thins to the north. The well 01MW58 was damaged during remedial construction and replaced with 01MW58R to improve monitoring coverage at the upgradient edge of the ASKO parcel. These wells were installed via sonic drilling and constructed of 10-foot screens and 2-inch diameter schedule 40 polyvinyl chloride. Well completion logs for these two new wells are included in Attachment A.1.

In addition to decommissioning 01MW53 and 01MW58, nine other wells designated in the GMP for decommissioning during redevelopment were decommissioned in February 2024 in anticipation of redevelopment activities. The wells decommissioned include 01MW88, 01MW103, 01MW109, 02MW05,[1] 02MW08, 02MW09, 02MW10, 02MW13, and 02MW22. Monitoring wells were decommissioned by a Washington State licensed driller in accordance with WAC 173-160-381.

The current status of Site monitoring wells is summarized in Table A.1 and shown on Figure A.1. The monitoring well network used for the short-term performance monitoring includes monitoring well locations as shown on Figure A.2 and is discussed in further detail in Section 3.0.

[1] Monitoring well 02MW05 was approved for decommissioning in 2024 but found that it was already reported to be decommissioned. The decommissioning was field verified by the drillers during the February 2024 decommissioning work.

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3.0 Short-Term Performance Monitoring Activities

The groundwater monitoring activities completed in 2024 represent the second year of short-term performance monitoring at the Site. The short-term monitoring was conducted for 2 years in the shoreline AOC (East Waterfront) and will continue for a total of 4 years in the upland AOCs (ASKO and Bulk Terminal). The AOCs will transition to long-term monitoring per the GMP following completion of the short-term monitoring schedule. Post-remediation short-term performance monitoring was outlined in the GMP in pre-redevelopment (initial) and post-redevelopment phases. Short-term performance monitoring was conducted quarterly per the GMP starting in January 2023. The first year of post-remediation monitoring was reported in the 2023 GMAR (Floyd|Snider 2024). Due to changes in the property redevelopment plans and schedule, the "initial" short-term monitoring has not yet transitioned to "after development" short-term monitoring but is anticipated to transition to after development monitoring later in 2025.

Performance monitoring is being conducted to assess remedy effectiveness within and downgradient of active treatment areas and includes assessment of the natural attenuation processes, groundwater flow patterns, and groundwater quality trends after remediation. The second year of short-term performance monitoring was conducted in 2024 at wells illustrated on Figure A.2 on a quarterly, semiannual, or annual basis. A detailed field sampling and analytical schedule for each well included in the 2024 short-term performance monitoring program is presented in Table A.2.

Quarterly groundwater monitoring was conducted on February 26 and 27, May 15, August 7 and 8, and November 20, 2024. Monitoring wells were sampled using standard operating procedures for low-flow sampling with a peristaltic pump. Depth to groundwater and field parameters (pH, temperature, turbidity, specific conductance, dissolved oxygen [DO], and oxidation–reduction potential [ORP]) were also recorded at each well sampled. Field parameters are summarized in Table A.4.

Groundwater elevations and flow patterns measured for the shallow WBZ in 2024 are presented in Figures A.3a through A.3c. The 2023 and 2024 IHS analytical results are presented in Table A.3 along with the result collected most recently prior to remediation for comparison (shown as pre-remediation). The 2024 results are illustrated by IHS or IHS groups: GRO, total DRO and ORO, TCE and VC, and benzene, in Figures A.4, A.5, A.6, and A.7, respectively. Penta and total arsenic results are not shown on a figure because analysis of these IHSs were spatially limited (one to two wells). IHS (and secondary MNA parameter *cis*-1,2-dichloroethene [DCE]) analytical results are presented in Table A.3. All other secondary MNA parameters and field parameters are presented in Table A.4. Laboratory reports for all monitoring events are included in Attachment A.2.

3.1 GROUNDWATER FLOW PATTERN ANALYSIS

Groundwater flow directions and gradients were evaluated for the shallow WBZ semiannually during the wet and dry seasons by collecting depth to groundwater measurements at key shallow WBZ wells during the February and August quarterly monitoring events per the

2023 GMAR (Floyd|Snider 2024). A supplemental ASKO-focused water level measurement event was completed in May 2024 at Ecology's request to support the remedial investigation being conducted on the upgradient BNSF parcel. Potentiometric maps of the shallow WBZ were prepared for each of these three events and are presented in Figures A.3a through A.3c.

In the upland AOCs, shallow WBZ groundwater flow patterns were monitored to confirm that flow patterns have stabilized following remedial construction, including installation of the ISS monoliths.

- On the Bulk Terminal, the primary groundwater flow is to the north-northwest. Groundwater mounding continues to be observed in the central portion of the parcel in the vicinity of 01MW12, likely because this remains a relatively large unpaved area at the Site with predominantly gravel fill from various excavations. The steepest gradients were measured between the CAA-2 and CAA-4 ISS monoliths in the vicinity of 01MW30 and 01MW19R. Groundwater levels and flow direction were relatively consistent with the pre-ISS modeling presented in the Engineering Design Report (EDR; Crete 2021) with some variability between wet and dry season, mostly within the area of groundwater mounding.
- On ASKO, shallow WBZ gradients remain relatively flat downgradient of the CAA-4 ISS monolith relative to pre-remediation conditions. During the second quarter, an ASKO-focused synoptic water level measurement event was conducted in coordination with BNSF monitoring, and upgradient groundwater flow was confirmed to be parallel to the southwest edge of the CAA-4 ISS monolith flowing westerly and then wrapping around the west corner of the monolith to a more northerly direction. Gradients are steeper between the CAA-4 and CAA-2 monoliths relative to pre-remediation conditions; however, groundwater flow directions remain relatively consistent between pre- and post-remediation conditions with a primary flow direction to the north. No significant change in water level elevations was observed between the wet and dry seasons.

In the shoreline AOC, at the East Waterfront, shallow WBZ groundwater elevations were consistent throughout 2024 with a primary flow direction to the north, relatively flat gradients toward the shoreline, and steeper gradients in the southeastern portion of the parcel consistent with topography and pre-remediation flow patterns.

3.2 BULK TERMINAL GROUNDWATER MONITORING

Short-term performance monitoring on the Bulk Terminal in 2024 included the following:

- Quarterly monitoring of shallow WBZ well 01MW84 downgradient of the CPOC at the edges of the current total petroleum hydrocarbons (TPH) plume and 01MW19R adjacent to the ISS monolith
- Semiannual monitoring of shallow WBZ wells 01MW12 and 01MW40 and intermediate WBZ well 01MW49R within the groundwater contaminant plumes and downgradient of ISS and excavation areas
- Annual monitoring of shallow WBZ well 01MW66 in the localized penta plume

On the Bulk Terminal, GRO concentrations remain greater than the CUL (800 micrograms per liter [µg/L]) but decreased (54% to 95%) compared to pre-remediation conditions in the two downgradient wells (01MW19R and 01MW84), with GRO concentrations ranging from 490 to 3,900 µg/L. GRO concentrations were less than the CUL at 01MW19R during the first, third, and fourth quarters with concentrations ranging from 490 to 560 µg/L. A duplicate sample was collected at 01MW19R in the second quarter, and the parent sample did not exceed (750 µg/L), but the duplicate results did exceed the CUL (1,000 µg/L). GRO concentrations were less than the CUL at wells 01MW12, 01MW40, and 01MW49R, with concentrations ranging from non-detect to 110 µg/L.

Total DRO and ORO concentrations remain greater than the CUL (500 µg/L) and have slightly increased at shallow WBZ wells 01MW12 and 01MW40 with concentrations ranging from 550 to 5,500 µg/L compared to pre-remediation concentrations of 590 to 1,100 µg/L. In 2024, benzene also exceeded the CUL (0.44 µg/L) at 01MW19R each quarter and at 01MW40 during the third quarter. Benzene exceedances at these two locations ranged from 0.98 µg/L to 2.2 µg/L. Benzene concentrations at 01MW19R decreased by over 99% compared to the pre-remediation concentration of 2,600 µg/L. The TPH and benzene concentrations at 01MW40 were much less during the third quarter compared to the first quarter of 2024, which had nearly 5 feet of change in water level elevations between the monitoring events, indicating that residual TPH in the smear zone may be causing seasonal variability in the Bulk Terminal results. Since CAA-1 was excavated to RELs, the residual TPH between CULs and RELs is expected to be a source of TPH to groundwater but will continue to decline over time as TPH degrades. Total DRO and ORO at CPOC and downgradient wells 01MW19R, 01MW49R, and 01MW84 continue to decrease relative to pre-remediation conditions.

Penta was only monitored in shallow WBZ well 01MW66 during February 2024. Penta concentrations continue to decrease but remain greater than the CUL (0.20 µg/L) with a concentration of 0.76 µg/L in 2024 (decreased from 3.6 µg/L in 2019 and 1.9 µg/L in 2023).

3.3 ASKO GROUNDWATER MONITORING

Short-term performance monitoring on ASKO in 2024 included the following:

- Quarterly monitoring of shallow WBZ wells 01MW53R and 01MW85 downgradient of the PlumeStop in situ treatment barrier at the CPOC and at the edges of the current cVOC plume, 01MW58R cross-gradient of the ISS treatment area, and 01MW46 adjacent to the ISS monolith.
- Semiannual monitoring of shallow WBZ well 01MW15 upgradient and adjacent to the ISS treatment area, shallow WBZ wells MW05, MW06, and 01MW56 downgradient of the ISS treatment area, and intermediate WBZ well 01MW108.
- A supplemental sample was collected from 01MW15 in May (Q2) due to elevated TCE observed during February (Q1) monitoring.

- Contingency shallow WBZ well 01MW107 was sampled quarterly in 2024 because of elevated cVOC concentrations at 01MW85. Contingency shallow WBZ well 01MW89 was sampled in February (Q1) because of elevated cVOC concentrations observed in the shallow WBZ at 01MW53 (per the GMP). Contingency shallow WBZ well 01MW80 was sampled in May (Q2) and August (Q3) at the request of Ecology to monitor elevated cVOC concentrations upgradient of the PlumeStop barrier.

The perched WBZ well MW03R was dry during each monitoring event and therefore not sampled in 2024.

On ASKO, TCE concentrations have decreased relative to pre-remediation conditions in the vicinity of the CAA-4 source area from 880 to 130 µg/L (01MW46), from 710 to 180 µg/L (at 01MW80), and from 240 to 51 µg/L (at MW05), respectively, but remain greater than the CUL of 0.50 µg/L. MW06, which is within the radius of the PlumeStop, did not have detectable TCE in the February 2023 baseline post-remediation sampling event, but TCE concentrations were detectable and increasing in 2024. TCE concentrations increased at downgradient ROW wells 01MW53R and 01MW85 in 2024. The well 01MW53R was sampled approximately 3 weeks after installation in February 2024; however, the elevated TCE concentration (26 µg/L) is attributed to drilling disturbances since TCE has declined to 15 µg/L in subsequent events. The TCE concentrations at 01MW85 have remained relatively stable at 5.0 to 6.5 µg/L, which are elevated relative to pre-remediation conditions when TCE was not detected, but are an improvement from the elevated TCE observed in 2023. Upgradient well 01MW58R also shows increased TCE concentrations at 23 to 92 µg/L relative to pre-remediation conditions of 42 µg/L. This increased TCE at the CPOC is attributed primarily to increases of TCE in the shallow zone upgradient of ASKO, which is discussed further in Section 4.0. cVOCs were not detected downgradient at contingency monitoring wells 01MW89 or 01MW107.

Vinyl chloride, which is a breakdown product of TCE, has increased relative to pre-remediation conditions at several ASKO monitoring wells, including 01MW15, 01MW46, 01MW53R, 01MW56, 01MW58R, 01MW80, 01MW85, and MW05. This is expected as TCE continues to degrade. Vinyl chloride has been variable at MW06 with slightly greater (4.5 µg/L) and slightly lesser (2.1 µg/L) concentrations observed in 2024 relative to pre-remediation conditions (2.8 µg/L). All shallow WBZ wells on ASKO have vinyl chloride concentrations greater than the CUL (0.20 µg/L); however, vinyl chloride was not detected at the two downgradient contingency wells 01MW89 and 01MW107. Vinyl chloride also decreased to less than CULs at intermediate WBZ well 01MW108 with concentrations ranging from 0.11 to 0.081 µg/L. The increasing concentrations of vinyl chloride, as well as the concentration of intermediate breakdown product DCE, is evidence that natural attenuation is occurring via anaerobic biodegradation. Results of natural attenuation parameters on ASKO are summarized in Section 4.2.2.

Benzene concentrations were monitored at source area wells 01MW46, 01MW80, and MW05 and downgradient well MW06. Benzene concentrations have decreased relative to pre-remediation conditions at 01MW46 and 01MW80 from 14 to 3.1 µg/L, and from 16 to 2.4 µg/L respectively. At MW05, benzene concentrations in 2024 were relatively consistent with pre-remediation

concentrations (1.0 µg/L) at 1.1 and 0.83 µg/L. Benzene was not detected at MW06, downgradient from MW05.

3.4 EAST WATERFRONT

Short-term performance monitoring on the East Waterfront in 2024 included the following:

- Quarterly monitoring of shallow WBZ well 02MW04R, within the pre-remediation groundwater contaminant plume, was conducted during the first three quarters of 2024.
- Annual monitoring of shallow wells and 02MW19 and 02MW07 was conducted during the first quarter of 2024. Shallow WBZ wells 02MW07 and 02MW19 are within the pre-remediation groundwater contaminant plume and downgradient of the excavation areas.

TPH (GRO and total DRO+ORO), benzene, and total arsenic results at all locations were less than CULs at the three monitoring wells (02MW04R, 02MW07, and 02MW19) each quarter they were sampled. All GRO and benzene concentrations were non-detect.

3.5 CONTINGENCY SAMPLING AND GROUNDWATER MONITORING PLAN DEVIATIONS

The 2024 monitoring events were adaptively managed each quarter in coordination with Ecology based on the cumulative data collected. Each quarter, the IHS results were evaluated relative to the GMP decision framework for contingency sampling. Additionally, because of remedial investigation data collected (by others) on the upgradient BNSF parcel indicating a source of TCE and TPH are present in the perched and shallow WBZs, Ecology requested supplemental samples on the downgradient ASKO parcel to evaluate potential migration of TCE and TPH across the property line that may contribute to elevated concentrations observed in ASKO groundwater. Refer to Section 5.2 for additional information on the BNSF remedial investigation results.

3.5.1 2024 Contingency Sampling

Contingency sample collection and analysis was conducted per the GMP to fulfill the short-term performance monitoring goals in coordination with Ecology.

- Contingency sampling of shallow WBZ well, 01MW107, downgradient of the ASKO parcel was implemented during the third quarter of 2023 and retained quarterly through 2024 because of elevated cVOC concentrations observed in monitoring wells 01MW53 and 01MW85.
- Contingency sampling of shallow WBZ well 01MW89, downgradient of the ASKO parcel and east of the PlumeStop barrier, was conducted in the second quarter of 2024 because of elevated concentration of cVOCs at 01MW46, 01MW53R, and 01MW15.
- Contingency sampling of shallow WBZ well 01MW80 for cVOCs was conducted in the second quarter, and for benzene and cVOCs in the third quarter because of elevated concentrations of cVOCs and benzene at 01MW46 and MW05.

- Total organic carbon was monitored at MW05, MW06, and 01MW85 to evaluate organic inputs upgradient and downgradient of the PlumeStop barrier, which could trigger incomplete degradation of TCE.
- A boring was advanced to the shallow WBZ within the PlumeStop in situ treatment barrier in February 2024 to evaluate carbon distribution approximately 2 years after installation.
- A supplemental groundwater sample was collected from 01MW15 during the second quarter to verify the elevated TCE observed during the first quarter of 2024.

Additional supplemental samples were collected in coordination with Ecology:

- TPH (DRO+ORO) was monitored in the upgradient well 01MW58R to evaluate potential migration of TPH from the upgradient BNSF parcel.
- A supplemental ASKO-focused water level measurement event was completed in May (Q2) 2024 in coordination with the BNSF monitoring event. This collaborative monitoring was conducted at Ecology's request to support the BNSF remedial investigation.
- Supplemental grab samples were collected from the PRB vaults and gravity well in response to BNSF data. Results are discussed under operation and maintenance (O&M) sampling in Section 5.1.

Contingency sampling will continue to be adaptively managed with Ecology on a quarterly basis.

3.5.2 Groundwater Monitoring Plan Deviations

There were no deviations from the GMP during the 2024 monitoring year, except for supplemental sampling described above, and modifications to the "initial" and "after development" short-term monitoring locations (due to changes in the redevelopment plans), which were coordinated with and approved by Ecology.

3.6 DATA VALIDATION

A Compliance Screening (USEPA Stage 2A) data quality review was performed on TPH, total and dissolved metals, select VOCs, total organic carbon, and dissolved gases data resulting from laboratory analysis. The data were reviewed using guidance and quality control criteria documented in the GMP (Floyd|Snider 2023), Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (USEPA 1986), National Functional Guidelines for Organic Superfund Methods Data Review (USEPA 2020a), and the National Functional Guidelines for Inorganic Superfund Methods Data Review (USEPA 2020b).

Based on the data quality review, data are determined to be of acceptable quality for use as reported or qualified. Data validation summaries with additional details for each quarterly event are included in Attachment A.3.

All data collected in 2024 were submitted to Ecology's Environmental Information Management system in December 2024.

4.0 Year 2 Data Evaluation and Performance Summary

Data evaluation is performed to assess compliance with cleanup standards, determine whether indications of organic contaminant degradation are present, and identify long-term groundwater quality trends and flow patterns as described in the following sections. The anticipated restoration time frame for the Shoreline AOC (East Waterfront) monitoring wells to achieve CULs estimated in the CAP is 5 years (Ecology 2020). The anticipated restoration time frame for the Upland AOC (including both ASKO and the Bulk Terminal) estimated in the CAP is 15 years at and downgradient of the CPOC. The most recent pre-remediation result and post-remediation datasets from 2023 and 2024 are presented in time concentration plots in Attachment A.4 to support evaluation of long-term trends related to meeting the restoration time frame goals. These plots are presented for compliance monitoring wells and select additional key locations to support long-term trend analysis.

4.1 COMPLIANCE WITH CLEANUP STANDARDS

Cleanup standards are defined as a CUL combined with a POC where the CUL must be met. Short-term groundwater monitoring results are evaluated on general performance relative to pre-remediation conditions in addition to CULs and cleanup standards.

4.1.1 Bulk Terminal

Groundwater compliance will be evaluated for the Bulk Terminal through long-term confirmation monitoring of wells at the CPOC (shallow WBZ wells 01MW03, 01MW19R, 01MW11R, 01MW86, and 01MW87 and intermediate WBZ well 01MW51). Of these wells, short-term monitoring is currently being conducted at 01MW19R. GRO, total DRO and ORO, and benzene all exceed the CULs at well 01MW19R with exceedance factors ranging from 1.2 to 2.2 for total DRO and ORO, and 2.2 to 5.0 for benzene. There was one exceedance of GRO in 2024 at 01MW19R, which was measured in a field duplicate where the parent sample result did not exceed. Time concentration plots for IHSs at 01MW19R and the downgradient well 01MW84 (for reference) are included in Attachment A.4. Overall, groundwater concentrations continue to decrease relative to pre-remediation conditions and are on an apparent track to comply with cleanup standards within the prescribed restoration time frame.

In the intermediate WBZ, further evidence of complete attenuation of TPH downgradient of the excavation and ISS areas is observed at 01MW49R where previously elevated total DRO+ORO decreased to less than the CUL during post-remediation monitoring.

4.1.2 ASKO Hydraulic

Groundwater compliance will be evaluated for ASKO through long-term confirmation monitoring of wells at the CPOC (shallow WBZ wells 01MW53R, 01MW85, and 01MW89 and intermediate WBZ well 01MW112). Of these wells, short-term monitoring is currently being conducted at 01MW53R and 01MW85. Time concentration plots for TCE and vinyl chloride at 01MW53R and 01MW85 are

included in Attachment A.4. In 2024, TCE and vinyl chloride exceeded the CULs at both wells 01MW53R and 01MW85. Exceedance factors at 01MW53R ranged from 1.65 to 52, and exceedance factors at 01MW85 ranged from 10 to 180. Contingency monitoring of 01MW107 and 01MW89 showed non-detect results of cVOCs downgradient of the CPOC and cross-gradient of the PlumeStop barrier, which indicates that the cVOC exceedances at 01MW53R and 01MW85 are localized and not migrating beyond the CPOC.

4.1.3 East Waterfront

Groundwater compliance will be evaluated for the East Waterfront through long-term confirmation monitoring of shallow WBZ wells (02MW04R, 02MW07, 02MW17, 02MW19, and 02MW20R). Of these wells, short-term monitoring is currently being conducted at 02MW04R, 02MW07, and 02MW19. Groundwater results from 2024 indicate that compliance with cleanup standards has been achieved ahead of the anticipated restoration time frame. All 2024 IHS results were less than CULs; therefore, groundwater monitoring of the East Waterfront will transition to long-term monitoring in 2025, as described in Section 6.4.

4.2 ASSESSMENT OF NATURAL ATTENUATION

Natural attenuation is expected to occur following removal of source soil contamination via excavation and ISS. The primary evidence of natural attenuation is decreasing IHS concentrations. Measurement of primary geochemical parameters collected during field sampling (particularly DO and ORP, but also pH, conductivity, and temperature) and secondary geochemical parameters (such as dissolved gases) provides additional information regarding the mechanisms of biotic degradation and favorability of site conditions for ongoing attenuation.

4.2.1 Bulk Terminal

On the Bulk Terminal, natural attenuation is occurring in the shallow and intermediate WBZ following removal of TPH-contaminated source soil by excavation in CAA-1 and CAA-2 and by ISS in CAA-2. The primary mechanism of attenuation of TPH is aerobic degradation as discussed in Section 3.3.1 of the GMP. Downgradient of CAA-2, aerobic degradation was additionally enhanced by addition of ORC-A within the CAA-2 excavation. The primary evidence of attenuation is an apparent trend of decreasing concentrations of TPH constituents including GRO, total DRO+ORO, and benzene.

Post-remediation monitoring provides evidence of TPH degradation occurring in the shallow WBZ on the Bulk Terminal. For instance, at 01MW19/01MW19R at the downgradient property line, benzene has decreased from 2,600 µg/L pre-remediation to 1.0 µg/L post-remediation, and GRO continues to decrease, from 10,000 µg/L (pre-remediation) to 1,300 µg/L in 2023 and intermittently less than CULs in 2024 with concentrations ranging from 490 to 1,000 µg/L. Total DRO+ORO decreased at 01MW19/01MW19R from 1,900 µg/L (pre-remediation) with some seasonal variability ranging from 580 to 1,100 µg/L in 2024. Similar trends of decreasing TPH constituent concentrations are observed at 01MW84 near the downgradient edge of the pre-remediation TPH plume as shown on Table A.3. At monitoring wells on-property closer to the

TPH source soil areas (01MW12 and 01MW40), there have been seasonal spikes in concentrations relative to pre-remediation conditions, which are likely the result of groundwater fluctuations in this area temporarily remobilizing residual TPH from smear zone soils. Eventually decreasing trends are expected at 01MW12 and 01MW40; however, low levels of residual TPH in soil greater than CULs but less than RELs is likely a residual source to groundwater that is expected to naturally attenuate within the restoration time frame.

The results of primary geochemical parameter analysis in groundwater at the Bulk Terminal parcel indicate that conditions are trending toward anaerobic degradation indicated by low DO and negative ORP. DO concentrations remain less than 0.5 milligrams per liter (mg/L), which indicates that the oxygen introduced to the groundwater through ORC-A during excavation/backfill activities is being rapidly consumed. TPH will continue to degrade under anaerobic conditions, but generally at a slower rate than under aerobic conditions. Infiltration of surface water through unpaved areas and migration of upgradient groundwater with aerobic background conditions are also sources that serve to replenish DO that is consumed by the degradation process. Primary geochemical parameters will continue to be assessed during subsequent monitoring events.

4.2.2 ASKO Hydraulic

On ASKO, natural attenuation is occurring following encapsulation of TCE-contaminated source soil by ISS in CAA-4. The primary mechanism of attenuation of TCE is anaerobic degradation by reductive dechlorination as discussed in Section 3.3.2 of the GMP. During reductive dechlorination, chlorine atoms on the cVOC molecule are replaced by other negatively charged particles, ultimately resulting in non-chlorinated and nonhazardous end products (methane and ethene). Downgradient of CAA-4, reductive dechlorination is expected to occur biotically from *Dehalococcoides* bacteria, which are naturally present in saturated soil. Additionally, at the downgradient property line where PlumeStop was amended with a ZVI electron donor and BDI Plus (an enriched natural consortium containing species of *Dehalococcoides*), abiotic degradation is expected to occur concurrently with biotic degradation. The primary evidence of reductive dechlorination is a trend of decreasing concentrations of the parent product TCE accompanied by increasing concentrations of the intermediate breakdown products of DCE and vinyl chloride. Abiotic degradation by ZVI is expected to produce de minimis amounts of DCE and vinyl chloride.

The 2024 groundwater results confirm that TCE and the breakdown products of DCE and vinyl chloride remain stable in the vicinity of the CAA-4 source area (01MW46) and upgradient well (01MW58R) west of the CAA-4 monolith. Evidence of increased biodegradation of TCE to DCE and vinyl chloride has also been observed at 01MW46 and 01MW58R, suggesting that there is a continued input of TCE parent product from upgradient groundwater at these locations. The occurrence of dechlorination is apparent when the 2024 results are compared to pre-remediation conditions; TCE, DCE, and vinyl chloride were all present at elevated concentrations exceeding CULs in groundwater in 2024 and concentrations of DCE and vinyl chloride were observed to be increasing, whereas only TCE was primarily present prior to remediation. The presence of TCE daughter products upgradient of the PlumeStop barrier (e.g., high DCE and vinyl

chloride concentrations in 01MW46, 01MW80, MW05, 01MW58R) additionally indicates that anaerobic degradation is occurring across the Site. While conditions favorable to anerobic degradation are beneficial for the Site, greater fluxes of DCE and vinyl chloride are less readily sorbed by PlumeStop and less susceptible to abiotic degradation via ZVI. Therefore, incomplete degradation of the daughter products due to insufficient residence time in the PlumeStop barrier is causing some localized breakthrough of DCE and vinyl chloride into the CPOC monitoring wells (01MW53R and 01MW85).

During the first and third quarters in 2024, secondary MNA parameters (total and dissolved [ferrous] iron, and dissolved gases) were analyzed at MW05 upgradient of the PlumeStop barrier, at MW06 within the PlumeStop barrier, and at 01MW85 downgradient of the PlumeStop barrier. The results of total iron and ferrous iron analysis show that iron at 01MW85 and MW05 is primarily ferrous, which is an indication of anaerobic degradation. The proportion of ferrous iron was less at MW06, which indicates that there is good distribution of iron (ZVI) in the PlumeStop barrier. The iron distribution is a line of evidence suggesting that the breakthrough of TCE observed at 01MW85 is not due to a depletion of ZVI.

The results of the dissolved gases show increased methane and ethene downgradient of the PlumeStop barrier relative to 2023 results, indicating that anerobic degradation of vinyl chloride is occurring. This is a line of evidence that there are increased inputs of daughter products through the PlumeStop barrier but active degradation is occurring despite low-level exceedances at the CPOC.

In addition to the geochemical lines of evidence, a performance soil boring was advanced upgradient of 01MW85 in the center of the PlumeStop barrier to verify the distribution of colloidal activated carbon in the shallow WBZ approximately 2 years after injections were complete. Carbon was not prominently detected, as would be expected, indicating that there is a diffuse section of PlumeStop in the vicinity of 01MW85 that may be affecting barrier performance at the CPOC. A ground penetrating radar survey was conducted after drilling, which found anomalies consistent with historical trenches that may have served as a preferential pathway for injection fluids in the vicinity of the diffuse section of the PlumeStop barrier.

The 2024 results are consistent with the 2023 observations in the intermediate WBZ 01MW108 where TCE and DCE remain non-detect and vinyl chloride concentrations remain less than the CUL. These results are evidence of complete attenuation of cVOCs downgradient of the ISS monolith in the intermediate WBZ.

Attenuation of cVOCs could not be assessed in the perched WBZ because this zone is no longer substantially present on ASKO following installation of an upgradient interceptor trench, which captures and treats perched WBZ groundwater from the upgradient BNSF parcel and discharges it into the shallow WBZ at the upgradient property boundary.

The geochemical parameters in groundwater at ASKO indicate that conditions continue to be anaerobic (low DO less than 0.5 mg/L and negative ORP) with low levels of total organic carbon

acting as a natural electron donor to support reductive dechlorination of TCE. The amount of ambient total organic carbon is insufficient to support complete reductive dechlorination, and the ZVI-enhanced PlumeStop barrier was designed to most efficiently degrade TCE rather than the TCE daughter products. Refer to Section 6.5 for contingency action recommendations.

4.2.3 East Waterfront

On the East Waterfront, all TPH-contaminated source soil was removed by excavation in CAA-6 in 2021 and attenuation of the post-excavation dissolved-phase TPH constituents in groundwater were expected to occur quickly by aerobic degradation. The 2024 results support this expectation with GRO and benzene results less than laboratory reporting limits at all wells during each monitoring event, and total DRO+ORO decreasing to near non-detect concentrations ranging from 52 to 110 µg/L.

Geochemical conditions on the East Waterfront are also aerobic, with generally positive ORP and DO up to 4.4 mg/L at 02MW04R nearest to the former TPH source area. These conditions suggest that degradation of the remaining petroleum is near complete, thus reducing the demand for oxygen necessary to facilitate the degradation process.

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5.0 Upgradient Groundwater Quality Evaluation

Data recently collected in the vicinity of the ASKO and BNSF property line are important to the overall assessment of groundwater quality and performance monitoring described in Section 4.0. The groundwater results from BNSF are relevant to both short-term and long-term compliance monitoring on ASKO since the perched WBZ groundwater from the BNSF parcel is captured and treated by the interceptor trench and PRB installed on the property boundary, and is then discharged to the shallow WBZ on the ASKO parcel via a gravity well. Additionally, shallow WBZ groundwater flow patterns show groundwater is flowing from the upgradient BNSF parcel onto the ASKO parcel (refer to Figure A.3b).

The BNSF parcel data are collected under a separate AO between BNSF and Ecology. The results of the BNSF quarterly groundwater monitoring are reported in their AO progress reports provided to Ecology by Arcadis U.S. Inc. (Arcadis 2024a, 2024b, 2024c, 2024d); therefore, the BNSF data are not included in this report. Monitoring locations are shown on Figure A.1.

5.1 OPERATION AND MAINTENANCE SAMPLING

The interceptor trench and PRB treatment vault at the ASKO/BNSF parcel boundary were designed to capture and treat perched WBZ groundwater from the upgradient BNSF parcel. The PRB, located in a treatment vault at the western end of the interceptor trench (refer to Figure A.2), treats the cVOC and TPH-impacted perched groundwater flowing from the upgradient BNSF parcel through the interceptor trench with ZVI-amended bedding sand. The treated groundwater is then discharged into a holding vault (clear vault) that is eventually gravity fed into the gravity well, which infiltrates into the shallow WBZ on the upgradient edge of the ASKO parcel. As part of O&M monitoring of the PRB treatment vault, grab samples for cVOCs were collected from the treatment (influent) vault, the clear vault, and the gravity well in 2023. The initial sampling showed that the cVOCs in the gravity well were an order of magnitude greater than the cVOCs in the clear vault, which infiltrates directly into the gravity well. At the request of Ecology, additional sampling of the treatment vault (influent vault), clear vault, and gravity well was conducted in 2024. The results are included in Table A.5. This sampling was requested in response to the discrepancy between the clear vault and gravity well results as well as the upgradient BNSF remedial investigation data, which shows elevated TCE and TPH concentrations on the BNSF parcel in both the perched and shallow WBZs (further described in Section 5.2).

The O&M samples in Table A.5 were compared to the BNSF remedial investigation groundwater data (Arcadis 2024a, 2024b, 2024c), and the ASKO parcel groundwater (e.g., 01MW58R) in Table A.3. This data comparison confirms that the treated perched WBZ groundwater discharging through clear vault has cVOC concentrations an order of magnitude less than the cVOC concentrations observed in the gravity well, the immediately downgradient ASKO well (01MW58R), and the BNSF remedial investigation well (e.g., MW-BN-03). This indicates that the elevated cVOC concentrations in the gravity well are not from the PRB interceptor trench, but rather from groundwater contamination that occurs in the shallow WBZ.

5.2 BNSF RAILWAY COMPANY GROUNDWATER MONITORING RESULTS

In 2024, quarterly groundwater monitoring was performed by BNSF on the portion of their property upgradient of CAA-4. This groundwater monitoring was conducted following their 2023 soil and reconnaissance groundwater monitoring investigation as part of their remedial investigation. The 2024 investigation consisted of quarterly monitoring of perched and shallow WBZ groundwater from existing and new wells installed on the BNSF parcel in 2023.

Available data for the BNSF remedial investigation were reviewed, including water level elevations and analytical laboratory results for cVOC and/or total DRO+ORO collected from seven perched WBZ monitoring wells and four shallow WBZ monitoring wells collected in February 2024, May 2024, and September 2024. These 2024 results for cVOCs and total DRO+ORO were reviewed relative to the 2020 Supplemental Upland Remedial Investigation/Feasibility Study dataset collected in 2019 (Floyd|Snider 2020) to better understand current upgradient conditions.

The 2019 Supplemental Remedial Investigation sampling showed that the greatest concentrations of TCE on the BNSF parcel in soil and groundwater were in the perched WBZ (Floyd|Snider 2020). Since construction of the interceptor trench and PRB vault by TOCST along the upgradient ASKO parcel boundary, TCE concentrations have decreased across the perched WBZ relative to their corresponding 2019 results. The decline in TCE concentrations in the perched WBZ on the BNSF parcel is attributed to ongoing interception and treatment by the PRB and dewatering of the perched WBZ to water level elevations below the most highly contaminated soils.

TCE did not exceed CULs in the shallow WBZ on the BNSF parcel during 2019 Supplemental Remedial Investigation sampling; however, concentrations at new BNSF well MW-BN-03 adjacent to and upgradient of the ASKO/BNSF property line had concentrations of TCE that were 3,300 times the CUL (1,650 µg/L in the most recent available dataset, compared to the CUL of 0.50 µg/L). Similarly elevated TCE was also detected farther southwest of the property line at 01MW93. The maximum concentration of TCE in groundwater at MW-BN-03 was collected adjacent to the apparent TCE soil source contamination at the top of the shallow WBZ (20 feet bgs) where a concentration of 30.5 mg/kg was detected (610 times greater than the CUL of 0.05 mg/kg; Arcadis 2024d). On the ASKO parcel, elevated TCE was also detected at the gravity well, which is screened in the shallow WBZ downgradient from MW-BN-03. TCE concentrations in shallow WBZ groundwater cross-gradient from the gravity well at 01MW58R remained stable relative to pre-remediation results at 01MW58. These results indicate that the presence of TCE-impacted soil in the BNSF parcel is acting as a continuing source of impacts to shallow WBZ groundwater on the BNSF parcel, which is migrating downgradient to the ASKO parcel.

CUL exceedances of lesser magnitude for total DRO+ORO were also detected at the new shallow WBZ well MW-BN-03, and DRO+ORO were newly detected at 01MW93 and at 01MW94 in the shallow WBZ on the BNSF parcel and at 01MW58R on the ASKO parcel. The total DRO+ORO exceedances in the BNSF perched WBZ monitoring wells ranged from 2,600 to 8,840 µg/L and in the shallow WBZ monitoring wells ranged from 1,232 to 2,619 µg/L. TPH could be a source of

total organic carbon acting as an electron donor for partial reductive dechlorination of TCE, as described in Section 4.2.2.

The potentiometric surface map for the second quarter of 2024 monitoring event, presented on Figure A.3b, shows that shallow WBZ groundwater upgradient of the ISS monolith flows parallel to the property line to the west-northwest. This parallel flow along the property line is consistent with predicted post-construction flow patterns presented in the EDR (Crete 2021). West of the ISS monolith, westerly horizontal flow transitions to an overall northerly direction onto the ASKO parcel. The groundwater flow patterns indicate that shallow WBZ groundwater is migrating from the BNSF parcel onto the ASKO parcel. Contaminant migration in the shallow WBZ from BNSF onto ASKO could have adverse effects on the cleanup action and associated restoration time frame.

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6.0 Recommended Short-Term Groundwater Monitoring Updates

The Year 2 compliance monitoring data were evaluated quarterly, and minor modifications were made to the monitoring program each quarter, in coordination with Ecology, using the adaptive management decision framework presented in Attachment A.3 of the GMP. The recommendations for the 2025 groundwater monitoring program based on the full Year 1 (2023) and Year 2 (2024) dataset are summarized in this section by site-wide and parcel-specific recommendations. The 2025 groundwater monitoring program with these recommendations is also presented in an updated table of monitoring wells and analytical schedule in Attachment A.5 and in Figure A.8.

6.1 SITE-WIDE GROUNDWATER FLOW PATTERNS

Hydrogeologic measurements of the shallow WBZ are recommended to continue semiannually in the Upland AOC in the first and third quarters of the year to represent the wet and dry seasons. Water levels will be recorded from the Upland AOC shallow WBZ wells designated for sampling in the monitoring network, plus an upgradient well for each parcel (01MW61 [to be replaced by 01MW60R], 01MW83, and 01MW100), and a few additional locations for full spatial coverage across the shallow WBZ (01MW35, 01MW102, 01MW106, and 01MW107). Potentiometric contour maps of the Upland AOC shallow WBZ for the wet and dry seasons will be prepared for the 2025 GMAR. To the extent possible, collection of groundwater elevation measurements will be coordinated with BNSFs consultant, as requested by Ecology, to document flow conditions across the BNSF and ASKO parcels.

6.2 BULK TERMINAL

Groundwater monitoring is recommended to continue on the Bulk Terminal per the GMP from the designated “after development” short-term monitoring network, following completion of grading and cap installation. Wells to be monitored in 2025 include the following:

- Semiannual monitoring of 01MW12, 01MW19R, 01MW84, and 01MW40 (01MW90R to replace 01MW40 following completion of cap installation).
- Annual monitoring of 01MW66.

As previously approved by Ecology, short-term monitoring of 01MW35 and 01MW49R has been discontinued since three consecutive results less than CULs have been achieved. Additionally, monitoring wells in conflict with redevelopment plans will be decommissioned prior to redevelopment activities beginning on the Bulk Terminal parcel (Lots B, C, D, and E), including 01MW30, 01MW39, 01MW40, 01MW06, and 01MW08.

6.3 ASKO HYDRAULIC

Groundwater monitoring is recommended to continue on the ASKO parcel per the GMP from the designated “after development” short-term monitoring network, following completion of grading and cap installation, which includes the following:

- Quarterly monitoring of 01MW53R, 01MW58R, 01MW85, and 01MW114 (new well)

- Semiannual monitoring of 01MW15, 01MW46, 01MW56, 01MW60R, MW05, and MW06.
- Contingency monitoring of 01MW107 quarterly, or as needed in coordination with Ecology.

The above monitoring program includes considerations for the following modifications to be implemented during the 2025 monitoring year:

- Quarterly monitoring will be retained at key wells in 2025 including 01MW53R, 01MW85, 01MW58R, and 01MW114, which are being used to evaluate performance of the in situ treatment barriers at the upgradient and downgradient property boundaries.
- A monitoring well (proposed 01MW114) will be installed adjacent to the gravity well following cap installation to assess migration of TCE and TPH in upgradient shallow WBZ groundwater from the BNSF parcel onto the ASKO parcel. Groundwater will initially be monitored for cVOCs and total DRO+ORO quarterly, and the frequency will be reevaluated with Ecology.
- Total DRO+ORO (and cVOCs) will continue to be monitored at shallow WBZ well 01MW58R to assess attenuation of COCs downgradient of the BNSF parcel.
- As previously approved by Ecology, monitoring well MW03R will be decommissioned prior to redevelopment. This perched WBZ well has been dry since its installation in 2022.
- Upgradient shallow WBZ well 01MW61 will be decommissioned and replaced with 01MW60R following completion of cap installation and monitoring of 01MW60R will be conducted quarterly after installation per the GMP. At the request of Ecology, the first monitoring event will also include analysis of TPH (DRO+ORO).
- Monitoring well MW02, which is within the footprint of the proposed stormwater detention facility and outside the pre-remediation cVOC plume, will be decommissioned. Monitoring well 01MW106 will be retained as a contingency well in place of contingency well MW02, which would be triggered for sampling if stronger-than-expected westward gradients or increasing IHS concentrations are observed at MW06. Monitoring well 01MW106 is appropriate to fulfill this contingency objective since the groundwater flow direction remains northerly.
- Following completion of grading and capping of the ASKO parcel, monitoring will transition to the “after redevelopment” short-term monitoring, anticipated to begin in the third quarter of 2025. Based on the change of development plans and supported by the 2024 monitoring data, wells 01MW45R, 01MW112, and 01MW113 designated in the GMP for installation after redevelopment are not currently needed for performance or confirmation monitoring, and therefore will not be installed.
    - 01MW15 will be retained in place of 01MW45R for short-term performance monitoring.

- Per the GMP, 01MW112 would be installed in the intermediate WBZ after redevelopment if IHS concentrations are increasing at 01MW53 or 01MW108. IHS concentrations are declining at 01MW108, and increasing IHS concentrations at 01MW53(R) are being monitored at downgradient contingency well 01MW107.
- Per the GMP, 01MW113 could be installed after redevelopment if stronger-than-expected westward gradients were observed in this area. The groundwater flow direction remains northerly, as shown in Figures A.3a through A.3c.

6.4 EAST WATERFRONT

Since all wells monitored under the short-term GMP have resulted in three or more consecutive quarters of IHSs less than CULs, groundwater monitoring will continue with long-term confirmation monitoring on the East Waterfront parcel per the GMP with the next monitoring event to occur in the third quarter of 2025. Monitoring wells 02MW04R, 02MW07, 02MW17, 02MW19, and 02MW20R will be monitored for IHSs on an annual basis. The replacement monitoring well 02MW20R will be installed at least 30 days prior to the third quarter monitoring event. The only modification from the GMP long-term monitoring scope is that the first long-term monitoring sampling event will occur in the third quarter of 2025 rather than in the fourth quarter.

Monitoring wells 02MW01 and 02MW18, which have no specified monitoring purpose, will be decommissioned in 2025, as previously approved by Ecology via email on January 15, 2025, in response to the 2024 fourth quarter quarterly progress report recommendations.

6.5 CONTINGENCY ACTION EVALUATION

Per the CAP and GMP, contingency actions would be evaluated if degradation rates appear to be too slow to reliably meet CULs within the predicted restoration time frame or if degradation is not apparent. This evaluation is being conducted proactively ahead of the 5-year Ecology periodic review period, as discussed in the GMP.

The post-remediation groundwater quality on ASKO shows cVOC CUL exceedances at the CPOC wells 01MW53R and 01MW85, which may require contingency actions to comply with the estimated restoration time frame. Evaluations conducted in 2024 included assessment of groundwater quality and geochemical parameters at the upgradient and downgradient boundaries of the parcel, supplemental sampling for total organic carbon, analysis of secondary MNA parameters (refer to Section 4.2.2), and investigating carbon distribution in soil with a performance soil boring (as described in Section 3.5.1). Regenesis Remediation Services (Regenesis) also evaluated performance of the PlumeStop barrier by reviewing groundwater quality in conjunction with the PlumeStop injection field notes and determined that high pressure injections and daylighting of injection fluids may be a line of evidence that the PlumeStop barrier has a diffuse section.

This extensive evaluation indicates that CUL exceedances of cVOCs at the CPOC are occurring for the following reasons:

- There is ongoing migration of TCE- and TPH-impacted shallow WBZ groundwater from an upgradient source area on the BNSF parcel.
- There is a diffuse section of the PlumeStop barrier approximately 50 feet long in the vicinity of 01MW85.
- There has been a change in groundwater quality since remedial design and implementation. More elevated levels of DCE and vinyl chloride are present and indicate that anaerobic degradation of TCE is occurring upgradient of the PlumeStop barrier, which was not observed pre-remediation.

Based on the extensive evaluation performed in 2024, the data indicate that immediately implementing a source control interim action on the upgradient BNSF parcel is necessary to mitigate the current ongoing recontamination of the ASKO parcel from TCE migrating in the shallow WBZ from the BNSF parcel onto the ASKO parcel. This ongoing recontamination poses a threat to the long-term integrity of the remedy on the ASKO parcel.

Separately, the diffuse section of the PlumeStop barrier should be reinforced to improve in situ treatment within this area. This reinforcement should be completed in 2025, and to ensure the maximum efficiency of groundwater treatment, this repair should be accompanied by upgradient source control on BNSF. Additionally, the ZVI-enhanced PlumeStop in situ groundwater treatment barrier was designed to treat TCE abiotically; however, post-remediation monitoring shows elevated concentrations of DCE and vinyl chloride are also present in groundwater flowing through the PlumeStop barrier. DCE and vinyl chloride are more efficiently degraded via reductive dechlorination, which requires a supplemental source of electron donors to achieve full degradation. Therefore, during reinforcement of the PlumeStop barrier, injections would be enhanced with a controlled-release organic carbon source that is compatible with colloidal activated carbon (such as AquiFix organic wax manufactured by Regenesis) in lieu of ZVI as a contingency measure.

6.6 SCHEDULE AND REPORTING

Groundwater monitoring will be completed on a quarterly basis in 2025 in accordance with the GMP and the recommendations contained in this GMAR, in coordination with Ecology. Per the Prospective Purchaser Consent Decree, quarterly progress reports will be submitted by the 15th of the month after each quarter and the 2025 GMAR will be submitted by March 1, 2026.

A recommendation for the PlumeStop repair approach will be presented to Ecology prior to implementation and the supplemental injection activities will be reported in the 2025 GMAR.

