# Cleanup Action Plan
# Dakota Creek Industries[1]
# Anacortes, Washington

---

*Facility Site ID: 2670*
*Cleanup Site ID: 5147*

[1] This site is listed in Ecology's ISIS database as the Anacortes Port of Dakota Creek. For purposes of this Cleanup Action Plan, the Site is identified as the Dakota Creek Industries Site.

July 2022

# Contact Information

For more information contact:

Toxics Cleanup Program
P.O. Box 47600
Olympia, WA 98504-7600
Phone: 360-407-6000

Washington State Department of Ecology — www.ecology.wa.gov

| | |
|---|---|
| Headquarters, Olympia | 360-407-6000 |
| Northwest Regional Office, Bellevue | 425-649-7000 |
| Southwest Regional Office, Olympia | 360-407-6300 |
| Central Regional Office, Union Gap | 509-575-2490 |
| Eastern Regional Office, Spokane | 509-329-3400 |

# ADA Accessibility

The Department of Ecology is committed to providing people with disabilities access to information and services by meeting or exceeding the requirements of the Americans with Disabilities Act (ADA), Section 504 and 508 of the Rehabilitation Act, and Washington State Policy #188.

To request an ADA accommodation, contact Ecology by phone at 360-407-6000 or email at arianne.fernandez@ecy.wa.gov. For Washington Relay Service or TTY call 711 or 877-833-6341. Visit Ecology's website for more information.

# Cleanup Action Plan
# Dakota Creek Industries

*Facility Site ID: 2670*
*Cleanup Site ID: 5147*

Toxics Cleanup Program

Washington State Department of Ecology

Olympia, Washington

*This page is purposely left blank*

# Table of Contents

# List of Figures and Tables

## Figures

### Tables



# List of Appendices

# List of Acronyms and Abbreviations

| Acronym/Abbreviation | Definition |
|---|---|
| ARAR | Applicable or Relevant and Appropriate Requirement |
| AST | Aboveground storage tank |
| bcy | Bank Cubic Yard |
| bgs | Below ground surface |
| BMP | Best Management Practice |
| CAP | Cleanup Action Plan |
| City | City of Anacortes |
| CFR | Code of Federal Regulations |
| cm | Centimeter |
| CMP | Compliance Monitoring Plan |
| cPAH | Carcinogenic Polycyclic Aromatic Hydrocarbon per MTCA |
| CQAPP | Construction Quality Assurance Project Plan |
| CSM | Conceptual Site Model |
| COC | Contaminant of Concern |
| CUL | Cleanup Level per MTCA |
| DAHP | Department of Archaeology and Historic Preservation |
| DCA | Disproportionate Cost Analysis |
| DCI | Dakota Creek Industries |
| DP | Direct Push |
| Ecology | Washington State Department of Ecology |
| EDR | Engineering Design Report |
| EICMMP | Engineering and Institutional Controls Monitoring and Maintenance Plan |
| EIS | Environmental Impact Statement |
| FS | Feasibility Study |
| GOIA | Governor's Office of Indian AffairsHA Hand Auger |
| HAZWOPER | Hazardous Waste Operations and Emergency Response |
| HPAH | High Molecular Weight Polycyclic Aromatic Hydrocarbons |

| | |
|---|---|
| HSA | Hollow Stem Auger |
| IHS | Indicator Hazardous Substance |
| IDP | Inadvertent Discovery Plan |
| Koc | Soil Organic Carbon-Water Partition Coefficient |
| LPAH | Low Molecular Weight Polycyclic Aromatic Hydrocarbons |
| mg/kg | Milligrams per kilogram |
| Marine Area | Portion of the Site below ordinary high water |
| MLLW | Mean Lower Low Water |
| MS | Manufacturing/Shipping |
| MTCA | Model Toxics Control Act |
| OC | Organic carbon |
| OHW | Ordinary High Water |
| OSHA | Occupational Safety and Health Act |
| PAH | Polycyclic Aromatic Hydrocarbon |
| PCB | Polychlorinated Biphenyl |
| Pier 1 | Port of Anacortes Pier 1 Marine Terminal |
| Pier 2 | Port of Anacortes Pier 2 Marine Terminal |
| PLP | Potentially Liable Party |
| Port | Port of Anacortes |
| POTW | Publicly Owned Treatment Water |
| PQL | Practical Quantitation Limits |
| RCW | Revised Code of Washington |
| RI | Remedial Investigation |
| ROW | Rights-Of-Way |
| SEPA | State Environmental Policy Act |
| Site | Dakota Creek Industries Site |
| SMA | Shoreline Management Act |
| SMS | Sediment Management Standard |
| SVOC | Semi-Volatile Organic Compound |
| SWPPP | Storm Water Pollution Prevention Plan |
| TBT | Tributyltin |