7.0 References

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Long-Term Compliance Monitoring Annual Report Appendix A: 2024 Groundwater Monitoring Annual Report

Time Oil Bulk Terminal

Tables

Table A.1
Well Inventory and Status

Well ID	Parcel	Water-Bearing Zone	Screened Interval (feet below TOC)	Status
01MW03	BT	Shallow	10–25	
01MW06	BT	Shallow	10–25	To be decommissioned during redevelopment in 2025. Well has no specified monitoring purpose.
01MW08	BT	Shallow	9–25	To be decommissioned during redevelopment in 2025. Well has no specified monitoring purpose.
01MW15	ASKO	Shallow	10–30	
01MW17	BT	Shallow	20–30	
01MW19R	BT	Shallow	10–20	
01MW30	BT	Shallow	15–28	To be decommissioned during redevelopment in 2025. Well has no specified monitoring purpose.
01MW34	BT	Shallow	10–20	
01MW35	BT	Shallow	10–20	
01MW36	BT	Shallow	10–20	
01MW39	BT	Shallow	7–22	Damaged during cleanup action and unusable. To be decommissioned during redevelopment (monitoring objective fulfilled by 01MW100 and 01MW40/01MW90R).
01MW40	BT	Shallow	7–22	To be decommissioned during redevelopment and replaced by 01MW90R.
01MW46	ASKO	Shallow	13–28	
01MW47	BT	Shallow	6–21	
01MW48	BT	Intermediate	28–32	
01MW49R	BT	Intermediate	35–40	
01MW51	BT	Intermediate	29–39	
01MW52	ASKO	Shallow	14–24	To be decommissioned during redevelopment (monitoring purpose fulfilled by 01MW89).
01MW53	ASKO	Shallow	16–26	Decommissioned in February 2024 and replaced 10 feet south.
01MW53R	ASKO	Shallow	17-27	
01MW56	ASKO	Shallow	16–26	
01MW57	ASKO	Intermediate	35.5–40.5	To be decommissioned during redevelopment. Within redevelopment structure footprint.
01MW58	ASKO	Shallow	25.5–35.5	Damaged during cleanup action. Decommissioned in February 2024 and replaced with 01MW58R.
01MW58R	ASKO	Shallow	24–34	
01MW61	ASKO	Shallow	22–37.5	To be decommissioned during redevelopment. Monitoring purpose (upgradient sentinel well) will be fulfilled by 01MW60R.
01MW66	BT	Shallow	12–22	
01MW80	ASKO	Shallow	20–28	
01MW83	EW	Shallow	14–24	
01MW84	BT	Shallow	17–23	
01MW85	ASKO	Shallow	18–27	
01MW86	BT	Shallow	14–24	
01MW87	BT	Shallow	11–21	
01MW88	BT	Shallow	11–21	Decommissioned in February 2024.
01MW89	ASKO	Shallow	18–26	
01MW100	BT	Shallow	20–30	Retained for monitoring in place of 01MW17.
01MW101	BT	Shallow	17–21	
01MW102	BT	Shallow	10–20	
01MW103	BT	Shallow	7–17	Decommissioned in February 2024.
01MW104	BT	Intermediate	28–33	
01MW106	ASKO	Shallow	15–25	
01MW107	ASKO	Shallow	17–27	
01MW108	ASKO	Intermediate	30–35	
01MW109	BT	Shallow	8–18	Decommissioned in February 2024.
01MW111	BT	Intermediate	30–35	To be decommissioned during redevelopment (outside of TPH impacts).
01MW12	BT	Shallow	4–19	
02MW01	EW	Shallow	10–20	To be decommissioned in 2025. No specified monitoring purpose.
02MW03	EW	Shallow	10–20	
02MW04R	EW	Shallow	5–15	
02MW05	EW	Intermediate	20–35	Monitoring well confirmed decommissioned in February 2024.
02MW07	EW	Shallow	1.5–11.5	
02MW08	EW	Shallow	13–22	Decommissioned in February 2024.
02MW09	EW	Shallow	7–12	Decommissioned in February 2024.
02MW10	EW	Shallow	2.5–7.5	Decommissioned in February 2024.
02MW13	EW	Shallow	5–15	Decommissioned in February 2024.
02MW14	EW	Shallow	5–15	Overgrown by blackberry bramble; inaccessible.
02MW16	EW	Shallow	5–15	
02MW17	EW	Shallow	1–11	
02MW18	EW	Shallow	4–14	To be decommissioned in 2025. No specified monitoring purpose.
02MW19	EW	Shallow	3–13	
02MW21	EW	Intermediate	18–28	
02MW22	EW	Intermediate	17–27	Decommissioned in February 2024.
MW01	ASKO	Shallow	18–28	To be decommissioned in 2025 prior to redevelopment (within anticipated redevelopment structure footprint).
MW02	ASKO	Shallow	18–28	To be decommissioned in 2025 prior to redevelopment (within anticipated redevelopment structure footprint).
MW03R	ASKO	Perched	13–18	To be decommissioned in 2025. Well dry and no longer needed.
MW05	ASKO	Shallow	19–29	
MW06	ASKO	Shallow	18–28	

Note:

Locations are listed alphanumerically.

Abbreviations:

ASKO ASKO Hydraulic
BT Bulk Terminal
EW East Waterfront
TOC Top of casing
TPH Total petroleum hydrocarbons

Table A.2
Summary of 2024 Short-Term Performance Monitoring

Well ID	Water-Bearing Zone	Screened Interval (feet below TOC)	Designation	Monitoring Schedule	GMP Notes	2024 Monitoring Schedule									2024 Monitoring Schedule				Monitoring Schedule Deviation Notes
						MNA Parameters [1]		Indicator Hazardous Substances											
						Primary	Secondary	Total Arsenic	GRO	Total DRO+ORO	Benzene	TCE	Vinyl Chloride	Penta	Q1	Q2	Q3	Q4	
Bulk Terminal Wells																			
01MW12	Shallow	4–19	CAA-1 Downgradient Plume	Semiannual		X			X	X	X				IHS		IHS		
01MW19R	Shallow	10–20	CAA-2 Source Area	Quarterly		X			X	X	X				IHS	IHS	IHS	IHS	
01MW35	Shallow	10–20	CAA-2 Downgradient Plume	Quarterly		X			X	X	X								Three consecutive results meeting CULs achieved. Monitoring complete in 2023.
01MW40	Shallow	7–22	CAA-1 Source Area	Initial Semiannual	Monitor until redevelopment; decommission during property redevelopment.	X			X	X	X				IHS		IHS		
01MW49R	Intermediate	35–40	CAA-2 Downgradient Plume	Semiannual		X			X	X	X				IHS		IHS		
01MW66	Shallow	12–22	--	Annual	On-property penta plume.	X								X	IHS				
01MW84	Shallow	17–23	CAA-2 Downgradient Plume	Quarterly		X			X	X	X				IHS	IHS	IHS	IHS	
ASKO Wells																			
01MW15	Shallow	10–30	CAA-4 Source Area	Initial Semiannual	Monitor until redevelopment; decommission during property redevelopment (within structure footprint).	X						X	X		IHS	IHS	IHS		Contingency sample collected in Q2 due to increased TCE concentrations observed in Q1. Well retained due to change in redevelopment plans.
01MW46	Shallow	13–28	CAA-4 Source Area	Quarterly	Monitor until redevelopment; decommission during property redevelopment (within structure footprint).	X					X	X	X		IHS	IHS	IHS	IHS	Well retained due to change in redevelopment plans.
01MW53R	Shallow	17-27	CAA-4 Downgradient Plume	Quarterly		X						X	X		IHS	IHS	IHS	IHS	Well replaced in February 2024 to deepen screen (from 26 to 27 feet bgs) and move well out of ROW.
01MW58R	Shallow	24-34	CAA-4 Source Area	Quarterly	Install and monitor after redevelopment grading					X		X	X		IHS	IHS	IHS	IHS	Well installed in February 2024 ahead of redevelopment.
01MW56	Shallow	16–26	CAA-4 Downgradient Plume	Semiannual		X					X	X	X		IHS		IHS		
01MW80	Shallow	20–28	CAA-4 Downgradient Plume	Contingency	Sample if increasing IHS concentrations at 01MW46, 01MW53, 01MW85, or MW05.							X	X			IHS	IHS		Sampled at request of Ecology due to elevated cVOCs at CPOC.
01MW85	Shallow	18–27	CAA-4 Downgradient Plume	Quarterly		X	X					X	X		IHS + MNA	IHS	IHS + MNA	IHS	
01MW89	Shallow	18–26	CAA-4 Downgradient Sentinel	Contingency	Sample if increasing IHS concentrations at 01MW53 or 01MW56							X	X		IHS				Contingency sampling triggered in Q1 2024.
01MW107	Shallow	17–27	CAA-4 Downgradient Sentinel	Contingency	Sample if increasing IHS concentrations at 01MW53 or 01MW85.	X						X	X		IHS	IHS	IHS	IHS	Contingency sampling triggered in Q3 2023 and retained quarterly through 2024.
01MW108	Intermediate	30–35	CAA-4 Downgradient Plume	Initial Semiannual	Monitor until redevelopment; decommission during property redevelopment (within structure footprint).	X						X	X		IHS		IHS		
MW03R	Perched	13–18	CAA-5 Source Area	Semiannual		X		X	X	X	X	X	X						Well was dry. No samples collected.
MW05	Shallow	19–29	CAA-4 Downgradient Plume	Initial Semiannual	Monitor until redevelopment; decommission during property redevelopment (within structure footprint).	X	X				X	X	X		IHS + MNA		IHS + MNA		Semiannual monitoring to continue due to change in redevelopment plans.
MW06	Shallow	18–28	CAA-4 Downgradient Plume	Initial Baseline	Sample once during first quarter of initial monitoring; contingency sample if increasing IHS concentrations at 01MW46, 01MW53, 01MW85, or MW05; monitor semiannually after redevelopment grading.	X	X				X	X	X		IHS + MNA		IHS + MNA		Began semiannual monitoring in 2024 since redevelopment plans changed.

Table A.2
Summary of 2024 Short-Term Performance Monitoring

Well ID	Water-Bearing Zone	Screened Interval (feet below TOC)	Designation	Monitoring Schedule	GMP Notes	2024 Monitoring Schedule									2024 Monitoring Schedule				Monitoring Schedule Deviation Notes
						MNA Parameters [1]		Indicator Hazardous Substances											
						Primary	Secondary	Total Arsenic	GRO	Total DRO+ORO	Benzene	TCE	Vinyl Chloride	Penta	Q1	Q2	Q3	Q4	
East Waterfront Wells																			
02MW04R	Shallow	5–15	CAA-6 Source Area	Quarterly		X			X	X	X				IHS	IHS	IHS		More than three consecutive results meeting CULs achieved after Q2 2024 event. Q3 2024 sample requested by Ecology to verify Q3 2023 benzene spike was not duplicated in 2024.
02MW07	Shallow	1.5–11.5	CAA-6 Downgradient Plume	Quarterly		X		X	X	X	X				IHS				Three consecutive results meeting CULs achieved after Q1 2024 event.
02MW19	Shallow	3–13	CAA-6 Downgradient Sentinel	Quarterly		X		X	X	X	X				IHS				Three consecutive results meeting CULs achieved after Q1 2024 event.

Notes:

Blank cells are intentional.

-- Not established.

1 Primary MNA parameters include field measurement of dissolved oxygen, oxidation–reduction potential, pH, conductivity, and temperature. Primary MNA parameters were collected during all sampling events specified in the short-term performance monitoring plan. Secondary MNA parameters include ferrous iron (field method) and laboratory analysis of total and dissolved iron, cis-1,2-dichloroethene, and dissolved gases (methane, ethene, and ethane). Secondary MNA parameters were analyzed from select wells semiannually to evaluate performance of the PlumeStop barrier.

Abbreviations:

ASKO ASKO Hydraulic
bgs Below ground surface
CPOC Conditional point of compliance
CUL Cleanup level
cVOC Chlorinated volatile organic compound
DRO Diesel-range organics
Ecology Washington State Department of Ecology
GMP Groundwater Monitoring Plan
GRO Gasoline-range organics
IHS Indicator hazardous substance
MNA Monitored natural attenuation
ORO Oil-range organics
penta Pentachlorophenol
ROW Right-of-way
TCE Trichloroethene
TOC Top of casing

Table A.3
Pre- and Post-Remediation Groundwater Results for Indicator Hazardous Substances

		Analyte Class	Total Metals	TPH		VOCs	cVOCs			SVOCs
		Analyte	Arsenic	GRO	Total DRO + ORO	Benzene	TCE	cis-1,2-DCE	Vinyl Chloride	Penta
		CAS No.	7440-38-2	--	-- (U=0)	71-43-2	79-01-6	156-59-2	75-01-4	87-86-5
		Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
		Cleanup Level	5.0	800	500	0.44	0.50	--	0.20	0.20
Parcel	Location	Sample Date								
Bulk Terminal	01MW12									
	Pre-remediation	4/30/2019		100 U	**590** (1)	**3.0**				
	Post-remediation	1/31/2023		100 U	**1,000** (1)	0.35 U				
		6/28/2023		110	**1,200** (1)	**1.3**				
		2/26/2024		100 U	**550** (1)	0.35 U				
		8/7/2024		100 U	**1,300** (1)	0.35 U				
	01MW19/01MW19R									
	Pre-remediation	4/30/2019		**10,000**	**1,900** (1)	**2,600**	*1.0 U*	1.0 U	0.20 U	
	Post-remediation	1/31/2023		**990**	**910** (1)	**5.2**				
		4/7/2023		**1,100**	**700** (1)	**4.4**				
		6/28/2023		**1,300**	**810** (1)	**2.1**				
		10/10/2023		**1,200**	**890** (1)	**1.6**				
				1,300	**920** (1)	**1.8**				
		2/26/2024		560	**600** (1)	**1.9**				
		5/15/2024		750	**680** (1)	**2.1**				
				1,000	**720** (1)	**2.2**				
		8/7/2024		500	**580** (1)	**0.98**				
		11/20/2024		490	**1,100** (1)	**1.0**				
	01MW35									
	Pre-remediation	5/1/2019		100 U	**550** (1)	0.35 UJ				
	Post-remediation	1/31/2023		100 U	110 (1)	0.35 U				
		4/7/2023		100 U	120 (1)	0.35 U				
		6/28/2023		100 U	76 (1)	0.35 U				
		10/10/2023		100 U	56 (1)	0.35 U				
	01MW40									
	Pre-remediation	4/30/2019			**1,100** (1)	0.35 UJ				
	Post-remediation	1/31/2023		100 U	**5,300** (1)	**0.73**				
		6/28/2023		100 U	**620** (1)	0.35 U				
		2/26/2024		110	**5,500** (1)	**1.6**				
		8/7/2024		100 U	**980** (1)	0.35 U				
	01MW49/01MW49R									
	Pre-remediation	5/1/2019		100 U	**850** (1)	0.35 UJ				
	Post-remediation	1/31/2023		100 U	260 (1)	0.35 U				
		6/29/2023		100 U	160 (1)	0.35 U				
		2/26/2024		100 U	200 (1)	0.35 U				
		8/7/2024		100 U	240 (1)	0.35 U				
	01MW51									
	Pre-remediation	5/26/2016		370	**1,800** (1)	*1.0 U*				
	Post-remediation	4/7/2023		100 U	250 U	0.35 U				
	01MW66									
	Pre-remediation	4/30/2019		100 U	250	0.35 UJ				**3.6**
	Post-remediation	1/31/2023								**1.9**
		2/26/2024								**0.76**
	01MW84									
	Pre-remediation	5/1/2019		**8,400**	**2,800** (1)	*5.0 U*				
	Post-remediation	1/31/2023		**2,300**	**810** (1)	0.35 U				
				2,200	**830** (1)	0.35 U				
		4/7/2023		**5,500**	**1,500** (1)	0.35 U				
		6/28/2023		**4,600**	**1,400** (1)	0.35 U				
				4,300	**1,300** (1)	0.35 U				
		10/10/2023		**3,500**	**1,500** (1)	0.35 U				
		2/26/2024		**1,800**	**540** (1)	0.35 U				
		5/15/2024		**3,900**	**1,400** (1)	0.35 U				
		8/7/2024		**2,500**	**970** (1)	0.35 U				
		11/20/2024		**1,800**	**1,200** (1)	0.35 U				
	01MW87									
	Pre-remediation	5/26/2019		100 U		*1.0 U*				
		5/1/2019			110					
	Post-remediation	4/7/2023		100 U	250 U	0.35 U				
ASKO	01MW15									
	Pre-remediation	5/2/2019		100 U	220 (1)	0.41	0.50 U	1.7	**7.2**	
	Post-remediation	2/1/2023					0.50 U	6.4	**36**	
		6/28/2023					0.50 U	5.7	**28**	
		2/26/2024					**27**	88	**59**	
		5/15/2024					**2.7**	18	**58**	
		8/7/2024					**0.59**	8.9	**36**	
	01MW46									
	Pre-remediation	5/2/2019			280 (1)	**14**	**880**	220	**11**	
	Post-remediation	2/1/2023				**3.8**	**240**	140	**17**	
		4/7/2023				*3.5 U*	**140**	110	**9.3**	
		6/28/2023				**4.3**	**280**	260	**25**	
		10/10/2023				**4.8**	**300**	400	**36**	
		2/26/2024				**3.1**	**220**	520	**69**	
		5/15/2024				**2.8 J**	**220**	490	**69**	
		8/7/2024				**3.1 J**	**160**	610	**96**	
		11/20/2024				*3.5 U*	**130**	770	**160**	

Table A.3
Pre- and Post-Remediation Groundwater Results for Indicator Hazardous Substances

		Analyte Class	Total Metals	TPH		VOCs	cVOCs			SVOCs
		Analyte	Arsenic	GRO	Total DRO + ORO	Benzene	TCE	cis-1,2-DCE	Vinyl Chloride	Penta
		CAS No.	7440-38-2	--	-- (U=0)	71-43-2	79-01-6	156-59-2	75-01-4	87-86-5
		Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
		Cleanup Level	5.0	800	500	0.44	0.50	--	0.20	0.20
Parcel	Location	Sample Date								
ASKO (cont.)	**01MW53/01MW53R** [2]									
	Pre-remediation	5/2/2019			94 [1]	0.35 U	0.50 U	4.4	**0.26**	
	Post-remediation	2/1/2023					**2.9**	5.4	**0.57**	
		4/7/2023					**2.1**	3.2	**0.36**	
		6/28/2023					**2.0**	2.9	**0.51**	
		10/10/2023					**1.5**	2.4	**0.59**	
		2/27/2024					**26**	2.9	**0.60**	
		5/15/2024					**12**	1.6	**0.33**	
		8/8/2024					**13**	2.0	**0.76**	
		11/20/2024					**15**	2.2	**0.41**	
	01MW56									
	Pre-remediation	5/2/2019			**1,000** [1]	0.35 U	0.50 U	1.0 U	**0.61**	
	Post-remediation	2/1/2023					**0.81**	1.0 U	**0.99**	
		6/28/2023					**0.62**	1.0 U	**0.97**	
		2/26/2024					**2.1**	1.0 U	**1.1**	
		8/7/2024					**0.97**	1.0 U	**1.2**	
	01MW58/01MW58R									
	Pre-remediation	5/2/2019			100 [1]		**42**	1.6	**0.30**	
	Post-remediation	2/27/2024					**40**	520	**31**	
		5/15/2024					**38**	490	**33**	
		8/7/2024			**1,300** [1]		**23**	270	**13**	
		11/20/2024			**570** [1]		**92**	200	**24**	
	01MW80									
	Pre-remediation	5/2/2019			380 [1]	**16**	**710**	250	**10**	
	Post-remediation	5/15/2024					**190**	350	**51**	
		8/8/2024				**2.4 J**	**180**	350	**65**	
	01MW85									
	Pre-remediation	5/3/2019			450 [1]		0.50 U	2.4	**7.9**	
	Post-remediation	1/31/2023					**5.7**	1,200	**13**	
		4/7/2023					**6.2**	1,200	**17**	
		6/28/2023					**110**	1,000	**13**	
		10/10/2023					**13**	1,100	**18**	
		2/27/2024					*5.0 U*	990	**28**	
		5/15/2024					**6.2**	970	**26**	
		8/8/2024					**6.5**	1,100	**33**	
		11/20/2024					**5.0**	990	**36**	
	01MW89									
	Pre-remediation	5/16/2016			350 [1]	*1.0 U*	*1.0 U*	1.0 U	0.020 U	
	Post-remediation	2/27/2024					0.50 U	1.0 U	0.020 U	
	01MW107									
	Pre-remediation	5/6/2019					0.50 U	1.0 U	0.020 U	
	Post-remediation	6/28/2023					0.50 U	1.0 U	0.020 U	
		10/10/2023					0.50 U	1.0 U	0.020 U	
		2/26/2024					0.50 U	1.0 U	0.020 U	
		5/15/2024					0.50 U	1.0 U	0.020 U	
		8/8/2024					0.50 U	1.0 U	0.020 U	
		11/20/2024					0.50 U	1.0 U	0.020 U	
	01MW108									
	Pre-remediation	5/3/2019					0.50 U	1.0 U	**0.33**	
	Post-remediation	2/1/2023					0.50 U	1.0 U	**0.27**	
		6/29/2023					0.50 U	1.0 U	0.065	
		2/26/2024					0.50 U	1.0 U	0.11	
		8/7/2024					0.50 U	1.0 U	0.081	
	MW05									
	Pre-remediation	5/3/2019		140	310 [1]	**1.0**	**240**	120	**27**	
	Post-remediation	2/1/2023				**1.4**	**140**	360	**6.8**	
		6/28/2023				**1.5 J**	**160**	360	**6.9**	
		2/27/2024				**1.1 J**	**120**	840	**24**	
		8/8/2024				**0.83 J**	**51**	840	**81**	
	MW06									
	Pre-remediation	5/3/2019			370 [1]	**2.6**	**330**	31	**2.8**	
	Post-remediation	2/1/2023				0.35 U	0.50 U	1.0 U	**2.6**	
		2/27/2024				0.35 U	**7.7**	68	**4.5**	
		8/8/2024				0.35 U	**48**	50	**2.1**	
East Waterfront	**02MW04/02MW04R**									
	Pre-remediation	5/18/2016		**3,100**	**2,000** [1]	**19**				
		5/3/2019				**3.7**				
	Post-remediation	2/1/2023		100 U	69 [1]	0.35 U				
		4/7/2023		100 U	250 U	0.35 U				
		6/29/2023		100 U	65 [1]	**29**				
		10/10/2023		100 U	250 U	0.35 U				
		2/27/2024		100 U	250 U	0.35 U				
				100 U	250 U	0.35 U				
		5/15/2024		100 U	52 [1]	0.35 U				
		8/7/2024		100 U	96 [1]	0.35 U				

Table A.3
Pre- and Post-Remediation Groundwater Results for Indicator Hazardous Substances

		Analyte Class	Total Metals	TPH		VOCs	cVOCs			SVOCs
		Analyte	Arsenic	GRO	Total DRO + ORO	Benzene	TCE	cis-1,2-DCE	Vinyl Chloride	Penta
		CAS No.	7440-38-2	--	-- (U=0)	71-43-2	79-01-6	156-59-2	75-01-4	87-86-5
		Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
		Cleanup Level	5.0	800	500	0.44	0.50	--	0.20	0.20
Parcel	Location	Sample Date								
East Waterfront (cont.)	**02MW07**									
	Pre-remediation	5/19/2016		100 U	160 (1)	*1.0 U*				
		5/3/2019			**670 (1)**					
		7/25/2019	3.9							
	Post-remediation	2/1/2023	1.0 U	100 U	86 (1)	0.35 U				
		4/7/2023	1.0 U	100 U	250 U	0.35 U				
		6/29/2023	1.1	100 U	76 (1)	0.35 U				
		10/10/2023	1.2	100 U	73 (1)	0.35 U				
		2/27/2024	1.0 U	100 U	250 U	0.35 U				
	02MW19									
	Pre-remediation	5/6/2019		100 U	380 (1)					
		7/25/2019	**14**							
	Post-remediation	2/1/2023	3.3	100 U	150 (1)	0.35 U				
		4/7/2023	4.7	100 U	76 (1)	0.35 U				
			4.8	100 U	84 (1)	0.35 U				
		6/29/2023	4.2	100 U	76 (1)	0.35 U				
		10/10/2023	3.1	100 U	81 (1)	0.35 U				
		2/27/2024	4.8	100 U	110 (1)	0.35 U				

Notes:

	Blanks are intentional. Data not collected for specific analyte.
--	Not available.
Italic	Reporting limit exceeds cleanup level.
BOLD	Detected exceedance of cleanup level.
1	Laboratory noted that the sample chromatographic pattern does not resemble the fuel standard used for quantitation for one or more of the detected concentrations in the sum.
2	Monitoring well 01MW53 was replaced with 01MW53R in February 2024.

Abbreviations:

ASKO	ASKO Hydraulic
CAS	Chemical Abstracts Service
cVOC	Chlorinated volatile organic compound
DCE	Dichloroethene
DRO	Diesel-range organics
GRO	Gasoline-range organics
µg/L	Micrograms per liter
ORO	Oil-range organics
penta	Pentachlorophenol
SVOC	Semivolatile organic compound
TCE	Trichloroethene
TPH	Total petroleum hydrocarbons
VOC	Volatile organic compound

Qualifiers:

J	Analyte was detected; concentration is an estimate.
U	Analyte was not detected at the given reporting limit.
UJ	Analyte was not detected at the given reporting limit, which is considered estimated.

Table A.4
Monitored Natural Attenuation and Field Parameters (2024)

		Primary MNA Parameters						Secondary MNA Parameters						Conventionals
Analyte Class		Field Measurements						Dissolved Gases			Metals			
Analyte		Dissolved Oxygen	Specific Conductance	ORP	pH	Temperature	Turbidity	Ethane	Ethene	Methane	Total Iron	Dissolved Iron	Ferrous iron	Total Organic Carbon
CAS No.		--	--	--	pH	--	--	74-84-0	74-85-1	74-82-8	7439-89-6	7439-89-6	15438-31-0	TOC
Unit		mg/L	µS/cm	mV	pH	°C	ntu	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L
Location Name	Date													
Bulk Terminal														
01MW12	2/26/2024	0.32	432.7	-99.4	6.65	11.0	3.03							
	8/7/2024	0.22	557	-33.6	6.57	16.2	2.82							
01MW19R	2/26/2024	0.37	207.7	-157.2	7.08	14.1	0.44							
	5/15/2024	0.25	184.8	-98.1	6.93	15.0	0.34							
	8/7/2024	0.27	231.4	-107	7.04	16.2	0.64							
	11/20/2024	0.01 U	221.7	-184.7	7.12	15.2	1.51							
01MW40	2/26/2024	0.37	406.5	-33.3	6.55	11.0	0.63							
	8/7/2024	0.25	526	-41.7	6.68	15.2	0.65							
01MW49R	2/26/2024	0.23	828	-136.7	7.00	14.0	0.36							
	8/7/2024	0.36	855	-104	7.08	15.7	1.87							
01MW66	2/26/2024	0.36	435.7	-108.1	6.69	12.4	8.55							
01MW84	2/26/2024	0.35	82.2	120.9	6.74	12.8	1.08							
	5/15/2024	0.24	73.3	-56.0	6.68	13.5	1.77							
	8/7/2024	0.27	105.2	-58.1	6.69	16.4	1.24							
	11/20/2024	0.01 U	102.3	-115.3	6.77	17.1	2.00							
ASKO														
01MW107	2/26/2024	1.50	313.4	126.9	6.11	13.7	0.62							
	5/15/2024	1.18	268.8	75.0	6.09	14.7	2.34							
	8/8/2024	0.92	349.8	130.9	6.15	15.0	1.97							
	11/20/2024	0.57	329	123.3	6.27	13.8	6.68							
01MW108	2/26/2024	0.22	590	-112.1	6.89	14.1	7.00							
	8/7/2024	0.33	663	-124.8	7.00	15.8	4.76							
01MW15	2/26/2024	0.29	480.6	-75.4	6.72	13.5	0.68							
	5/15/2024	0.18	451.6	-45.8	6.69	14.7	0.33							
	8/7/2024	0.32	640	-92.0	6.98	15.1	1.86							
01MW46	2/26/2024	0.16	399.1	-128	7.23	14.7	0.83							
	5/15/2024	0.22	372.1	-53.5	7.12	14.9	0.78							
	8/7/2024	0.36	475.4	-133.9	7.03	15.0	1.31							
	11/20/2024	0.44	636	-109.2	6.99	14.5	3.06							
01MW53R	2/27/2024	0.28	567	-68.4	6.63	13.5	0.98							
	5/15/2024	0.35	505	-51.0	6.41	14.4	2.12							
	8/8/2024	0.28	697	-9.2	6.67	15.7	2.46							
	11/20/2024	0.45	637	-70.9	6.65	14.5	2.47							

Table A.4
Monitored Natural Attenuation and Field Parameters (2024)

		Primary MNA Parameters						Secondary MNA Parameters						
Analyte Class		Field Measurements						Dissolved Gases			Metals			Conventionals
Analyte		Dissolved Oxygen	Specific Conductance	ORP	pH	Temperature	Turbidity	Ethane	Ethene	Methane	Total Iron	Dissolved Iron	Ferrous iron	Total Organic Carbon
CAS No.		--	--	--	pH	--	--	74-84-0	74-85-1	74-82-8	7439-89-6	7439-89-6	15438-31-0	TOC
Unit		mg/L	µS/cm	mV	pH	°C	ntu	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L
Location Name	Date													
ASKO (cont.)														
01MW56	2/26/2024	0.25	583	-13.9	6.60	14.2	0.45							
	8/7/2024	0.24	669	21.6	6.61	16.4	0.79							
01MW58R	2/26/2024	0.25	423.3	-137.2	7.39	13.6	3.62							
	5/15/2024	0.26	367.4	-97.4	7.23	14.7	1.90							
	8/7/2024	0.39	517	-132.6	7.30	15.1	1.50							
	11/20/2024	0.53	637	-130.3	7.26	13.5	2.60							
01MW80	5/15/2024	0.33	347.3	-48.7	6.68	15.1	1.21							
	8/8/2024	0.33	486.6	-80.6	6.88	14.4	1.18							
01MW85	1/31/2023	2.41	577	-57.7	6.89	14.9	3.32	15 U	15 U	1,800			5,000	
	10/10/2023	0.29	476	34.5	6.78	14.9	1.10	0.22 U	2.7 J	320 J				
	2/27/2024	0.24	513	-83.6	6.89	14.1	0.36	0.56 U	14	2,500	4,300	4,300		
	5/15/2024	0.36	472.6	-73.4	6.82	14.9	1.00							
	8/8/2024	0.25	662	-53.1	6.94	15.3	1.04	0.56 U	11	1,000	4,300	4,000	3.5	3.2
	11/20/2024	0.43	653	-101	6.94	14.8	1.61							
01MW89	2/27/2024	0.48	649	59.0	6.37	14.4	1.16							
MW05	2/27/2024	0.49	399.4	-125.1	7.22	12.0	1.66	0.56 U	29	42	2,200	2,000		
	8/8/2024	0.32	520	-136.5	7.38	14.1	1.25	0.56 U	24	31	2,200	2,100	1.5	4.2
MW06	2/27/2024	0.31	522	-64.1	6.69	13.0	2.99	0.56 U	0.58 U	52	7,200	6,900		
	8/8/2024	0.33	560	-83.8	7.00	14.7	3.36	0.56 U	0.76	29	2,900	2,500	2.5	3.3
East Waterfront														
02MW04R	2/27/2024	0.77	254.1	50.4	6.76	9.6	0.68							
	5/15/2024	4.37	253.3	63.6	6.75	12.9	0.84							
	8/7/2024	3.8	323.5	81.3	6.86	17.5	2.13							
02MW07	2/27/2024	0.7	293.8	133.8	6.29	9.2	2.48							
02MW19	2/27/2024	0.4	441.9	-48.9	6.43	10.8	2.12							

Notes:

Blanks are intentional. Data not collected for specific analyte.

Field measurements are presented to the decimal places reported on the field meters.

-- Not available.

Abbreviations:

ASKO ASKO Hydraulic
CAS Chemical Abstracts Service
°C Degrees Celsius
µg/L Micrograms per liter
µS/cm Microsiemens per centimeter
mg/L Milligrams per liter
MNA Monitored natural attenuation
mV Millivolts
ntu Nephelometric turbidity units
ORP Oxidation–reduction potential

Qualifiers:

J Analyte was detected; concentration is an estimate.
U Analyte was not detected at the associated reporting limit.

Table A.5
PRB Vaults and Gravity Well Grab Sample Results

		Analyte Class	TPH	cVOCs		
		Analyte	Total DRO + ORO	TCE	cis-1,2-DCE	Vinyl Chloride
		CAS No.	71-55-6	79-01-6	156-59-2	75-01-4
		Unit	µg/L	µg/L	µg/L	µg/L
		Cleanup Level	500	0.50	--	0.20
Parcel	Location	Sample Date				
ASKO	Gravity Well	10/10/2023		**490**	130	**11**
		11/9/2023		**370**	98	**21**
		2/26/2024		**110**	23	**27**
		5/15/2024		**700**	610	**260**
		8/7/2024	380 (1)	**840**	540	**6.3**
		11/20/2024		**370**	410	**35**
	Clear Vault	11/9/2023		**31**	1.4	0.058
		2/26/2024		**17**	1.0 U	0.020 U
		5/15/2024		**13**	1.0 U	0.020 U
		8/7/2024		**9.2**	1.0 U	0.020 U
		11/20/2024		**11 J**	1.4	0.020 U
	Influent Vault	2/26/2024		**40**	3.6	0.15
		5/15/2024		**25**	4.2	0.16
		8/7/2024		**26**	4.6	0.18
		11/20/2024		**14**	4.9	**0.22**

Notes:

Blanks are intentional. Data not collected for specific analyte.

-- Not available.

BOLD Detected exceedance of cleanup level.

1 Laboratory noted that the sample chromatographic pattern does not resemble the fuel standard used for quantitation for one or more of the detected concentrations in the sum.

Abbreviations:

ASKO ASKO Hydraulic
CAS Chemical Abstracts Service
cVOC Chlorinated volatile organic compound
DCE Dichloroethene
DRO Diesel-range organics
µg/L Micrograms per liter
ORO Oil-range organics
TCE Trichloroethene
TPH Total petroleum hydrocarbons

Qualifier:

U Analyte was not detected at the given reporting limit.

Long-Term Compliance Monitoring Annual Report Appendix A: 2024 Groundwater Monitoring Annual Report

Time Oil Bulk Terminal

Figures

Legend

Existing Monitoring Well Locations

- Shallow WBZ Monitoring Well
- Intermediate WBZ Monitoring Well
- Perched WBZ Monitoring Well
- Monitoring Wells Decommissioned in 2024

Well Decommissioning Plan

- Damaged—Decommission Required
- Decommission During Redevelopment

Cleanup Action Components

- Excavated to CULs
- Excavated to RELs
- In Situ Stabilization/Solidification
- PlumeStop Injection
- ORC-A Treatment
- Interceptor Trench
- PRB Wall for Trench
- Gravity Well

Other Site Features

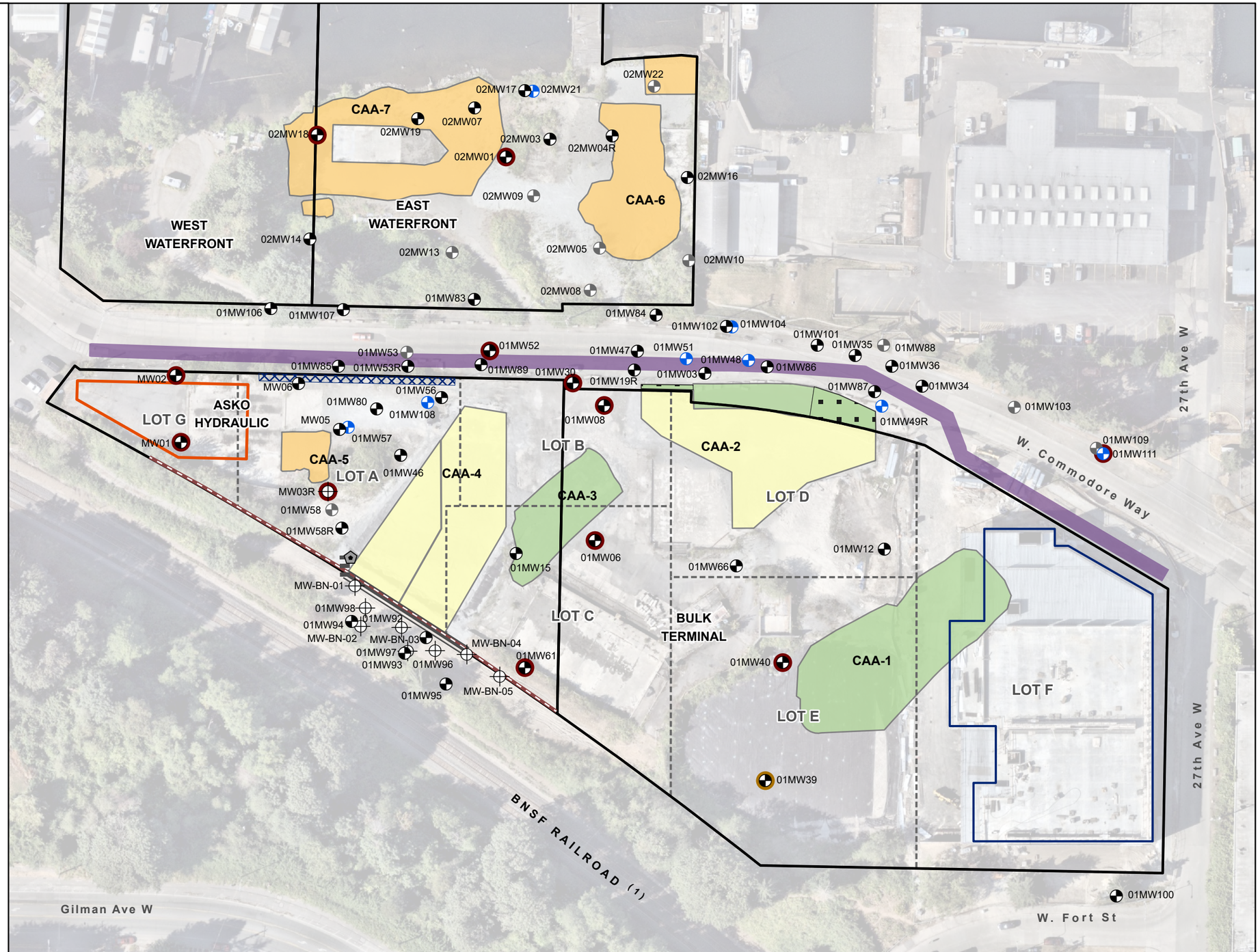
- Property Boundary for the Former TOC Seattle Terminal
- Existing Structure
- King County Tax Parcel
- Conditional Point of Compliance
- Existing Retaining Wall
- Proposed Stormwater Detention Facility

Notes:
1. Remedial Investigation on the BNSF Railroad property upgradient of ASKO is in progress under a separate Agreed Order with Ecology.
· Parcel boundaries obtained from King County Geographic Information Systems Center, 2022. King County tax parcel boundaries were updated for redevelopment after approval of the Cleanup Action Plan and completion of cleanup action construction. Lot lines are approximate. Not for legal use.
· Orthoimagery obtained from Nearmap, 2024.

Abbreviations:
BNSF = BNSF Railway Company
CUL = Cleanup level
ORC-A = Oxygen Release Compound Advanced
PRB = Permeable reactive barrier
REL = Remediation level
TOC = TOC Holdings Co. and any predecessor entity including Time Oil Company
WBZ = Water-bearing zone

0 45 90 180
Scale in Feet

N



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Long-Term Compliance Monitoring Annual Report
Appendix A: 2024 Groundwater Monitoring Annual Report
Time Oil Bulk Terminal
Seattle, Washington

Figure A.1
Site Features and Monitoring Well Status Summary

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2/24/2025

Legend

Existing Monitoring Well Locations

- Shallow WBZ Monitoring Well
- Intermediate WBZ Monitoring Well
- Perched WBZ Monitoring Well

2024 Monitoring Locations

- Quarterly Performance
- Semiannual Performance
- Annual Performance
- Contingency Performance(1)

Cleanup Action Components

- Excavated to CULs
- Excavated to RELs
- In Situ Stabilization/Solidification
- PlumeStop Injection
- ORC-A Treatment
- Interceptor Trench
- PRB Wall for Trench
- Gravity Well

Approximate Extent of IHSs Exceeding CULs Before Cleanup Action (2019)

- Arsenic >5.0 µg/L
- Gasoline-Range Organics >800 µg/L
- Diesel- and Oil-Range Organics >500 µg/L
- Benzene >0.44 µg/L
- Trichloroethene >0.50 µg/L
- Vinyl Chloride >0.20 µg/L
- Penta >0.20 µg/L

Other Site Features

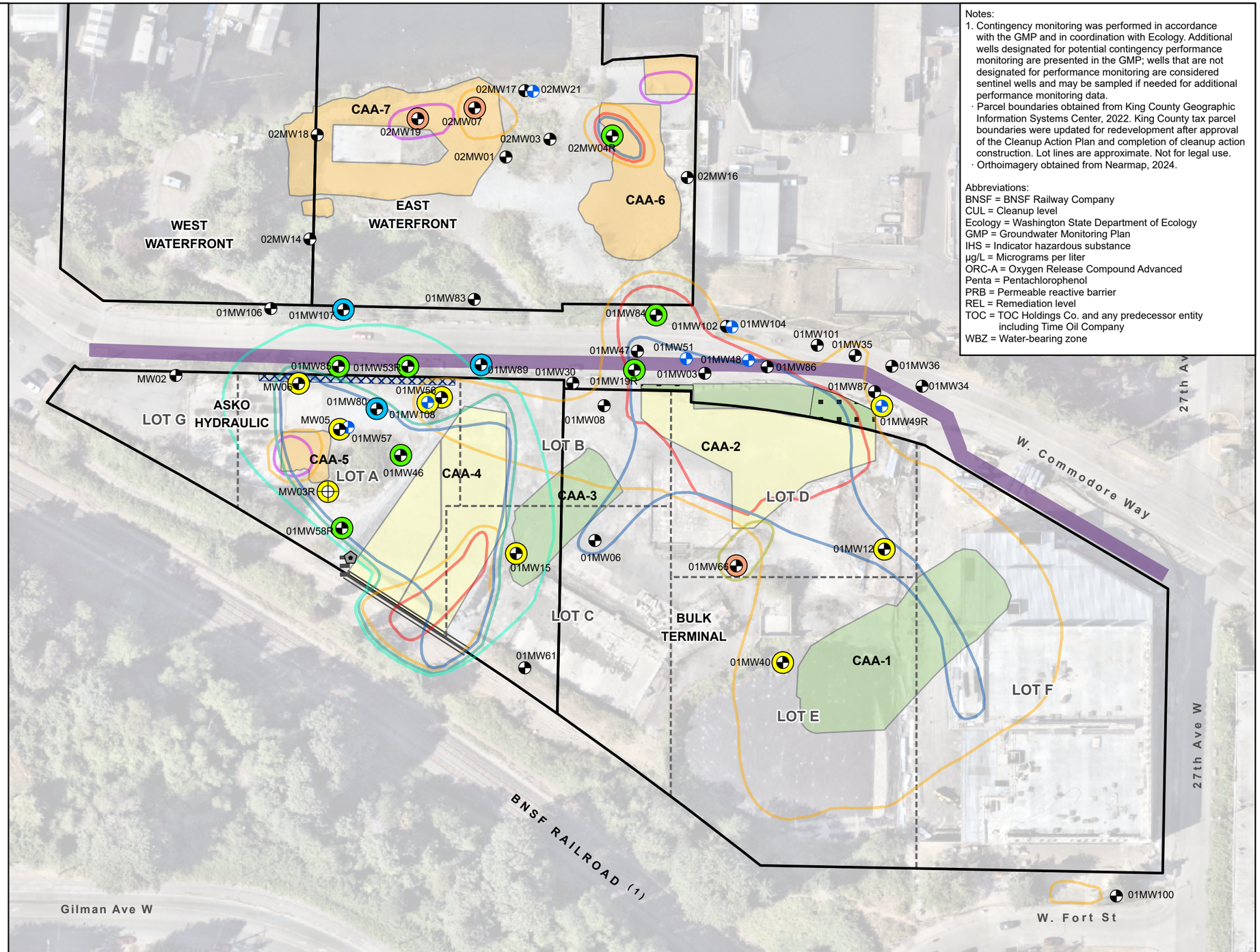
- Property Boundary for the Former TOC Seattle Terminal
- King County Tax Parcel
- Conditional Point of Compliance

0 45 90 180
Scale in Feet

N

Notes:
1. Contingency monitoring was performed in accordance with the GMP and in coordination with Ecology. Additional wells designated for potential contingency performance monitoring are presented in the GMP; wells that are not designated for performance monitoring are considered sentinel wells and may be sampled if needed for additional performance monitoring data.
- Parcel boundaries obtained from King County Geographic Information Systems Center, 2022. King County tax parcel boundaries were updated for redevelopment after approval of the Cleanup Action Plan and completion of cleanup action construction. Lot lines are approximate. Not for legal use.
- Orthoimagery obtained from Nearmap, 2024.

Abbreviations:
BNSF = BNSF Railway Company
CUL = Cleanup level
Ecology = Washington State Department of Ecology
GMP = Groundwater Monitoring Plan
IHS = Indicator hazardous substance
µg/L = Micrograms per liter
ORC-A = Oxygen Release Compound Advanced
Penta = Pentachlorophenol
PRB = Permeable reactive barrier
REL = Remediation level
TOC = TOC Holdings Co. and any predecessor entity including Time Oil Company
WBZ = Water-bearing zone



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Long-Term Compliance Monitoring Annual Report
Appendix A: 2024 Groundwater Monitoring Annual Report
Time Oil Bulk Terminal
Seattle, Washington

Figure A.2
2024 Short-Term Performance Monitoring Locations

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2/13/2025

Legend

- Groundwater Contour (feet NAVD 88)
- Shallow WBZ Groundwater Flow Direction

Existing Monitoring Well Locations

- Shallow WBZ Monitoring Well

Cleanup Action Components

- Excavated to CULs
- Excavated to RELs
- In Situ Stabilization/Solidification
- PlumeStop Injection
- ORC-A Treatment
- Interceptor Trench
- PRB Wall for Trench
- Gravity Well

Other Site Features

- Property Boundary for the Former TOC Seattle Terminal
- Conditional Point of Compliance

Notes:
· Depth to water measurements not collected at select wells that were inaccessible because they are located within the W. Commodore Way right of way or buried by gravel or vegetation.
· Parcel boundaries obtained from King County Geographic Information Systems Center, 2011. Lot lines are approximate. Not for legal use.
· Orthoimagery obtained from Nearmap, 2024.

Abbreviations:
BNSF = BNSF Railway Company
CUL = Cleanup level
ORC-A = Oxygen Release Compound Advanced
NAVD 88 = North American Vertical Datum of 1988
PRB = Permeable reactive barrier
REL = Remediation level
TOC = TOC Holdings Co. and any predecessor entity including Time Oil Company
WBZ = Water-bearing zone

0 45 90 180
Scale in Feet
N

02MW18 18.98
02MW19 18.86
02MW07 18.32
02MW04R 18.73
02MW16 19.185
CAA-7
CAA-6
EAST WATERFRONT
WEST WATERFRONT
01MW106 21.78
01MW107 21.24
01MW83 21.83
01MW84 28.73
01MW102 28.71
01MW89 20.61
01MW85 21.71
01MW53R 21.82
01MW30 23.05
01MW19R 32.36
MW06 24.62
01MW56 25.24
ASKO HYDRAULIC
MW05 25.87
01MW46 24.72
CAA-5
CAA-2
CAA-4
CAA-3
01MW58R 28.07
01MW15 31.96
01MW06 40.51
01MW66 42.83
01MW12 44.51
BULK TERMINAL
01MW61 32.19
01MW40 39.03
CAA-1
01MW100 42.47
20
22
24
26
28
30
32
34
36
38
40
42
44
W. Commodore Way
27th Ave W
BNSF RAILROAD
Gilman Ave W
W. Fort St

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Long-Term Compliance Monitoring Annual Report
Appendix A: 2024 Groundwater Monitoring Annual Report
Time Oil Bulk Terminal
Seattle, Washington

Figure A.3a
Shallow WBZ Groundwater Elevations–
February 2024

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2/13/2025

Legend

- Groundwater Contour (feet NAVD 88)
- Shallow WBZ Groundwater Flow Direction

Existing Monitoring Well Locations

- Shallow WBZ Monitoring Well
- Shallow WBZ Monitoring Well-BNSF Property

Cleanup Action Components

- Excavated to CULs
- Excavated to RELs
- In Situ Stabilization/Solidification
- PlumeStop Injection
- ORC-A Treatment
- Interceptor Trench
- PRB Wall for Trench
- Gravity Well

Other Site Features

- Property Boundary for the Former TOC Seattle Terminal
- Conditional Point of Compliance

Notes:
· Depth to water measurements not collected at select wells that were inaccessible because they are located within the W. Commodore Way right of way or buried by gravel or vegetation.
· Parcel boundaries obtained from King County Geographic Information Systems Center, 2011. Lot lines are approximate. Not for legal use.
· Orthoimagery obtained from Nearmap, 2024.

Abbreviations:
BNSF = BNSF Railway Company
CUL = Cleanup level
ORC-A = Oxygen Release Compound Advanced
NAVD 88 = North American Vertical Datum of 1988
PRB = Permeable reactive barrier
REL = Remediation level
TOC = TOC Holdings Co. and any predecessor entity including Time Oil Company
WBZ = Water-bearing zone

0 45 90 180
Scale in Feet

N

02MW18 19.23
02MW19 18.78
02MW07 18.65
02MW04R 19.03
02MW16 19.39
CAA-7
CAA-6
EAST WATERFRONT
WEST WATERFRONT
01MW107 20.58
01MW83 20.95
01MW106 21.10
01MW84 28.53
01MW102 28.48
01MW85 21.12
01MW53R 21.33
01MW19R 31.38
MW06 23.69
01MW80 22.31
01MW56 24.5
ASKO HYDRAULIC
MW05 25.17
01MW46 23.71
CAA-5
CAA-4
CAA-3
CAA-2
01MW58R 27.45
Gravity Well 28.53
01MW15 31.64
01MW94 28.96
MW-BN-03 30.74
01MW93 30.61
01MW95 31.39
01MW61 32.02
01MW66 41.16
01MW12 43.09
BULK TERMINAL
01MW40 37.47
CAA-1
01MW100 42.82
20
22
24
26
28
30
32
34
36
38
40
42
W. Commodore Way
27th Ave W
BNSF RAILROAD
Gilman Ave W
W. Fort St

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Long-Term Compliance Monitoring Annual Report
Appendix A: 2024 Groundwater Monitoring Annual Report
Time Oil Bulk Terminal
Seattle, Washington

Figure A.3b
Shallow WBZ Groundwater Elevations–
May 2024

I:\GIS\Projects\Cantera-TOC\01-Tasks\06-Groundwater Monitoring\01-LTCMP AND GMP\Appendix A 2024\2024 Annual Report.aprx
2/24/2025

Legend

- Groundwater Contour (feet NAVD 88)
- Shallow WBZ Groundwater Flow Direction

Existing Monitoring Well Locations

- Shallow WBZ Monitoring Well

Cleanup Action Components

- Excavated to CULs
- Excavated to RELs
- In Situ Stabilization/Solidification
- PlumeStop Injection
- ORC-A Treatment
- Interceptor Trench
- PRB Wall for Trench
- Gravity Well

Other Site Features

- Property Boundary for the Former TOC Seattle Terminal
- Conditional Point of Compliance

Notes:
· Depth to water measurements not collected at select wells that were inaccessible because they are located within the W. Commodore Way right of way or buried by gravel or vegetation.
· Parcel boundaries obtained from King County Geographic Information Systems Center, 2011. Lot lines are approximate. Not for legal use.
· Orthoimagery obtained from Nearmap, 2024.

Abbreviations:
BNSF = BNSF Railway Company
CUL = Cleanup level
ORC-A = Oxygen Release Compound Advanced
NAVD 88 = North American Vertical Datum of 1988
PRB = Permeable reactive barrier
REL = Remediation level
TOC = TOC Holdings Co. and any predecessor entity including Time Oil Company
WBZ = Water-bearing zone

0 45 90 180
Scale in Feet

N

02MW18 18.25
02MW19 18.2.0
02MW07 17.87
02MW04R 18.16
02MW16 18.70
CAA-7
CAA-6
EAST WATERFRONT
WEST WATERFRONT
01MW107 19.84
01MW83 20.35
01MW84 28.11
01MW102 27.84
MW02 22.64
01MW85 20.66
01MW53R 20.06
01MW30 22.20
01MW19R 30.18
MW06 23.16
01MW80 21.68
01MW56 23.81
ASKO HYDRAULIC
MW05 24.69
01MW46 23.00
CAA-5
CAA-2
CAA-4
CAA-3
01MW68R 27.01
Gravity Well 28.15
01MW35 31.24
01MW66 37.62
01MW12 38.26
BULK TERMINAL
01MW61 31.73
01MW40 34.13
CAA-1
01MW100 41.09
18
20
22
24
26
28
30
32
34
36
38
40
W. Commodore Way
27th Ave W
BNSF RAILROAD
Gilman Ave W
W. Fort St

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Long-Term Compliance Monitoring Annual Report
Appendix A: 2024 Groundwater Monitoring Annual Report
Time Oil Bulk Terminal
Seattle, Washington

Figure A.3c
Shallow WBZ Groundwater Elevations–
August 2024

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2/13/2025

Legend

Groundwater Sample Result

- Non-detect or ≤ CUL
- > CUL–≤ 2x CUL
- > 2x CUL

Existing Monitoring Well Locations

- Shallow WBZ Monitoring Well
- Intermediate WBZ Monitoring Well
- Perched WBZ Monitoring Well

Cleanup Action Components

- Excavated to CULs
- Excavated to RELs
- In Situ Stabilization/Solidification
- PlumeStop Injection
- ORC-A Treatment
- Interceptor Trench
- PRB Wall for Trench
- Gravity Well

Other Site Features

- Property Boundary for the Former TOC Seattle Terminal
- King County Tax Parcel
- Conditional Point of Compliance

CUL
GRO: 800 µg/L

Notes:
- Chemical results are presented only at locations where detected result exceeds the CUL. When a field duplicate sample was collected, the maximum result of the parent sample and duplicate is shown.
- Results displayed in **RED** indicate an exceedance of the CUL.
- Parcel boundaries obtained from King County Geographic Information Systems Center, 2022. King County tax parcel boundaries were updated for redevelopment after approval of the Cleanup Action Plan and completion of cleanup action construction. Lot lines are approximate. Not for legal use.
- Orthoimagery obtained from Nearmap, 2024.

Abbreviations:
BNSF = BNSF Railway Company
CUL = Cleanup level
GRO = Gasoline-range organics
IHS = Indicator hazardous substance
µg/L = Micrograms per liter
ORC-A = Oxygen Release Compound Advanced
PRB = Permeable reactive barrier
REL = Remediation level
TOC = TOC Holdings Co. and any predecessor entity including Time Oil Company
WBZ = Water-bearing zone

0 45 90 180
Scale in Feet

N

01MW84	
Sample Date	GRO
2/26/2024	1,800
5/15/2024	3,900
8/7/2024	2,500
11/20/2024	1,800

01MW19R	
Sample Date	GRO
2/26/2024	560
5/15/2024	1,000
8/7/2024	500
11/20/2024	490

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Long-Term Compliance Monitoring Annual Report
Appendix A: 2024 Groundwater Monitoring Annual Report
Time Oil Bulk Terminal
Seattle, Washington

Figure A.4
2024 IHS Analytical Results:
Gasoline-Range Organics

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2/13/2025

Legend

Groundwater Sample Result

- Non-detect or ≤ CUL
- > CUL–≤ 2x CUL
- > 2x CUL

Existing Monitoring Well Locations

- Shallow WBZ Monitoring Well
- Intermediate WBZ Monitoring Well
- Perched WBZ Monitoring Well

Cleanup Action Components

- Excavated to CULs
- Excavated to RELs
- In Situ Stabilization/Solidification
- PlumeStop Injection
- ORC-A Treatment
- Interceptor Trench
- PRB Wall for Trench
- Gravity Well

Other Site Features

- Property Boundary for the Former TOC Seattle Terminal
- King County Tax Parcel
- Conditional Point of Compliance

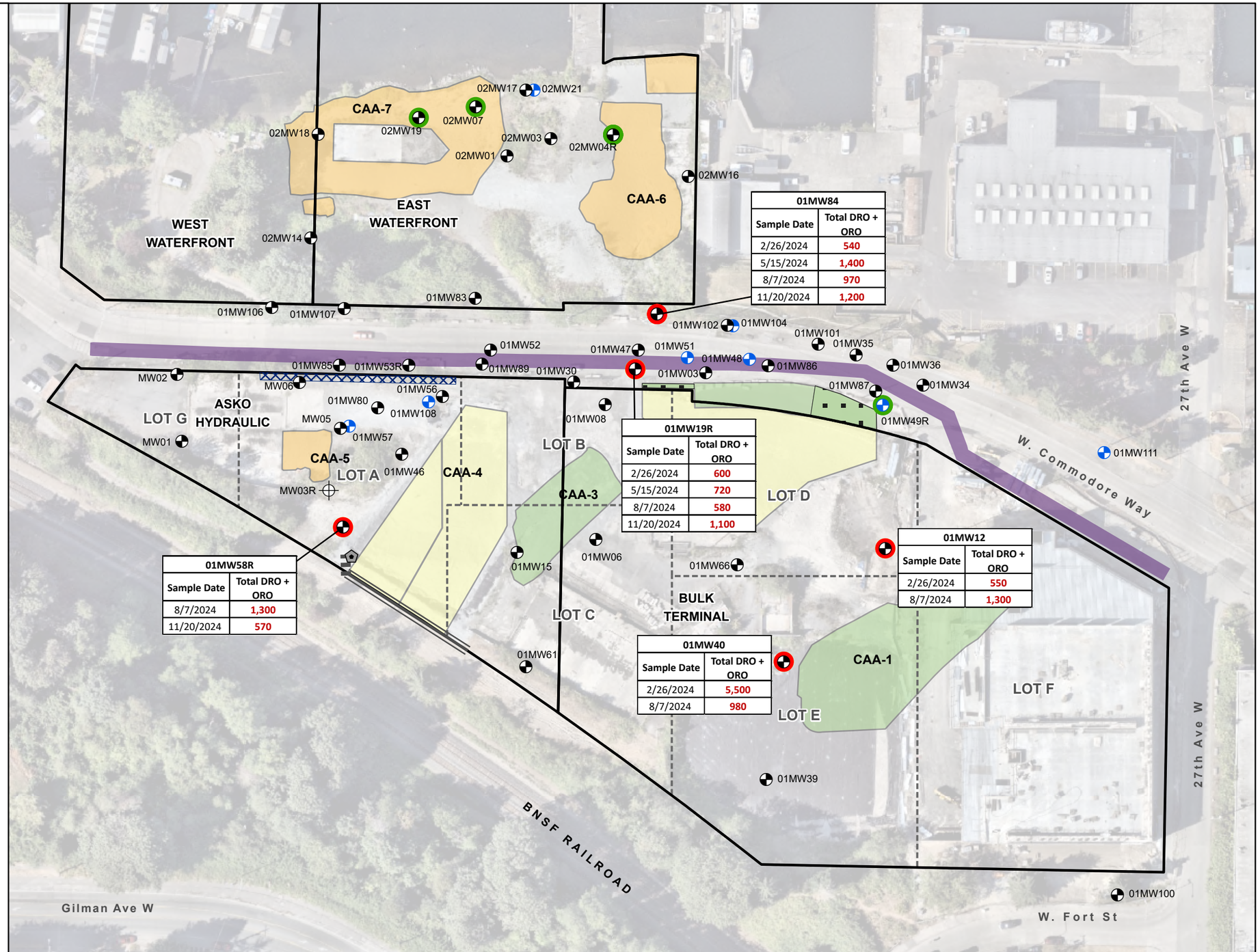
CUL
Total DRO + ORO: 500 µg/L

Notes:
- Chemical results are presented only at locations where detected result exceeds the CUL. When a field duplicate sample was collected, the maximum result of the parent sample and duplicate is shown.
- Results displayed in **RED** indicate an exceedance of the CUL.
- Parcel boundaries obtained from King County Geographic Information Systems Center, 2022. King County tax parcel boundaries were updated for redevelopment after approval of the Cleanup Action Plan and completion of cleanup action construction. Lot lines are approximate. Not for legal use.
- Orthoimagery obtained from Nearmap, 2024.

Abbreviations:
BNSF = BNSF Railway Company
CUL = Cleanup level
DRO = Diesel-range organics
IHS = Indicator hazardous substance
µg/L = Micrograms per liter
ORC-A = Oxygen Release Compound Advanced
ORO = Oil-range organics
PRB = Permeable reactive barrier
REL = Remediation level
TOC = TOC Holdings Co. and any predecessor entity including Time Oil Company
WBZ = Water-bearing zone

0 45 90 180
Scale in Feet

N



01MW84	
Sample Date	Total DRO + ORO
2/26/2024	540
5/15/2024	1,400
8/7/2024	970
11/20/2024	1,200

01MW19R	
Sample Date	Total DRO + ORO
2/26/2024	600
5/15/2024	720
8/7/2024	580
11/20/2024	1,100

01MW12	
Sample Date	Total DRO + ORO
2/26/2024	550
8/7/2024	1,300

01MW58R	
Sample Date	Total DRO + ORO
8/7/2024	1,300
11/20/2024	570

01MW40	
Sample Date	Total DRO + ORO
2/26/2024	5,500
8/7/2024	980

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Long-Term Compliance Monitoring Annual Report
Appendix A: 2024 Groundwater Monitoring Annual Report
Time Oil Bulk Terminal
Seattle, Washington

Figure A.5
2024 IHS Analytical Results:
Total Diesel-Range and Oil-Range Organics

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2/13/2025

Legend

Groundwater Sample Result

- Non-detect or ≤ CUL
- > CUL–≤ 2x CUL
- > 2x CUL

Existing Monitoring Well Locations

- Shallow WBZ Monitoring Well
- Intermediate WBZ Monitoring Well
- Perched WBZ Monitoring Well

Cleanup Action Components

- Excavated to CULs
- Excavated to RELs
- In Situ Stabilization/Solidification
- PlumeStop Injection
- ORC-A Treatment
- Interceptor Trench
- PRB Wall for Trench
- Gravity Well

Other Site Features

- Property Boundary for the Former TOC Seattle Terminal
- King County Tax Parcel
- Conditional Point of Compliance

CUL
Trichloroethene: 0.50 µg/L
Vinyl Chloride: 0.20 µg/L

TCE Result / VC Result

Notes:
- Chemical results are presented only at locations where detected result exceeds the CUL. When a field duplicate sample was collected, the maximum result of the parent sample and duplicate is shown.
- Results displayed in **RED** indicate a detected exceedance of the CUL.
- Results displayed in *italics* indicate a non-detect exceedance of the CUL.
- Parcel boundaries obtained from King County Geographic Information Systems Center, 2022. King County tax parcel boundaries were updated for redevelopment after approval of the Cleanup Action Plan and completion of cleanup action construction. Lot lines are approximate. Not for legal use.
- Orthoimagery obtained from Nearmap, 2024.

Abbreviations:
BNSF = BNSF Railway Company
CUL = Cleanup level
TCE = Trichloroethene
IHS = Indicator hazardous substance
µg/L = Micrograms per liter
ORC-A = Oxygen Release Compound Advanced
PRB = Permeable reactive barrier
REL = Remediation level
TOC = TOC Holdings Co. and any predecessor entity including Time Oil Company
WBZ = Water-bearing zone
Qualifier:
U = Analyte was not detected at the given reporting limit

0 45 90 180
Scale in Feet

N

01MW85		
Sample Date	TCE	VC
2/26/2024	*5 U*	28
5/15/2024	6.2	26
8/7/2024	6.5	33
11/20/2024	5	36

01MW53R		
Sample Date	TCE	VC
2/26/2024	26	0.6
5/15/2024	12	0.33
8/7/2024	13	0.76
11/20/2024	15	0.41

01MW56		
Sample Date	TCE	VC
2/26/2024	2.1	1.1
8/7/2024	0.97	1.2

MW06		
Sample Date	TCE	VC
2/26/2024	7.7	4.5
8/7/2024	48	2.1

MW05		
Sample Date	TCE	VC
2/26/2024	120	24
8/7/2024	51	81

01MW80		
Sample Date	TCE	VC
5/15/2024	190	51
8/7/2024	180	65

01MW58R		
Sample Date	TCE	VC
2/26/2024	40	31
5/15/2024	38	33
8/7/2024	23	13
11/20/2024	92	24

01MW46		
Sample Date	TCE	VC
2/26/2024	220	69
5/15/2024	220	69
8/7/2024	160	96
11/20/2024	130	160

01MW15		
Sample Date	TCE	VC
2/26/2024	27	59
5/15/2024	2.7	58
8/7/2024	0.59	36

EAST WATERFRONT
WEST WATERFRONT
CAA-7
CAA-6
CAA-5
CAA-4
CAA-3
CAA-2
CAA-1
LOT G
ASKO HYDRAULIC
LOT A
LOT D
BULK TERMINAL
LOT E
LOT F
02MW17 02MW21 02MW07 02MW19 02MW18 02MW03 02MW04R 02MW01 02MW16 02MW14
01MW106 01MW107 01MW83 01MW84 01MW102 01MW104 01MW101 01MW35 01MW52 01MW47 01MW51 01MW48 01MW86 01MW36 01MW89 01MW30 01MW19R 01MW03 01MW87 01MW34 MW02 01MW08 01MW49R 01MW108 01MW57 MW01 01MW111 MW03R 01MW06 01MW66 01MW12 01MW61 01MW40 01MW39 01MW100
27th Ave W
W. Commodore Way
BNSF RAILROAD
Gilman Ave W
W. Fort St

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Appendix A: 2024 Groundwater Monitoring Annual Report
Time Oil Bulk Terminal
Seattle, Washington

Figure A.6
2024 IHS Analytical Results: Trichloroethene and Vinyl Chloride

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2/13/2025

Legend

Groundwater Sample Result

- Non-detect or ≤ CUL
- > CUL–≤ 2x CUL
- > 2x CUL

Existing Monitoring Well Locations

- Shallow WBZ Monitoring Well
- Intermediate WBZ Monitoring Well
- Perched WBZ Monitoring Well

Cleanup Action Components

- Excavated to CULs
- Excavated to RELs
- In Situ Stabilization/Solidification
- PlumeStop Injection
- ORC-A Treatment
- Interceptor Trench
- PRB Wall for Trench
- Gravity Well

Other Site Features

- Property Boundary for the Former TOC Seattle Terminal
- King County Tax Parcel
- Conditional Point of Compliance

CUL
Benzene: 0.44 µg/L

Notes:
- Chemical results are presented only at locations where detected result exceeds the CUL. When a field duplicate sample was collected, the maximum result of the parent sample and duplicate is shown.
- Results displayed in **RED** indicate a detected exceedance of the CUL.
- Results displayed in *italics* indicate a non-detect exceedance of the CUL.
- Parcel boundaries obtained from King County Geographic Information Systems Center, 2022. King County tax parcel boundaries were updated for redevelopment after approval of the Cleanup Action Plan and completion of cleanup action construction. Lot lines are approximate. Not for legal use.
- Orthoimagery obtained from Nearmap, 2024.

Abbreviations:
BNSF = BNSF Railway Company
CUL = Cleanup level
IHS = Indicator hazardous substance
µg/L = Micrograms per liter
ORC-A = Oxygen Release Compound Advanced
PRB = Permeable reactive barrier
REL = Remediation level
TOC = TOC Holdings Co. and any predecessor entity including Time Oil Company
WBZ = Water-bearing zone
Qualifier:
U = Analyte was not detected at the given reporting limit

0 45 90 180
Scale in Feet

N

01MW80	
Sample Date	Benzene
8/7/2024	2.4

01MW19R	
Sample Date	Benzene
2/26/2024	1.9
5/15/2024	2.2
8/7/2024	0.98
11/20/2024	1

MW05	
Sample Date	Benzene
2/26/2024	1.1
8/7/2024	0.83

01MW46	
Sample Date	Benzene
2/26/2024	3.1
5/15/2024	2.8
8/7/2024	3.1
11/20/2024	*3.5 U*

01MW40	
Sample Date	Benzene
2/26/2024	1.6
8/7/2024	*0.35 U*

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Long-Term Compliance Monitoring Annual Report
Appendix A: 2024 Groundwater Monitoring Annual Report
Time Oil Bulk Terminal
Seattle, Washington

Figure A.7
2024 IHS Analytical Results: Benzene

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2/13/2025

Legend

Monitoring Well Locations

- Proposed Shallow WBZ Monitoring Well
- Shallow WBZ Monitoring Well
- Intermediate WBZ Monitoring Well
- Perched WBZ Monitoring Well

2025 Monitoring Locations

- Quarterly Performance
- Semiannual Performance
- Annual Performance
- Semiannual Water Level Measurement
- Annual Confirmation
- Contingency Performance[(1)]
- Decommission in 2025

Cleanup Action Components

- Excavated to CULs
- Excavated to RELs
- In Situ Stabilization/Solidification
- PlumeStop Injection
- ORC-A Treatment
- Interceptor Trench
- PRB Wall for Trench
- Gravity Well

Other Site Features

- Property Boundary for the Former TOC Seattle Terminal
- King County Tax Parcel
- Conditional Point of Compliance

0 45 90 180
Scale in Feet

N

Notes:
1. Contingency monitoring will be performed in accordance with the GMP and in coordination with Ecology. Additional wells designated for potential contingency performance monitoring are presented in the GMP; wells that are not designated for performance monitoring are considered sentinel wells and may be sampled if needed for additional performance monitoring data.

· Parcel boundaries obtained from King County Geographic Information Systems Center, 2022. King County tax parcel boundaries were updated for redevelopment after approval of the Cleanup Action Plan and completion of cleanup action construction. Lot lines are approximate. Not for legal use.

· Orthoimagery obtained from Nearmap, 2024.

Abbreviations:
BNSF = BNSF Railway Company
CUL = Cleanup level
Ecology = Washington State Department of Ecology
IHS = Indicator hazardous substance
µg/L = Micrograms per liter
ORC-A = Oxygen Release Compound Advanced
Penta = Pentachlorophenol
PRB = Permeable reactive barrier
REL = Remediation level
TOC = TOC Holdings Co. and any predecessor entity including Time Oil Company
WBZ = Water-bearing zone

Long-Term Compliance Monitoring Annual Report
Appendix A: 2024 Groundwater Monitoring Annual Report
Time Oil Bulk Terminal
Seattle, Washington

Figure A.8
Monitoring Locations and
Proposed Monitoring Well Network Updates for 2025

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Long-Term Compliance Monitoring
Annual Report Appendix A:
2024 Groundwater Monitoring Annual Report

Time Oil Bulk Terminal

Attachment A.1
Well Logs

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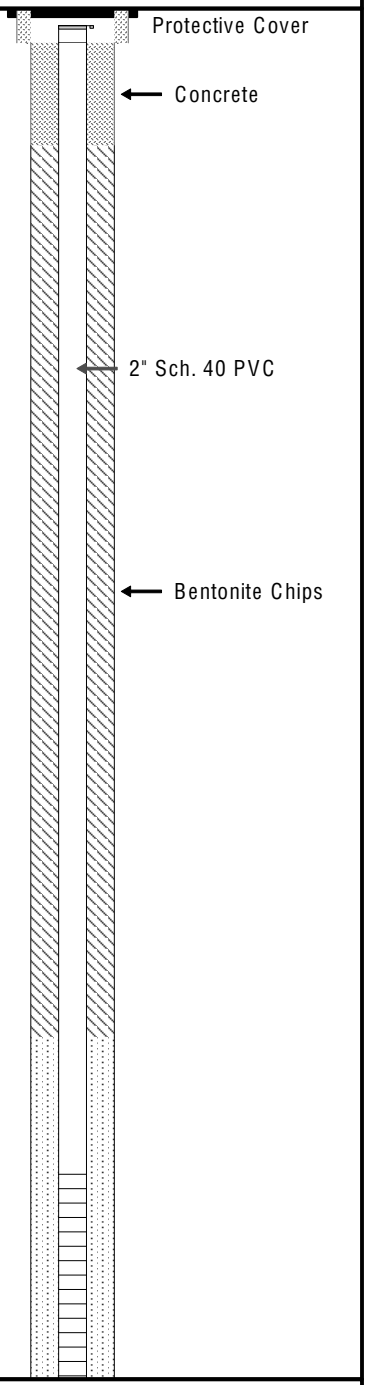
PROJECT: **Time Oil Seattle**	LOCATION: **2737 W Commodore Way**	WELL ID: **01MW53R**	
LOGGED BY: **P. Osterhout**	BORING LOCATION: **South shoulder of W Commodore Way**	ECOLOGY WELL ID: **BQG 976**	
DRILLED BY: **AEC**	COORDINATE SYSTEM: **NAD83/91; NAVD88 ft**	NORTHING: **245604.59**	EASTING: **1255902.76**
DRILLING EQUIPMENT: **Terrasonic**	SCREENED INTERVAL (ft bgs): **17-27**	GROUND SURFACE ELEV.: **43.35**	TOC ELEVATION: **42.85**
DRILLING METHOD: **Sonic**		TOTAL DEPTH (ft bgs): **30**	DEPTH TO WATER (ft bgs): **21**
SAMPLING METHOD: **Continuous Liner Bags**		BORING DIAMETER (inch): **6"**	DRILL DATE: **2/8/2024**

Depth (feet)	USCS Symbol	Description
0	SM	Moss/asphalt ground surface with stormwater ponding; Brown **SILTY SAND** with gravel; wet; no odor.
6	ML	Brown and orange mottled **SILT**; stiff to hard; moist to dry, no odor.
10	SM	Grades to **SILTY SAND**.
12	SP	Grades to clean, brown, fine to very fine **SAND**; loose; moist; no odor.
14		Becomes more orange/brown.
16		Becomes fully orange.
		Brown, very fine to fine **SAND**; moist.
18		
20		

Drive/Recovery



ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

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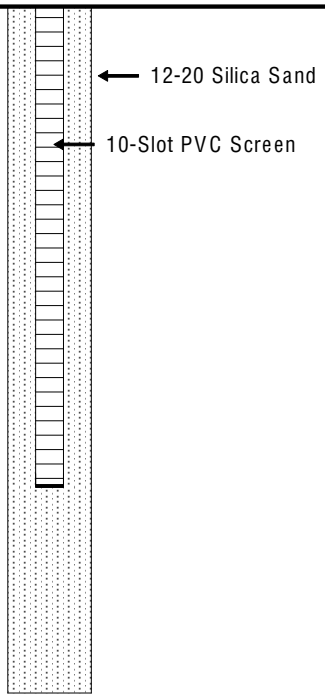
PROJECT: **Time Oil Seattle**	LOCATION: **2737 W Commodore Way**	WELL ID: **01MW53R**	
LOGGED BY: **P. Osterhout**	BORING LOCATION: **South shoulder of W Commodore Way**	ECOLOGY WELL ID: **BQG 976**	
DRILLED BY: **AEC**	COORDINATE SYSTEM: **NAD83/91; NAVD88 ft**	NORTHING: **245604.59**	EASTING: **1255902.76**
DRILLING EQUIPMENT: **Terrasonic**	SCREENED INTERVAL (ft bgs): **17-27**	GROUND SURFACE ELEV.: **43.35**	TOC ELEVATION: **42.85**
DRILLING METHOD: **Sonic**		TOTAL DEPTH (ft bgs): **30**	DEPTH TO WATER (ft bgs): **21**
SAMPLING METHOD: **Continuous Liner Bags**		BORING DIAMETER (inch): **6"**	DRILL DATE: **2/8/2024**

Depth (feet)	USCS Symbol	Description	Drive/ Recovery	Well Construction
20				
		Becomes gray, fine **SAND**; wet; no odor.		
22				
		Approximately 6" of brown sand.		
		Approximately 3" of gray sand.		
24		Gray, clayey **SILT**; hard.		
		Becomes soft to medium stiff.		
26	ML			
		Becomes hard.		
28				
30		Bottom of boring = 30 ft bgs.		



ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

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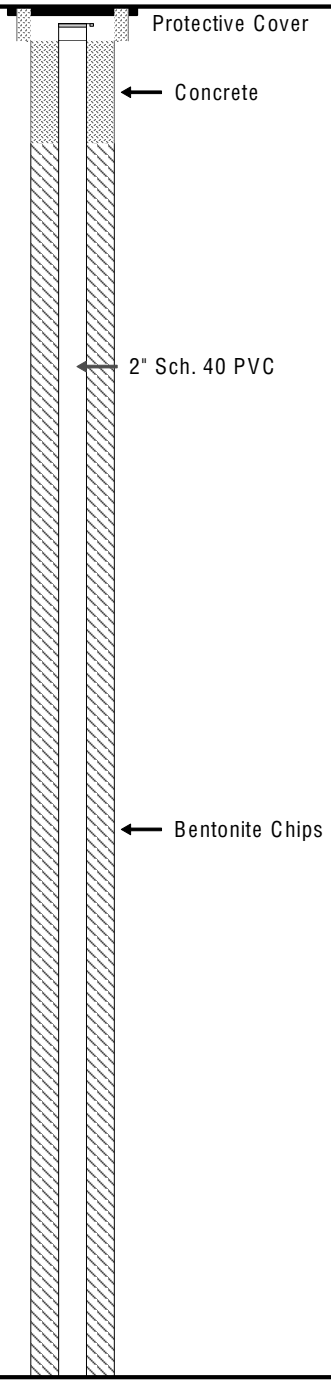
PROJECT: **Time Oil Seattle**	LOCATION: **2737 W Commodore Way**	WELL ID: **01MW58R**	
LOGGED BY: **P. Osterhout**	BORING LOCATION: **Approximately 25 ft NW of Gravity Well**	ECOLOGY WELL ID: **BQG 975**	
DRILLED BY: **AEC**	COORDINATE SYSTEM: **NAD83/91; NAVD88 ft**	NORTHING: **245463.99**	EASTING: **1255845.53**
DRILLING EQUIPMENT: **Terrasonic**	SCREENED INTERVAL (ft bgs): **24-34**	GROUND SURFACE ELEV.: **53.66**	TOC ELEVATION: **52.95**
DRILLING METHOD: **Sonic**		TOTAL DEPTH (ft bgs): **38**	DEPTH TO WATER (ft bgs): **26**
SAMPLING METHOD: **Continuous Liner Bags**		BORING DIAMETER (inch): **6"**	DRILL DATE: **2/8/2024**

Depth (feet)	USCS Symbol	Description
0	ML	Mud and gravel ground surface; Gray, sandy **SILT** with gravel; stiff; moist; no odor.
4	CL	Gray **CLAY**; very stiff.
8	SM	Gray, fine **SAND** with silt; moist to wet; no odor.
10	SP	Transitions to brown, fine and clean **SAND**; moist.
14	CL	Mottled brown **CLAY**.
16		Gray **CLAY** with trace sand; very stiff to hard; dry to moist.
18	SM	Grades to very fine **SILTY SAND**; stiff; dry to moist; no odor.
20		

Drive/ Recovery

Well Construction



ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

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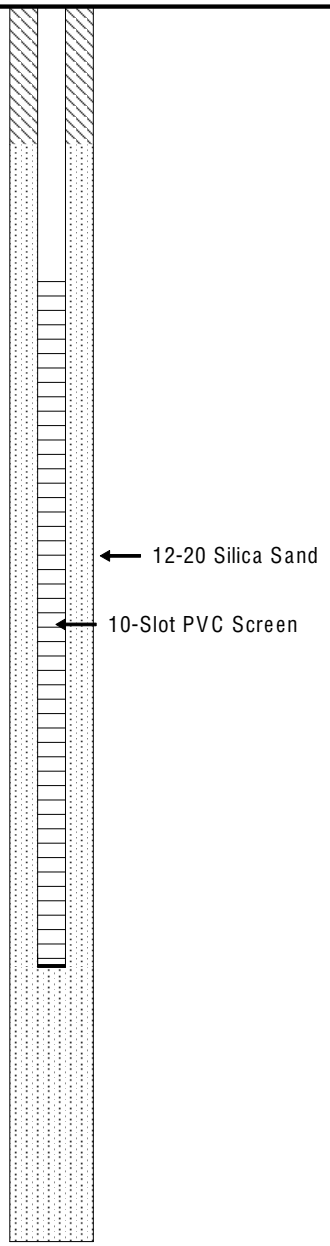
PROJECT: **Time Oil Seattle**	LOCATION: **2737 W Commodore Way**	WELL ID: **01MW58R**	
LOGGED BY: **P. Osterhout**	BORING LOCATION: **Approximately 25 ft NW of Gravity Well**	ECOLOGY WELL ID: **BQG 975**	
DRILLED BY: **AEC**	COORDINATE SYSTEM: **NAD83/91; NAVD88 ft**	NORTHING: **245463.99**	EASTING: **1255845.53**
DRILLING EQUIPMENT: **Terrasonic**	SCREENED INTERVAL (ft bgs): **24-34**	GROUND SURFACE ELEV.: **53.66**	TOC ELEVATION: **52.95**
DRILLING METHOD: **Sonic**		TOTAL DEPTH (ft bgs): **38**	DEPTH TO WATER (ft bgs): **26**
SAMPLING METHOD: **Continuous Liner Bags**		BORING DIAMETER (inch): **6"**	DRILL DATE: **2/8/2024**

Depth (feet)	USCS Symbol	Description
20		
22		Grades to gray, fine and clean **SAND**; loose; moist; no odor.
24		
26 ▼		SAA; becomes wet.
28	SP	
30		
32		
34	ML	Gray, clayey **SILT**; hard; dry.
	SM	Very fine **SILTY SAND**; stiff; wet.
	CL	**CLAY**; dry.
36	SM-CL	Approximately 4" seam of very fine **SANDY CLAY**; very stiff; moist.
	CL	Very hard **CLAY**; dry.
38		Bottom of boring = 38 ft bgs.

Drive/ Recovery

Well Construction



ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

Long-Term Compliance Monitoring
Annual Report Appendix A:
2024 Groundwater Monitoring Annual Report

Time Oil Bulk Terminal

Attachment A.2
Laboratory Reports

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
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March 12, 2024

Kristin Anderson, Project Manager
Floyd-Snider
Two Union Square
601 Union St, Suite 600
Seattle, WA 98101

Dear Ms Anderson:

Included are the results from the testing of material submitted on February 27, 2024 from the Cantera TOC, F&BI 402383 project. There are 44 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Floyd Snider Lab Data, Pamela Osterhout
FDS0312R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on February 27, 2024 by Friedman & Bruya, Inc. from the Floyd-Snider Cantera TOC, F&BI 402383 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Floyd-Snider
402383 -01	01MW108-022624
402383 -02	01MW12-022624
402383 -03	01MW56-022624
402383 -04	01MW40-022624
402383 -05	01MW46-022624
402383 -06	01MW66-022624
402383 -07	01MW58R-022624
402383 -08	01MW15-022624
402383 -09	01MW19R-022624
402383 -10	01MW49R-022624
402383 -11	01MW84-022624
402383 -12	01MW107-022624
402383 -13	MW05-022724
402383 -14	MW06-022724
402383 -15	01MW89-022724
402383 -16	01MW53R-022724
402383 -17	01MW85-022724
402383 -18	02MW19-022724
402383 -19	02MW07-022724
402383 -20	02MW04R-022724
402383 -21	02MW04R-D-022724
402383 -22	Trip Blank

Samples MW05-022724, MW06-022724, and 01MW85-022724 were sent to Onsite Environmental for dissolved gases analysis. The report is enclosed.

All quality control requirements were acceptable.

Date of Report: 03/12/24
Date Received: 02/27/24
Project: Cantera TOC, F&BI 402383
Date Extracted: 03/04/24
Date Analyzed: 03/04/24

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
01MW12-022624 402383-02	<100	104
01MW40-022624 402383-04	110	93
01MW19R-022624 402383-09	560	107
01MW49R-022624 402383-10	<100	95
01MW84-022624 402383-11 1/5	1,800	108
02MW19-022724 402383-18	<100	94
02MW07-022724 402383-19	<100	99
02MW04R-022724 402383-20	<100	94
02MW04R-D-022724 402383-21	<100	98
Method Blank 04-431 MB	<100	96

Date of Report: 03/12/24
Date Received: 02/27/24
Project: Cantera TOC, F&BI 402383
Date Extracted: 02/29/24
Date Analyzed: 02/29/24

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 50-150)
01MW12-022624 402383-02	550 x	<250	92
01MW40-022624 402383-04	5,000 x	530 x	112
01MW19R-022624 402383-09	600 x	<250	104
01MW49R-022624 402383-10	200 x	<250	114
01MW84-022624 402383-11	540 x	<250	93
02MW19-022724 402383-18	110 x	<250	104
02MW07-022724 402383-19	<50	<250	99
02MW04R-022724 402383-20	<50	<250	104
02MW04R-D-022724 402383-21	<50	<250	100
Method Blank 04-480 MB	<50	<250	94

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW05-022724	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	02/28/24	Lab ID:	402383-13 x10
Date Analyzed:	02/29/24	Data File:	402383-13 x10.046
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	2,000

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW06-022724	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	02/28/24	Lab ID:	402383-14 x10
Date Analyzed:	02/29/24	Data File:	402383-14 x10.047
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	6,900

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	01MW85-022724	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	02/28/24	Lab ID:	402383-17 x10
Date Analyzed:	02/29/24	Data File:	402383-17 x10.048
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	4,300

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Floyd-Snider
Date Received:	NA	Project:	Cantera TOC, F&BI 402383
Date Extracted:	02/28/24	Lab ID:	I4-156 mb
Date Analyzed:	02/28/24	Data File:	I4-156 mb.115
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50

Analysis For Total Metals By EPA Method 6020B

Client ID:	MW05-022724	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	02/28/24	Lab ID:	402383-13 x10
Date Analyzed:	02/29/24	Data File:	402383-13 x10.066
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	2,200

Analysis For Total Metals By EPA Method 6020B

Client ID:	MW06-022724	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	02/28/24	Lab ID:	402383-14 x10
Date Analyzed:	02/29/24	Data File:	402383-14 x10.067
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	7,200

Analysis For Total Metals By EPA Method 6020B

Client ID:	01MW85-022724	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	02/28/24	Lab ID:	402383-17 x10
Date Analyzed:	02/29/24	Data File:	402383-17 x10.068
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	4,300

Analysis For Total Metals By EPA Method 6020B

Client ID:	02MW19-022724	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	02/28/24	Lab ID:	402383-18
Date Analyzed:	02/28/24	Data File:	402383-18.165
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	4.8

Analysis For Total Metals By EPA Method 6020B

Client ID:	02MW07-022724	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	02/28/24	Lab ID:	402383-19
Date Analyzed:	02/28/24	Data File:	402383-19.166
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Floyd-Snider
Date Received:	NA	Project:	Cantera TOC, F&BI 402383
Date Extracted:	02/28/24	Lab ID:	I4-154 mb
Date Analyzed:	02/28/24	Data File:	I4-154 mb.113
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Iron	<50

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW108-022624	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	03/01/24	Lab ID:	402383-01
Date Analyzed:	03/01/24	Data File:	030120.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	78	126
Toluene-d8	102	84	115
4-Bromofluorobenzene	102	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	0.11
cis-1,2-Dichloroethene	<1
Trichloroethene	<0.5

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW12-022624	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	03/01/24	Lab ID:	402383-02
Date Analyzed:	03/01/24	Data File:	030121.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	78	126
Toluene-d8	104	84	115
4-Bromofluorobenzene	101	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW56-022624	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	03/01/24	Lab ID:	402383-03
Date Analyzed:	03/01/24	Data File:	030132.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	92	78	126
Toluene-d8	100	84	115
4-Bromofluorobenzene	104	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	1.1
cis-1,2-Dichloroethene	<1
Trichloroethene	2.1

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW40-022624	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	03/01/24	Lab ID:	402383-04
Date Analyzed:	03/01/24	Data File:	030130.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	78	126
Toluene-d8	97	84	115
4-Bromofluorobenzene	101	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	1.6

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW46-022624	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	03/01/24	Lab ID:	402383-05
Date Analyzed:	03/01/24	Data File:	030138.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	96	78	126
Toluene-d8	96	84	115
4-Bromofluorobenzene	99	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	69
Benzene	3.1

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW46-022624	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	03/01/24	Lab ID:	402383-05 1/10
Date Analyzed:	03/04/24	Data File:	030428.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	78	126
Toluene-d8	100	84	115
4-Bromofluorobenzene	104	72	130

Compounds:	Concentration ug/L (ppb)
cis-1,2-Dichloroethene	520
Trichloroethene	220

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW58R-022624	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	03/01/24	Lab ID:	402383-07 1/10
Date Analyzed:	03/01/24	Data File:	030134.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	78	126
Toluene-d8	100	84	115
4-Bromofluorobenzene	99	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	31
cis-1,2-Dichloroethene	520
Trichloroethene	40

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW15-022624	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	03/01/24	Lab ID:	402383-08
Date Analyzed:	03/01/24	Data File:	030137.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	89	78	126
Toluene-d8	108	84	115
4-Bromofluorobenzene	100	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	59
cis-1,2-Dichloroethene	88
Trichloroethene	27

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW19R-022624	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	03/01/24	Lab ID:	402383-09
Date Analyzed:	03/01/24	Data File:	030131.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	78	126
Toluene-d8	104	84	115
4-Bromofluorobenzene	103	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	1.9

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW49R-022624	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	03/01/24	Lab ID:	402383-10
Date Analyzed:	03/01/24	Data File:	030122.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	78	126
Toluene-d8	101	84	115
4-Bromofluorobenzene	101	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW84-022624	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	03/01/24	Lab ID:	402383-11
Date Analyzed:	03/01/24	Data File:	030123.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	105	78	126
Toluene-d8	105	84	115
4-Bromofluorobenzene	104	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW107-022624	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	03/01/24	Lab ID:	402383-12
Date Analyzed:	03/01/24	Data File:	030124.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	78	126
Toluene-d8	98	84	115
4-Bromofluorobenzene	100	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.02
cis-1,2-Dichloroethene	<1
Trichloroethene	<0.5

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	MW05-022724	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	03/01/24	Lab ID:	402383-13 1/10
Date Analyzed:	03/01/24	Data File:	030136.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	96	78	126
Toluene-d8	96	84	115
4-Bromofluorobenzene	99	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	24
cis-1,2-Dichloroethene	840
Trichloroethene	120
Benzene	1.1 j

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	MW06-022724	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	03/01/24	Lab ID:	402383-14
Date Analyzed:	03/01/24	Data File:	030135.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	78	126
Toluene-d8	99	84	115
4-Bromofluorobenzene	95	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	4.5
cis-1,2-Dichloroethene	68
Trichloroethene	7.7
Benzene	<0.35

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW89-022724	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	03/01/24	Lab ID:	402383-15
Date Analyzed:	03/01/24	Data File:	030125.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	78	126
Toluene-d8	100	84	115
4-Bromofluorobenzene	94	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.02
cis-1,2-Dichloroethene	<1
Trichloroethene	<0.5

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW53R-022724	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	03/01/24	Lab ID:	402383-16
Date Analyzed:	03/01/24	Data File:	030133.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	95	78	126
Toluene-d8	90	84	115
4-Bromofluorobenzene	97	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	0.60
cis-1,2-Dichloroethene	2.9
Trichloroethene	26

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW85-022724	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	03/01/24	Lab ID:	402383-17 1/10
Date Analyzed:	03/01/24	Data File:	030134.D
Matrix:	Water	Instrument:	GCMS13
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	93	71	132
Toluene-d8	96	68	139
4-Bromofluorobenzene	110	62	136

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	28
cis-1,2-Dichloroethene	990
Trichloroethene	<5

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	02MW19-022724	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	03/01/24	Lab ID:	402383-18
Date Analyzed:	03/01/24	Data File:	030126.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	92	78	126
Toluene-d8	102	84	115
4-Bromofluorobenzene	103	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	02MW07-022724	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	03/01/24	Lab ID:	402383-19
Date Analyzed:	03/01/24	Data File:	030129.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	92	78	126
Toluene-d8	103	84	115
4-Bromofluorobenzene	107	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	02MW04R-022724	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	03/01/24	Lab ID:	402383-20
Date Analyzed:	03/01/24	Data File:	030127.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	78	126
Toluene-d8	104	84	115
4-Bromofluorobenzene	97	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	02MW04R-D-022724	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	03/01/24	Lab ID:	402383-21
Date Analyzed:	03/01/24	Data File:	030128.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	96	78	126
Toluene-d8	104	84	115
4-Bromofluorobenzene	105	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Cantera TOC, F&BI 402383
Date Extracted:	03/01/24	Lab ID:	04-0406 mb
Date Analyzed:	03/01/24	Data File:	030119.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	78	126
Toluene-d8	99	84	115
4-Bromofluorobenzene	101	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.02
cis-1,2-Dichloroethene	<1
Trichloroethene	<0.5
Benzene	<0.1 j

Analysis for Semivolatile Phenols By EPA Method 8270E SIM

Client Sample ID:	01MW66-022624	Client:	Floyd-Snider
Date Received:	02/27/24	Project:	Cantera TOC, F&BI 402383
Date Extracted:	02/29/24	Lab ID:	402383-06
Date Analyzed:	02/29/24	Data File:	022922.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2,4,6-Tribromophenol	118	50	150

Compounds:	Concentration ug/L (ppb)
Pentachlorophenol	0.76

Analysis for Semivolatile Phenols By EPA Method 8270E SIM

Client Sample ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Cantera TOC, F&BI 402383
Date Extracted:	02/29/24	Lab ID:	04-0481 mb
Date Analyzed:	02/29/24	Data File:	022921.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2,4,6-Tribromophenol	70	50	150

Compounds:	Concentration ug/L (ppb)
Pentachlorophenol	<0.2

Date of Report: 03/12/24
Date Received: 02/27/24
Project: Cantera TOC, F&BI 402383

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 402383-21 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	100	70-130