| | |
|---|---|
| TCLP | Toxicity Characteristic Leaching Procedure |
| TDS | Total Dissolved Solids |
| TEE | Terrestrial Ecological Evaluation |
| TEQ | Toxicity Equivalency Quotient |
| TOC | Total Organic Carbon |
| TP | Test Pit |
| TS | Total Solids |
| TVS | Total Volatile Solids |
| µg/L | Micrograms per Liter |
| Upland Area | Portion of the Site above ordinary high water |
| USEPA | United States Environmental Protection Agency |
| UST | Underground Storage Tank |
| VCP | Voluntary Cleanup Program |
| VOC | Volatile Organic Compound |
| WAC | Washington Administrative Code |
| WISHA | Washington Industrial Safety and Health Act |

# Executive Summary

This document presents the Cleanup Action Plan (CAP) for the Anacortes Port Dakota Creek Industries (DCI) Site (Site) generally located between Commercial and R Avenue north of 3rd Street in Anacortes, Washington. While this site is listed in Ecology's ISIS database as the Anacortes Port of Dakota Creek Site, for purposes of this Cleanup Action Plan, it is identified as the Dakota Creek Industries Site. A preliminary CAP for the Site was prepared by the Port of Anacortes (Port) pursuant to an Agreed Order meeting the requirements of the Model Toxics Control Cleanup Act (MTCA) administered by Ecology under RCW 70A.305 and Chapter 173-340 of the Washington Administrative Code (WAC).

The Port completed independent soil cleanups and an Ecology-approved Interim Action (WAC 173-340-430) that removed contaminated soils in the Upland Area and all known contaminated Marine Area sediment. This CAP describes the final cleanup action for the remaining contamination located in the Upland soils and groundwater at the Site and sets forth functional requirements that the cleanup must meet, including follow-up monitoring. The cleanup action schedule will be attached as an exhibit to the Consent Decree.

## Site Background

Since approximately 1879, the Site has been used for shipping, shipbuilding, ship repairs and other maritime-related industrial purposes and has contained various above ground storage tanks (ASTs), a rail spur, and associated buildings including machine shops, welding shops and equipment sheds to support industrial operations. Prior to 2008, the Marine Area contained multiple piers, docks and two marine railway boat lifts.

The west marine railway, located between the East Pier and Pier 1, was removed in the early 1990s. The east marine railway located between the East Pier and Pier 2 was removed in 2008 as part of the Project Pier 1 redevelopment activities. The Project Pier 1 redevelopment activities also included the removal of the L and East Docks and associated structures; dredging of approximately 170,000 cubic yards of sediment to remove sediment contamination and achieve the current navigation depths; installation of 670 linear feet of sheet pile bulkhead to reconfigure the southern shoreline; placement of 250 linear feet of riprap along the basin's east boundary and construction of the Central Pier.

Concurrent with the 2008 redevelopment activities, an interim action cleanup was completed under the terms of an Agreed Order, in accordance with the Ecology-approved RI/FS Work Plan and Interim Action Work Plan Addendum (GeoEngineers 2008) to remove approximately 26,000 cubic yards of contaminated sediment from the Marine Area and contaminated soil from the Upland Area. Cleanup objectives were met at the point of compliance for sediment in the Marine Area; therefore, no further action is required for sediment.

DCI currently operates a shipyard at the Site and leases the property from the Port. DCI uses the facility for vessel construction and maintenance activities. The Site includes a portion of the Port's Pier 1 Marine Terminal, a centrally located outfitting dock (Central Pier), a syncrolift, upland fabrication areas, shops, a sandblast grit storage shed, stormwater treatment facility, warehouses and storage areas. The northern portion of Pier 1 (which is a deep water moorage terminal) is used by DCI to support dry dock operations.

Although the specific future uses of the Site will depend on the operations of the Port's lessees, the anticipated future use of the Site is continued industrial purposes including shipbuilding, ship repairs and other maritime-related industrial business. The property is currently leased to DCI for an additional 37 years.

## Ecology Agreed Order and Regulatory Framework

Environmental studies completed at the Site since approximately 1991 identified that historical activities including vessel moorage, bulk fuel and oil storage, and shipbuilding activities resulted in the release of contaminants to soil, groundwater and sediment. In 1991, 2001 and 2002, independent cleanup actions were completed by the Port to address historical soil contamination.

On December 12, 2007, the Port entered Agreed Order No. DE-07TCPHQ-5080 with Ecology. Under the Agreed Order, the Port was required to complete an interim cleanup action in the Marine Area, evaluate the nature and extent of contamination in affected media on a Site-wide basis and develop and evaluate cleanup alternatives for addressing contamination remaining at the Site.

Completion of the Remedial Investigation/Feasibility Study (RI/FS) Work Plan, RI sampling and analysis, the Marine Area interim action, the RI/FS Report and a draft CAP fulfill the work requirements required of the Agreed Order. Field data collection in accordance with the Ecology-approved RI/FS Work Plan, summary of completed Interim Action activities and an evaluation of cleanup action alternatives are presented in the RI/FS Report (GeoEngineers 2022a).

Implementation of the selected cleanup action (summarized below) will be completed under a Consent Decree between the Port and Ecology.

## Nature and Extent of Contamination

Based on a review of the Upland and Marine Area RI results, contaminants were found at concentrations above preliminary cleanup levels in sediment, groundwater and soil at the Site. Groundwater and sediment results indicate surface water is a transport pathway for contaminants. Surface water was not sampled but instead is addressed through development

of groundwater cleanup levels protective of surface water, and through diversion of non-contact stormwater to a treatment system managed under a National Pollutant Discharge Elimination System (NPDES) permit. For the purposes of this document, we have consolidated terminology regarding preliminary, proposed, and final cleanup levels and address them as cleanup levels.

**Sediment**

Arsenic, copper, lead, mercury, zinc, tributyltin (TBT), low molecular weight PAHs (LPAHs), high molecular weight PAHs (HPAHs), cPAHs, polychlorinated biphenyls (PCBs), dioxin and furans were found above cleanup levels for Marine Area sediment (cleanup levels are listed in Table 3.1). However, interim action dredging and excavation activities completed between July and November 2008 in general accordance with the Ecology-approved RI/FS Work Plan and Interim Action Work Plan Addendum resulted in the removal of identified contaminants exceeding CULs from the Marine Area. Sediment samples collected from the base of the interim action dredge prism and sediment sample results from previous environmental studies within the Marine Area met cleanup level requirements; therefore, the in-water portion of the cleanup at the Site is considered complete and no further action is required.

**Groundwater**

Arsenic, nickel, and cPAHs were identified as groundwater contaminants for the Upland Area. Between 2015 and 2016, DCI replaced a significant portion of their gravel working surface with asphalt pavement which acts to prevent stormwater infiltration through the soil column. RI Groundwater monitoring results show a decrease in groundwater concentration over time which appear to indicate that the paved surfaces are limiting the infiltration, leaching and subsequent migration of contaminants through the soil column to groundwater. In addition, this data show that contaminants that remain in place in saturated zone soils have stabilized and are limiting migration downgradient toward the Guemes Channel since paving was completed.

Petroleum and chromium were detected in groundwater above cleanup levels; however, monitoring results collected during the RI show petroleum and chromium concentrations decreased over time to below cleanup levels.

**Soil**

Arsenic and nickel, and cPAHs were identified as soil contaminants for the Upland Area. In the eastern portion of the Site, arsenic and nickel exceeded CULs in fill deposits from the ground surface down to a depth of approximately 8 feet below ground surface (bgs). In the north central portion of the Site, arsenic and nickel exceeded CULs in fill deposits from the ground surface down to a depth of approximately 10 feet bgs. In the central portion of the Site, total cPAH calculated using the toxicity equivalency quotient (TEQ) methodology exceeded the soil cleanup level in historical fill deposits between approximately 5 and 13 feet bgs. In the south-central portion of the Site, arsenic exceeded the soil cleanup levels in historical fill deposits from between approximately 5 and 8 feet bgs. In the western portion of the Site, arsenic and

nickel exceeded the CUL in fill deposits from the ground surface down to a depth of approximately 10 feet bgs. Results of soil/sediment samples collected at the Site from the underlying native surface show that the Upland Area CUL exceedances are limited to the overlying fill soil and do not extend to the underlying native surface.

Petroleum was also found in soils above cleanup levels; however, previous independent cleanup actions as described in section 2.4 removed these contaminants. Appendix A includes verification sampling data showing their associated cleanup levels were met for the Site.

**Surface Water**

Stormwater is either collected and treated before permitted discharge to Guemes Channel or infiltrates into the soil. The onsite stormwater treatment facility is overseen by Ecology's Water Quality Program. Collected stormwater does not come into contact with historically contaminated soils; therefore, no further remedial action is required under this CAP to be protective of the surface water pathway. The groundwater to surface water pathway is addressed via groundwater cleanup levels established for the Site, which will be protective of the surface water cleanup levels.