Date of Report: 03/12/24
Date Received: 02/27/24
Project: Cantera TOC, F&BI 402383

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	100	104	72-139	4

Date of Report: 03/12/24
Date Received: 02/27/24
Project: Cantera TOC, F&BI 402383

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: 402395-01 x10 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	63,000	0 b	0 b	75-125	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	92	80-120

Date of Report: 03/12/24
Date Received: 02/27/24
Project: Cantera TOC, F&BI 402383

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: 402378-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	<1	93	92	75-125	1
Iron	ug/L (ppb)	100	156	88 b	85 b	75-125	3 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	92	80-120
Iron	ug/L (ppb)	100	97	80-120

Date of Report: 03/12/24
Date Received: 02/27/24
Project: Cantera TOC, F&BI 402383

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: 402383-04 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Vinyl chloride	ug/L (ppb)	10	0.39	107	50-150
cis-1,2-Dichloroethene	ug/L (ppb)	10	2.7	104 b	10-211
Trichloroethene	ug/L (ppb)	10	8.3	101 b	35-149
Benzene	ug/L (ppb)	10	1.6	105	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Vinyl chloride	ug/L (ppb)	10	114	115	64-142	1
cis-1,2-Dichloroethene	ug/L (ppb)	10	110	112	70-130	2
Trichloroethene	ug/L (ppb)	10	99	98	70-130	1
Benzene	ug/L (ppb)	10	103	104	70-130	1

Date of Report: 03/12/24
Date Received: 02/27/24
Project: Cantera TOC, F&BI 402383

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR SEMIVOLATILE PHENOLS BY EPA METHOD 8270E SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 30)
Pentachlorophenol	ug/L (ppb)	2.5	71	89	70-130	22

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the standard reporting limit. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

402383

SAMPLE CHAIN OF CUSTODY

02/27/24

Report To Kristin Anderson, Pamela Osterhout + Lab Data @ Floydsnider.com

Company Floyd Snider

Address 601 Union St, Suite 600

City, State, ZIP Seattle, WA 98101

Phone 206-292-2078 Email

SAMPLERS (*signature*)

PROJECT NAME: Cantera TOC

PO #

REMARKS: cVOCs include: TCE, cis-1,2-DCE and vinyl chloride

Project specific RLs? - Yes / No

INVOICE TO: Pioneer

TURNAROUND TIME
- [x] Standard turnaround
- [ ] RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- [ ] Archive samples
- [ ] Other
- (Default: Dispose after 30 days)

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	cVOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Benzene only	Perchlorate EPA 331.0 - SIM			Notes
01MW108-022624	01A-C	2/26/24	09:01	GW	3					X							
01MW12-022624	02A-G	"	09:15	"	7	X	X						X				
01MW56-022624	03A-C	"	10:07	"	3					X							
01MW40-022624	04A-G	"	10:07	"	7	X	X						X				
01MW46-022624	05A-F	"	11:16	"	6					X			X				
01MW66-022624	06	"	11:30	"	1									X			
01MW58R-022624	07A-C	"	12:19	"	3					X							
01MW15-022624	08A-C	"	12:15	"	3					X							
01MW19R-022624	09A-G	"	14:05	"	7	X	X						X				
01MW49R-022624	10A-G	"	15:22	"	7	X	X						X				

ANALYSES REQUESTED

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Danielle Gotthardt	FIS	2/27/24	14:55
Received by:	ANHPHAN	FSB	02/27/24	14:55
Relinquished by:		Samples received at 1		
Received by:				

Friedman & Bruya, Inc.
Ph. (206) 285-8282

SAMPLE CHAIN OF CUSTODY

402383

02/27/24 F3/K4/3VW4

Page # 2 of 3

Report To Kristin, Pamela + Lab Data

Company Floyd Snider

Address

City, State, ZIP see page 1

Phone Email

SAMPLERS (signature) Danielle Gallagher

PROJECT NAME Cantera - TOC

PO #

REMARKS Sub diss. gases to Onsite for low RL's

Project specific RLs? - Yes / No

INVOICE TO Pioneer

TURNAROUND TIME
- [X] Standard turnaround
- [ ] RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- [ ] Archive samples
- [ ] Other
- Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	Total Arsenic	cVOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Benzene	Total Iron	Diss. Iron (AF)	Dissolved Gases RSK-175	Notes
						ANALYSES REQUESTED											Diss Gases include Methane ethene + ethane
01MW84-022624	11A-G	2/26/24	15:05	GW	7	X	X						X				
01MW107-022624	12A-C	"	16:14	GW	3					X							
MW05-022724	13A-	2/27/24	08:45	GW	11					X			X	X	X	X	
MW06-022724	14A-		08:46	GW	11					X			X	X	X	X	
~~NEW~~ 01MW89-022724	15A-C		10:25	GW	3					X							
01MW53R-022724	16A-C		10:10	GW	3					X							
01MW85-022724	17A-H		11:11	GW	8					X				X	X	X	
02MW19-022724	18A-H		11:30	GW	8	X	X		X				X				
02MW07-022724	19A-H		12:45	GW	8	X	X		X				X				
02MW04R-022724	20A-G	"	12:12	GW	7	X	X						X				

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Danielle Gallagher	Danielle Gallagher	F/S	2/27/24	14:65
Received by:	ANH PHAN	F&B	02/27/24	14:55
Relinquished by:		Samples received at 1 °C		
Received by:				

Friedman & Bruya, Inc.
Ph. (206) 285-8282

402383

SAMPLE CHAIN OF CUSTODY

02/27/24 F3/K4/VW4

Page # 3 of 3

Report To Kristin, Pamela

Company Floyd Snider

Address

City, State, ZIP See page 1

Phone Email

SAMPLERS (*signature*)

PROJECT NAME: Cantera-TOC

PO #

REMARKS

Project specific RLs? - Yes / No

INVOICE TO: Pioneer

TURNAROUND TIME
- X Standard turnaround
- ☐ RUSH
- Rush charges authorized by:

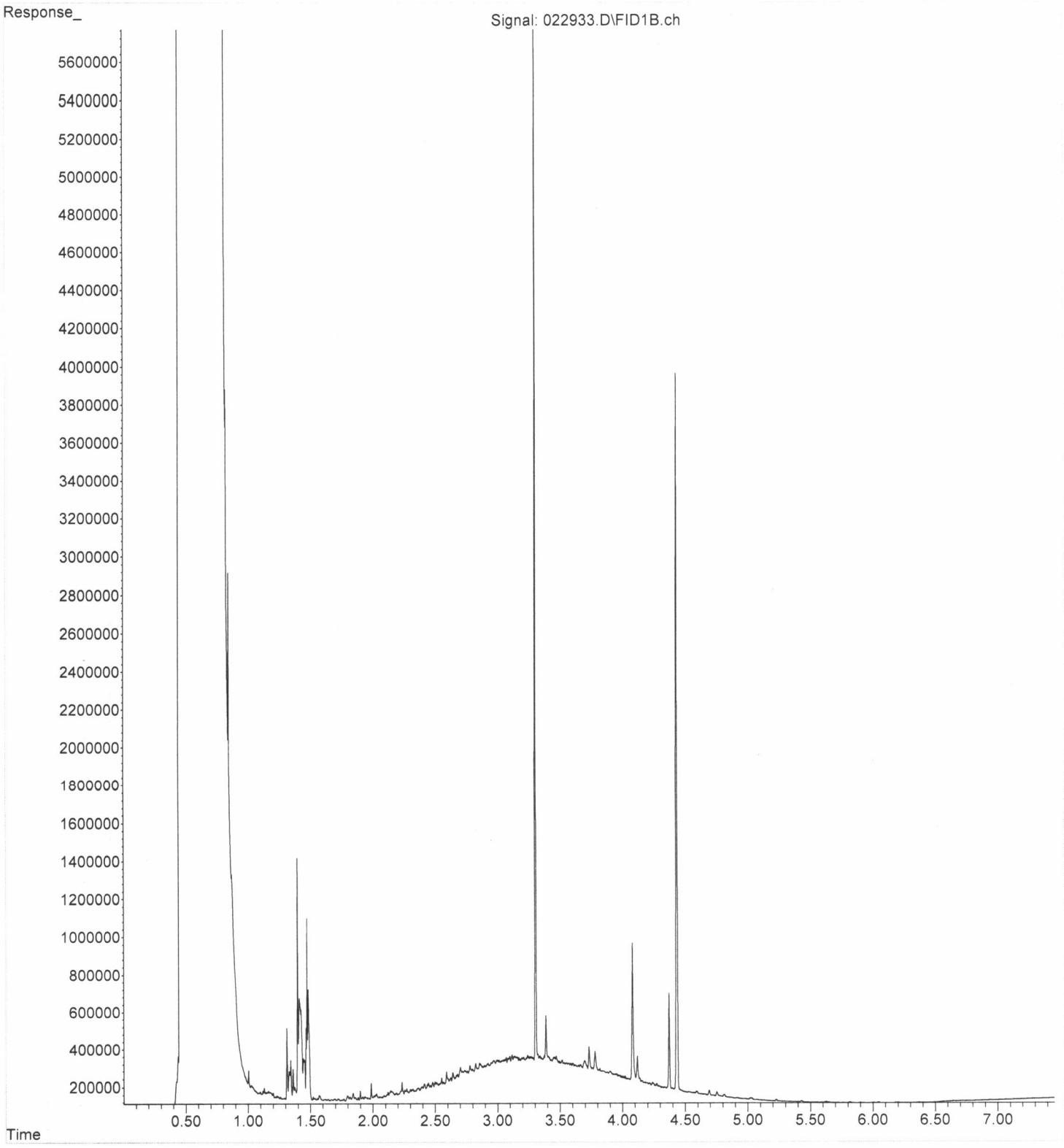
SAMPLE DISPOSAL
- ☐ Archive samples
- ☐ Other
- Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Remark 8260				Notes
						ANALYSES REQUESTED											
02MW04R-D-022724	21A-F	2/27/24	12:15	GW	6	X	X						X				
TRIP BLANK	22A-B	2/27/24	14:00	QC	2												HOLD

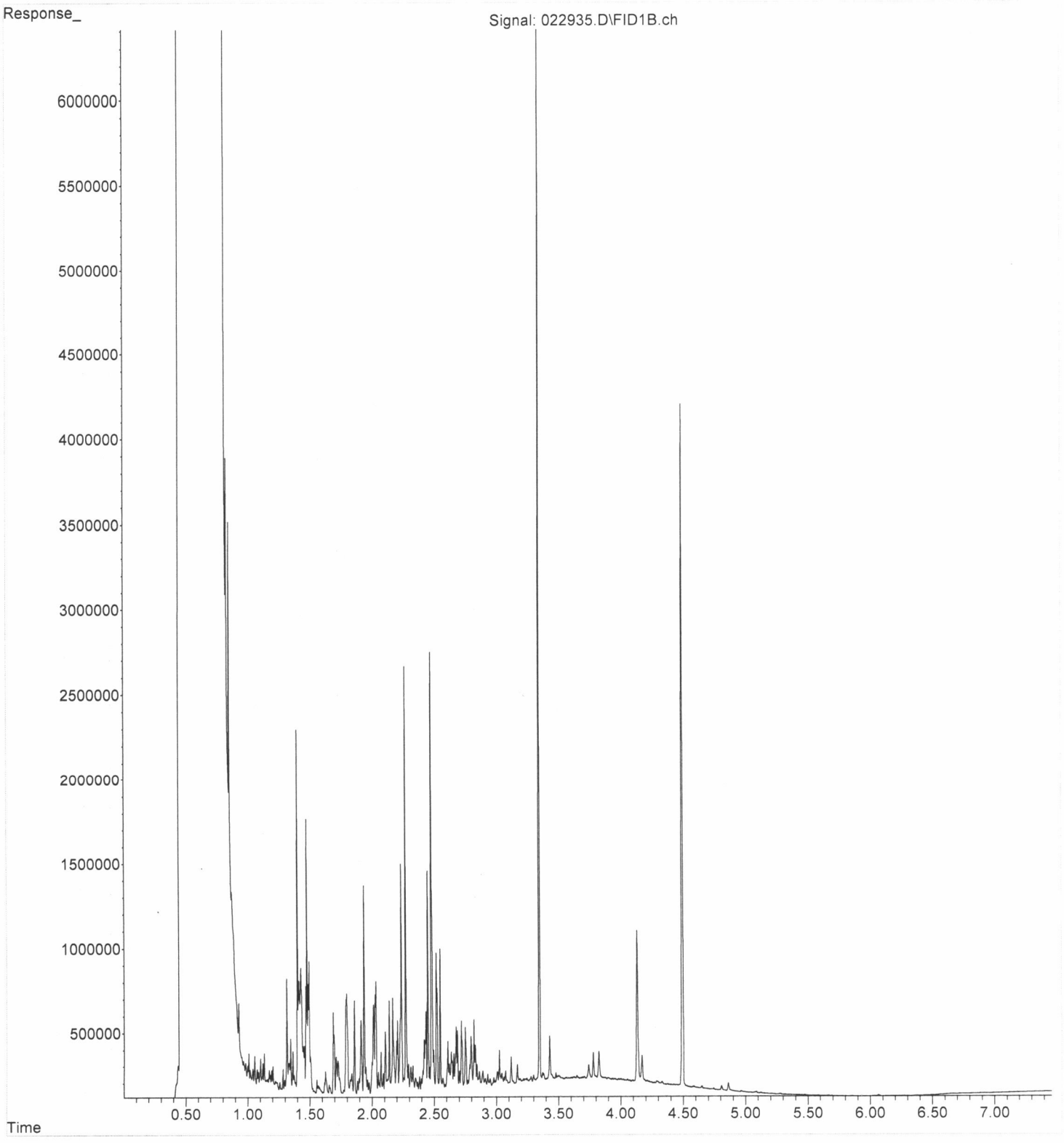
SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Danielle Gallagher	FIS	2/27/24	14:55
Received by:	ANH PHAN	F&S	02/27/24	14:55
Relinquished by:		Samples received at 1 °C		
Received by:				

Friedman & Bruya, Inc.
Ph. (206) 285-8282

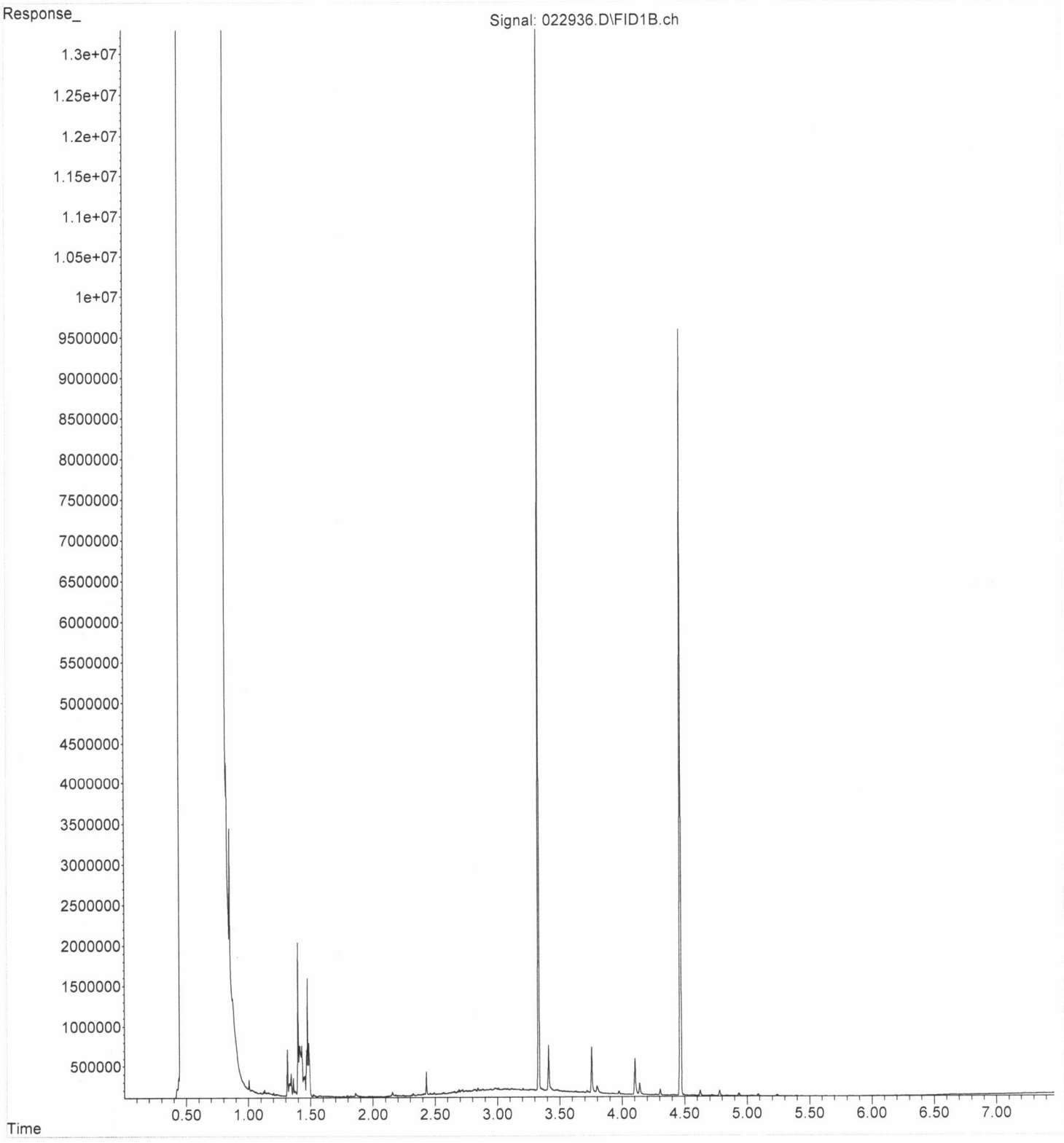
File :P:\Proc_GC10\02-29-24\022933.D
Operator : IJL
Acquired : 29 Feb 2024 02:37 pm using AcqMethod DX.M
Instrument : GC10
Sample Name: 402303-02
Misc Info : GMZ1
Vial Number: 26



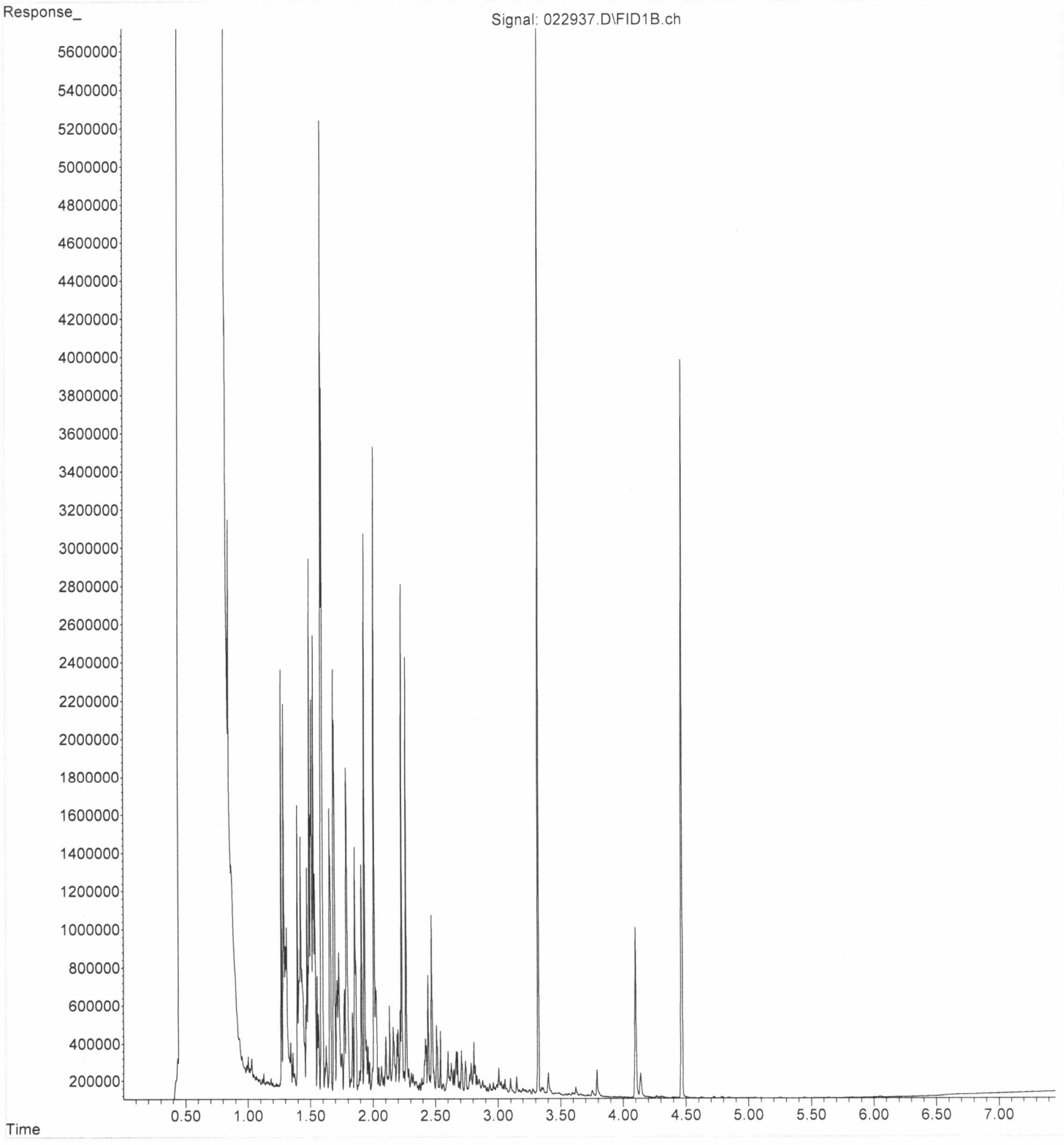
File :P:\Proc_GC10\02-29-24\022935.D
Operator : IJL
Acquired : 29 Feb 2024 03:00 pm using AcqMethod DX.M
Instrument : GC10
Sample Name: 402303-09
Misc Info : 8 mg/1
Vial Number: 28



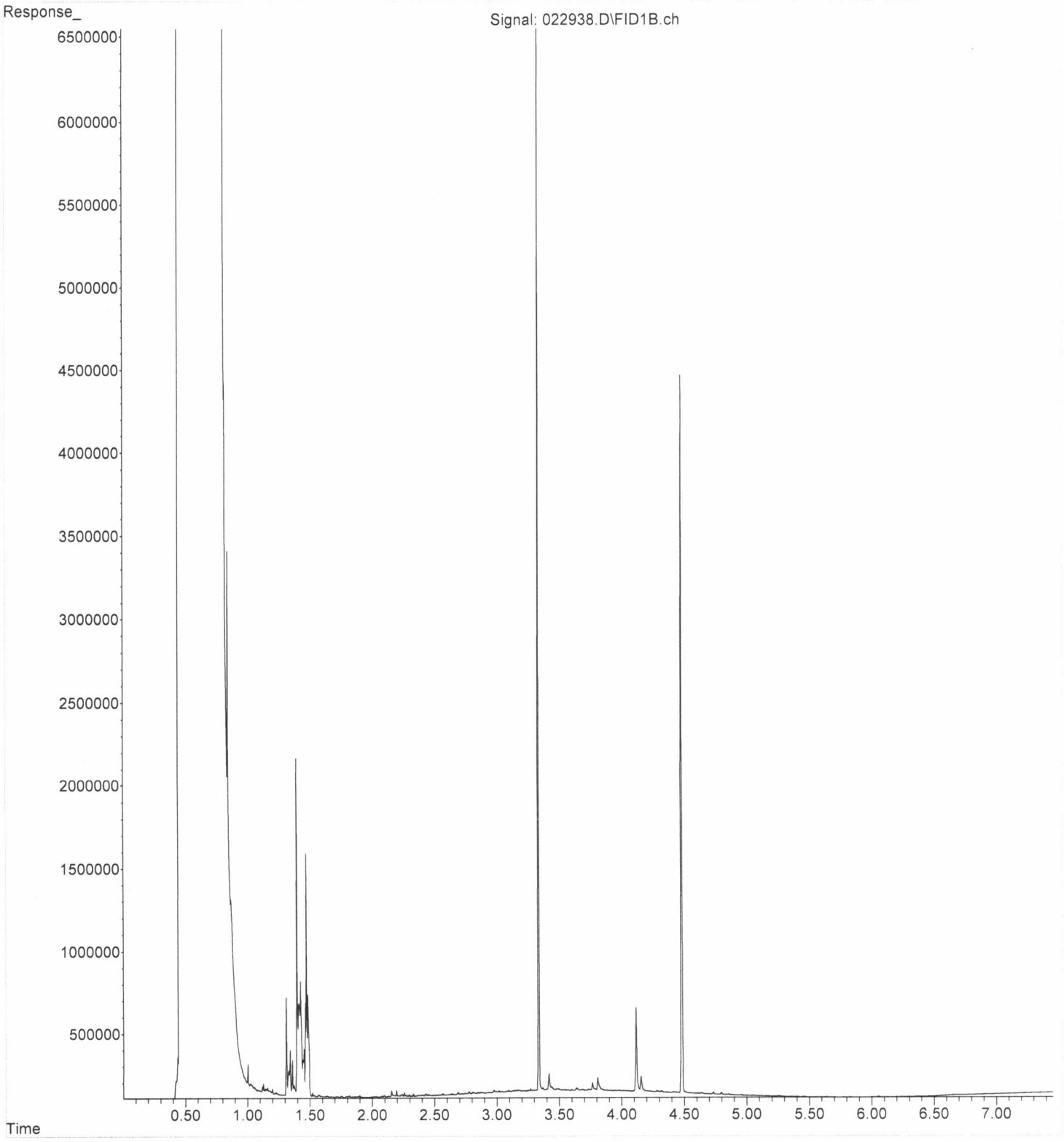
File :P:\Proc_GC10\02-29-24\022936.D
Operator : IJL
Acquired : 29 Feb 2024 03:11 pm using AcqMethod DX.M
Instrument : GC10
Sample Name: 402303-10
Misc Info :
Vial Number: 29



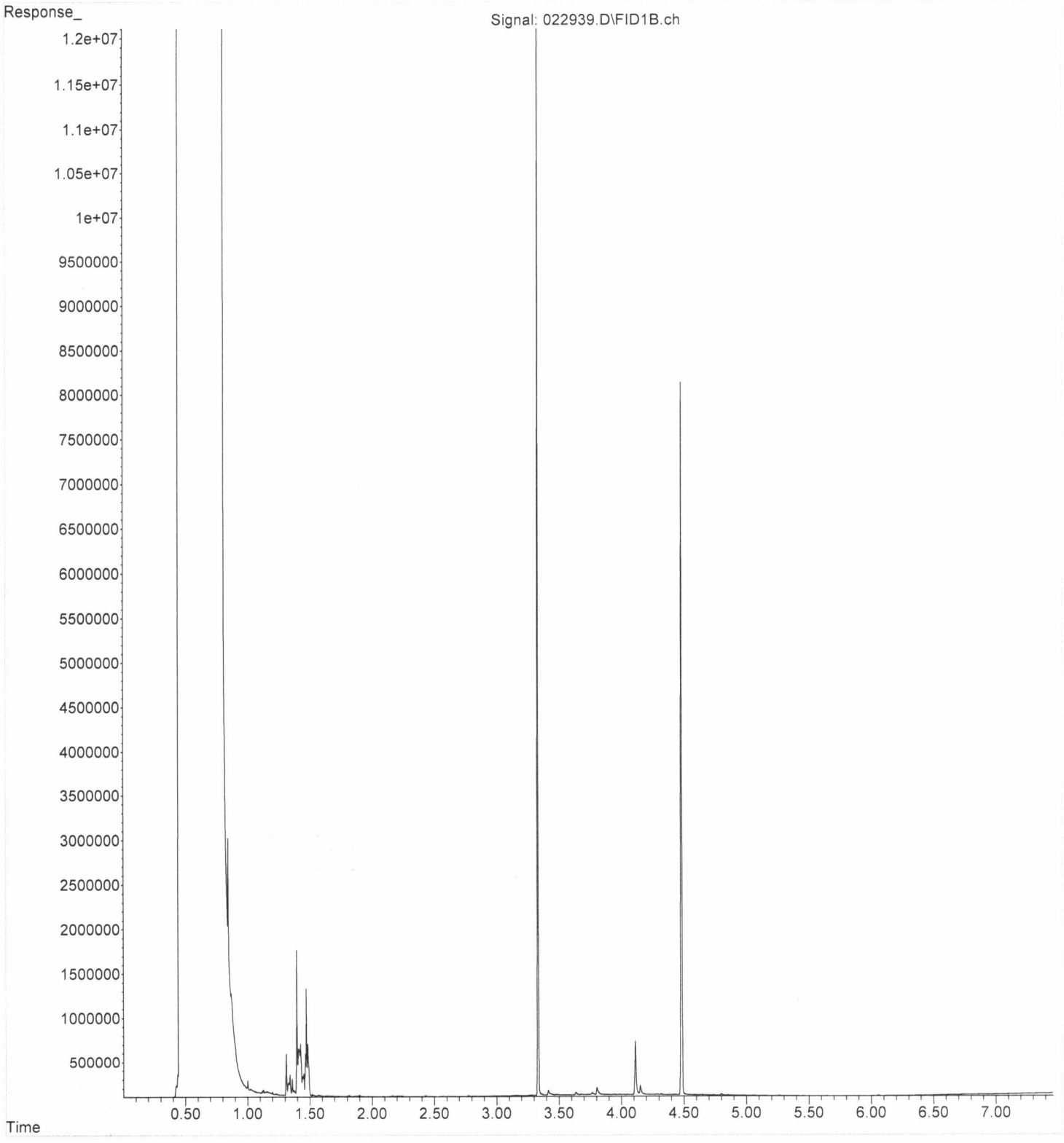
File :P:\Proc_GC10\02-29-24\022937.D
Operator : IJL
Acquired : 29 Feb 2024 03:23 pm using AcqMethod DX.M
Instrument : GC10
Sample Name: 402303-11
Misc Info : 8 mg/l
Vial Number: 30



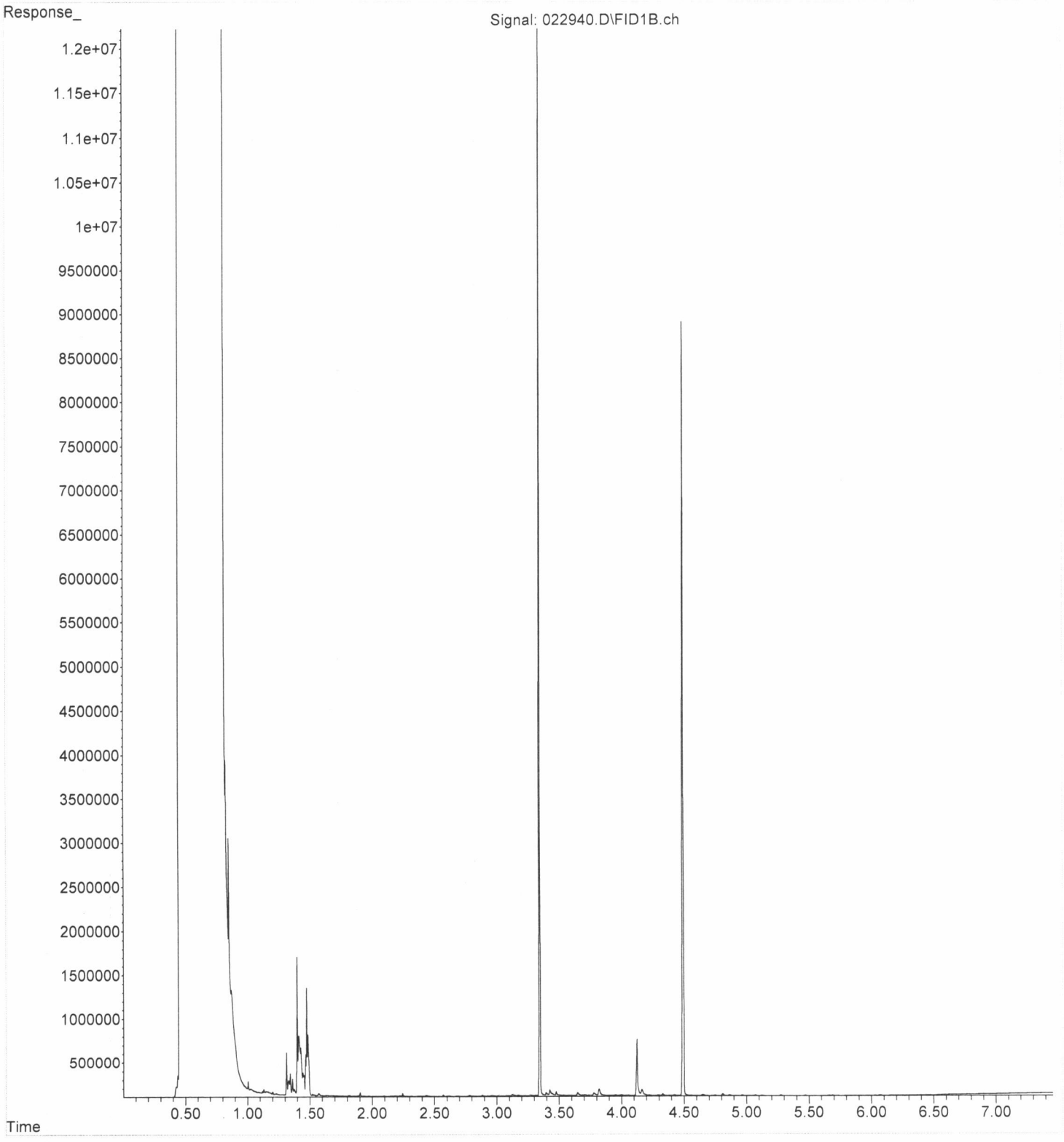
File :P:\Proc_GC10\02-29-24\022938.D
Operator : IJL
Acquired : 29 Feb 2024 03:34 pm using AcqMethod DX.M
Instrument : GC10
Sample Name: 402303-18
Misc Info : 8 MCM/1
Vial Number: 31



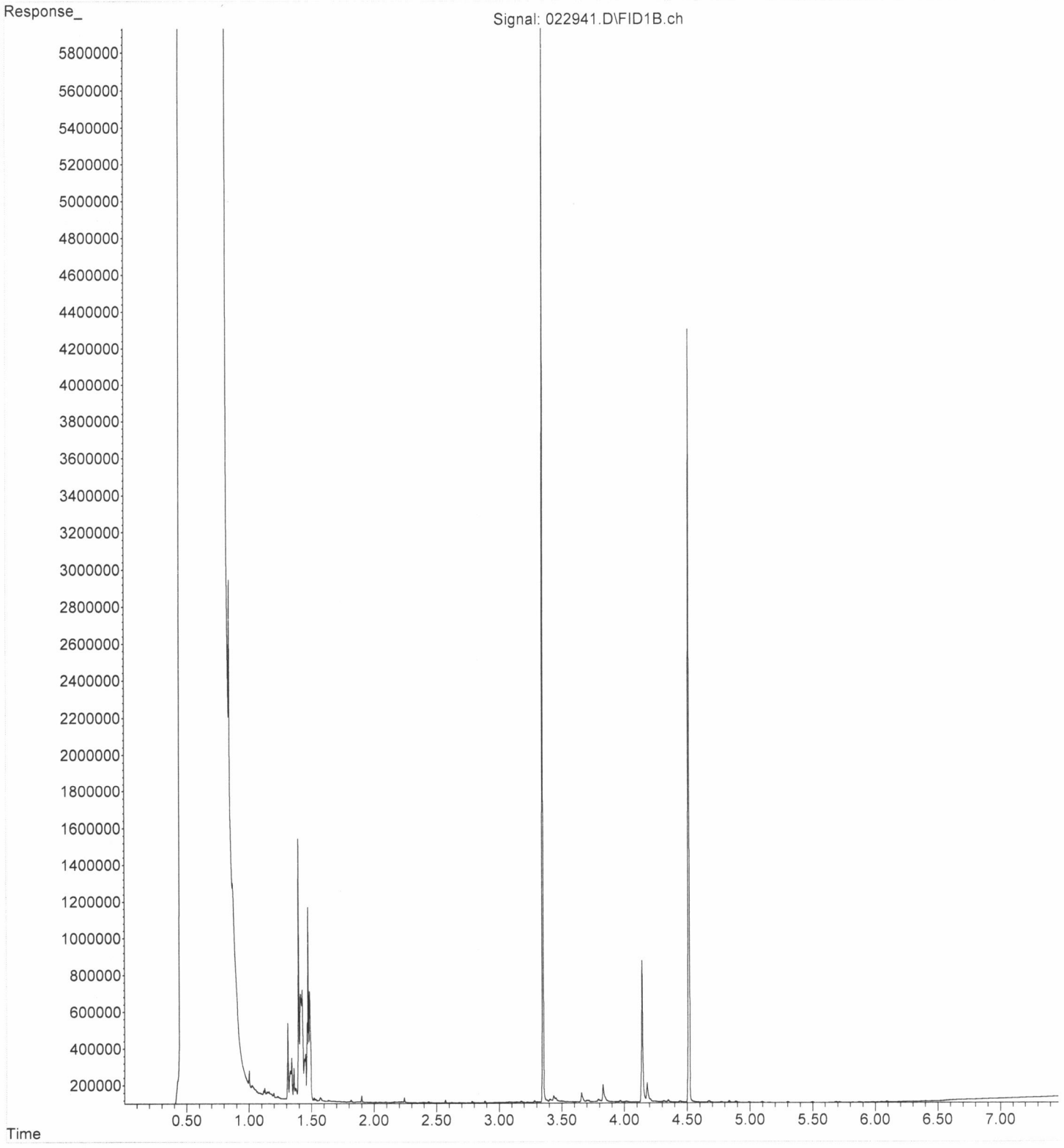
File :P:\Proc_GC10\02-29-24\022939.D
Operator : IJL
Acquired : 29 Feb 2024 03:46 pm using AcqMethod DX.M
Instrument : GC10
Sample Name: 402303-19
Misc Info : 8mg/l
Vial Number: 32



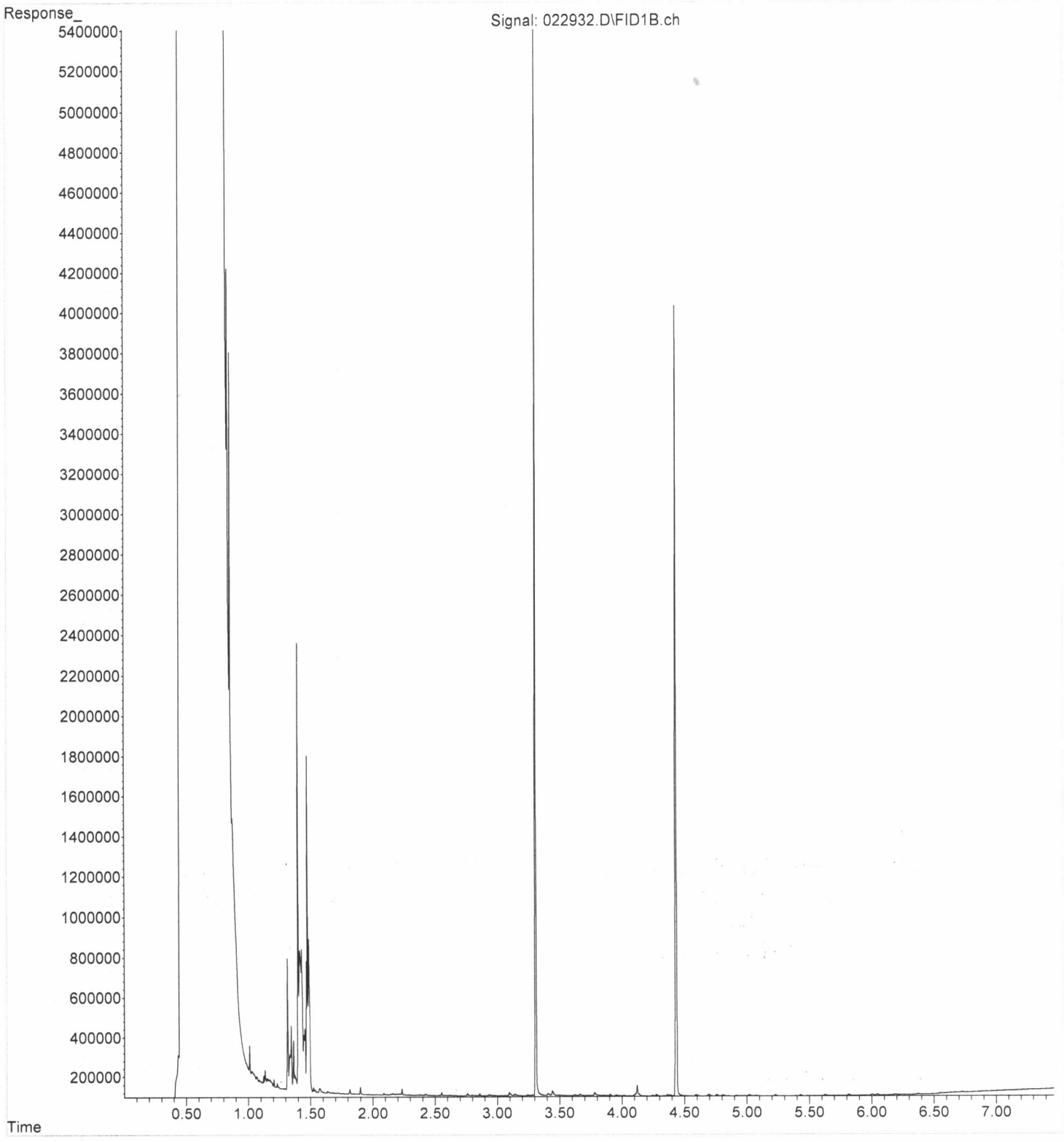
File :P:\Proc_GC10\02-29-24\022940.D
Operator : IJL
Acquired : 29 Feb 2024 03:58 pm using AcqMethod DX.M
Instrument : GC10
Sample Name: 402303-20
Misc Info : 8M3/1
Vial Number: 33



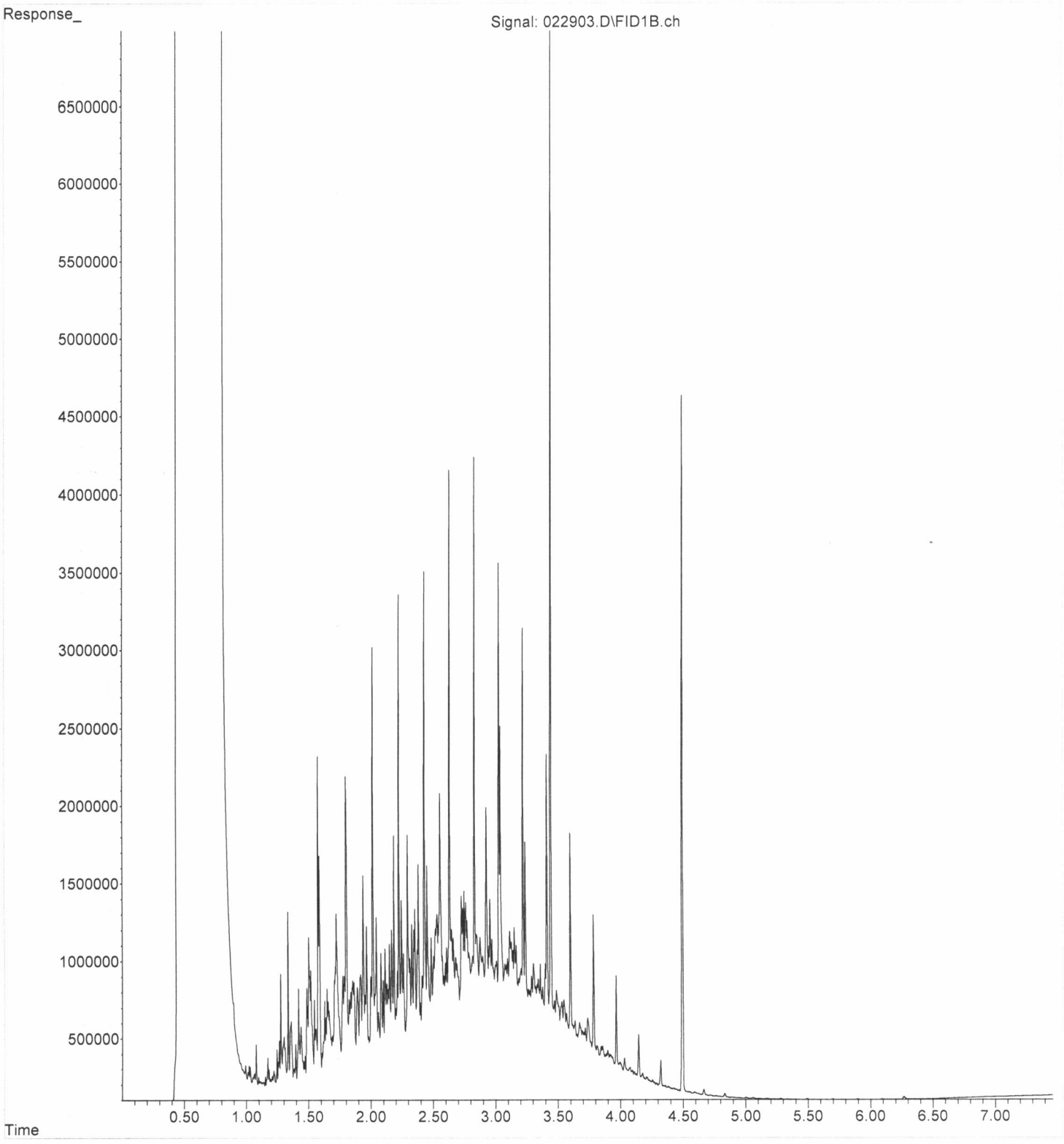
File :P:\Proc_GC10\02-29-24\022941.D
Operator : IJL
Acquired : 29 Feb 2024 04:09 pm using AcqMethod DX.M
Instrument : GC10
Sample Name: 402303-21
Misc Info : 8M23/1
Vial Number: 34



File :P:\Proc_GC10\02-29-24\022932.D
Operator : IJL
Acquired : 29 Feb 2024 02:25 pm using AcqMethod DX.M
Instrument : GC10
Sample Name: 04-480 mb
Misc Info :
Vial Number: 25



File :P:\Proc_GC10\02-29-24\022903.D
Operator : IJL
Acquired : 29 Feb 2024 08:50 am using AcqMethod DX.M
Instrument : GC10
Sample Name: 500 DX 71-40D
Misc Info :
Vial Number: 3



OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

March 11, 2024

Michael Erdahl
Friedman & Bruya, Inc.
5500 4th Avenue South
Seattle, WA 98108

Re: Analytical Data for Project 402383
Laboratory Reference No. 2402-360

Dear Michael:

Enclosed are the analytical results and associated quality control data for samples submitted on February 28, 2024.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: March 11, 2024
Samples Submitted: February 28, 2024
Laboratory Reference: 2402-360
Project: 402383

Case Narrative

Samples were collected on February 27, 2024 and received by the laboratory on February 28, 2024. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below. However the soil results for the QA/QC samples are reported on a wet-weight basis.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: March 11, 2024
Samples Submitted: February 28, 2024
Laboratory Reference: 2402-360
Project: 402383

DISSOLVED GASES
RSK 175

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	MDL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW05-022724**						
Laboratory ID:	02-360-01						
Methane	**42**	0.55	0.53	RSK 175	3-5-24	3-5-24	
Ethane	**ND**	0.56	0.33	RSK 175	3-5-24	3-5-24	
Ethene	**29**	0.58	0.33	RSK 175	3-5-24	3-5-24	
Surrogate:	*Percent Recovery*	*Control Limits*					
1-Butene	*88*	*50-150*					
Client ID:	**MW06-022724**						
Laboratory ID:	02-360-02						
Methane	**52**	0.55	0.53	RSK 175	3-5-24	3-5-24	
Ethane	**ND**	0.56	0.33	RSK 175	3-5-24	3-5-24	
Ethene	**ND**	0.58	0.33	RSK 175	3-5-24	3-5-24	
Surrogate:	*Percent Recovery*	*Control Limits*					
1-Butene	*88*	*50-150*					
Client ID:	**01MW85-022724**						
Laboratory ID:	02-360-03						
Methane	**2500**	28	27	RSK 175	3-5-24	3-5-24	
Ethane	**ND**	0.56	0.33	RSK 175	3-5-24	3-5-24	
Ethene	**14**	0.58	0.33	RSK 175	3-5-24	3-5-24	
Surrogate:	*Percent Recovery*	*Control Limits*					
1-Butene	*97*	*50-150*					

Date of Report: March 11, 2024
Samples Submitted: February 28, 2024
Laboratory Reference: 2402-360
Project: 402383

DISSOLVED GASES
RSK 175
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	MDL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK							
Laboratory ID:	MB0305W1						
Methane	**ND**	0.55	0.53	RSK 175	3-5-24	3-5-24	
Ethane	**ND**	0.56	0.33	RSK 175	3-5-24	3-5-24	
Ethene	**ND**	0.58	0.33	RSK 175	3-5-24	3-5-24	
Surrogate:	*Percent Recovery*	*Control Limits*					
1-Butene	*100*	*50-150*					

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANK										
Laboratory ID:	SB0305W1									
	SB	SBD	SB	SBD	SB	SBD				
Methane	**44.5**	**40.4**	44.2	44.2	101	91	75-125	10	25	
Ethane	**84.0**	**76.0**	83.2	83.2	101	91	75-125	10	25	
Ethene	**78.8**	**72.0**	77.7	77.7	101	93	75-125	9	25	
Surrogate:										
1-Butene					*102*	*92*	*50-150*			

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.