# Cleanup Action Plan Overview

Potentially applicable response actions and associated remediation technologies were identified and screened for the development of cleanup action alternatives to address contaminants in two mediums at the Site (soil and groundwater)[1]. When determining the final cleanup objectives and mediums that require further cleanup actions under this CAP, Ecology incorporated actions completed during Project Pier 1 redevelopment, independent cleanup actions, and interim cleanup actions in the Marine Area and Upland Area of the Site.

The screening process determined the most appropriate technologies and process options based on their expected implementability, reliability, effectiveness, and relative cost. Screening also considered modifying criteria associated with current and future land uses, consideration of potential historical and archaeological remains, and impacts to existing habitat resources. Cleanup action alternatives were then developed by combining technologies retained through the screening process to meet the Site cleanup standards. The design parameters used to develop the alternatives were based on both engineering judgment and the current knowledge of Site conditions and are conceptual-level designs for the implementation of the individual technologies. In accordance with the requirements of WAC 173-340-350 and WAC 173-340-360, cleanup action alternatives were evaluated against the following criterion:

[1] As previously discussed, interim action dredging and excavation activities completed in 2008 removed sediment contaminants exceeding CULs from the Marine Area. Sediment samples collected from the base of the interim action dredge prism and sediment sample results from previous environmental studies within the Marine Area provide the basis for sediment not being considered a medium of concern for the Site.

- Compliance with cleanup standards and applicable laws;
- Provision for a reasonable restoration time frame; and
- Use of permanent solutions to the maximum extent practicable by comparison of the following:
    - Protectiveness;
    - Permanence;
    - Cost;
    - Effectiveness over the long term;
    - Short-term risk management;
    - Net environmental benefit;
    - Technical and administrative implementability; and,
    - Consideration of public concerns.

A MTCA disproportionate cost analysis (DCA) was then completed to determine which cleanup action alternative that otherwise meets the threshold requirements, achieves the highest level of environmental benefit while not being disproportionate in cost relative to the other alternatives.

## Selected Cleanup Action

As a result of the cleanup action evaluation and screening process in the RI/FS, Cleanup Action Alternative 2 emerged as the preferred alternative which meets the minimum threshold requirements, achieves a high level of environmental benefit and is not disproportionate in cost relative to the other alternatives evaluated. Implementation of Cleanup Action Alternative 2 will result in contaminant mass reduction and will be used in conjunction with containment technologies and institutional controls to prevent direct human contact and reduce the potential for leaching and migration of residual contamination to surface water within a reasonable restoration time frame. As detailed below, Ecology reviewed the interim action completed for the Marine Area sediment and determined no further actions are required to meet cleanup levels.

In general, the selected remedy includes the removal of contaminant source area soil in which detected concentrations have the greatest potential to adversely impact groundwater. Remaining contamination at the Site will remain isolated below existing protective barriers (pavement caps) to prevent contact with Site workers, and institutional controls will be established to maintain the protective caps, prevent the use of groundwater as drinking water, and restrict or manage appropriately, potential future ground disturbances. Compliance monitoring will then be performed to verify the effectiveness of the removal action. At present,

the existing monitoring results indicate that groundwater is in compliance with the cleanup standards at the conditional point of compliance separating the upland and marine portions of the Site. Long-term groundwater monitoring at the Site will be used to evaluate groundwater conditions over-time and assess contaminant concentrations relative to the cleanup standards and further natural attenuation of contaminants.

Consistent with Chapter 70A.305 Revised Code of Washington (RCW), as implemented by WAC 173-340, Ecology has determined that the selected Site cleanup action is protective of human health and the environment, will attain federal and state requirements that are applicable or relevant and appropriate, complies with cleanup standards, and provides for compliance monitoring. In addition, the selected cleanup action satisfies the preference expressed in WAC 173-340-360 for the use of permanent solutions to the maximum extent practicable and provides for a reasonable restoration time frame. It is anticipated to be completed within 1-2 years from finalization of this Cleanup Action Plan.

# 1.0 Introduction

This document presents the Cleanup Action Plan (CAP) for the Dakota Creek Industries Site (Site) located in Anacortes, Washington. The general location of the Site is shown in Figure 1.1. This CAP has been prepared pursuant to requirements of the Model Toxics Control Cleanup Act (MTCA) administered by the Washington State Department of Ecology (Ecology) under 70A.305 RCW and Chapter 173-340 of the Washington Administrative Code (WAC). This CAP provides a description of the cleanup action and sets forth functional requirements that the cleanup must meet to achieve the cleanup action objectives for the Site. The cleanup action schedule will be attached as an exhibit to the Consent Decree.