X2 - Sample extract treated with a silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in methods 8260 & 8270, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Y1 - Negative effects of the matrix from this sample on the instrument caused values for this analyte in the bracketing continuing calibration verification standard (CCVs) to be outside of 20% acceptance criteria. Because of this, quantitation limits and sample concentrations should be considered estimates.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

02-360

Page # 1 of 1

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 5500 4th Ave S

City, State, ZIP Seattle, WA 98108

Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTER
Onsite

PROJECT NAME/NO.	PO #
402383	D-689

REMARKS

Report to MDL, Methane, Ethane, Ethene ~~EIM EDD~~ Floyd Snider EDD

TURNAROUND TIME

☒ Standard TAT

RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

Dispose after 30 days

Return samples

Will call with instructions

	Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: Dissolved Gases RSK *	Nitrate	Nitrite	Sulfate	RSK-175						Notes
1	MW05-022724		2/27/2024	845	water	3	x										* Methane, Ethane, Ethene
2	MW06-022724		2/27/2024	846	water	3	x										
3	01MW85-022724		2/27/2024	1111	water	3	x										

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
~~Relinquished by:~~		Michael Erdahl	Friedman & Bruya	2/28/24	0820
Received by:		M. VOUN	OSE	2/28/24	1415
Relinquished by:					
Received by:					

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Vineta Mills, M.S.
Eric Young, B.S.

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
office@friedmanandbruya.com
www.friedmanandbruya.com

May 23, 2024

Kristin Anderson, Project Manager
Floyd-Snider
Two Union Square
601 Union St, Suite 600
Seattle, WA 98101

Dear Ms Anderson:

Included are the results from the testing of material submitted on May 15, 2024 from the Cantera-TOC/Time Oil, F&BI 405273 project. There are 19 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Floyd Snider Lab Data, Pamela Osterhout
FDS0523R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on May 15, 2024 by Friedman & Bruya, Inc. from the Floyd-Snider Cantera-TOC/Time Oil, F&BI 405273 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Floyd-Snider
405273 -01	01MW19R-051524
405273 -02	01MW84-051524
405273 -03	01MW15-051524
405273 -04	01MW46-051524
405273 -05	01MW53R-051524
405273 -06	01MW58R-051524
405273 -07	01MW80-051524
405273 -08	01MW85-051524
405273 -09	01MW107-051524
405273 -10	02MW04R-051524
405273 -11	01MW19R-051524-D

All quality control requirements were acceptable.

Date of Report: 05/23/24
Date Received: 05/15/24
Project: Cantera-TOC/Time Oil, F&BI 405273
Date Extracted: 05/17/24
Date Analyzed: 05/17/24

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
01MW19R-051524 405273-01	750	120
01MW84-051524 405273-02	3,900	102
02MW04R-051524 405273-10	<100	104
01MW19R-051524-D 405273-11 1/10	1,000	102
Method Blank 04-895 MB	<100	82

Date of Report: 05/23/24
Date Received: 05/15/24
Project: Cantera-TOC/Time Oil, F&BI 405273
Date Extracted: 05/20/24
Date Analyzed: 05/20/24

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 50-150)
01MW19R-051524 405273-01	680 x	<250	86
01MW84-051524 405273-02	1,400 x	<250	89
02MW04R-051524 405273-10	52 x	<250	83
01MW19R-051524-D 405273-11	720 x	<250	86
Method Blank 04-1181 MB	<50	<250	81

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW19R-051524	Client:	Floyd-Snider
Date Received:	05/15/24	Project:	Cantera-TOC/Time Oil
Date Extracted:	05/21/24	Lab ID:	405273-01
Date Analyzed:	05/21/24	Data File:	052116.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	78	126
Toluene-d8	106	84	115
4-Bromofluorobenzene	93	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	2.1

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW84-051524	Client:	Floyd-Snider
Date Received:	05/15/24	Project:	Cantera-TOC/Time Oil
Date Extracted:	05/21/24	Lab ID:	405273-02
Date Analyzed:	05/21/24	Data File:	052113.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	92	78	126
Toluene-d8	105	84	115
4-Bromofluorobenzene	96	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW15-051524	Client:	Floyd-Snider
Date Received:	05/15/24	Project:	Cantera-TOC/Time Oil
Date Extracted:	05/21/24	Lab ID:	405273-03
Date Analyzed:	05/21/24	Data File:	052124.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	78	126
Toluene-d8	106	84	115
4-Bromofluorobenzene	96	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	58
cis-1,2-Dichloroethene	18
Trichloroethene	2.7

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW46-051524	Client:	Floyd-Snider
Date Received:	05/15/24	Project:	Cantera-TOC/Time Oil
Date Extracted:	05/21/24	Lab ID:	405273-04 1/10
Date Analyzed:	05/21/24	Data File:	052123.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	78	126
Toluene-d8	102	84	115
4-Bromofluorobenzene	95	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	69
cis-1,2-Dichloroethene	490
Benzene	2.8 j
Trichloroethene	220

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW53R-051524	Client:	Floyd-Snider
Date Received:	05/15/24	Project:	Cantera-TOC/Time Oil
Date Extracted:	05/21/24	Lab ID:	405273-05
Date Analyzed:	05/21/24	Data File:	052118.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	78	126
Toluene-d8	98	84	115
4-Bromofluorobenzene	88	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	0.33
cis-1,2-Dichloroethene	1.6
Trichloroethene	12

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW58R-051524	Client:	Floyd-Snider
Date Received:	05/15/24	Project:	Cantera-TOC/Time Oil
Date Extracted:	05/21/24	Lab ID:	405273-06 1/10
Date Analyzed:	05/21/24	Data File:	052120.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	78	126
Toluene-d8	104	84	115
4-Bromofluorobenzene	94	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	33
cis-1,2-Dichloroethene	490
Trichloroethene	38

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW80-051524	Client:	Floyd-Snider
Date Received:	05/15/24	Project:	Cantera-TOC/Time Oil
Date Extracted:	05/21/24	Lab ID:	405273-07 1/10
Date Analyzed:	05/21/24	Data File:	052122.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	105	78	126
Toluene-d8	98	84	115
4-Bromofluorobenzene	96	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	51
cis-1,2-Dichloroethene	350
Trichloroethene	190

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW85-051524	Client:	Floyd-Snider
Date Received:	05/15/24	Project:	Cantera-TOC/Time Oil
Date Extracted:	05/21/24	Lab ID:	405273-08 1/10
Date Analyzed:	05/21/24	Data File:	052119.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	93	78	126
Toluene-d8	96	84	115
4-Bromofluorobenzene	90	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	26
cis-1,2-Dichloroethene	970
Trichloroethene	6.2

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW107-051524	Client:	Floyd-Snider
Date Received:	05/15/24	Project:	Cantera-TOC/Time Oil
Date Extracted:	05/21/24	Lab ID:	405273-09
Date Analyzed:	05/21/24	Data File:	052114.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	78	126
Toluene-d8	98	84	115
4-Bromofluorobenzene	92	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.02
cis-1,2-Dichloroethene	<1
Trichloroethene	<0.5

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	02MW04R-051524	Client:	Floyd-Snider
Date Received:	05/15/24	Project:	Cantera-TOC/Time Oil
Date Extracted:	05/21/24	Lab ID:	405273-10
Date Analyzed:	05/21/24	Data File:	052115.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	111	78	126
Toluene-d8	101	84	115
4-Bromofluorobenzene	90	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW19R-051524-D	Client:	Floyd-Snider
Date Received:	05/15/24	Project:	Cantera-TOC/Time Oil
Date Extracted:	05/21/24	Lab ID:	405273-11
Date Analyzed:	05/21/24	Data File:	052117.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	97	78	126
Toluene-d8	100	84	115
4-Bromofluorobenzene	99	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	2.2

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Cantera-TOC/Time Oil
Date Extracted:	05/21/24	Lab ID:	04-1104 mb
Date Analyzed:	05/21/24	Data File:	052108.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	107	78	126
Toluene-d8	103	84	115
4-Bromofluorobenzene	91	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.02
cis-1,2-Dichloroethene	<1
Benzene	<0.035 j
Trichloroethene	<0.5

Date of Report: 05/23/24
Date Received: 05/15/24
Project: Cantera-TOC/Time Oil, F&BI 405273

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 405236-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	91	70-130

Date of Report: 05/23/24
Date Received: 05/15/24
Project: Cantera-TOC/Time Oil, F&BI 405273

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	88	88	65-151	0

Date of Report: 05/23/24
Date Received: 05/15/24
Project: Cantera-TOC/Time Oil, F&BI 405273

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: 405273-09 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Vinyl chloride	ug/L (ppb)	10	<0.02	92	50-150
cis-1,2-Dichloroethene	ug/L (ppb)	10	<1	96	10-211
Benzene	ug/L (ppb)	10	<0.35	94	50-150
Trichloroethene	ug/L (ppb)	10	<0.5	96	35-149

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Vinyl chloride	ug/L (ppb)	10	89	88	64-142	1
cis-1,2-Dichloroethene	ug/L (ppb)	10	90	91	70-130	1
Benzene	ug/L (ppb)	10	88	88	70-130	0
Trichloroethene	ug/L (ppb)	10	91	94	70-130	3

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the standard reporting limit. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

405273

SAMPLE CHAIN OF CUSTODY

05/15/24 F2/VW4

Page # 1 of 1

Report To Kristin Anderson + Pamela Osterhout

Company Floyd Snider

Address 601 Union St, Suite 600

City, State, ZIP Seattle, WA 98101

Phone 206 292-2078 Email

SAMPLERS (signature)

PROJECT NAME: Cantera-TOC/Time Oil

PO #

REMARKS: CVOCs by 8260: TCE, cis1,2-DCE, and vinyl chloride
Project specific RLs? - Yes / No

INVOICE TO: Pioneer

TURNAROUND TIME
- [x] Standard turnaround
- [ ] RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- [ ] Archive samples
- [ ] Other
- Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Benzene 8260	TCE, cis-1,2-DCE, VC			Notes
01MW19R-051524	01 A-G	5/15/24	12:03	GW	7	✓	✓						✓				
01MW84-051524	02 ↓		13:28		7	✓	✓						✓				
01MW15-051524	03 A-C		10:58		3									✓			
01MW46-051524	04		08:56		3								✓	✓			
01MW53R-051524	05		10:17		3									✓			
01MW58R-051524	06 ↓		10:03		3									✓			
01MW80-051524	07 A-B		15:47		2									✓			
01MW85-051524	08 A-C		11:10		3									✓			
01MW107-051524	09 ↓		11:57		3									✓			
02MW04R-051524	10 A-G		15:38		7	✓	✓						✓				
01MW19R-051524-D	11 ↓	5/15/24	1200	GW	7	✓	✓						✓				

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		C. OREIRO	FLOYD SNIDER	5/15/24	1715
Received by:		VINH	FDI	5-15-24	1715
Relinquished by:			Samples received at 4 °C		
Received by:					

Friedman & Bruya, Inc.
Ph. (206) 285-8282

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 405273 CLIENT FCS INITIALS: MW DATE: 5-15-24

If custody seals are present on cooler, are they intact? ☑ NA ☐ YES ☐ NO

Cooler/Sample temperature 4 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☑ YES ☐ NO

How did samples arrive?
☑ Over the Counter ☐ Picked up by F&BI ☐ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☑ YES ☐ NO
*or other representative documents, letters, and/or shipping memos

Number of days samples have been sitting prior to receipt at laboratory 0 days

Are the samples clearly identified? (explain "no" answer below) ☑ YES ☐ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☑ YES ☐ NO

Were appropriate sample containers used? ☑ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☑ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☐ NA ☑ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

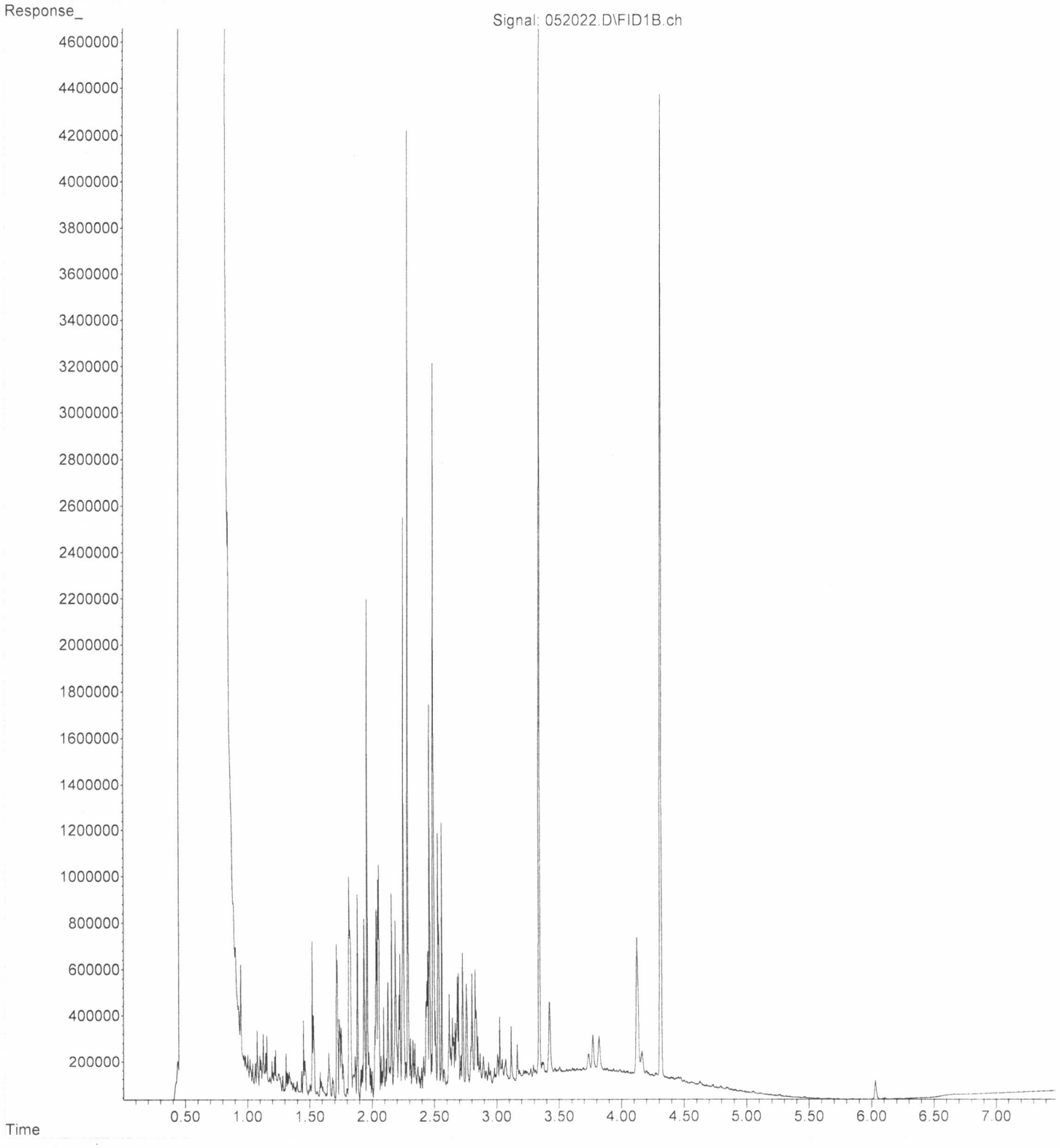
Sample ID's	☑ Yes	☐ No	
Date Sampled	☑ Yes	☐ No	☐ Not on COC/label
Time Sampled	☑ Yes	☐ No	☐ Not on COC/label
# of Containers	☑ Yes	☐ No	☐ Not on COC/label
Relinquished	☑ Yes	☐ No	
Requested analysis	☑ Yes	☐ On Hold	

Other comments (use a separate page if needed)

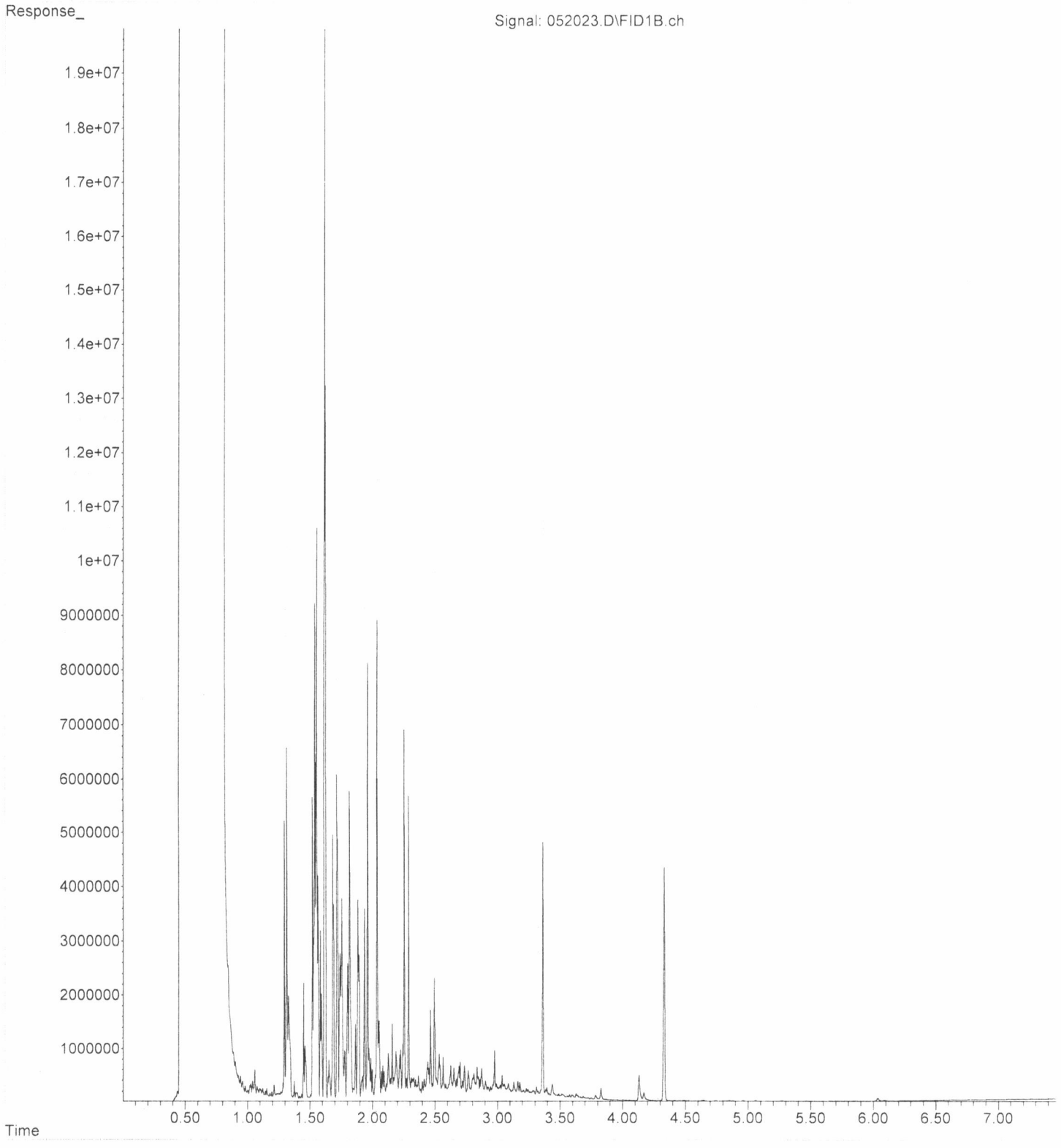
Air Samples: Were any additional canisters/tubes received? ☑ NA ☐ YES ☐ NO

Number of unused TO15 canisters _____ **Number of unused TO17 tubes** _____

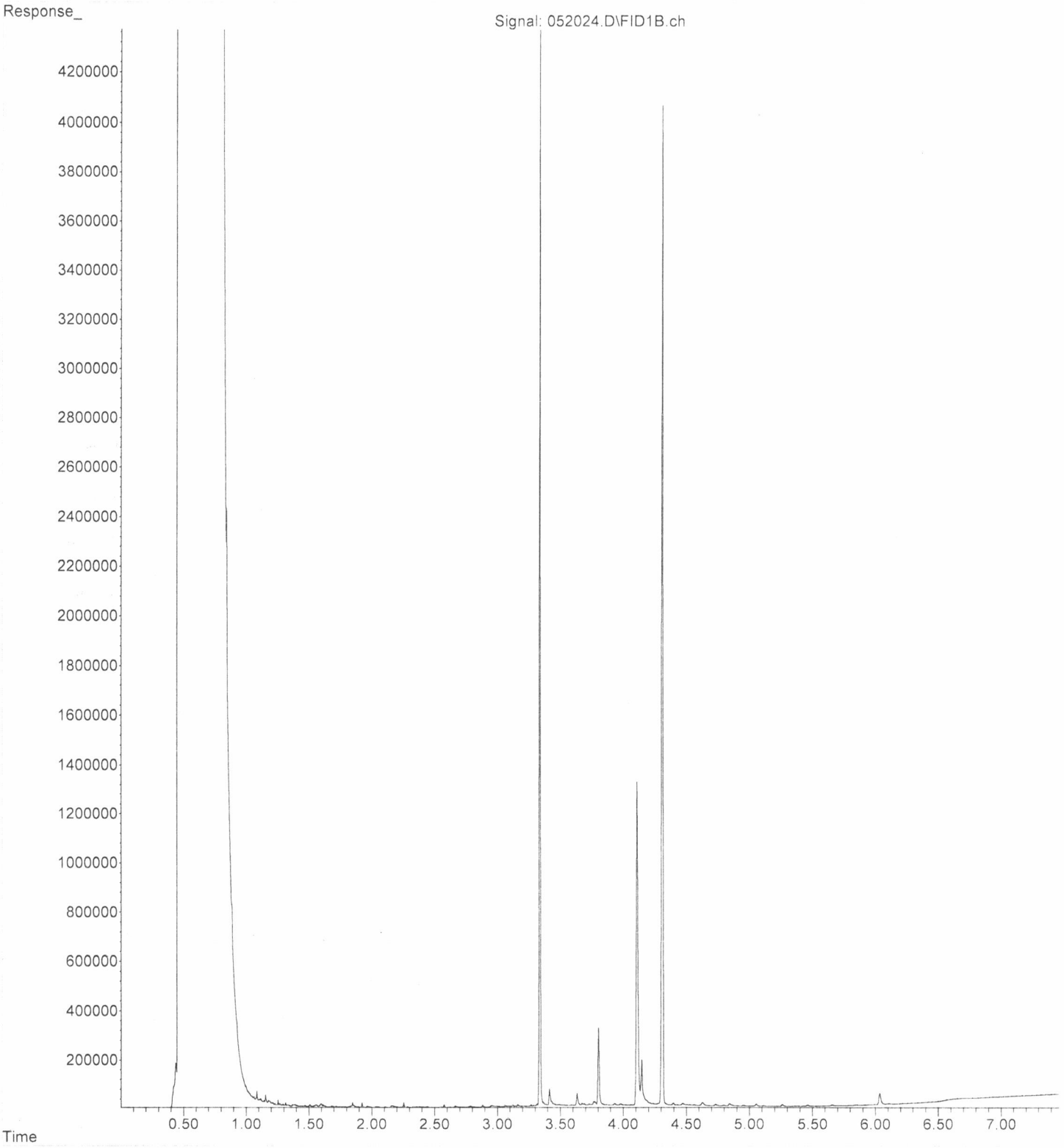
File :P:\Proc_GC14\05-20-24\052022.D
Operator : TL
Acquired : 20 May 2024 06:22 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 405273-01
Misc Info : ERR
Vial Number: 16



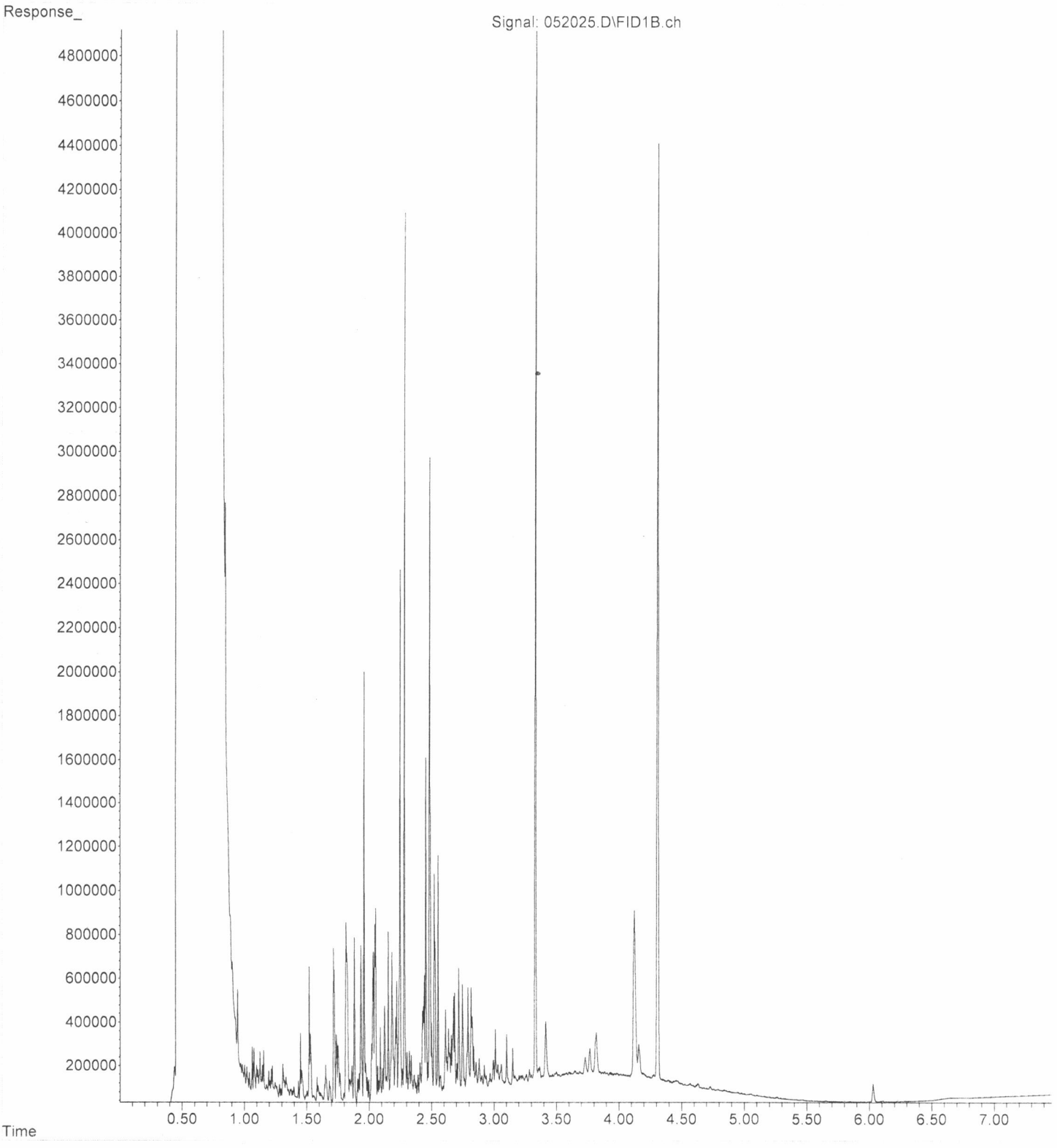
File :P:\Proc_GC14\05-20-24\052023.D
Operator : TL
Acquired : 20 May 2024 06:34 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 405273-02
Misc Info : ERR
Vial Number: 17



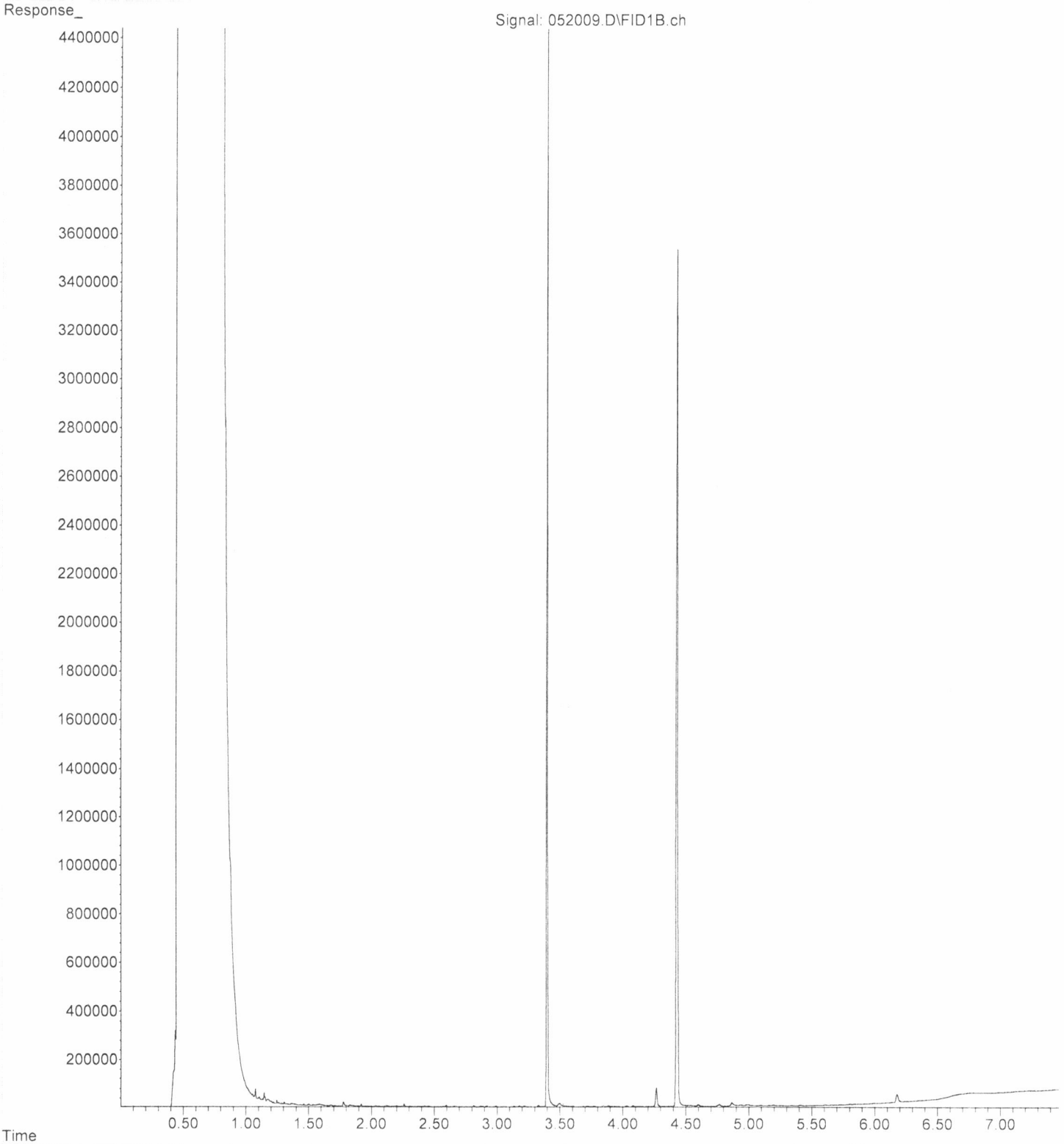
File :P:\Proc_GC14\05-20-24\052024.D
Operator : TL
Acquired : 20 May 2024 06:46 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 405273-10
Misc Info : ERR
Vial Number: 18



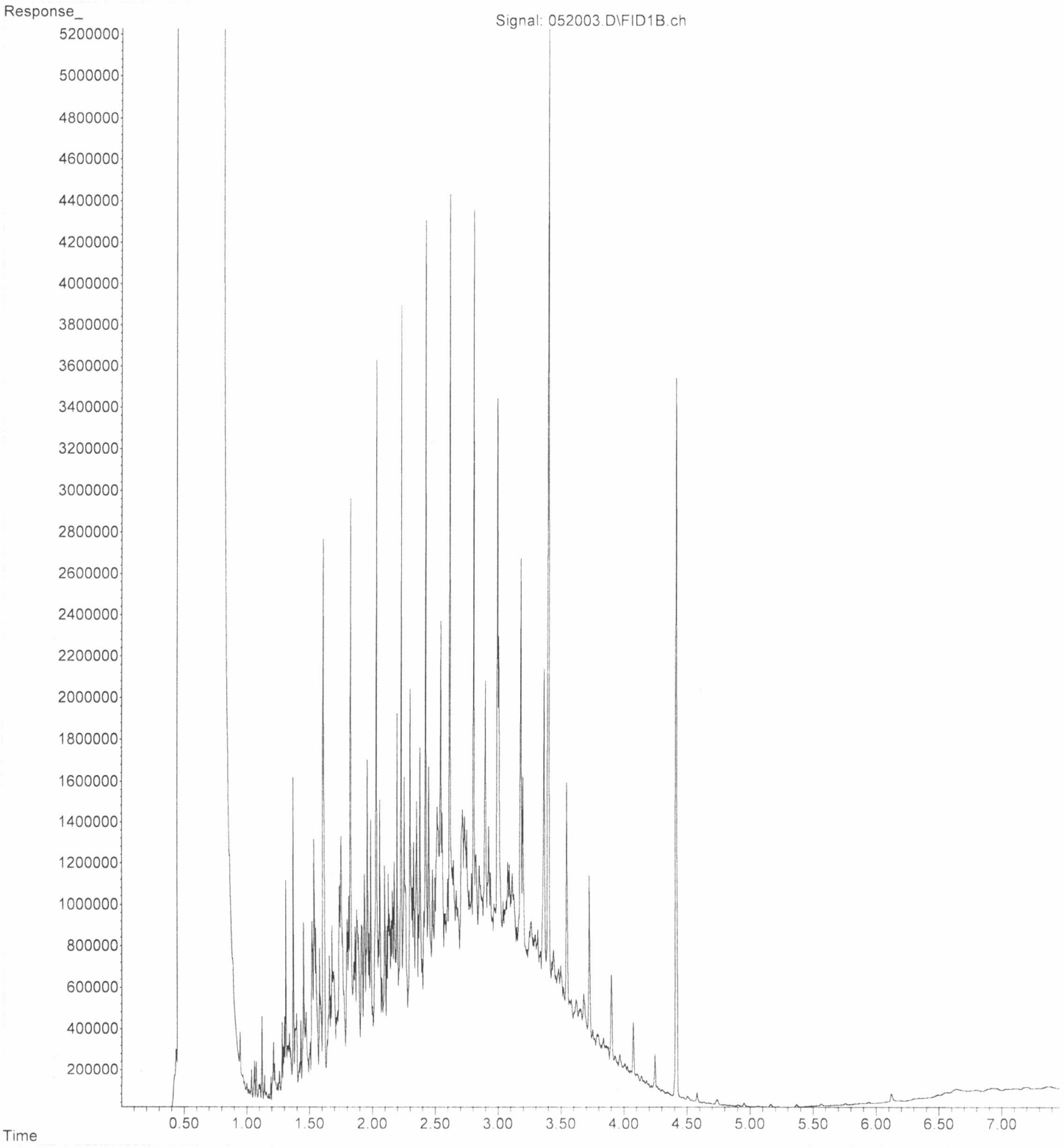
File :P:\Proc_GC14\05-20-24\052025.D
Operator : TL
Acquired : 20 May 2024 06:58 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 405273-11
Misc Info : ERR
Vial Number: 19



File :P:\Proc_GC14\05-20-24\052009.D
Operator : TL
Acquired : 20 May 2024 03:48 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 04-1181 mb
Misc Info : ERR
Vial Number: 7



File :P:\Proc_GC14\05-20-24\052003.D
Operator : TL
Acquired : 20 May 2024 08:37 am using AcqMethod DX.M
Instrument : GC14
Sample Name: 500 Dx 71-40G
Misc Info : ERR
Vial Number: 3



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
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August 20, 2024

Kristin Anderson, Project Manager
Floyd-Snider
Two Union Square
601 Union St, Suite 600
Seattle, WA 98101

Dear Ms Anderson:

Included are the results from the testing of material submitted on August 8, 2024 from the Cantera/Time Oil, F&BI 408160 project. There are 36 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Floyd Snider Lab Data, Pamela Osterhout
FDS0820R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on August 8, 2024 by Friedman & Bruya, Inc. from the Floyd-Snider Cantera/Time Oil, F&BI 408160 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Floyd-Snider
408160 -01	01MW12-080724
408160 -02	01MW19R-080724
408160 -03	01MW40-080724
408160 -04	01MW49R-080724
408160 -05	01MW84-080724
408160 -06	01MW46-080724
408160 -07	01MW58R-080724
408160 -08	01MW108-080724
408160 -09	01MW56-080724
408160 -10	02MW04R-080724
408160 -11	01MW15-080724
408160 -12	01MW80-080824
408160 -13	01MW85-080824
408160 -14	01MW53R-080824
408160 -15	01MW107-080824
408160 -16	MW05-080824
408160 -17	MW06-080824
408160 -18	MW06-080824-D

Samples 01MW85-080824, MW05-080824, and MW06-080824 were sent to Alliance Technical Group for total organic carbon and to Onsite Environmental for dissolved gases testing. The reports are enclosed.

All quality control requirements were acceptable.

Date of Report: 08/20/24
Date Received: 08/08/24
Project: Cantera/Time Oil, F&BI 408160
Date Extracted: 08/15/24
Date Analyzed: 08/15/24

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
01MW12-080724 408160-01	<100	103
01MW19R-080724 408160-02	500	104
01MW40-080724 408160-03	<100	100
01MW49R-080724 408160-04	<100	102
01MW84-080724 408160-05 1/10	2,500	103
02MW04R-080724 408160-10	<100	94
Method Blank 04-1757 MB	<100	93

Date of Report: 08/20/24
Date Received: 08/08/24
Project: Cantera/Time Oil, F&BI 408160
Date Extracted: 08/13/24
Date Analyzed: 08/13/24

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 50-150)
01MW12-080724 408160-01	940 x	310 x	90
01MW19R-080724 408160-02	580 x	<250	102
01MW40-080724 408160-03	980 x	<250	98
01MW49R-080724 408160-04	240 x	<250	105
01MW84-080724 408160-05	970 x	<250	99
01MW58R-080724 408160-07	880 x	370 x	148
02MW04R-080724 408160-10	96 x	<250	96
Method Blank 04-1910 MB	<50	<250	85

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW12-080724	Client:	Floyd-Snider
Date Received:	08/08/24	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/12/24	Lab ID:	408160-01
Date Analyzed:	08/12/24	Data File:	081237.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	78	126
Toluene-d8	97	84	115
4-Bromofluorobenzene	101	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW19R-080724	Client:	Floyd-Snider
Date Received:	08/08/24	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/12/24	Lab ID:	408160-02
Date Analyzed:	08/12/24	Data File:	081238.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	78	126
Toluene-d8	102	84	115
4-Bromofluorobenzene	104	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	0.98

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW40-080724	Client:	Floyd-Snider
Date Received:	08/08/24	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/12/24	Lab ID:	408160-03
Date Analyzed:	08/12/24	Data File:	081239.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	78	126
Toluene-d8	97	84	115
4-Bromofluorobenzene	103	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW49R-080724	Client:	Floyd-Snider
Date Received:	08/08/24	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/12/24	Lab ID:	408160-04
Date Analyzed:	08/12/24	Data File:	081240.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	78	126
Toluene-d8	95	84	115
4-Bromofluorobenzene	102	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW84-080724	Client:	Floyd-Snider
Date Received:	08/08/24	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/12/24	Lab ID:	408160-05
Date Analyzed:	08/12/24	Data File:	081241.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	78	126
Toluene-d8	96	84	115
4-Bromofluorobenzene	99	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW46-080724	Client:	Floyd-Snider
Date Received:	08/08/24	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/12/24	Lab ID:	408160-06 1/10
Date Analyzed:	08/13/24	Data File:	081252.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	106	78	126
Toluene-d8	97	84	115
4-Bromofluorobenzene	103	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	96
cis-1,2-Dichloroethene	610
Benzene	3.1 j
Trichloroethene	160

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW58R-080724	Client:	Floyd-Snider
Date Received:	08/08/24	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/12/24	Lab ID:	408160-07 1/10
Date Analyzed:	08/13/24	Data File:	081251.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	106	78	126
Toluene-d8	100	84	115
4-Bromofluorobenzene	105	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	13
cis-1,2-Dichloroethene	270
Trichloroethene	23

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW108-080724	Client:	Floyd-Snider
Date Received:	08/08/24	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/12/24	Lab ID:	408160-08
Date Analyzed:	08/12/24	Data File:	081242.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	97	78	126
Toluene-d8	98	84	115
4-Bromofluorobenzene	98	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	0.081
cis-1,2-Dichloroethene	<1
Trichloroethene	<0.5

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW56-080724	Client:	Floyd-Snider
Date Received:	08/08/24	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/12/24	Lab ID:	408160-09
Date Analyzed:	08/12/24	Data File:	081245.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	78	126
Toluene-d8	97	84	115
4-Bromofluorobenzene	101	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	1.2
cis-1,2-Dichloroethene	<1
Trichloroethene	0.97

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	02MW04R-080724	Client:	Floyd-Snider
Date Received:	08/08/24	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/12/24	Lab ID:	408160-10
Date Analyzed:	08/12/24	Data File:	081243.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	78	126
Toluene-d8	97	84	115
4-Bromofluorobenzene	101	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW15-080724	Client:	Floyd-Snider
Date Received:	08/08/24	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/12/24	Lab ID:	408160-11
Date Analyzed:	08/13/24	Data File:	081254.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	78	126
Toluene-d8	98	84	115
4-Bromofluorobenzene	99	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	36
cis-1,2-Dichloroethene	8.9
Trichloroethene	0.59

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW80-080824	Client:	Floyd-Snider
Date Received:	08/08/24	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/12/24	Lab ID:	408160-12 1/10
Date Analyzed:	08/13/24	Data File:	081253.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	78	126
Toluene-d8	99	84	115
4-Bromofluorobenzene	98	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	65
cis-1,2-Dichloroethene	350
Benzene	2.4 j
Trichloroethene	180

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW85-080824	Client:	Floyd-Snider
Date Received:	08/08/24	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/12/24	Lab ID:	408160-13 1/10
Date Analyzed:	08/13/24	Data File:	081250.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	78	126
Toluene-d8	95	84	115
4-Bromofluorobenzene	98	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	33
cis-1,2-Dichloroethene	1,100
Trichloroethene	6.5

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW53R-080824	Client:	Floyd-Snider
Date Received:	08/08/24	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/12/24	Lab ID:	408160-14
Date Analyzed:	08/12/24	Data File:	081246.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	78	126
Toluene-d8	95	84	115
4-Bromofluorobenzene	98	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	0.76
cis-1,2-Dichloroethene	2.0
Trichloroethene	13

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW107-080824	Client:	Floyd-Snider
Date Received:	08/08/24	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/12/24	Lab ID:	408160-15
Date Analyzed:	08/12/24	Data File:	081244.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	78	126
Toluene-d8	98	84	115
4-Bromofluorobenzene	100	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.02
cis-1,2-Dichloroethene	<1
Trichloroethene	<0.5

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	MW05-080824	Client:	Floyd-Snider
Date Received:	08/08/24	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/12/24	Lab ID:	408160-16 1/10
Date Analyzed:	08/13/24	Data File:	081249.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	78	126
Toluene-d8	98	84	115
4-Bromofluorobenzene	101	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	81
cis-1,2-Dichloroethene	840
Benzene	0.83 j
Trichloroethene	51

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	MW06-080824	Client:	Floyd-Snider
Date Received:	08/08/24	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/12/24	Lab ID:	408160-17
Date Analyzed:	08/12/24	Data File:	081247.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	78	126
Toluene-d8	98	84	115
4-Bromofluorobenzene	102	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	2.0
cis-1,2-Dichloroethene	49
Benzene	<0.35
Trichloroethene	46

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	MW06-080824-D	Client:	Floyd-Snider
Date Received:	08/08/24	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/12/24	Lab ID:	408160-18
Date Analyzed:	08/13/24	Data File:	081248.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	78	126
Toluene-d8	97	84	115
4-Bromofluorobenzene	103	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	2.1
cis-1,2-Dichloroethene	50
Benzene	<0.35
Trichloroethene	48

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/12/24	Lab ID:	04-1833 mb
Date Analyzed:	08/12/24	Data File:	081235.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	78	126
Toluene-d8	93	84	115
4-Bromofluorobenzene	101	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.02
cis-1,2-Dichloroethene	<1
Benzene	<0.035 j
Trichloroethene	<0.5

Analysis For Total Metals By EPA Method 6020B

Client ID:	01MW85-080824	Client:	Floyd-Snider
Date Received:	08/08/24	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/09/24	Lab ID:	408160-13 x40
Date Analyzed:	08/12/24	Data File:	408160-13 x40.148
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	4,300

Analysis For Total Metals By EPA Method 6020B

Client ID:	MW05-080824	Client:	Floyd-Snider
Date Received:	08/08/24	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/09/24	Lab ID:	408160-16 x40
Date Analyzed:	08/12/24	Data File:	408160-16 x40.149
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	2,200

Analysis For Total Metals By EPA Method 6020B

Client ID:	MW06-080824	Client:	Floyd-Snider
Date Received:	08/08/24	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/09/24	Lab ID:	408160-17 x40
Date Analyzed:	08/12/24	Data File:	408160-17 x40.150
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	2,900

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Floyd-Snider
Date Received:	NA	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/09/24	Lab ID:	I4-660 mb
Date Analyzed:	08/09/24	Data File:	I4-660 mb.171
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	01MW85-080824	Client:	Floyd-Snider
Date Received:	08/08/24	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/13/24	Lab ID:	408160-13 x20
Date Analyzed:	08/14/24	Data File:	408160-13 x20.042
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	4,000

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW05-080824	Client:	Floyd-Snider
Date Received:	08/08/24	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/13/24	Lab ID:	408160-16 x20
Date Analyzed:	08/14/24	Data File:	408160-16 x20.043
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	2,100

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	MW06-080824	Client:	Floyd-Snider
Date Received:	08/08/24	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/13/24	Lab ID:	408160-17 x20
Date Analyzed:	08/14/24	Data File:	408160-17 x20.044
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	2,500

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Floyd-Snider
Date Received:	NA	Project:	Cantera/Time Oil, F&BI 408160
Date Extracted:	08/13/24	Lab ID:	I4-672 mb
Date Analyzed:	08/13/24	Data File:	I4-672 mb.149
Matrix:	Water	Instrument:	ICPMS3
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	<50 k

Date of Report: 08/20/24
Date Received: 08/08/24
Project: Cantera/Time Oil, F&BI 408160

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 408160-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	96	70-130

Date of Report: 08/20/24
Date Received: 08/08/24
Project: Cantera/Time Oil, F&BI 408160

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	76	92	65-151	19

Date of Report: 08/20/24
Date Received: 08/08/24
Project: Cantera/Time Oil, F&BI 408160

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: 408160-05 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Vinyl chloride	ug/L (ppb)	10	<0.02	117	50-150
cis-1,2-Dichloroethene	ug/L (ppb)	10	<1	106	10-211
Benzene	ug/L (ppb)	10	<0.35	105	50-150
Trichloroethene	ug/L (ppb)	10	<0.5	97	35-149

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Vinyl chloride	ug/L (ppb)	10	107	107	64-142	0
cis-1,2-Dichloroethene	ug/L (ppb)	10	98	99	70-130	1
Benzene	ug/L (ppb)	10	95	103	70-130	8
Trichloroethene	ug/L (ppb)	10	89	97	70-130	9

Date of Report: 08/20/24
Date Received: 08/08/24
Project: Cantera/Time Oil, F&BI 408160

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: 408161-44 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	209	82 b	89 b	75-125	8 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	80	80-120

Date of Report: 08/20/24
Date Received: 08/08/24
Project: Cantera/Time Oil, F&BI 408160

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: 408153-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Iron	ug/L (ppb)	100	87.5	104 b	81 b	75-125	25 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Iron	ug/L (ppb)	100	120	80-120

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the standard reporting limit. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

408160

SAMPLE CHAIN OF CUSTODY

08/08/24 VW4/F3/K2

Page # 1 of 2

Report To Kristin Anderson + Pamela Osterhout
Company 1001 Union St, Suite 600
Address Seattle, WA 98101
City, State, ZIP Floyd Snider
Phone 206 292-7078 Email Lab Data@FloydSnider.com

SAMPLERS (*signature*)

PROJECT NAME: Cantera/Time Oil

PO #

REMARKS
* cVOCs include TCE, cis-1,2-DCE + vinyl chloride
Project specific RLs? - Yes / No

INVOICE TO: Pioneer

TURNAROUND TIME
☒ Standard turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	cVOCs* EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Benzene 8260				Notes
						ANALYSES REQUESTED											* sub diss. gases + onsite for lower RLs (methane, ethene and ethane)
01MW12-080724	01 A-C	8/7/24	13:40	GW	7	✓	✓						✓				
01MW19R-080724	02		11:45		7	✓	✓						✓				
01MW40-080724	03		14:30		7	✓	✓						✓				
01MW49R-080724	04		10:45		7	✓	✓						✓				
01MW84-080724	05		12:45		7	✓	✓						✓				
01MW46-080724	06A-F		10:25		6					✓			✓				
01MW58R-080724	07A-D		11:12		4	✓				✓							
01MW108-080724	08A-C		13:40		3					✓							
01MW56-080724	09		15:40		3					✓							
02MW04R-080724	10A-G		15:30		7	✓	✓						✓				

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Pamela Osterhout	Floyd Snider	8/8/24	12:28
Received by:		Nhan Phan	FEBI	8/8/24	1228
Relinquished by:			Samples received at 3 °C		
Received by:					

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

408160

SAMPLE CHAIN OF CUSTODY

08/08/24 VW4/F3/K2

Page 2 of 2

Report To Kristin Anderson + Pamela Osterhout
Company Floyd Snider
Address 601 Union St, Suite 600
City, State, ZIP Seattle, WA
Phone 206 292-2078 Email LabData@FloydSnider.com

SAMPLERS (*signature*)

PROJECT NAME: Cantera/Time Oil

PO #

REMARKS: * cVOCs include TCE, cis-1,2-DCE, + VC.
Project specific RLs? - Yes / No

INVOICE TO

TURNAROUND TIME
☒ Standard turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260 *	PAHs EPA 8270	PCBs EPA 8082	TOC	8260 Benzene	Total + Diss Iron	Dissolved gases RSK	Notes
						ANALYSES REQUESTED											Diss. iron Field Filtered
01MW15-080724	11 A-D	8/7/24	14:30	GW	4					✓							Hold TOC
01MW80-080824	12 A-F	8/8/24	08:45		6					✓				✓			
01MW85-080824	13 A-M		09:40		13					✓			✓		✓	✓	HOLD Dx
01MW55R-080824	14 A-C		11:00		3					✓							
01MW107-080824	15 ↓		08:45		3					✓							
MW05-080824	16 A-M		09:31		13					✓			✓	✓	✓	✓	HOLD Dx
MW06-080824	17 ↓		11:00		13					✓			✓	✓	✓	✓	HOLD Dx
MW06-080824-D	18 A-F		11:11		6					✓				✓			
					AP 08/08												

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Pamela Osterhout	F/S	8/8/24	1228
Received by:		Nhan Phan	FEBT	8/8/24	1228
Relinquished by:			Samples received at 3 °C		
Received by:					

Friedman & Bruya, Inc.
5500 4th Ave S.
Seattle WA 98108
(206) 285-8282
office@friedmanandbruya.com

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 408160 CLIENT Floyd Snider INITIALS/ DATE: WP 08/08/24

If custody seals are present on cooler, are they intact? ☑ NA ☐ YES ☐ NO

Cooler/Sample temperature 3 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☑ YES ☐ NO

How did samples arrive?
☑ Over the Counter ☐ Picked up by F&BI ☐ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☑ YES ☐ NO Initials/ Date: AP 08/08/24
*or other representative documents, letters, and/or shipping memos

Number of days samples have been sitting prior to receipt at laboratory 0-1 days

Are the samples clearly identified? (explain "no" answer below) ☑ YES ☐ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☑ YES ☐ NO

Were appropriate sample containers used? ☑ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☑ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☐ NA ☑ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

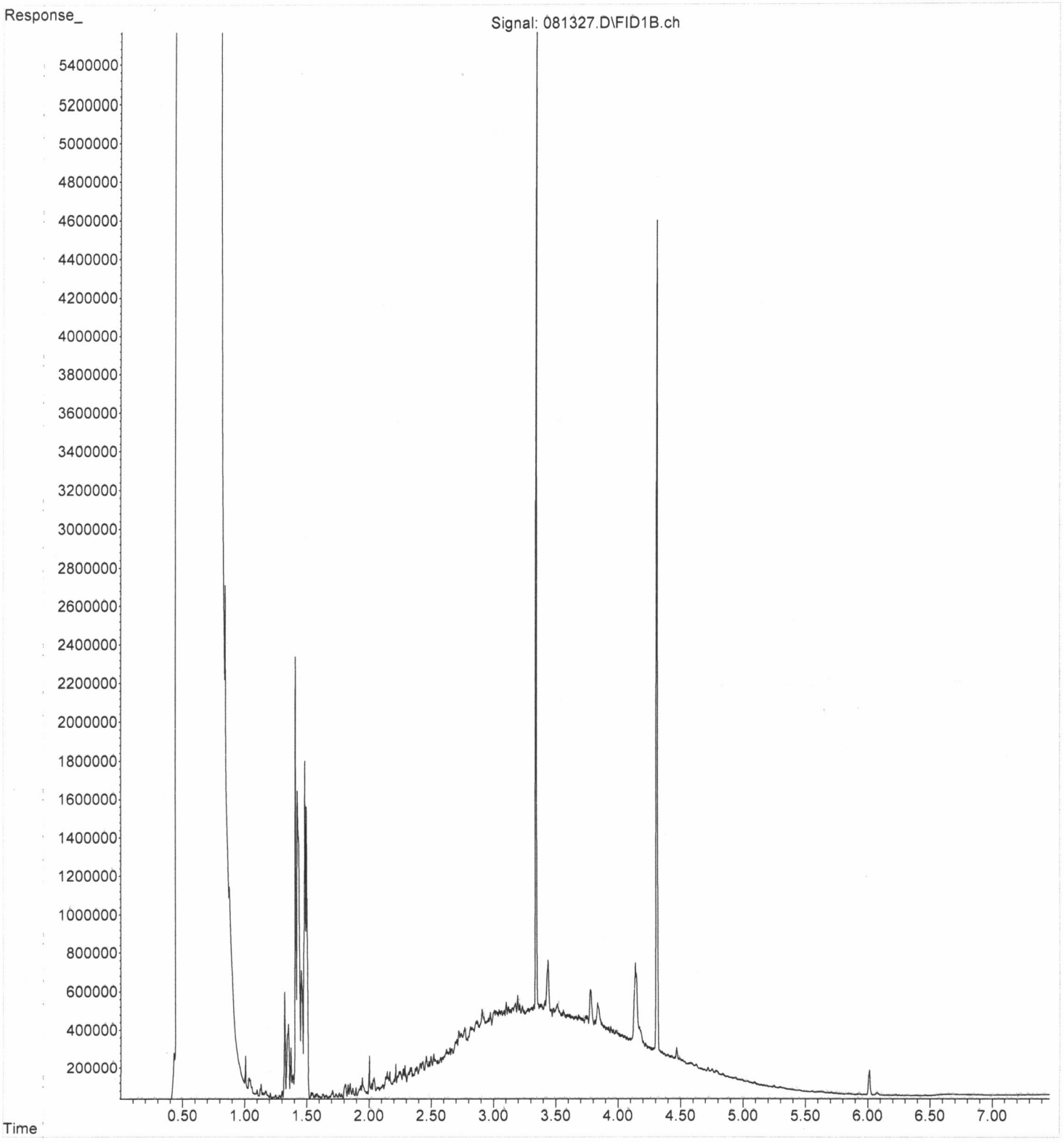
Sample ID's	☑ Yes ☐ No	☐ Not on COC/label
Date Sampled	☑ Yes ☐ No	☐ Not on COC/label
Time Sampled	☑ Yes ☐ No	☐ Not on COC/label
# of Containers	☐ Yes ☑ No	Not on COC. Added at lab for MW06-080824-D (18)
Relinquished	☑ Yes ☐ No	
Requested analysis	☑ Yes ☐ On Hold	

Other comments (use a separate page if needed)

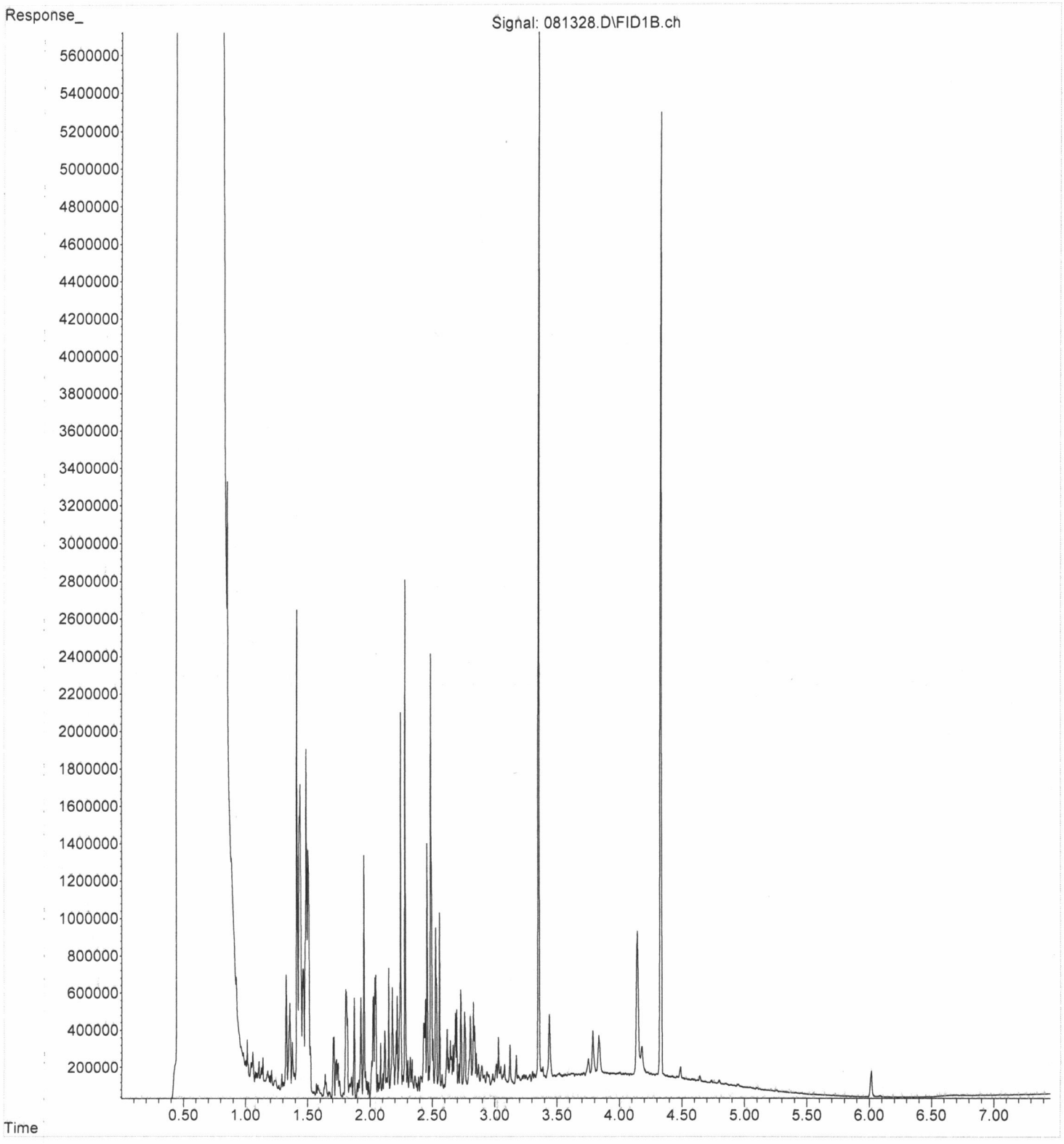
Air Samples: Were any additional canisters/tubes received? ☑ NA ☐ YES ☐ NO

Number of unused TO15 canisters _____ **Number of unused TO17 tubes** _____

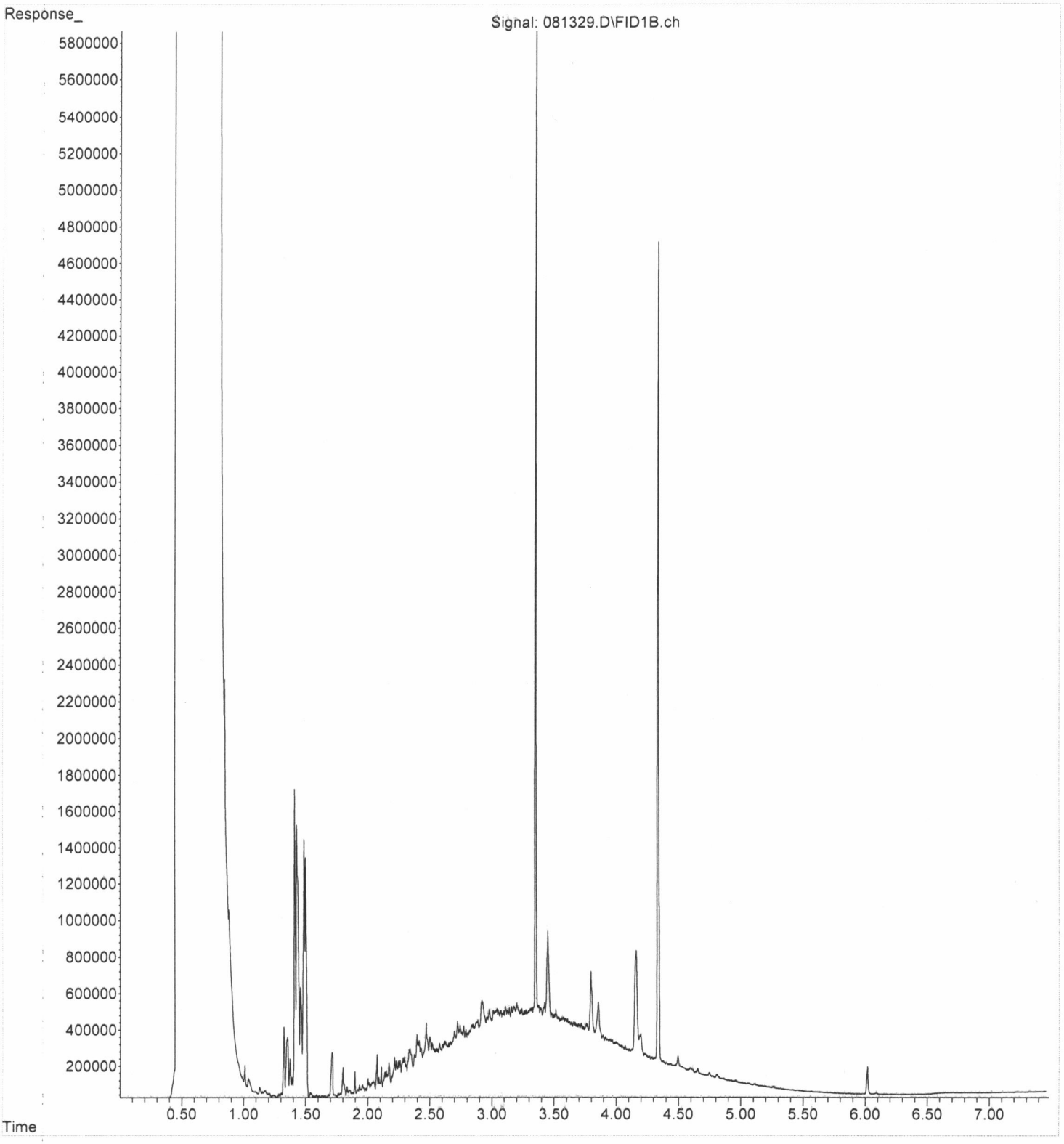
File :P:\Proc_GC14\08-13-24\081327.D
Operator : TL
Acquired : 13 Aug 2024 05:43 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 408160-01
Misc Info : ERR
Vial Number: 105



File :P:\Proc_GC14\08-13-24\081328.D
Operator : TL
Acquired : 13 Aug 2024 05:55 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 408160-02
Misc Info : ERR
Vial Number: 106

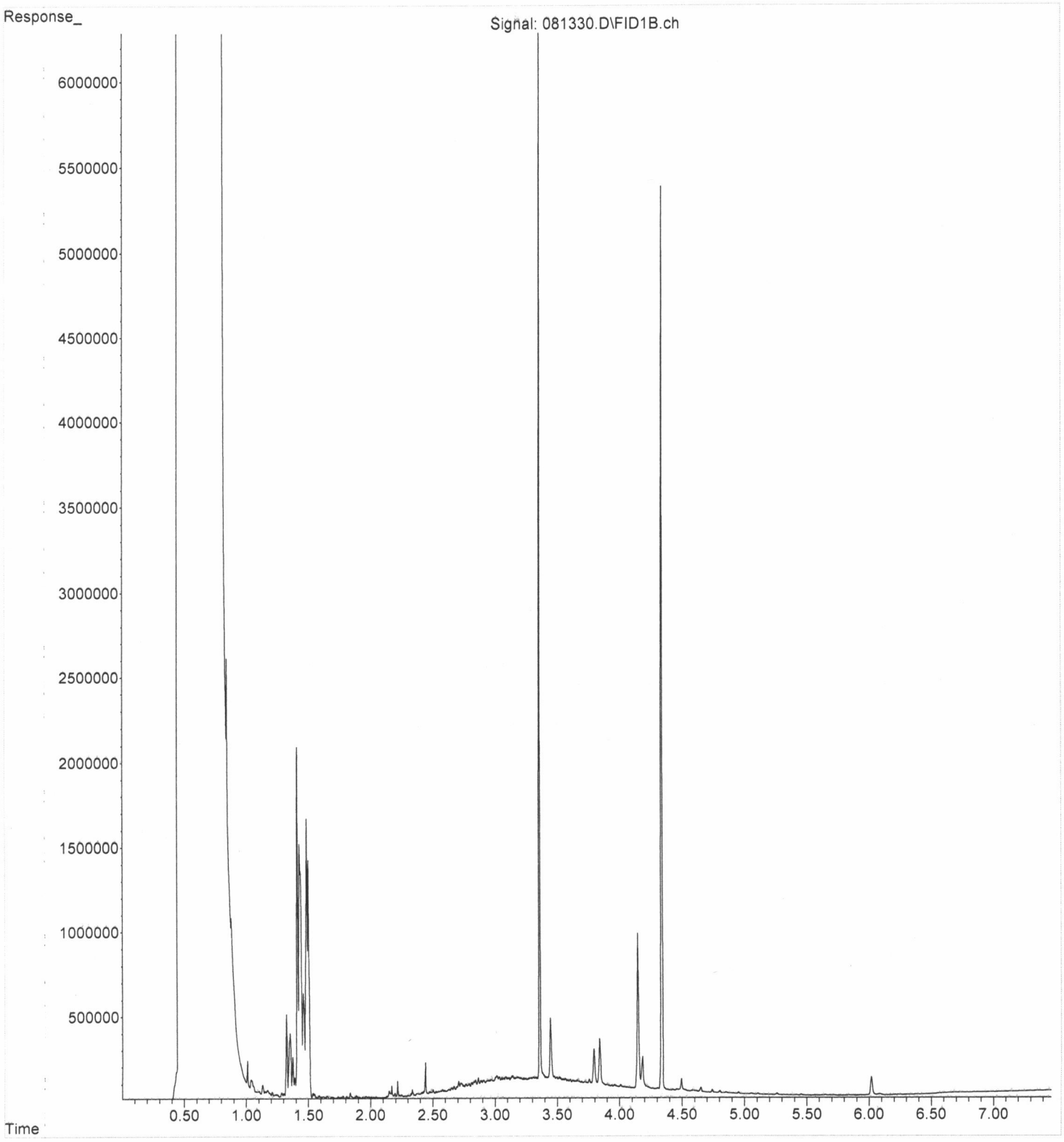


File :P:\Proc_GC14\08-13-24\081329.D
Operator : TL
Acquired : 13 Aug 2024 06:07 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 408160-03
Misc Info : ERR
Vial Number: 107

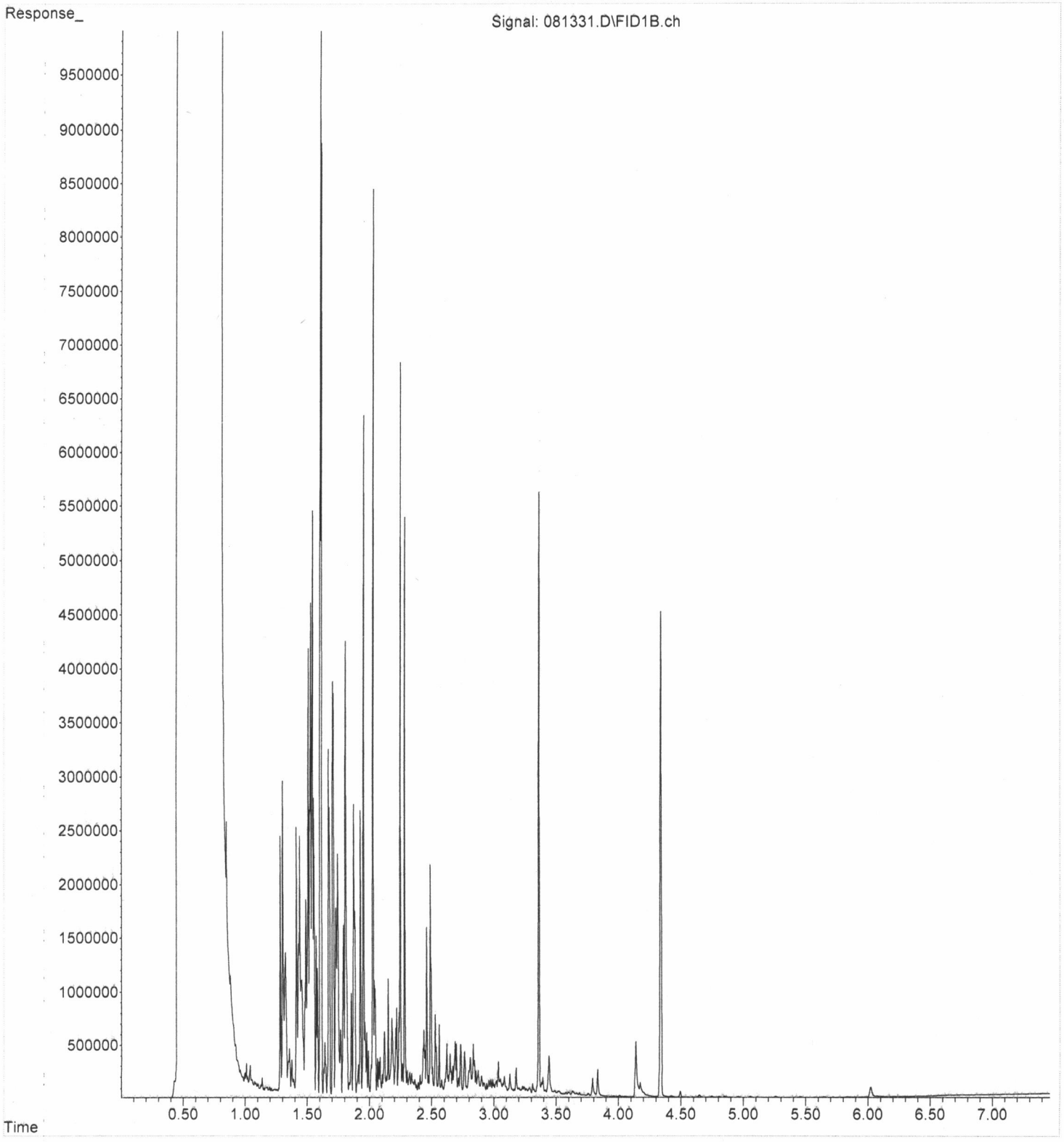


File :P:\Proc_GC14\08-13-24\081330.D
Operator : TL
Acquired : 13 Aug 2024 06:19 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 408160-04
Misc Info :
Vial Number: 108

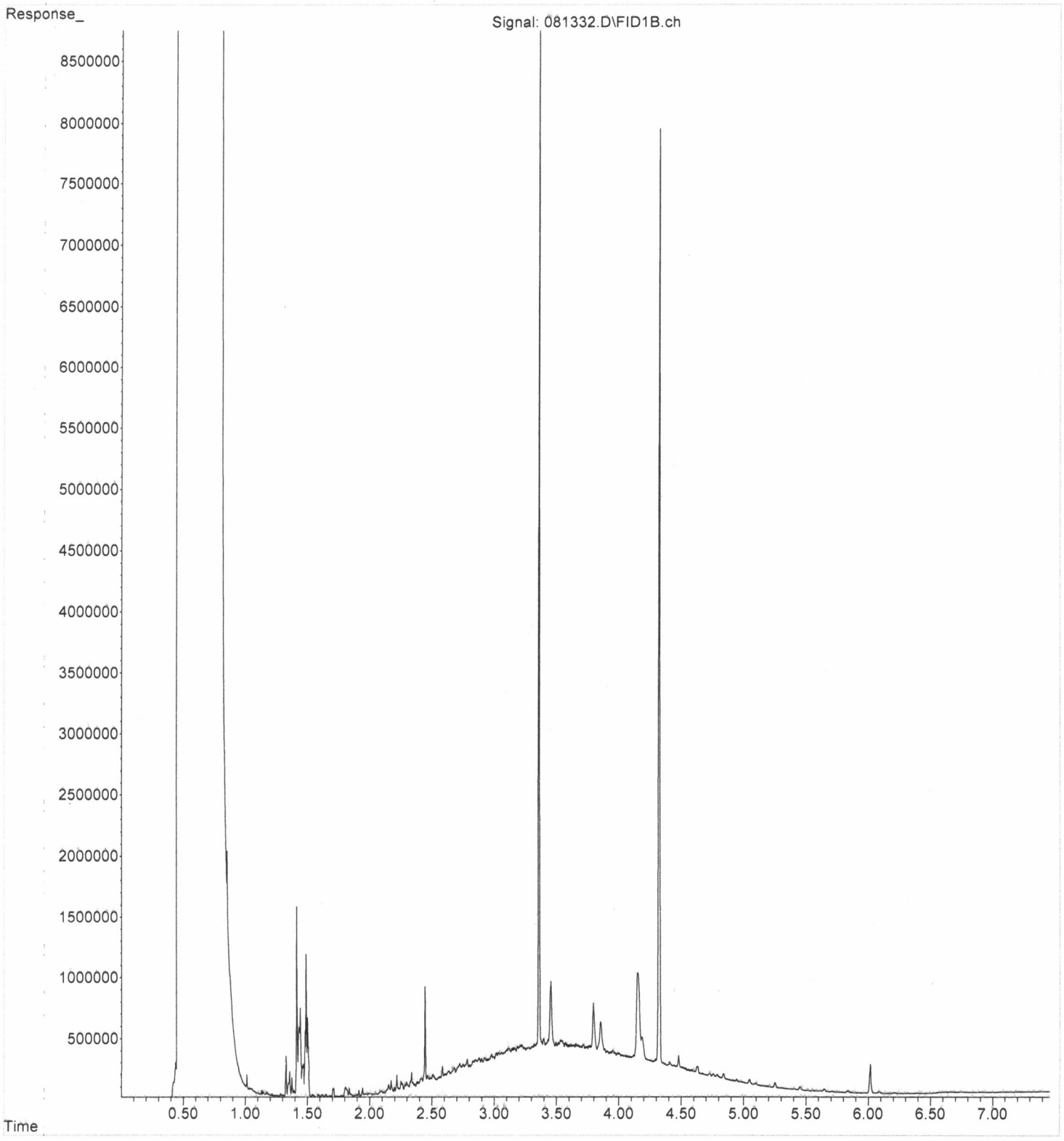
ERR



File : P:\Proc_GC14\08-13-24\081331.D
Operator : TL
Acquired : 13 Aug 2024 06:31 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 408160-05
Misc Info : ERR
Vial Number: 109

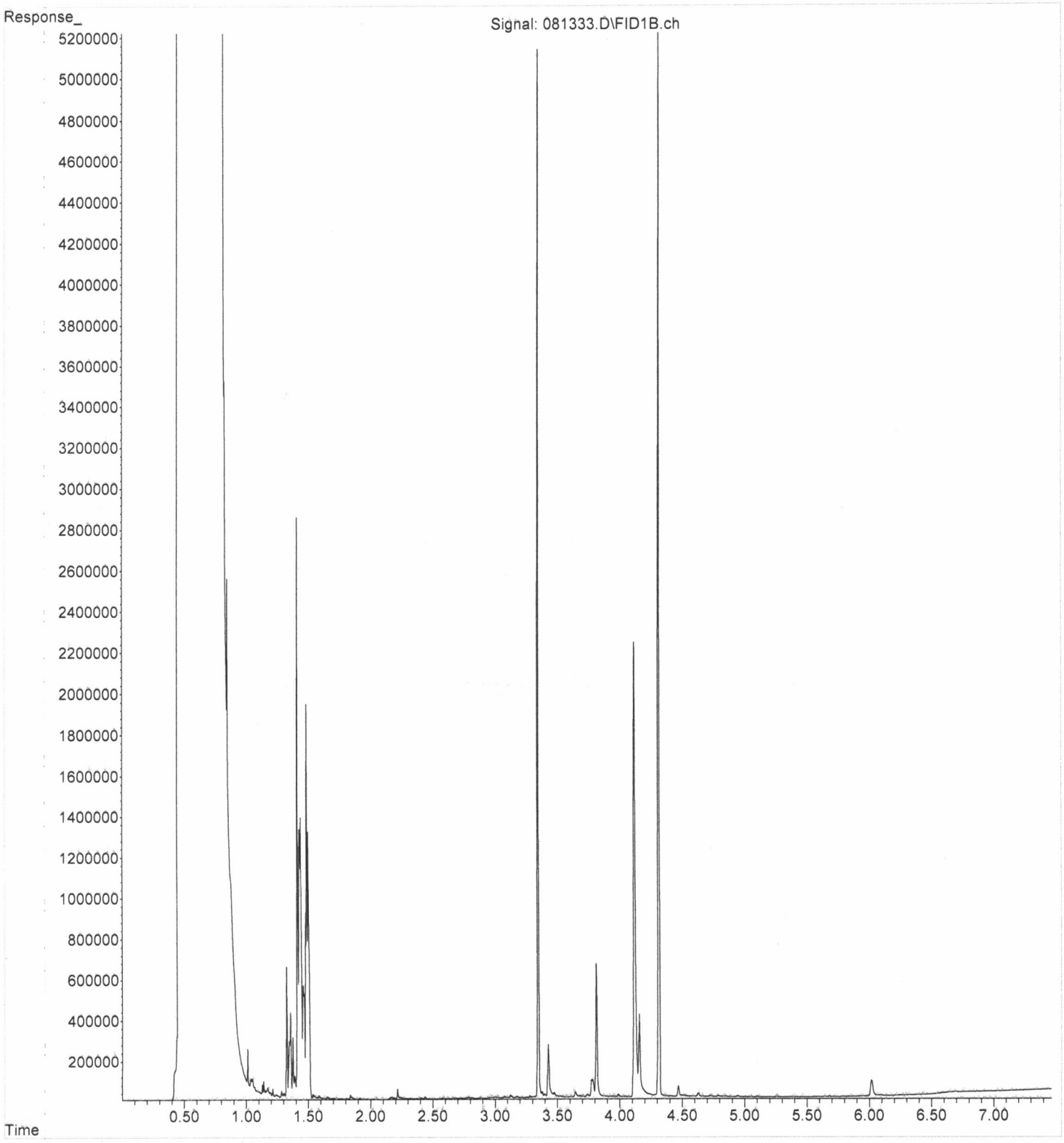


File :P:\Proc_GC14\08-13-24\081332.D
Operator : TL
Acquired : 13 Aug 2024 06:43 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 408160-07
Misc Info : ERR
Vial Number: 110

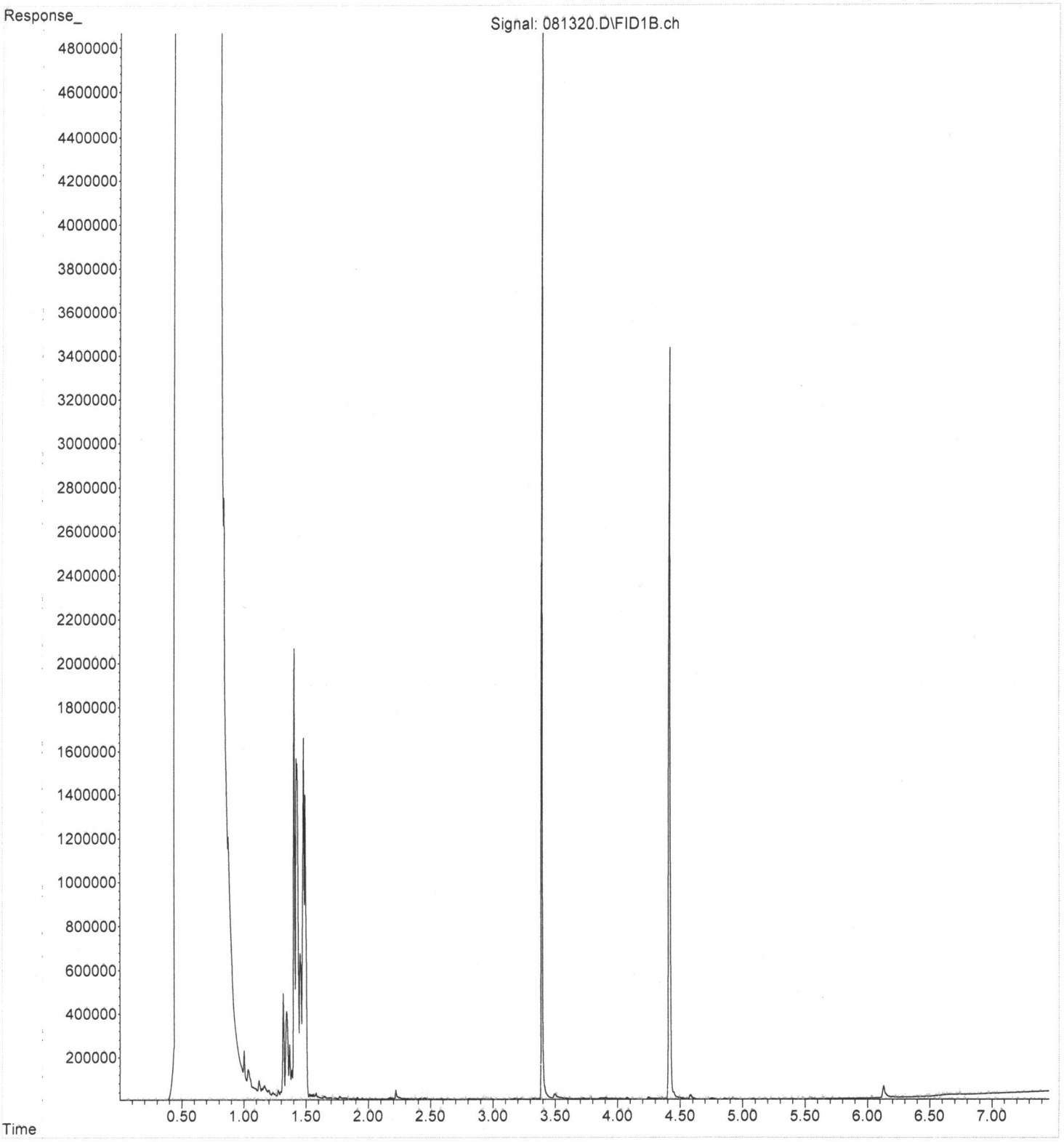


File :P:\Proc_GC14\08-13-24\081333.D
Operator : TL
Acquired : 13 Aug 2024 06:55 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 408160-10
Misc Info :
Vial Number: 111

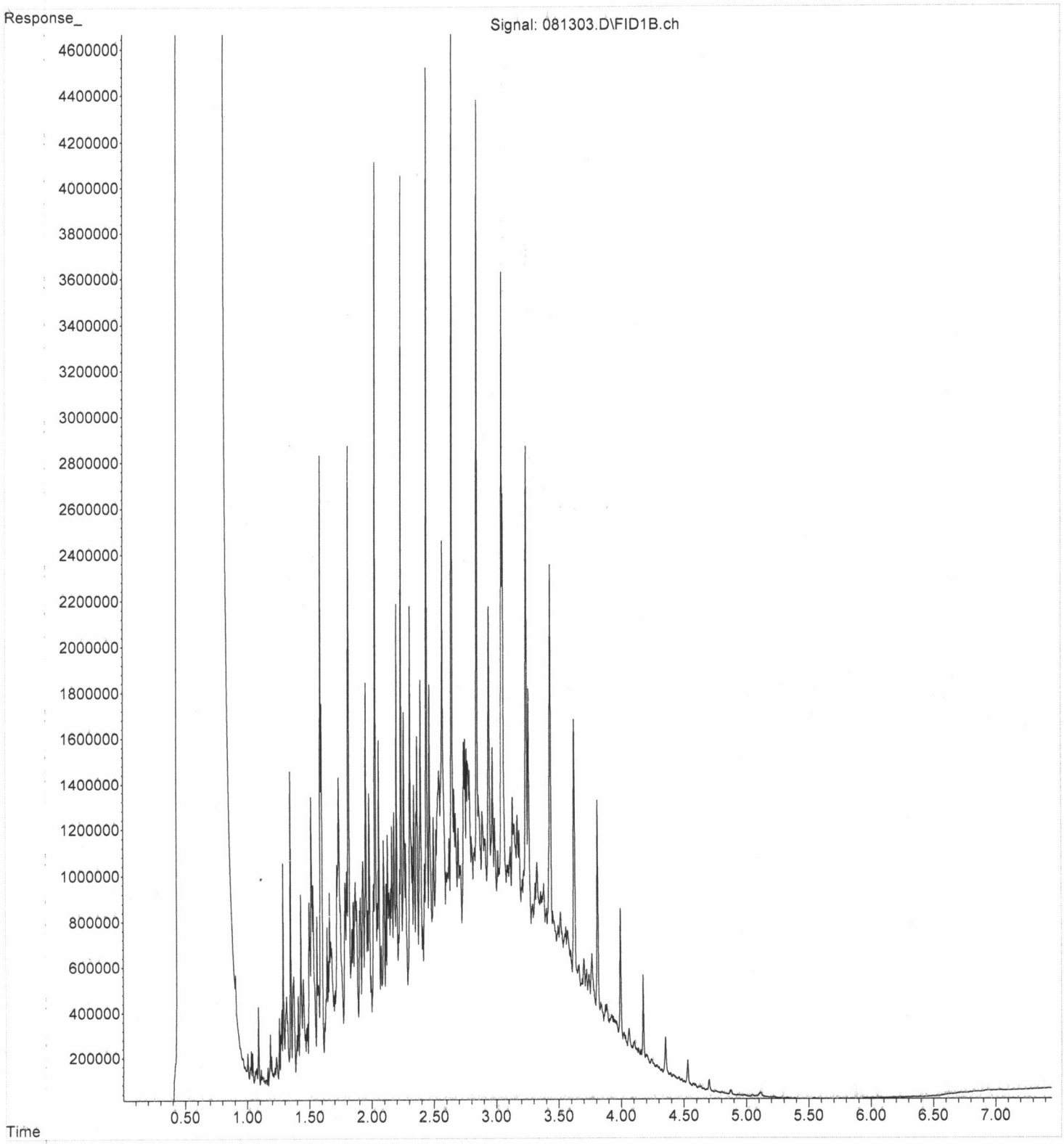
ERR



File :P:\Proc_GC14\08-13-24\081320.D
Operator : TL
Acquired : 13 Aug 2024 01:51 pm using AcqMethod DX.M
Instrument : GC14
Sample Name: 04-1910 mb
Misc Info : ERR
Vial Number: 102



File :P:\Proc_GC14\08-13-24\081303.D
Operator : TL
Acquired : 13 Aug 2024 09:41 am using AcqMethod DX.M
Instrument : GC14
Sample Name: 500 Dx 71-152C
Misc Info : ERR
Vial Number: 3



OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

August 15, 2024

Michael Erdahl
Friedman & Bruya, Inc.
5500 4th Avenue South
Seattle, WA 98108

Re: Analytical Data for Project 408160
Laboratory Reference No. 2408-110

Dear Michael:

Enclosed are the analytical results and associated quality control data for samples submitted on August 9, 2024.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: August 15, 2024
Samples Submitted: August 9, 2024
Laboratory Reference: 2408-110
Project: 408160

Case Narrative

Samples were collected on August 8, 2024 and received by the laboratory on August 9, 2024. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below. However the soil results for the QA/QC samples are reported on a wet-weight basis.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: August 15, 2024
Samples Submitted: August 9, 2024
Laboratory Reference: 2408-110
Project: 408160

DISSOLVED GASES
RSK 175

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags	MDL
Client ID:	**01MW85-080824**						
Laboratory ID:	08-110-01						
Methane	**1000**	5.5	RSK 175	8-13-24	8-13-24		5.2
Ethane	**ND**	0.56	RSK 175	8-13-24	8-13-24		0.33
Ethene	**11**	0.58	RSK 175	8-13-24	8-13-24		0.33
Surrogate:	*Percent Recovery*	*Control Limits*					
1-Butene	*100*	*50-150*					
Client ID:	**MW05-080824**						
Laboratory ID:	08-110-02						
Methane	**31**	0.55	RSK 175	8-13-24	8-13-24		0.52
Ethane	**ND**	0.56	RSK 175	8-13-24	8-13-24		0.33
Ethene	**24**	0.58	RSK 175	8-13-24	8-13-24		0.33
Surrogate:	*Percent Recovery*	*Control Limits*					
1-Butene	*112*	*50-150*					
Client ID:	**MW06-080824**						
Laboratory ID:	08-110-03						
Methane	**29**	0.55	RSK 175	8-13-24	8-13-24		0.52
Ethane	**ND**	0.56	RSK 175	8-13-24	8-13-24		0.33
Ethene	**0.76**	0.58	RSK 175	8-13-24	8-13-24		0.33
Surrogate:	*Percent Recovery*	*Control Limits*					
1-Butene	*108*	*50-150*					

Date of Report: August 15, 2024
Samples Submitted: August 9, 2024
Laboratory Reference: 2408-110
Project: 408160

DISSOLVED GASES
RSK 175
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags	MDL
METHOD BLANK							
Laboratory ID:	MB0813W1						
Methane	**ND**	0.55	RSK 175	8-13-24	8-13-24		0.52
Ethane	**ND**	0.56	RSK 175	8-13-24	8-13-24		0.33
Ethene	**ND**	0.58	RSK 175	8-13-24	8-13-24		0.33
Surrogate:	*Percent Recovery*	*Control Limits*					
1-Butene	*98*	*50-150*					

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANK										
Laboratory ID:	SB0813W1									
	SB	SBD	SB	SBD	SB	SBD				
Methane	**45.3**	**43.3**	44.2	44.2	102	98	75-125	5	25	
Ethane	**84.8**	**81.6**	83.2	83.2	102	98	75-125	4	25	
Ethene	**77.7**	**80.3**	77.7	77.7	100	103	75-125	3	25	
Surrogate:										
1-Butene					*104*	*107*	*50-150*			

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1 - Sample extract treated with a sulfuric acid/silica gel cleanup procedure.

X2 - Sample extract treated with a silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in methods 8260 & 8270, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Y1 - Negative effects of the matrix from this sample on the instrument caused values for this analyte in the bracketing continuing calibration verification standard (CCVs) to be outside of 20% acceptance criteria. Because of this, quantitation limits and sample concentrations should be considered estimates.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Send Report To Michael Erdahl

Company Friedman & Bruya.

Address 5500 4th Ave S

City, State, ZIP Seattle, WA 98108

Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTER
OnSite Environmental

08-110

PROJECT NAME/NO.
408160

PO #
E-339mg

REMARKS
Report to MDL | Floyd Snider
EDD

Page # 1 of 1

TURNAROUND TIME
☒ Standard
RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
Dispose after 30 days
Return samples
Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: Dissolved Gases RSk	Methane, Ethene, Ethene									Notes
01MW85-080824	1	8/8/2024	9:40	water	3	x										
MW05-080824	2	8/8/2024	9:31	water	3	x										
MW06-080824	3	8/8/2024	11:00	water	3	x										

Friedman & Bruya, Inc.
5500 4th Ave S
Seattle, WA 98115
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Mac Goldman	Friedman and Bruya	8/9/24	9/31
Received by:	MNOW	OHE	8/9/24	1500
Relinquished by:				
Received by:				

3600 Fremont Ave N
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
5500 4th Ave S
Seattle, WA 98108

RE: 408160,
Work Order Number: 2408163

August 16, 2024

Attention Michael Erdahl:

Fremont Analytical, Inc, an Alliance Technical Group company, received 3 sample(s) on 8/9/2024 for the analyses presented in the following report.

Total Organic Carbon by SM 5310C

All analyses were performed according to our accredited Quality Assurance program. Please contact the laboratory if you should have any questions about the results.

Please note, while the appearance of our logo and branding will update, our commitment to accuracy, speed, and customer service remain values celebrated and shared by Alliance Technical Group. Thank you for the opportunity to serve you.

Sincerely,

Brianna Barnes
Project Manager

DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.4 for Environmental Testing
ORELAP Certification: WA 100009 (NELAP Recognized) for Environmental Testing
Washington State Department of Ecology Accredited for Environmental Testing, Lab ID C910

Original

Date: *08/16/2024*

CLIENT: Friedman & Bruya
Project: 408160
Work Order: 2408163

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2408163-001	01MW85-080824	08/08/2024 9:40 AM	08/09/2024 4:08 PM
2408163-002	MW05-080824	08/08/2024 9:31 AM	08/09/2024 4:08 PM
2408163-003	MW06-080824	08/08/2024 11:00 AM	08/09/2024 4:08 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **2408163**
Date: **8/16/2024**

CLIENT: Friedman & Bruya
Project: 408160

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MCL - Maximum Contaminant Level
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

CLIENT: Friedman & Bruya
Project: 408160

Lab ID: 2408163-001 **Collection Date:** 8/8/2024 9:40:00 AM
Client Sample ID: **01MW85-080824** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Organic Carbon by SM 5310C				Batch ID: R93706		Analyst: SLL
Total Organic Carbon	3.20	0.700		mg/L	1	8/15/2024 8:07:00 PM

Lab ID: 2408163-002 **Collection Date:** 8/8/2024 9:31:00 AM
Client Sample ID: **MW05-080824** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Organic Carbon by SM 5310C				Batch ID: R93706		Analyst: SLL
Total Organic Carbon	4.19	0.700		mg/L	1	8/15/2024 9:34:00 PM

Lab ID: 2408163-003 **Collection Date:** 8/8/2024 11:00:00 AM
Client Sample ID: **MW06-080824** **Matrix:** Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Organic Carbon by SM 5310C				Batch ID: R93706		Analyst: SLL
Total Organic Carbon	3.26	0.700		mg/L	1	8/15/2024 9:56:00 PM

Work Order: 2408163
CLIENT: Friedman & Bruya
Project: 408160

QC SUMMARY REPORT

Total Organic Carbon by SM 5310C

Sample ID: **MB-93706**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **8/15/2024**		RunNo: **93706**		
Client ID: **MBLKW**	Batch ID: **R93706**					Analysis Date: **8/15/2024**		SeqNo: **1956956**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	ND	0.700									

Sample ID: **LCS-93706**	SampType: **LCS**			Units: **mg/L**		Prep Date: **8/15/2024**		RunNo: **93706**		
Client ID: **LCSW**	Batch ID: **R93706**					Analysis Date: **8/15/2024**		SeqNo: **1956957**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	24.6	0.700	25.00	0	98.5	87.6	109				

Sample ID: **2408163-001ADUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **8/15/2024**		RunNo: **93706**		
Client ID: **01MW85-080824**	Batch ID: **R93706**					Analysis Date: **8/15/2024**		SeqNo: **1956959**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	3.17	0.700						3.203	1.13	20	

Sample ID: **2408163-001AMS**	SampType: **MS**			Units: **mg/L**		Prep Date: **8/15/2024**		RunNo: **93706**		
Client ID: **01MW85-080824**	Batch ID: **R93706**					Analysis Date: **8/15/2024**		SeqNo: **1956960**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	26.4	0.700	25.00	3.203	92.9	76.5	111				

Sample ID: **2408163-001AMSD**	SampType: **MSD**			Units: **mg/L**		Prep Date: **8/15/2024**		RunNo: **93706**		
Client ID: **01MW85-080824**	Batch ID: **R93706**					Analysis Date: **8/15/2024**		SeqNo: **1956961**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	26.2	0.700	25.00	3.203	91.8	76.5	111	26.43	1.01	30	

Sample Log-In Check List

Client Name:	FB	Work Order Number:	2408163
Logged by:	Clare Griggs	Date Received:	8/9/2024 4:08:00 PM

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Client		

Log In

3.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Present ☑
4.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5.	Were all items received at a temperature of >2°C to 6°C *	Yes ☑	No ☐	NA ☐
6.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
7.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8.	Are samples properly preserved?	Yes ☑	No ☐	
9.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
11.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
12.	Does paperwork match bottle labels?	Yes ☑	No ☐	
13.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14.	Is it clear what analyses were requested?	Yes ☑	No ☐	
15.	Were all hold times (except field parameters, pH e.g.) able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified:		Date:	
By Whom:		Via:	☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:			
Client Instructions:			

17. Additional remarks:

Item Information

Item #	Temp °C
Sample	3.1

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Page # 1 of 1

Send Report To Michael Erdahl

Company Friedman & Bruya.

Address 5500 4th Ave S

City, State, ZIP Seattle, WA 98108

Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTER
Alliance Technical Group

PROJECT NAME/NO.	PO #
408160	E-340mg

REMARKS

Floyd Snider EDD 24081163

TURNAROUND TIME
☒ Standard
RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
Dispose after 30 days
Return samples
Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: TOC										Notes
01MW85-080824		8/8/2024	9:40	water	1	x										
MW05-080824		8/8/2024	9:31	water	1	x										
MW06-080824		8/8/2024	11:00	water	1	x										

Friedman & Bruya, Inc.
5500 4th Ave S
Seattle, WA 98115
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Mac Goldman	Friedman and Bruya	8/9/24	9:31
Received by:		Jack Hawthorne	AFG	8/9/24	1608
Relinquished by:					
Received by:					

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Vineta Mills, M.S.
Eric Young, B.S.

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
office@friedmanandbruya.com
www.friedmanandbruya.com

December 3, 2024

Pamela Osterhout, Project Manager
Floyd-Snider
Two Union Square
601 Union St, Suite 600
Seattle, WA 98101

Dear Ms Osterhout:

Included are the results from the testing of material submitted on November 20, 2024 from the Time Oil Seattle, F&BI 411323 project. There are 16 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Floyd Snider Lab Data, Kristin Anderson
FDS1203R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on November 20, 2024 by Friedman & Bruya, Inc. from the Floyd-Snider Time Oil Seattle, F&BI 411323 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Floyd-Snider
411323 -01	01MW53R-112024
411323 -02	01MW85-112024
411323 -03	01MW107-112024
411323 -04	01MW58R-112024
411323 -05	01MW84-112024
411323 -06	01MW84-D-112024
411323 -07	01MW46-112024
411323 -08	01MW19R-112024
411323 -09	Trip Blank

All quality control requirements were acceptable.

Date of Report: 12/03/24
Date Received: 11/20/24
Project: Time Oil Seattle, F&BI 411323
Date Extracted: 11/21/24
Date Analyzed: 11/25/24

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
01MW84-112024 411323-05	1,700	88
01MW84-D-112024 411323-06	1,800	101
01MW19R-112024 411323-08	490	98
Method Blank 04-2722 MB	<100	91

Date of Report: 12/03/24
Date Received: 11/20/24
Project: Time Oil Seattle, F&BI 411323
Date Extracted: 11/21/24
Date Analyzed: 11/21/24

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
01MW58R-112024 411323-04	570 x	<250	104
01MW84-112024 411323-05	1,100 x	<250	110
01MW84-D-112024 411323-06	1,200 x	<250	117
01MW19R-112024 411323-08	710 x	350 x	111
Method Blank 04-2890 MB	<50	<250	110

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW53R-112024	Client:	Floyd-Snider
Date Received:	11/20/24	Project:	Time Oil Seattle, F&BI 411323
Date Extracted:	11/27/24	Lab ID:	411323-01
Date Analyzed:	11/27/24	Data File:	112727.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	78	126
Toluene-d8	97	84	115
4-Bromofluorobenzene	98	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	0.41
cis-1,2-Dichloroethene	2.2
Trichloroethene	15

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW85-112024	Client:	Floyd-Snider
Date Received:	11/20/24	Project:	Time Oil Seattle, F&BI 411323
Date Extracted:	11/27/24	Lab ID:	411323-02 1/10
Date Analyzed:	11/27/24	Data File:	112729.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	91	78	126
Toluene-d8	95	84	115
4-Bromofluorobenzene	98	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	36
cis-1,2-Dichloroethene	990
Trichloroethene	5.0

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW107-112024	Client:	Floyd-Snider
Date Received:	11/20/24	Project:	Time Oil Seattle, F&BI 411323
Date Extracted:	11/27/24	Lab ID:	411323-03
Date Analyzed:	11/27/24	Data File:	112723.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	94	78	126
Toluene-d8	95	84	115
4-Bromofluorobenzene	95	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.02
cis-1,2-Dichloroethene	<1
Trichloroethene	<0.5

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW58R-112024	Client:	Floyd-Snider
Date Received:	11/20/24	Project:	Time Oil Seattle, F&BI 411323
Date Extracted:	11/27/24	Lab ID:	411323-04 1/10
Date Analyzed:	11/27/24	Data File:	112728.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	89	78	126
Toluene-d8	90	84	115
4-Bromofluorobenzene	103	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	24
cis-1,2-Dichloroethene	200
Trichloroethene	92

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW84-112024	Client:	Floyd-Snider
Date Received:	11/20/24	Project:	Time Oil Seattle, F&BI 411323
Date Extracted:	11/27/24	Lab ID:	411323-05
Date Analyzed:	11/27/24	Data File:	112725.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	78	126
Toluene-d8	101	84	115
4-Bromofluorobenzene	99	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW84-D-112024	Client:	Floyd-Snider
Date Received:	11/20/24	Project:	Time Oil Seattle, F&BI 411323
Date Extracted:	11/27/24	Lab ID:	411323-06
Date Analyzed:	11/27/24	Data File:	112726.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	92	78	126
Toluene-d8	102	84	115
4-Bromofluorobenzene	99	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	<0.35

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW46-112024	Client:	Floyd-Snider
Date Received:	11/20/24	Project:	Time Oil Seattle, F&BI 411323
Date Extracted:	11/27/24	Lab ID:	411323-07 1/10
Date Analyzed:	11/27/24	Data File:	112730.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	78	126
Toluene-d8	95	84	115
4-Bromofluorobenzene	101	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	160
cis-1,2-Dichloroethene	770
Trichloroethene	130
Benzene	<3.5

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	01MW19R-112024	Client:	Floyd-Snider
Date Received:	11/20/24	Project:	Time Oil Seattle, F&BI 411323
Date Extracted:	11/27/24	Lab ID:	411323-08
Date Analyzed:	11/27/24	Data File:	112724.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	87	78	126
Toluene-d8	91	84	115
4-Bromofluorobenzene	96	72	130

Compounds:	Concentration ug/L (ppb)
Benzene	1.0

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	Time Oil Seattle, F&BI 411323
Date Extracted:	11/27/24	Lab ID:	04-2867 mb
Date Analyzed:	11/27/24	Data File:	112718.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	MD

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	93	78	126
Toluene-d8	96	84	115
4-Bromofluorobenzene	94	72	130

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.02
cis-1,2-Dichloroethene	<1
Trichloroethene	<0.5
Benzene	<0.35

Date of Report: 12/03/24
Date Received: 11/20/24
Project: Time Oil Seattle, F&BI 411323

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 411293-06 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	99	70-130

Date of Report: 12/03/24
Date Received: 11/20/24
Project: Time Oil Seattle, F&BI 411323

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	92	92	72-139	0

Date of Report: 12/03/24
Date Received: 11/20/24
Project: Time Oil Seattle, F&BI 411323

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: 411322-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Vinyl chloride	ug/L (ppb)	10	<0.02	102	50-150
cis-1,2-Dichloroethene	ug/L (ppb)	10	1.4	84	10-211
Benzene	ug/L (ppb)	10	<0.35	104	50-150
Trichloroethene	ug/L (ppb)	10	11	0 b	35-149

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Vinyl chloride	ug/L (ppb)	10	108	107	64-142	1
cis-1,2-Dichloroethene	ug/L (ppb)	10	106	100	70-130	6
Benzene	ug/L (ppb)	10	106	103	70-130	3
Trichloroethene	ug/L (ppb)	10	96	94	70-130	2

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported between the method detection limit and the lowest calibration point. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

411323

SAMPLE CHAIN OF CUSTODY

11-20-24

Page # 1 of 1 F2 MW2

Report To Pamela Osterhout + Kristin Anderson
Company Floyd Snider
Address 601 Union St, Suite 600
City, State, ZIP Seattle, WA
Phone _____ Email Lab.data@floydsnider.com

SAMPLERS (*signature*)

PROJECT NAME: Time Oil Seattle

PO #

REMARKS

Project specific RLs? - Yes / No

INVOICE TO: Pioneer

TURNAROUND TIME
- [x] Standard turnaround
- [ ] RUSH
Rush charges authorized by: _____

SAMPLE DISPOSAL
- [ ] Archive samples
- [ ] Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	TCE, cis-1,2-DCE, VC by 8260D	Benzene by 8260D			Notes
01MW53R-112024	01 A-C	11/20/24	13:31	GW	3								✓				
01MW85-112024	02 A-C	"	14:15	"	3								✓				
01MW107-112024	03 A-C	"	13:50	"	3								✓				
01MW58R-112024	04 A-D	"	11:00	"	4	✓							✓				
01MW84-112024	05 A-G	"	10:40	"	7	✓	✓							✓			
01MW84-D-112024	06 A-G	"	10:50	"	7	✓	✓							✓			
01MW46-112024	07 A-C	"	10:11	"	3								✓	✓			
01MW19R-112024	08 A-G	"	09:45	"	7	✓	✓							✓			
TRIP BLANK	09 A B																HOLD
													Samples received at 3 °C				

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		P. Osterhout	FS	11/20/24	15:21
Received by:		Anh Phan	FBI	11/20/24	15:21
Relinquished by:					
Received by:					

Friedman & Bruya, Inc.
Ph. (206) 285-8282

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 41132 CLIENT Floyd Snider INITIALS/ DATE: AP 11/20/24

If custody seals are present on cooler, are they intact? ☑ NA ☐ YES ☐ NO

Cooler/Sample temperature 3 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☑ YES ☐ NO

How did samples arrive?
☑ Over the Counter ☐ Picked up by F&BI ☐ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☑ YES ☐ NO Initials/ Date: NP 11/21
*or other representative documents, letters, and/or shipping memos

Number of days samples have been sitting prior to receipt at laboratory 0 days

Are the samples clearly identified? (explain "no" answer below) ☑ YES ☐ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☑ YES ☐ NO

Were appropriate sample containers used? ☑ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☑ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☐ NA ☑ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

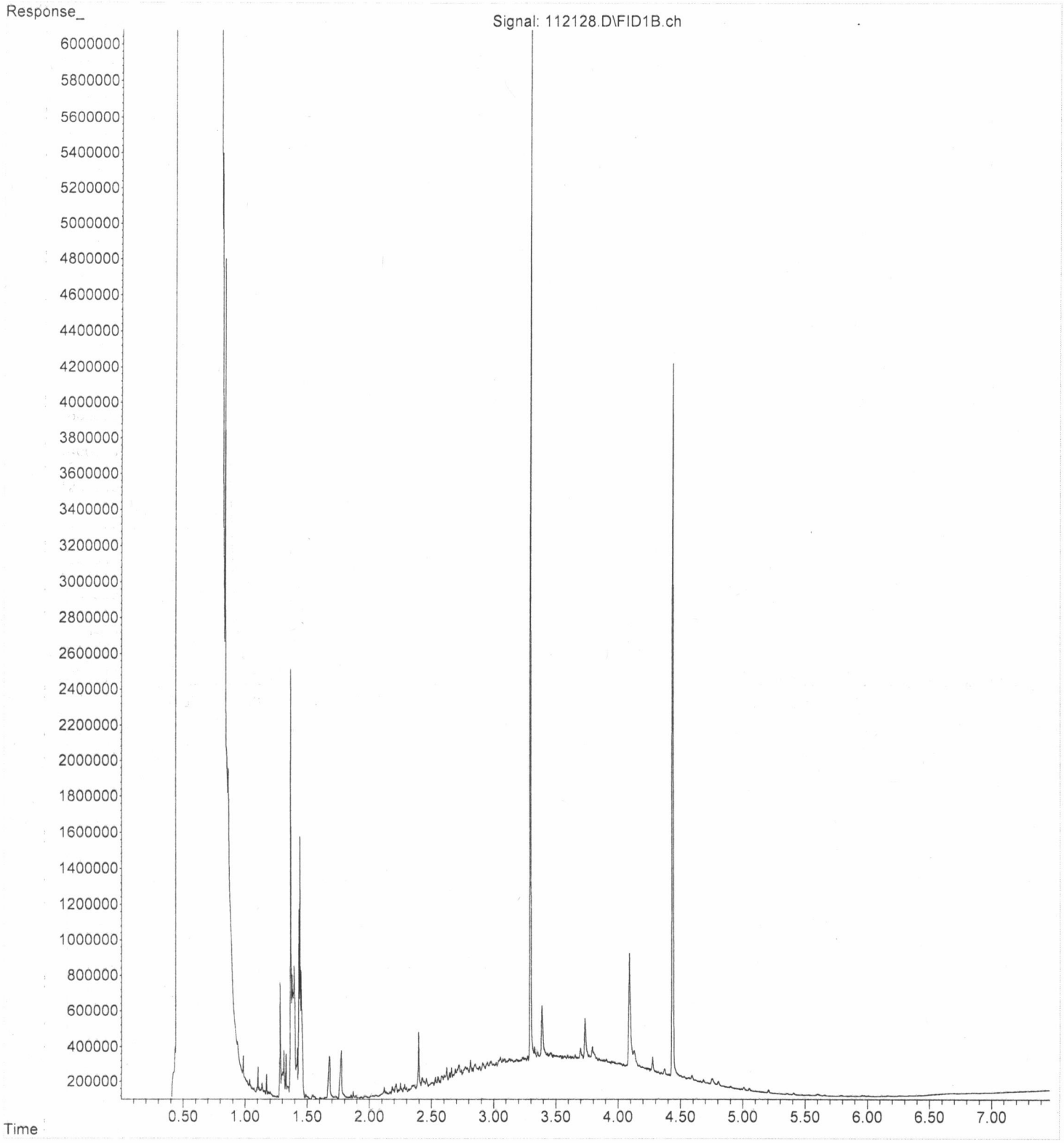
Sample ID's	☑ Yes ☐ No	☐ Not on COC/label
Date Sampled	☑ Yes ☐ No	☐ Not on COC/label
Time Sampled	☑ Yes ☐ No	☐ Not on COC/label
# of Containers	☑ Yes ☐ No	
Relinquished	☑ Yes ☐ No	
Requested analysis	☑ Yes ☐ On Hold	

Other comments (use a separate page if needed)

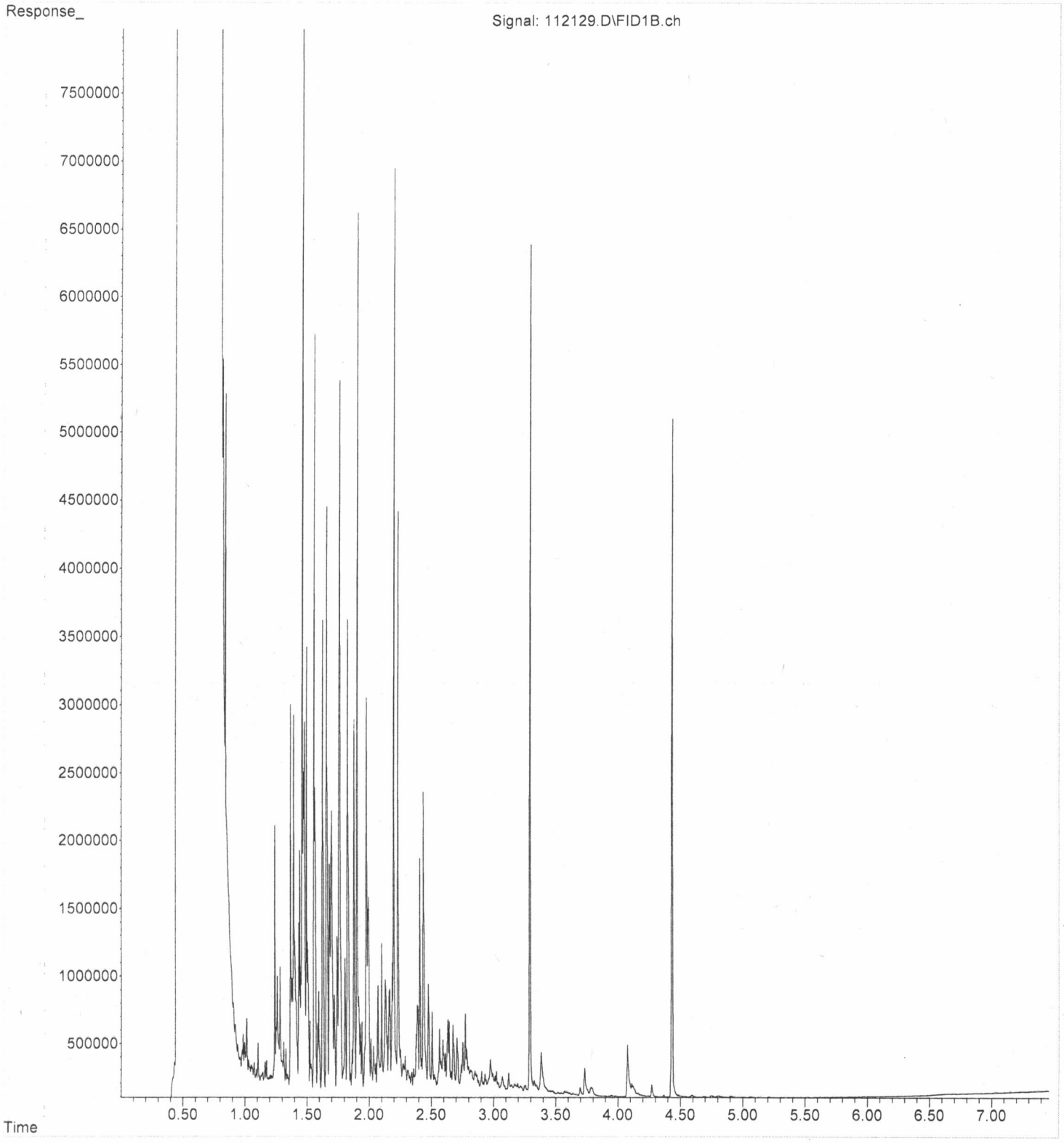
Air Samples: Were any additional canisters/tubes received? ☑ NA ☐ YES ☐ NO

Number of unused TO15 canisters _____ Number of unused TO17 tubes _____

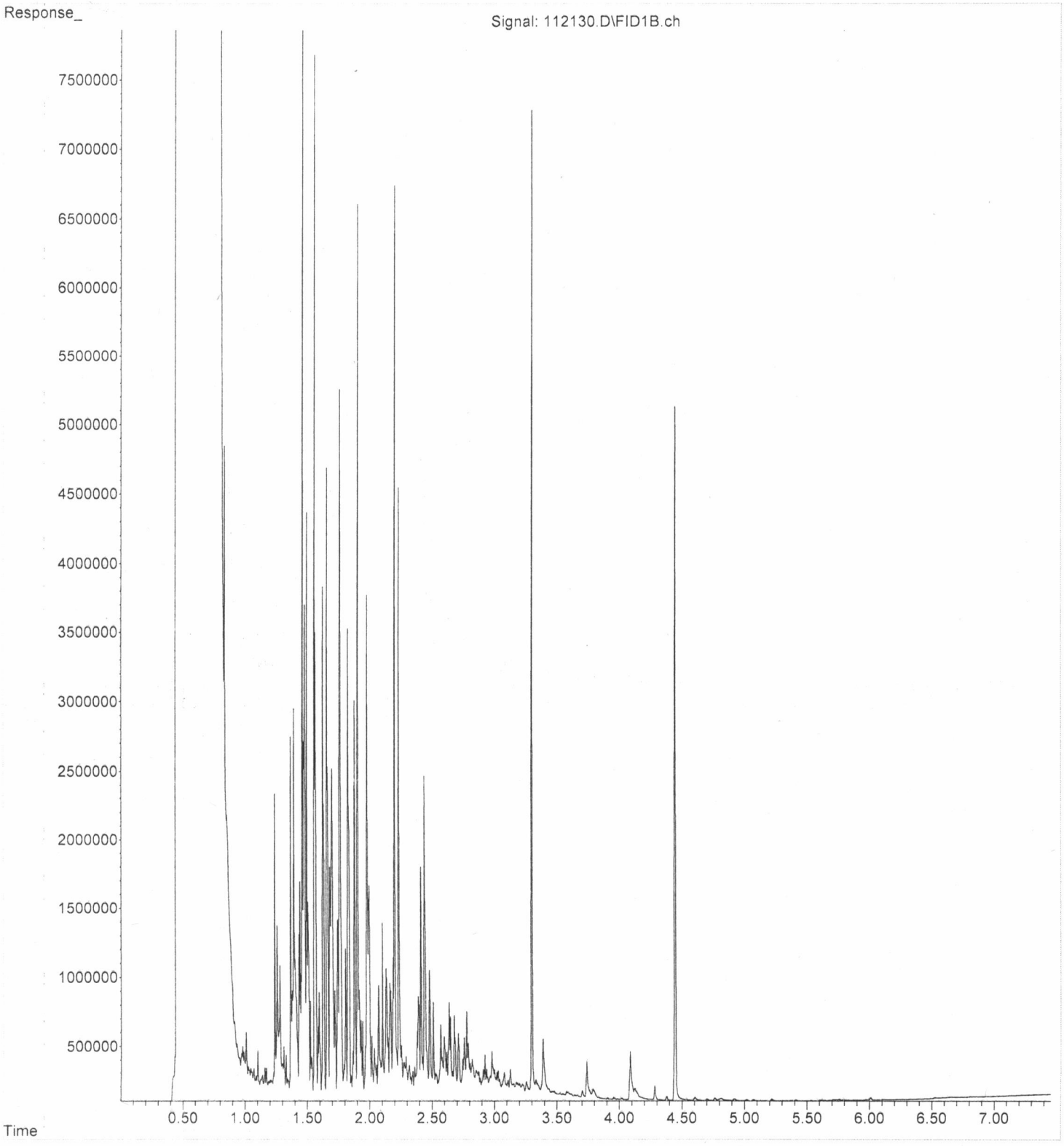
File :P:\Proc_GC10\11-21-24\112128.D
Operator : TL
Acquired : 21 Nov 2024 04:12 pm using AcqMethod DX.M
Instrument : GC10
Sample Name: 411323-04
Misc Info :
Vial Number: 23



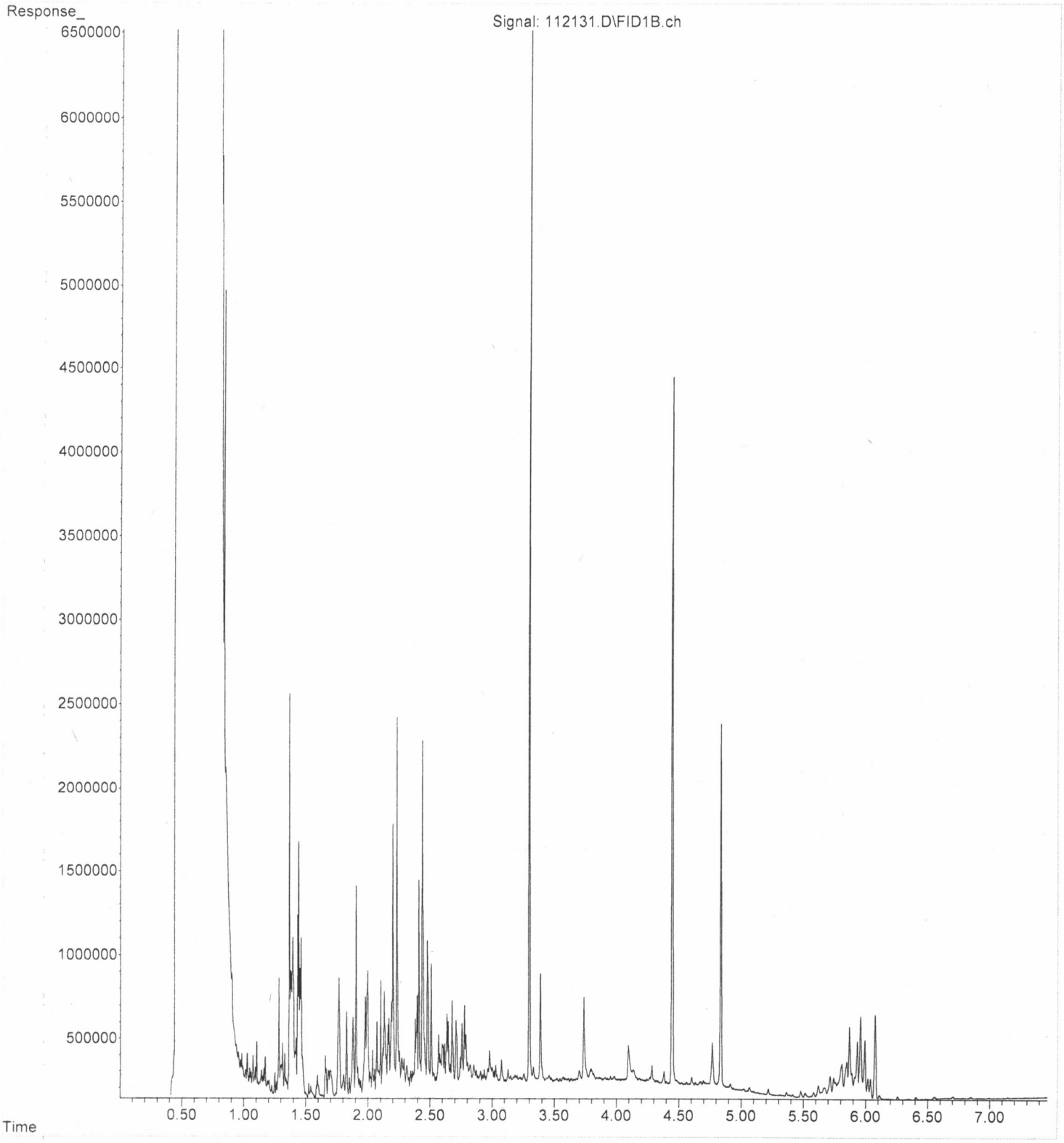
File :P:\Proc_GC10\11-21-24\112129.D
Operator : TL
Acquired : 21 Nov 2024 04:23 pm using AcqMethod DX.M
Instrument : GC10
Sample Name: 411323-05
Misc Info :
Vial Number: 24



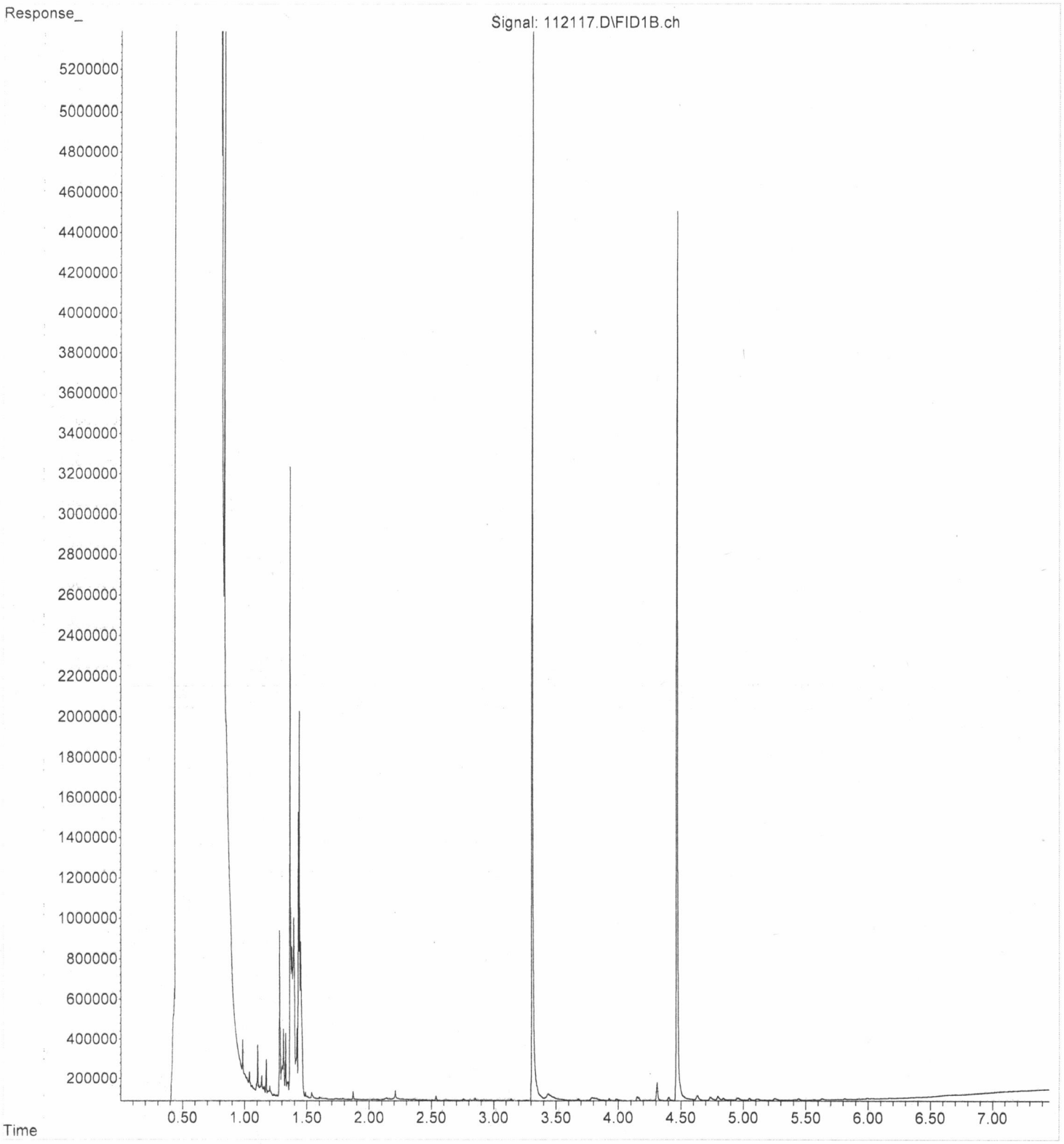
File :P:\Proc_GC10\11-21-24\112130.D
Operator : TL
Acquired : 21 Nov 2024 04:35 pm using AcqMethod DX.M
Instrument : GC10
Sample Name: 411323-06
Misc Info :
Vial Number: 25



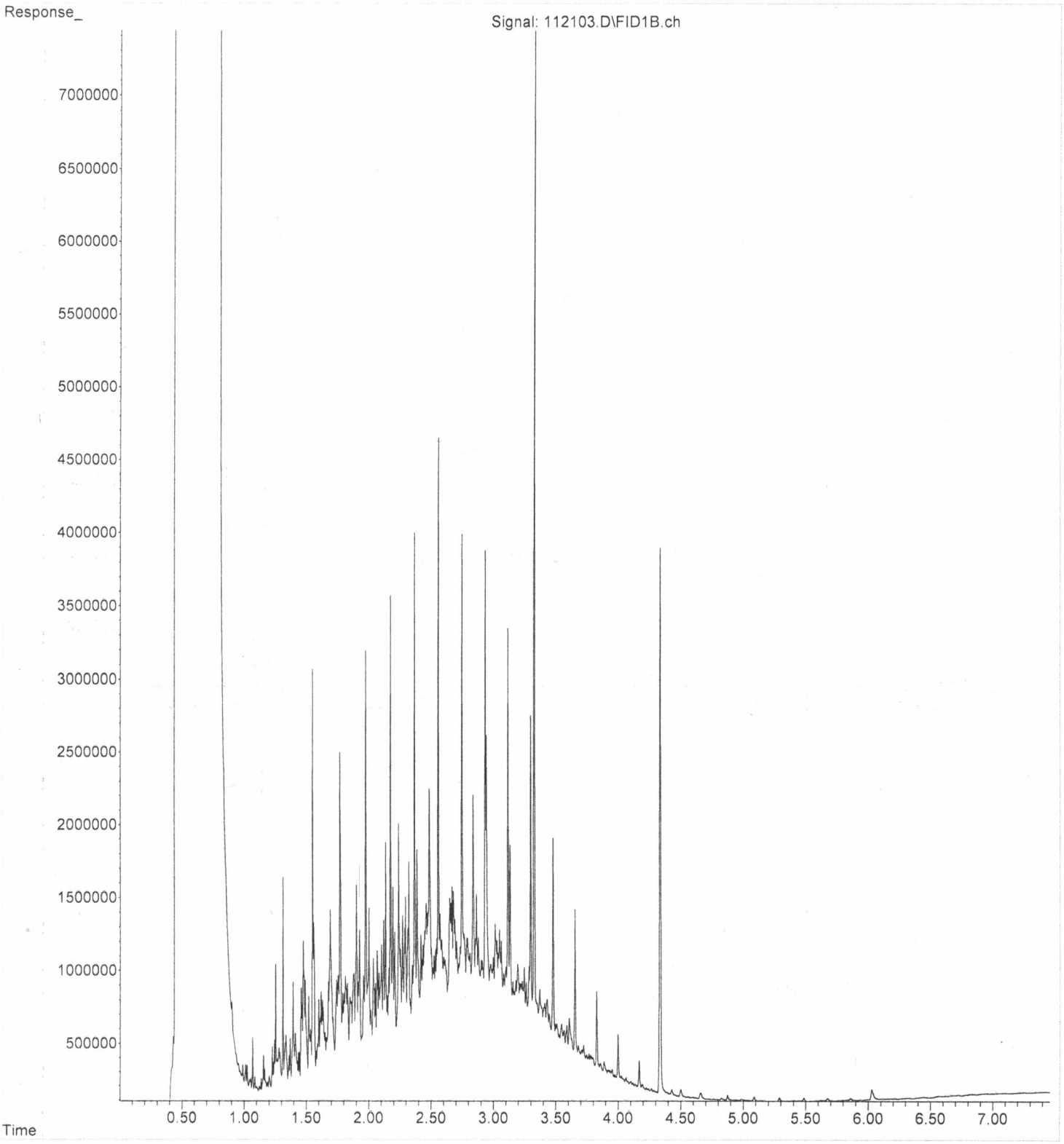
File :P:\Proc_GC10\11-21-24\112131.D
Operator : TL
Acquired : 21 Nov 2024 04:47 pm using AcqMethod DX.M
Instrument : GC10
Sample Name: 411323-08
Misc Info :
Vial Number: 26



File :P:\Proc_GC10\11-21-24\112117.D
Operator : TL
Acquired : 21 Nov 2024 02:02 pm using AcqMethod DX.M
Instrument : GC10
Sample Name: 04-2890 mb
Misc Info :
Vial Number: 14



File :P:\Proc_GC10\11-21-24\112103.D
Operator : TL
Acquired : 21 Nov 2024 07:50 am using AcqMethod DX.M
Instrument : GC10
Sample Name: 500 Dx 73-88G
Misc Info :
Vial Number: 3



Long-Term Compliance Monitoring
Annual Report Appendix A:
2024 Groundwater Monitoring Annual Report

Time Oil Bulk Terminal

Attachment A.3
Data Validation Summaries

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Two Union Square
601 Union Street, Suite 600
Seattle, WA 98101
tel: 206.292.2078 fax: 206.682.7867

Data Validation Summary

Prepared by:	Cheronne Oreiro
Date:	March 28, 2024
Project ID:	Cantera-TOC
Sample Event(s):	2024 Q1 Groundwater Monitoring
Sample Delivery Group(s):	402383
Sample Media:	Groundwater

A Compliance Screening (USEPA Stage 2A) data quality review was performed on volatile organic compounds, diesel-range organics, oil-range organics, gasoline-range organics, pentachlorophenol, total and dissolved metals, and methane, ethane, and ethene data resulting from laboratory analysis. The data were reviewed using guidance and quality control (QC) criteria documented in the *Supplemental Upland Remediation Investigation Work Plan* (Floyd|Snider 2019), *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* (USEPA 1986), *National Functional Guidelines for Organic Superfund Methods Data Review* (USEPA 2020a), and the *National Functional Guidelines for Inorganic Superfund Methods Data Review* (USEPA 2020b).

A total of 20 water samples and 1 field duplicate sample were submitted to Friedman & Bruya, Inc. (FBI) in Seattle, Washington, for chemical analysis by USEPA 8260D, NWTPH-Dx, NWTPH-Gx, USEPA 8270E, USEPA 6020B, and RSK 175. FBI reported results under 1 sample delivery group: 402383.

DATA QUALITY REVIEW

Field and laboratory QC parameters for all samples met project criteria.

All Analytes

All "j" flagged laboratory results were qualified as "J" per project standardization rules.

DATA QUALITY SUMMARY

Based on the data quality review, data are determined to be of acceptable quality for use as reported or qualified.

REFERENCES

Floyd|Snider. 2019. *Time Oil Bulk Terminal PPA Supplemental Upland Remediation Investigation Work Plan.* Prepared for Cantera Development Group, LLC. March.

U.S. Environmental Protection Agency (USEPA). 1986. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods.* U.S. Prepared by the Office of Solid Waste and Emergency Response. EPA-530/SW-846.

_____. 2020a. *National Functional Guidelines for Organic Superfund Methods Data Review.* Prepared by the Office of Superfund Remediation and Technology Innovation. EPA-540-R-20-005/OLEM 9240.0-51. November.

_____. 2020b. *National Functional Guidelines for Inorganic Superfund Methods Data Review.* Prepared by the Office of Superfund Remediation and Technology Innovation. EPA-542-R-20-006/OLEM 9240.1-66. November.

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Data Validation Summary

Prepared by:	Henry Bates
Date:	May 31, 2024
Project ID:	Cantera-TOC
Sample Event(s):	2024 Q2 GW Monitoring
Sample Delivery Group(s):	402273
Sample Media:	Groundwater

A Compliance Screening (USEPA Stage 2A) data quality review was performed on volatile organic compounds, diesel-range organics, oil-range organics, and gasoline-range organics data resulting from laboratory analysis. The data were reviewed using guidance and quality control (QC) criteria documented in the *Supplemental Upland Remedial Investigation Work Plan* (Floyd|Snider 2019), *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* (USEPA 1986), and the *National Functional Guidelines for Organic Superfund Methods Data Review* (USEPA 2020).

A total of 10 groundwater samples and 1 field duplicate sample were submitted to Friedman & Bruya, Inc. (FBI) in Seattle, Washington, for chemical analysis by USEPA 8260D, NWTPH-Dx, and NWTPH-Gx. FBI reported results under 1 sample delivery group: 405273.

DATA QUALITY REVIEW

Field and laboratory QC parameters for all samples met project criteria.

All Analytes

All “j” flagged laboratory results were qualified as “J” per project standardization rules.

DATA QUALITY SUMMARY

Based on the data quality review, data are determined to be of acceptable quality for use as reported or qualified.

REFERENCES

Floyd|Snider. 2019. *Time Oil Bulk Terminal PPA Supplemental Upland Remediation Investigation Work Plan.* Prepared for Cantera Development Group, LLC. March.

U.S. Environmental Protection Agency (USEPA). 1986. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods.* U.S. Prepared by the Office of Solid Waste and Emergency Response. EPA-530/SW-846.

_____. 2020. *National Functional Guidelines for Organic Superfund Methods Data Review.* Prepared by the Office of Superfund Remediation and Technology Innovation. EPA-540-R-20-005/OLEM 9240.0-51. November.

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Data Validation Summary

Prepared by:	Charlie Lentz
Date:	September 12, 2024
Project ID:	Cantera-TOC
Sample Event(s):	2024 Q3 Groundwater Monitoring
Sample Delivery Group(s):	408160, 2408163, 2408-110
Sample Media:	Groundwater

A Compliance Screening (USEPA Stage 2A) data quality review was performed on total and dissolved metals, select volatile organic compounds, total petroleum hydrocarbons, dissolved gasses, and total organic carbon data resulting from laboratory analysis. The data were reviewed using guidance and quality control (QC) criteria documented in the *Long-Term Compliance Monitoring Plan* (Crete 2023), *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* (USEPA 1986), *National Functional Guidelines for Organic Superfund Methods Data Review* (USEPA 2020a), and the *National Functional Guidelines for Inorganic Superfund Methods Data Review* (USEPA 2020b).

A total of 17 groundwater samples and 1 field duplicate were submitted to Friedman & Bruya, Inc. (FBI) in Seattle, Washington, for chemical analysis by USEPA 6020B, USEPA 8260D, NWTPH-Dx and -Gx. Select samples were additionally sent to OnSite Environmental Inc. (OnSite) in Redmond, Washington, for chemical analysis by RSK 175, and to Alliance Technical Group (ATG) in Seattle, Washington, for chemical analysis by SM 5310C. FBI reported results under sample delivery group (SDG) 408160, OnSite under SDG 2408-110, and ATG under SDG 2408163.

DATA QUALITY REVIEW

Field and laboratory QC parameters for samples met project criteria. All “j” flagged laboratory results were reported below the standard reporting limit and are considered estimated and have been given the final qualifier “J”.

DATA QUALITY SUMMARY

Based on the data quality review, data are determined to be of acceptable quality for use as reported or qualified.

REFERENCES

Crete Consulting, Inc. (Crete). 2023. *Time Oil Bulk Terminal Long-Term Compliance Monitoring Plan, Time Oil Bulk Terminal, Seattle, Washington*. Prepared for TOC Seattle Terminal 1, LLC. 10 February.

U.S. Environmental Protection Agency (USEPA). 1986. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods.* U.S. Prepared by the Office of Solid Waste and Emergency Response. EPA-530/SW-846.

_____. 2020a. *National Functional Guidelines for Organic Superfund Methods Data Review.* Prepared by the Office of Superfund Remediation and Technology Innovation. EPA-540R-20-005/OLEM 9240.0-51. November.

_____. 2020b. *National Functional Guidelines for Inorganic Superfund Methods Data Review.* Prepared by the Office of Superfund Remediation and Technology Innovation. EPA-542-R-20-006/OLEM 9240.1-66. November.

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Data Validation Summary

Prepared by:	Charlie Lentz
Date:	December 10, 2024
Project ID:	Cantera-TOC
Sample Event(s):	2024 Q4 Groundwater Monitoring
Sample Delivery Group(s):	411323
Sample Media:	Groundwater

A Compliance Screening (2A) data quality review was performed on select volatile organic compounds, total petroleum hydrocarbons (TPH) as diesel, and TPH as gasoline data resulting from laboratory analysis. The data were reviewed using guidance and quality control (QC) criteria documented in the *Groundwater Monitoring Plan* (Floyd|Snider 2023), *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* (USEPA 1986), and the *National Functional Guidelines for Organic Superfund Methods Data Review* (USEPA 2020).

A total of seven groundwater samples and one field duplicate were submitted to Friedman & Bruya, Inc. (FBI) in Seattle, Washington, for chemical analysis by USEPA 8260D, NWTPH-Dx, and NWTPH-Gx. FBI reported results under one sample delivery group: 411323.

DATA QUALITY REVIEW

Field and laboratory QC parameters for all samples met project criteria.

DATA QUALITY SUMMARY

Based on the data quality review, data are determined to be of acceptable quality for use as reported or qualified.

REFERENCES

Floyd|Snider. 2023. *Time Oil Bulk Terminal Site—Groundwater Monitoring Plan.* Appendix A to the Long-Term Compliance Monitoring Plan. Prepared for Cantera Development Group, LLC. January.

U.S. Environmental Protection Agency (USEPA). 1986. *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods.* U.S. Prepared by the Office of Solid Waste and Emergency Response. EPA-530/SW-846.

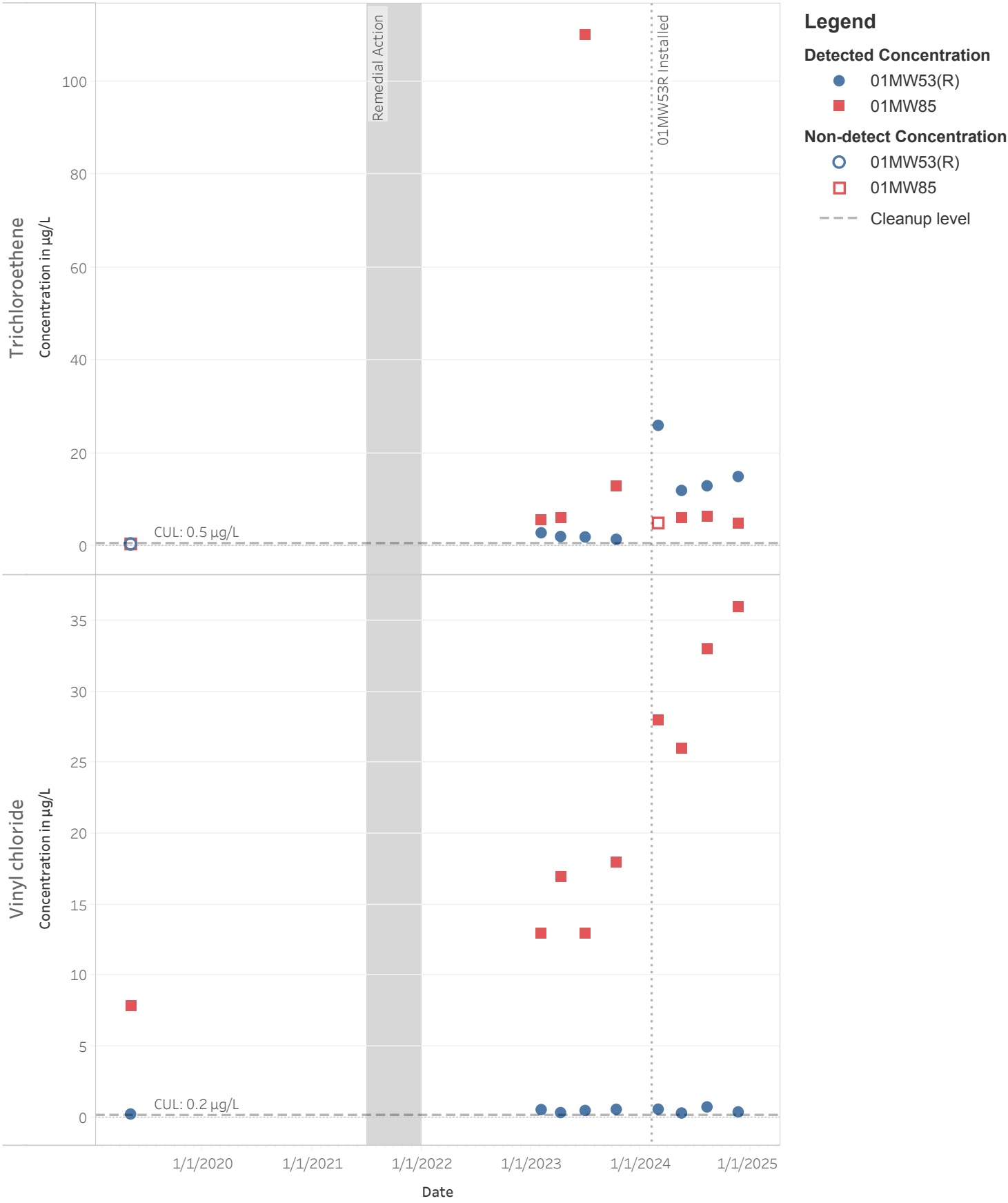
_____. 2020. *National Functional Guidelines for Organic Superfund Methods Data Review.* Prepared by the Office of Superfund Remediation and Technology Innovation. EPA-540-R-20-005/OLEM 9240.0-51. November.

Long-Term Compliance Monitoring
Annual Report Appendix A:
2024 Groundwater Monitoring Annual Report

Time Oil Bulk Terminal

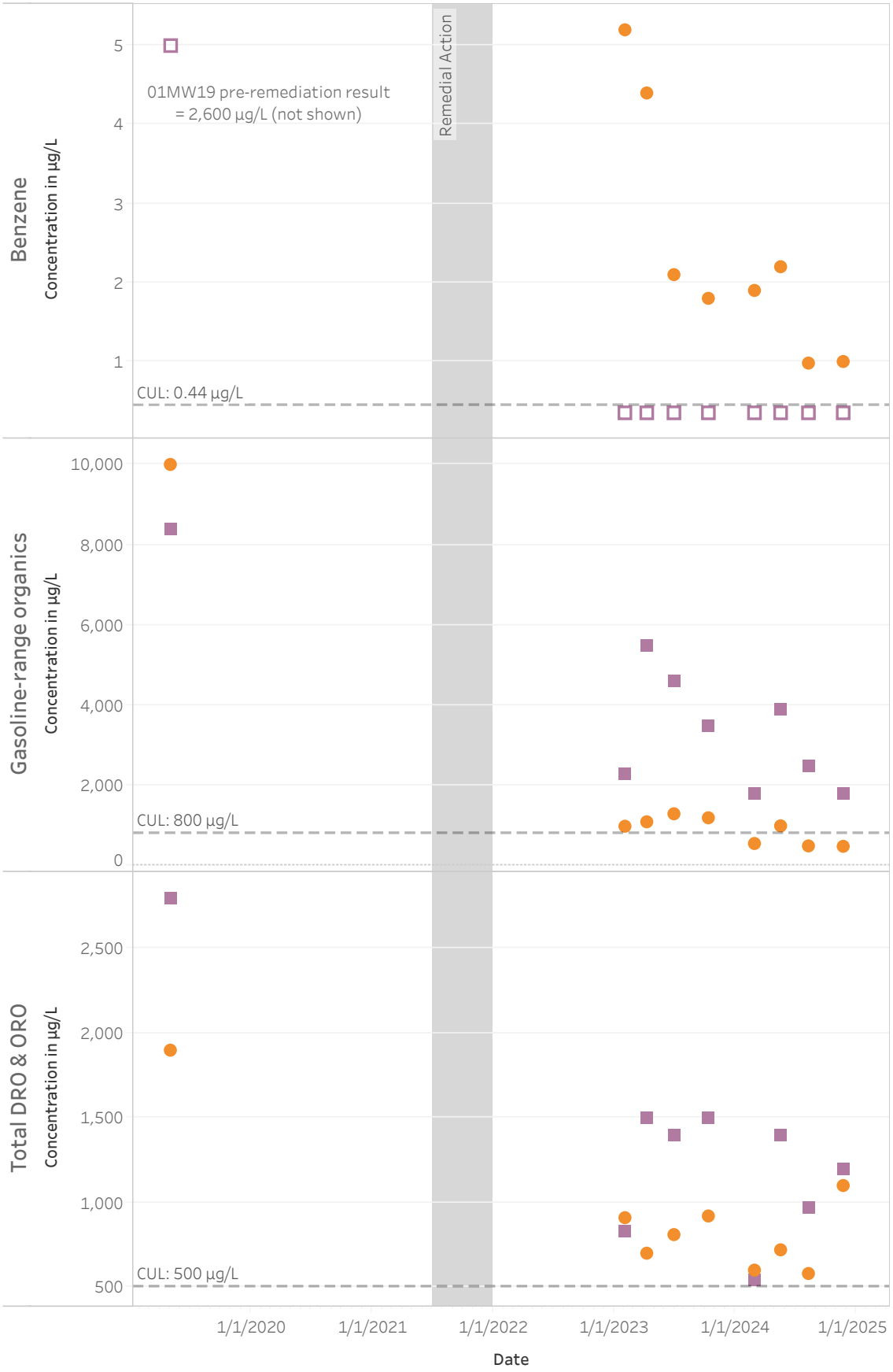
Attachment A.4
Time Concentration Plots

ASKO Hydraulic CPOC Wells



Abbreviations:
CPOC = Conditional point of compliance, CUL = Cleanup level, µg/L = Micrograms per liter

Bulk Terminal CPOC Well and Downgradient Well



Abbreviations:
CPOC = Conditional point of compliance, CUL = Cleanup level, DRO = Diesel-range organics, ORO = Oil-range organics, µg/L = Micrograms per liter

Long-Term Compliance Monitoring
Annual Report Appendix A:
2024 Groundwater Monitoring Annual Report

Time Oil Bulk Terminal

Attachment A.5
Updated Monitoring Well
Sampling and Analytical Schedule

Attachment A.5
Updated Short-Term Monitoring Well Sampling and Analytical Schedule

Well ID	Water-Bearing Zone	Screened Interval (feet below TOC)	Proposed Monitoring Frequency [1]	Notes	Proposed Monitoring Parameters							Monitoring Schedule				Change Log [4]
					Indicator Hazardous Substances						MNA Parameters [3]	2025				
					Total Arsenic by USEPA 6020B	GRO by NWTPH-Gx	Total DRO+ORO by NWTPH-Dx	Benzene by USEPA 8260D	cVOCs [2] by USEPA 8260D	Penta by USEPA 8270D SIM	Field Parameters	Q1	Q2	Q3	Q4	
Bulk Terminal Parcel Wells																
Wells Designated for Analytical Sampling																
01MW12	Shallow	4–19	Semiannual			X	X	X			X	IHS		IHS		
01MW19R	Shallow	10–20	Quarterly (2023–2024)/ Semiannual (2025–2026)			X	X	X			X	IHS		IHS		
01MW35	Shallow	10–20	Quarterly (2023)			X	X	X			X					Three consecutive results meeting CULs achieved. Short-term monitoring complete in 2023.
01MW40	Shallow	7–22	Initial Semiannual	Monitor until redevelopment; decommission during property redevelopment (within structure footprint).		X	X	X			X	IHS	To be decommissioned			Decommission prior to or during redevelopment, and continue monitoring at replacement well 01MW90R.
01MW49R	Intermediate	35–40	Semiannual (2023-2024)			X	X	X			X					Three consecutive results meeting CULs achieved. Short-term monitoring complete in 2024.
01MW66	Shallow	12–22	Annual	On-property penta plume.						X	X	IHS				
01MW84	Shallow	17–23	Quarterly (2023–2024)/ Semiannual (2025–2026)			X	X	X			X	IHS		IHS		
01MW87	Shallow	11–21	Contingency	Retain as contingency during performance period if IHS concentrations increase at 01MW12.		X	X	X			X					
01MW90R	Shallow	new (~5–15)	Redevelopment Semiannual	Install and monitor in place of 01MW40 after redevelopment grading.		X	X	X			X			IHS		To be installed following redevelopment in 2025.
Wells Designated for Contingency or Water Level Monitoring Only																
01MW100	Shallow	20–30	--	Retain for collection of additional performance data if needed.												Upgradient sentinel monitoring location retained in place of 01MW17.
01MW102	Shallow	10–20	--	Retain for collection of additional performance data if needed.												
01MW104	Intermediate	28–33	Contingency	Sample if IHS concentrations increasing at 01MW49R or 01MW51.												Current data suggest contingency well is not needed.
ASKO Parcel Wells																
Wells Designated for Analytical Sampling																
MW03R	Perched	13–18	Semiannual		X	X	X	X	X		X	To be decommissioned				Well continued to be dry in 2024 and no samples were collected. Well to be decommissioned prior to redevelopment in 2025.
MW05	Shallow	19–29	Initial Semiannual	Monitor until redevelopment; decommission during property redevelopment (within structure footprint).				X	X		X	IHS		IHS		Ecology requested to continue monitoring semiannually while cVOCs are elevated at the CPOC.
MW06	Shallow	18–28	Initial Baseline/Contingency/ Redevelopment	Contingency sample if increasing IHSs at 01MW53, 01MW85 or MW05; sample semiannually after redevelopment grading.				X	X		X	IHS		IHS		
01MW15	Shallow	10–30	Initial Semiannual	Monitor until redevelopment; decommission during property redevelopment (within structure footprint).					X		X	IHS		IHS		Change in redevelopment plans. Continue monitoring per initial short-term GMP in 2025.
01MW45R	Shallow	new (~12–27)	Redevelopment Semiannual	Install and monitor after redevelopment grading.		X	X	X	X		X					Change of redevelopment plans means retaining 01MW15. Therefore, 01MW45R is not anticipated to be installed.

Attachment A.5
Updated Short-Term Monitoring Well Sampling and Analytical Schedule

Well ID	Water-Bearing Zone	Screened Interval (feet below TOC)	Proposed Monitoring Frequency [1]	Notes	Proposed Monitoring Parameters							Monitoring Schedule				Change Log [4]
					Indicator Hazardous Substances						MNA Parameters [3]	2025				
					Total Arsenic by USEPA 6020B	GRO by NWTPH-Gx	Total DRO+ORO by NWTPH-Dx	Benzene by USEPA 8260D	cVOCs [2] by USEPA 8260D	Penta by USEPA 8270D SIM	Field Parameters	Q1	Q2	Q3	Q4	
ASKO Parcel Wells (cont.)																
Wells Designated for Analytical Sampling (cont.)																
01MW46	Shallow	13–28	Initial Quarterly/Redevelopment Semiannual	Monitor until redevelopment; decommission during property redevelopment (within structure footprint). Replace and continue monitoring 01MW46R after redevelopment grading if needed.				X	X		X	IHS		IHS		Change in redevelopment plans. Retain well and transition to semiannual monitoring in Q1 2025.
01MW53R	Shallow	17-27	Quarterly (2023–2025)/ Semiannual (2026)	Reinstalled during Q1 2024 and continue monitoring. Previous well was screened 16-26.					X		X	IHS	IHS	IHS	IHS	Continue monitoring quarterly in 2025.
01MW56	Shallow	16–26	Semiannual						X		X	IHS		IHS		
01MW58R	Shallow	24-34	Quarterly (2024-2025)/ Semiannual (2026)	Installed and initiated monitoring in Q1 2024.			X		X		X	IHS	IHS	IHS	IHS	Continue monitoring quarterly in 2025. Added DRO+ORO analysis in coordination with Ecology.
01MW60R	Shallow	new (~25–40)	Redevelopment Semiannual	Install and monitor after redevelopment grading.					X		X			IHS & DRO+ ORO		To be installed following redevelopment in 2025. Begin monitoring semiannually. Sample for Total DRO+ORO during the first monitoring event.
01MW85	Shallow	18–27	Quarterly (2023–2025)/ Semiannual (2026)						X		X	IHS	IHS	IHS	IHS	Continue monitoring quarterly in 2025.
01MW108	Intermediate	30–35	Initial Semiannual	Monitor until redevelopment; decommission during property redevelopment (within structure footprint).					X		X					Three consecutive results meeting CULs achieved. Short-term monitoring complete in 2024.
Wells Designated for Contingency or Water Level Monitoring Only																
MW02	Shallow	18–28	Contingency						X		X	To be decommissioned				Within footprint of stormwater detention system. To be decommissioned in 2025 prior to redevelopment.
01MW61	Shallow	22–37.5	--									To be decommissioned				Performance monitoring objectives to be fulfilled by 01MW60R.
01MW80	Shallow	20–28	Initial Contingency	Monitor if increasing IHSs at 01MW53, 01MW85 or MW05; decommission during property redevelopment.					X		X					Retained as contingency well since redevelopment plans changed.
01MW89	Shallow	18–26	Contingency	Sample if increasing IHSs at 01MW53 or 01MW56.					X		X					Contingency monitoring will be reassessed quarterly.
01MW106	Shallow	15–25	--	Retain for collection of water levels or monitor if increasing IHSs at MW06.					X							Retain as contingency location in place of MW02.
01MW107	Shallow	17–27	Contingency	Monitor if increasing IHSs at 01MW53 or 01MW85.					X		X	IHS				Contingency sampling triggered in Q3 2023. Continued monitoring will be reassessed quarterly.
01MW112	Intermediate	new (~30–35)	Redevelopment Contingency	Install after redevelopment grading; sample if increasing IHSs at 01MW53 or 01MW108.					X		X					Current data suggest contingency well is not needed.
01MW113	Shallow	new (~12–27)	Redevelopment Contingency	Install after redevelopment grading if needed; monitor if stronger than expected westward gradients or increasing IHSs at MW06.					X		X					Current data suggest contingency well is not needed.
01MW114	Shallow	new (~25–40)	Quarterly (2025)	Install to monitor groundwater quality at the BNSF/ASKO property boundary, and evaluate groundwater quality in the shallow WBZ adjacent to the gravity well.					X		X		IHS	IHS	IHS	To be installed in 2025 and monitored quarterly for cVOCs adjacent to the gravity well/BNSF property boundary. Sample for Total DRO+ORO during the first monitoring event.

Attachment A.5
Updated Short-Term Monitoring Well Sampling and Analytical Schedule

Well ID	Water-Bearing Zone	Screened Interval (feet below TOC)	Proposed Monitoring Frequency [1]	Notes	Proposed Monitoring Parameters							Monitoring Schedule				Change Log [4]
					Indicator Hazardous Substances						MNA Parameters [3]	2025				
					Total Arsenic by USEPA 6020B	GRO by NWTPH-Gx	Total DRO+ORO by NWTPH-Dx	Benzene by USEPA 8260D	cVOCs [2] by USEPA 8260D	Penta by USEPA 8270D SIM	Field Parameters	Q1	Q2	Q3	Q4	
East Waterfront Parcel Wells																
Wells Designated for Analytical Sampling																
02MW04R	Shallow	5–15	Quarterly (2023–2024)/ Annual (2025–2026)			X	X	X			X			IHS		Transition to long-term monitoring in 2025.
02MW07	Shallow	1.5–11.5	Quarterly (2023)/ Annual (2024–2026)		X	X	X	X			X			IHS		Transition to long-term monitoring in 2025.
02MW17	Shallow	1–11	Contingency (2023–2024)/ Annual (2025–2026)	Sample if increasing IHSs at 02MW04R or 02MW07.	X	X	X	X			X			IHS		Transition to long-term monitoring in 2025.
02MW19	Shallow	3–13	Quarterly (2023)/ Annual (2024–2026)		X	X	X	X			X			IHS		Transition to long-term monitoring in 2025.
02MW20R	Shallow	new (~1–11)	Annual (2025–2026)	Install after redevelopment grading; sample if increasing IHSs at 02MW04R.	X	X	X	X			X			IHS		Install and begin long-term monitoring in Q3 2025.
02MW16	Shallow	5–15	--	Retain for collection of additional performance data if needed.												
02MW18	Shallow	4–14	--									To be decommissioned				
01MW83	Shallow	14–24	--	Retain for collection of additional performance data if needed.												

Notes:

Blank cells are intentional.

Wells not designated for short-term monitoring are considered sentinels and may be sampled at the Property Owner's discretion or at Washington State Department of Ecology's request to obtain additional performance data, if needed. Water levels will be collected from the ASKO and Bulk Terminal monitoring wells designated for sampling and select other wells (01MW35, 01MW61, 01MW83, 01MW100, 01MW102, 01MW106, and 01MW107) semiannually (Q1 and Q3).

-- Not established.

Italics Proposed well to be installed after redevelopment (if needed).

1 Wells designated for initial short-term monitoring will be sampled until grading and utility installation for property redevelopment. Wells designated for redevelopment monitoring will be installed and sampled after grading has been completed.

2 cVOCs include TCE, cis-1,2-dichloroethene, and vinyl chloride.

3 Primary MNA parameters are field measurements that will be collected during every event and include dissolved oxygen, oxidation–reduction potential, pH, specific conductance, and temperature. No secondary MNA parameters are proposed to be collected in 2025.

4 Additional changes:

- The 2023 and 2024 schedule was completed and removed from the table.
- Wells decommissioned in 2023 and 2024 were removed from the table.
- Sentinel wells not designated for contingency use or water level monitoring were removed from the table (refer to Table A.1 for full well inventory list).

Abbreviations:

ASKO ASKO Hydraulic
BNSF BNSF Railway Company
CPOC Conditional point of compliance
CUL Cleanup level
cVOC Chlorinated volatile organic compound
DRO Diesel-range organics
Ecology Washington State Department of Ecology
GMP Groundwater Monitoring Plan
GRO Gasoline-range organics
IHS Indicator hazardous substance
MNA Monitored natural attenuation
ORO Oil-range organics
penta Pentachlorophenol
TCE Trichloroethene
TOC Top of casing
USEPA U.S. Environmental Protection Agency
WBZ Water-bearing zone

This and the following pages have been inserted by Ecology as supplemental information to the 2024 Annual Report.

Seeds, Tena (ECY)

From: Kristin Anderson <Kristin.Anderson@floydsnider.com>
Sent: Wednesday, March 12, 2025 10:55 AM
To: Seeds, Tena (ECY); Kim Hempel
Cc: Doug Ciserella; mike@cantera-group.com; Bill Joyce; Alexandra Kleeman; Jamie Stevens; DeBoer, Chris (ECY)
Subject: Re: Time Oil Bulk Terminal - Long-Term Compliance Monitoring Annual Report
Attachments: 2023-2024 Water Level Elevations.xlsx

External Email

Hi Tena, thanks for your review and comments. The requested table is attached. Our reponses to Ecology's comments are provided in red below.

Kristin Anderson, LHG Associate Principal, Senior Geologist (she/her)
FLOYD | SNIDER
601 Union Street, Suite 600 | Seattle, WA 98101 | tel: 206.292.2078 | dir: 206.805.2183 | cell: 206.552.4241
Kristin.Anderson@floydsnider.com | floydsnider.com
A Certified B Corporation | We're hiring!

From: Seeds, Tena (ECY) <TSEE461@ECY.WA.GOV>
Sent: Thursday, March 6, 2025 10:57 AM
To: Kim Hempel <khempel@pioneerees.com>
Cc: Doug Ciserella <doug@cantera-group.com>; mike@cantera-group.com <mike@cantera-group.com>; Bill Joyce <william.joyce@hcmp.com>; Alexandra Kleeman <alexandra.kleeman@hcmp.com>; Jamie Stevens <jamie.stevens@creteconsulting.com>; Kristin Anderson <Kristin.Anderson@floydsnider.com>; DeBoer, Chris (ECY) <chde461@ECY.WA.GOV>
Subject: RE: Time Oil Bulk Terminal - Long-Term Compliance Monitoring Annual Report

Hi Kim,

Thanks for submitting the annual report for 2024. Ecology has the following comments, primarily for informational purposes; you don't necessarily need to make edits to the text based on these. However, **please submit an additional table that includes the depth to groundwater measurements and associated elevations for all wells measured during the 2023 and 2024 groundwater monitoring activities**. Similarly, please also include one in the next annual report for 2025 (see 5th bullet comment below).

- **Section 3.5.1 2024 Contingency Sampling** – The 5th bullet notes that a boring was advanced to the shallow WBZ within the PlumeStop in situ treatment barrier in February 2024 to evaluate carbon distribution, but does not provide any other details. I did find that this boring was mentioned in the Q1 2024 PPCD progress report, but no data or other information for this boring has been submitted to Ecology. I'm assuming it was only for the purpose of visually observing whether carbon from the PlumeStop injections was present at that location. Is that a correct assumption? This boring is briefly mentioned again in Section 4.2.2.

The boring was advanced to 28 feet bgs and visually observed for the presence of carbon. A small sample of soil from within the shallow WBZ was sent to RRS for visual and qualitative testing of carbon as well, and they reported that no substantial carbon was present in that sample.

- **Section 3.5.1 2024 Contingency Sampling** – The 2nd to last bullet states that the collaborative groundwater elevation monitoring was conducted at Ecology's request to support the BNSF remedial investigation. To clarify, Ecology requested collaborative water level monitoring between Cantera and BNSF to evaluate Site-wide groundwater flow conditions in order to assess the cause of the increased CVOC concentrations at the CPOC.

  Acknowledged.

- **Section 4.2.2 ASKO Hydraulic** – The last sentence of the fourth paragraph indicates that the exceedances at the CPOC are "low-level." Ecology disagrees that the exceedances are "low-level". The vinyl chloride concentrations at 01MW85 are 2 orders of magnitude higher than the CUL. TCE is 1 order of magnitude higher at that well and 2 orders of magnitude higher at 01MW53R than the CUL. In addition, cis-1,2-DCE at 01MW85 is about 2 orders of magnitude higher than the Method B CUL.

  Acknowledged

- **5.2 BNSF Railway Company Groundwater Monitoring Results** – The 4th paragraph indicates that the maximum TCE concentration in groundwater at BNSF well MW-BN-03 was collected adjacent to the apparent TCE soil source contamination at the top of the shallow WBZ (20 ft bgs) where a concentration of 30.5 mg/kg was detected. For additional context, this TCE soil detection was in BNSF's RI boring SB-BN-06, which is located near historical property boundary wells where elevated TCE concentrations were detected in soil, including 01MW62 in 2008 (66 mg/kg at 17.5 ft bgs and 52 mg/kg at 20 ft bgs), 01MW71 in 2010 (120 mg/kg at 20 ft bgs), and 01MW78 in 2011 (47 mg/kg at 25 ft bgs).

  Acknowledged. The TCE soil concentrations noted by Ecology in the vicinity of the property line of ASKO and BNSF prior to remediation are similar to the magnitude and depth of the remaining TCE soil source identified on BNSF. As discussed in the RI/FS, the distribution of TCE in soil in this area is consistent with shallow release(s) on the BNSF parcel that migrated downward and downgradient onto the ASKO Parcel. TOCST performed in situ stabilization on TCE-contaminated soils up to the BNSF property to address all accessible source TCE contamination, including at the locations and sample depths noted by Ecology.

- **Section 6.1 Site-Wide Groundwater Flow Patterns** – In addition to the potentiometric contour maps that will be provided in the 2025 GMAR, please also provide a summary table showing depth to groundwater measurements and calculated groundwater elevations for each of the wells.

  See attached summary table of all water level measurements and corresponding elevations collected from the site well network in 2023 and 2024 – this table will be updated and presented in the 2025 GMAR.

- **Table A.1 Well Inventory and Status** – It would be helpful to show status of all of the wells listed, not just the ones that were or will be decommissioned or are inaccessible. Also, 01MW17 is listed in this table, but my understanding is that it was decommissioned when 01MW99 was decommissioned because it interfered with the redevelopment plan on Lot F. Please confirm status of 01MW17.

  Can you clarify what you mean by showing the status of all listed wells? Do you want text such as "active-monitoring purpose summarized in Table A.2"?

You are correct, 01MW17 was decommissioned, and it is included in that summary table by mistake. We will update this table per your request for the 2025 GMAR, once we receive further clarification regarding our above questions

- **Table A.3 Pre- and Post-Remediation Groundwater Results for IHSs** – There is no CUL listed for cis-1,2-DCE. I know that the PPCD/CAP did not establish a CUL for that compound, but since it is present as a degradation product of TCE and at elevated concentrations in some of the wells, you should at least reference the current MTCA Method B value that is applicable to the potential exposure pathways for this Site. In this case, the most stringent value would be 16 ug/L for protection of drinking water and VI (the current Method B groundwater screening level protective of VI is 180 ug/L).
  We disagree with including a CUL for cis-1,2-DCE (DCE) in the table since there was no cleanup standard in the CAP. DCE is identified as a secondary monitored natural attenuation parameter in the GMP with no established monitoring requirement beyond Year 1. DCE has continued to be monitored as a secondary MNA parameter and is useful as a line of evidence for reductive dechlorination of TCE. The results are included in the IHS results table for ease of reference only; in future reports, DCE will be included with the other secondary MNA parameters. Given that the site-specific cleanup levels as well as the corresponding MTCA criteria for the drinking water and vapor intrusion pathway referenced by Ecology are more stringent for TCE and vinyl chloride than the referenced MTCA criteria for cis-1,2-DCE, these IHS results are the most appropriate criteria for evaluating the progress of site groundwater cleanup.

Regards,

Tena Seeds, PE (she/her)
Cleanup Site Manager/Senior Engineer, Uplands Unit
Northwest Region Toxics Cleanup Program
Washington State Department of Ecology
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From: Kim Hempel <khempel@pioneerees.com>
Sent: Wednesday, February 26, 2025 8:17 PM
To: Seeds, Tena (ECY) <TSEE461@ECY.WA.GOV>
Cc: Doug Ciserella <doug@cantera-group.com>; mike@cantera-group.com; William Joyce (william.joyce@hcmp.com) <william.joyce@hcmp.com>; Alexandra Kleeman <alexandra.kleeman@hcmp.com>; Jamie Stevens <jamie.stevens@creteconsulting.com>; Kristin Anderson <Kristin.Anderson@floydsnider.com>
Subject: Time Oil Bulk Terminal - Long-Term Compliance Monitoring Annual Report

External Email

Good evening Tena,

As required by Prospective Purchaser Consent Decree (PPCD No. 20-2-15215-3 SEA), the Long-Term Compliance Monitoring Annual Report for the Time Oil Bulk Terminal Site is available for download at the link below, which documents activities performed in 2024 in accordance with the Long-Term Compliance Monitoring Plan (LTCMP).

https://www.dropbox.com/scl/fi/9i0cy0bg6gdjn5h4msfh1/2025.02.26-Time-Oil-LTCM-2024-Annual-Report.pdf?rlkey=ea3dz2yh03qzxck665eqdjtnx&dl=0

Please let me know if you have any questions.

Thanks,
Kim

Kim Hempel | *Senior Project Manager*

Pioneer Engineering & Environmental Services, LLC
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2023-2024 Water Level Measurements

Site Parcel	Location and Measurement Date	TOC Elevation (ft NAVD88)	Depth to Water (ft bTOC)	Water Level Elevation
Bulk Terminal	**01MW03**			
	4/7/2023	44.22	10.25	33.97
	6/28/2023		13.03	31.19
	01MW06			
	1/31/2023	47.73	7.90	39.83
	4/7/2023		7.51	40.22
	6/28/2023		10.50	37.23
	2/26/2024		7.22	40.51
	01MW08			
	1/31/2023	45.15	10.48	34.67
	4/7/2023		10.45	34.70
	6/28/2023		13.12	32.03
	01MW12			
	1/31/2023	45.78	1.05	44.73
	4/7/2023		0.45	45.33
	6/28/2023		6.40	39.38
	10/10/2023		3.73	42.05
	2/26/2024		1.27	44.51
	5/15/2024		2.69	43.09
	8/7/2024		7.52	38.26
	01MW17			
	1/31/2023	59.33	16.74	42.59
	4/7/2023		16.38	42.95
	6/28/2023		18.28	41.05
	01MW19R			
	1/31/2023	43.84	11.90	31.94
	4/7/2023		11.90	31.94
	6/28/2023		13.90	29.94
	10/10/2023		13.38	30.46
	2/26/2024		11.48	32.36
	5/15/2024		12.46	31.38
	8/7/2024		13.66	30.18
	11/20/2024		11.51	32.33
	01MW30			
	1/31/2023	44.42	21.41	23.01
	4/7/2023		21.70	22.72
	6/28/2023		22.22	22.20
	10/10/2023		22.20	22.22
	2/26/2024		21.37	23.05
	8/7/2024		22.22	22.20

2023-2024 Water Level Measurements

Site Parcel	Location and Measurement Date	TOC Elevation (ft NAVD88)	Depth to Water (ft bTOC)	Water Level Elevation
Bulk Terminal	**01MW34**			
	4/7/2023	45.21	19.94	25.27
	01MW35			
	1/31/2023	44.55	15.66	28.89
	4/7/2023		16.72	27.83
	6/28/2023		17.28	27.27
	10/10/2023		17.23	27.32
	01MW36			
	1/31/2023	45.19	16.68	28.51
	4/7/2023		17.29	27.90
	6/28/2023		17.49	27.70
	01MW40			
	1/31/2023	49.01	10.61	38.40
	4/7/2023		10.45	38.56
	6/28/2023		14.16	34.85
	10/10/2023		12.40	36.61
	2/26/2024		9.98	39.03
	5/15/2024		11.54	37.47
	8/7/2024		14.88	34.13
	01MW47			
	4/7/2023	43.87	13.15	30.72
	01MW48			
	4/7/2023	44.72	21.10	23.62
	01MW49R			
	1/31/2023	45.20	26.59	18.61
	4/7/2023		25.80	19.40
	6/29/2023		25.86	19.34
	2/26/2024		25.96	19.24
	8/7/2024		26.34	18.86
	01MW51			
	4/7/2023	44.17	20.38	23.79
	01MW66			
	1/31/2023	47.33	4.78	42.55
	4/7/2023		4.70	42.63
	6/28/2023		9.50	37.83
	10/10/2023		7.00	40.33
	2/26/2024		4.50	42.83
	5/15/2024		6.17	41.16
	8/7/2024		9.71	37.62

2023-2024 Water Level Measurements

Site Parcel	Location and Measurement Date	TOC Elevation (ft NAVD88)	Depth to Water (ft bTOC)	Water Level Elevation
Bulk Terminal	**01MW84**			
	1/31/2023	43.62	14.69	28.93
	4/7/2023		15.30	28.32
	6/28/2023		15.71	27.91
	10/10/2023		15.85	27.77
	2/26/2024		14.89	28.73
	5/15/2024		15.09	28.53
	8/7/2024		15.51	28.11
	11/20/2024		15.23	28.39
	01MW86			
	4/7/2023	44.80	14.89	29.91
	01MW87			
	4/7/2023	45.27	13.55	31.72
	01MW88			
	1/31/2023	45.10	16.29	28.81
	4/7/2023		16.90	28.20
	6/28/2023		17.05	28.05
	01MW99			
	1/31/2023	66.01	23.08	42.93
	4/7/2023		22.75	43.26
	6/28/2023		24.84	41.17
	01MW100			
	1/31/2023	63.68	21.40	42.28
	4/7/2023		20.60	43.08
	6/29/2023		22.20	41.48
	10/10/2023		23.01	40.67
	2/27/2024		21.21	42.47
	5/15/2024		20.86	42.82
	8/7/2024		22.59	41.09
	01MW101			
	1/31/2023	44.57	15.22	29.35
	4/7/2023		16.58	27.99
	6/28/2023		17.59	26.98
	01MW102			
	1/31/2023	44.44	16.71	27.73
	4/7/2023		16.67	27.77
	6/28/2023		17.56	26.88
	10/10/2023		17.42	27.02
	2/26/2024		15.73	28.71
	5/15/2024		15.96	28.48
	8/7/2024		16.60	27.84

2023-2024 Water Level Measurements

Site Parcel	Location and Measurement Date	TOC Elevation (ft NAVD88)	Depth to Water (ft bTOC)	Water Level Elevation
Bulk Terminal	**01MW104**			
	1/31/2023	44.12	21.96	22.16
	4/7/2023		22.14	21.98
	6/28/2023		22.93	21.19
	01MW105			
	1/31/2023	46.17	11.00	35.17
	4/7/2023		10.75	35.42
	6/28/2023		11.77	34.40
	01MW109			
	1/31/2023	46.47	15.02	31.45
	4/7/2023		15.01	31.46
	6/28/2023		15.54	30.93
	01MW110			
	1/31/2023	51.94	13.84	38.10
	4/7/2023		13.77	38.17
	6/28/2023		15.05	36.89
	01MW111			
	1/31/2023	46.55	26.65	19.90
	4/7/2023		26.29	20.26
	6/28/2023		26.10	20.45
ASKO Hydraulic	**01MW15**			
	2/1/2023	50.83	19.32	31.51
	4/7/2023		19.20	31.63
	6/28/2023		19.51	31.32
	10/10/2023		19.60	31.23
	2/26/2024		18.87	31.96
	5/15/2024		19.19	31.64
	8/7/2024		19.59	31.24
	01MW46			
	2/1/2023	46.68	22.33	24.35
	4/7/2023		22.37	24.31
	6/28/2023		23.82	22.86
	10/10/2023		23.72	22.96
	2/26/2024		21.96	24.72
	5/15/2024		22.97	23.71
	8/7/2024		23.68	23.00
	11/20/2024		23.02	23.66
	01MW52			
	4/7/2023	43.5	23.08	20.42

2023-2024 Water Level Measurements

Site Parcel	Location and Measurement Date	TOC Elevation (ft NAVD88)	Depth to Water (ft bTOC)	Water Level Elevation
ASKO Hydraulic	**01MW53**			
	2/1/2023	43.11	23.21	19.90
	4/7/2023		22.42	20.69
	6/28/2023		22.70	20.41
	10/10/2023		22.94	20.17
	01MW53R			
	2/27/2024	43.35	21.53	21.82
	5/15/2024		22.02	21.33
	8/7/2024		23.29	20.06
	11/20/2024		22.28	21.07
	01MW56			
	2/1/2023	44.50	19.62	24.88
	4/7/2023		19.63	24.87
	6/28/2023		20.35	24.15
	10/10/2023		20.86	23.64
	2/26/2024		19.26	25.24
	5/15/2024		20.00	24.50
	8/7/2024		20.69	23.81
	01MW57			
	1/31/2023	45.77	25.63	20.14
	4/7/2023		25.74	20.03
	6/28/2023		25.98	19.79
	01MW58R			
	2/26/2024	53.66	25.59	28.07
	5/15/2024		26.21	27.45
	8/7/2024		26.65	27.01
	11/20/2024		26.23	27.43
	01MW61			
	1/31/2023	58.93	27.26	31.67
	4/7/2023		26.94	31.99
	6/28/2023		27.20	31.73
	10/10/2023		27.35	31.58
	2/26/2024		26.74	32.19
	5/15/2024		26.91	32.02
	8/7/2024		27.20	31.73
	01MW80			
	5/15/2024	44.83	22.52	22.31
	8/7/2024		23.15	21.68

2023-2024 Water Level Measurements

Site Parcel	Location and Measurement Date	TOC Elevation (ft NAVD88)	Depth to Water (ft bTOC)	Water Level Elevation
ASKO Hydraulic	**01MW85**			
	1/31/2023	44.05	22.50	21.55
	4/7/2023		22.56	21.49
	6/28/2023		23.00	21.05
	10/10/2023		23.44	20.61
	2/27/2024		22.34	21.71
	5/15/2024		22.93	21.12
	8/7/2024		23.39	20.66
	11/20/2024		23.38	20.67
	01MW89			
	1/31/2023	43.26	22.72	20.54
	4/7/2023		22.85	20.41
	6/28/2023		23.16	20.10
	2/27/2024		22.65	20.61
	8/7/2024		23.45	19.81
	01MW106			
	1/31/2023	43.68	22.30	21.38
	4/7/2023		22.33	21.35
	6/28/2023		22.99	20.69
	10/10/2023		23.47	20.21
	2/26/2024		21.90	21.78
	5/15/2024		22.58	21.10
	01MW107			
	1/31/2023	43.68	22.63	21.05
	4/7/2023		22.73	20.95
	6/28/2023		23.31	20.37
	10/10/2023		24.34	19.34
	2/26/2024		22.44	21.24
	5/15/2024		23.10	20.58
	8/7/2024		23.84	19.84
	11/20/2024		23.92	19.76
	01MW108			
	2/1/2023	44.94	24.36	20.58
	4/7/2023		24.33	20.61
	6/29/2023		25.18	19.76
	2/26/2024		24.32	20.62
	8/7/2024		25.17	19.77
	MW01			
	1/31/2023	46.44	21.95	24.49
	4/7/2023		21.93	24.51
	6/28/2023		22.17	24.27

2023-2024 Water Level Measurements

Site Parcel	Location and Measurement Date	TOC Elevation (ft NAVD88)	Depth to Water (ft bTOC)	Water Level Elevation
ASKO Hydraulic	**MW02**			
	1/31/2023	46.73	24.77	21.96
	4/7/2023		23.84	22.89
	6/28/2023		24.11	22.62
	8/7/2024		24.09	22.64
	MW05			
	2/1/2023	45.82	20.14	25.68
	4/7/2023		20.37	25.45
	6/28/2023		20.99	24.83
	10/10/2023		21.25	24.57
	2/27/2024		19.95	25.87
	5/15/2024		20.65	25.17
	8/7/2024		21.13	24.69
	MW06			
	2/1/2023	45.76	21.38	24.38
	4/7/2023		21.67	24.09
	6/28/2023		22.43	23.33
	10/10/2023		22.50	23.26
	2/27/2024		21.14	24.62
	5/15/2024		22.07	23.69
	8/7/2024		22.60	23.16
	Gravity Well			
	10/10/2023	58.61	30.57	28.04
	5/15/2024		30.08	28.53
	8/7/2024		30.46	28.15
	11/20/2024		30.11	28.50
East Waterfront	**01MW83**			
	4/7/2023	42.67	21.43	21.24
	6/28/2023		22.02	20.65
	10/10/2023		22.78	19.89
	2/26/2024		20.84	21.83
	5/15/2024		21.72	20.95
	8/7/2024		22.32	20.35
	02MW01			
	2/1/2023	24.07	5.45	18.62
	4/7/2023		4.52	19.55
	6/28/2023		5.39	18.68
	02MW03			
	2/1/2023	27.78	8.93	18.85
	4/7/2023		8.00	19.78
	6/28/2023		9.04	18.74

2023-2024 Water Level Measurements

Site Parcel	Location and Measurement Date	TOC Elevation (ft NAVD88)	Depth to Water (ft bTOC)	Water Level Elevation
East Waterfront	**02MW04R**			
	2/1/2023	26.39	7.79	18.60
	4/7/2023		6.73	19.66
	6/29/2023		7.84	18.55
	10/10/2023		8.01	18.38
	2/27/2024		7.66	18.73
	5/15/2024		7.36	19.03
	8/7/2024		8.23	18.16
	02MW07			
	2/1/2023	20.78	2.79	17.99
	4/7/2023		1.70	19.08
	6/29/2023		2.28	18.50
	10/10/2023		2.72	18.06
	2/27/2024		2.46	18.32
	5/15/2024		2.13	18.65
	8/7/2024		2.91	17.87
	02MW13			
	2/1/2023	30.05	8.24	21.81
	4/7/2023		8.53	21.52
	02MW16			
	2/1/2023	27.14	8.01	19.13
	4/7/2023		7.43	19.71
	6/28/2023		8.19	18.95
	10/10/2023		8.37	18.77
	2/27/2024		7.95	19.19
	5/15/2024		7.75	19.39
	8/7/2024		8.44	18.70
	02MW17			
	2/1/2023	20.73	2.07	18.66
	4/7/2023		0.99	19.74
	6/28/2023		2.10	18.63
	10/10/2023		2.27	18.46
	02MW18			
	2/1/2023	23.98	5.28	18.70
	4/7/2023		4.39	19.59
	6/28/2023		5.17	18.81
	10/10/2023		5.62	18.36
	2/27/2024		5.00	18.98
	5/15/2024		4.75	19.23
	8/7/2024		5.73	18.25

2023-2024 Water Level Measurements

Site Parcel	Location and Measurement Date	TOC Elevation (ft NAVD88)	Depth to Water (ft bTOC)	Water Level Elevation
East Waterfront	**02MW19**			
	2/1/2023	21.63	3.02	18.61
	4/7/2023		2.22	19.41
	6/29/2023		2.60	19.03
	10/10/2023		3.21	18.42
	2/27/2024		2.77	18.86
	5/15/2024		2.85	18.78
	8/7/2024		3.43	18.20
	02MW21			
	2/1/2023	20.96	5.91	15.05
	4/7/2023		3.15	17.81
	6/28/2023		3.20	17.76

Abbreviations:

btoc below top of casing
ft feet
NAVD88 North American Vertical Datum of 1988
TOC Top of casing