## 1.1 General Facility Information and Site/Property Definitions

| | |
|---|---|
| Site Name: | Anacortes Port of Dakota Creek |
| Facility Site ID No.: | 2670 |
| Cleanup Site ID No.: | 5147 |
| Property Address: | 115 Q Avenue, Anacortes, Washington |
| Coordinates: | N48.520606°, W122.610640° |
| Township/Range: | NW¼, S18, T35N, R2E, |
| Parcel Numbers: | P32866, P32867, P32903, P32904, P32905, P32906, P32907, P54924, P55030, P55031, P56539 |
| Owner: | Port of Anacortes |

The Site, as defined under the MTCA is where a hazardous substance has been deposited, stored, disposed of, or placed, or has otherwise come to be located. The Site includes the parcels listed above.

Dakota Creek Industries (DCI) currently leases multiple property parcels from the Port of Anacortes (Port) which are located within the Site boundary. These parcels are used for shipyard operations including vessel construction and maintenance activities (Figure 1.2). The lease area includes a portion of the Port's Pier 1 Marine Terminal, a centrally located outfitting dock (Central Pier), a syncro-lift, upland fabrication areas, shops, a sandblast grit storage shed, stormwater treatment facility, warehouses and storage areas. The northern portion of Pier 1 (which is a deep-water moorage terminal) is used by DCI to support dry dock operations. Current DCI operations and Site features are shown on Figure 1.3.

The parts of the Site offshore of Ordinary High Water (OHW) of the Site (henceforth referred to as the Marine Area) is located between the Port's Pier 1 and Pier 2 Marine Terminals (Pier 1 and Pier 2) and is maintained with a navigation depth of approximately -35 feet Mean Lower Low Water (MLLW) to support shipyard operations. To the west and south, the Marine Area is

separated from the uplands by vertical sheet pile bulkheads. To the east, the Marine Area is bound by Pier 2 which is an earth fill structure and a pile supported wharf along the northern most part of the facility. The slope of the earth fill is armored with large rock (riprap).

The parts of the Site landward of OHW (henceforth referred to as the Upland Area) are relatively flat with a ground surface elevation of approximately 15 feet MLLW. Most of the upland area is paved with asphalt or concrete. The limited unpaved parts of the Upland Area consist of a crushed gravel working surface that is maintained for fabrication layout and heavy equipment operations. Public access to the shipyard facility and the Port's Pier 1 and Pier 2 facilities is restricted with fencing, signage and security guards.

## 1.2 Regulatory Framework

Environmental studies completed at the Site since approximately 1991 have identified that historical uses including vessel moorage, bulk fuel and oil storage, and shipbuilding activities resulted in the release of contaminants to soil, groundwater and sediment.

On December 12, 2007, the Port entered into Agreed Order No. DE-07TCPHQ-5080 with Ecology. Pursuant to the Agreed Order, the Port completed a Remedial Investigation (RI) and Feasibility Study (FS) to:

- Evaluate the nature and extent of contamination in the affected media on a Site-wide basis;
- Complete an interim cleanup action in the Marine Area addressing identified sediment contamination; and to
- Develop and evaluate cleanup alternatives for addressing identified Upland Area contamination.

A detailed description of the previous environmental studies completed, the interim action activities performed, evaluation of the nature and extent of contaminants, and selection process for a preferred remedial alternative meeting the MTCA threshold requirements are presented in the RI/FS Report (GeoEngineers 2022a).

## 1.3 Purpose

A CAP is required as part of the Site cleanup process under MTCA Cleanup Regulations (Chapter 173-340 WAC). The purpose of the CAP is to identify the cleanup action for the Site. More specifically, this plan:

- Describes the Site;
- Summarizes current Site conditions;
- Summarizes the cleanup action alternatives considered in the remedy selection process;

- Describes the selected cleanup action for the Site and the rationale for selecting the alternative;
- Identifies Site-specific cleanup levels and points of compliance for each hazardous substance and medium of concern for the cleanup action;
- Identifies applicable state and federal laws for the cleanup action;
- Identifies residual contamination remaining on the site after cleanup (if applicable) and restrictions on future uses and activities at the site to ensure continued protection of human health and the environment;
- Discusses compliance monitoring requirements and contingencies; and
- Presents the schedule for implementing the CAP.

## 1.4 Cleanup Action Determination

Ecology has determined that the cleanup action described in this CAP will comply with the requirements for selection of a remedy under WAC 173-340-360. Specifically, these requirements include a cleanup action that will be protective of human health and the environment, attain federal and state requirements that are applicable or relevant and appropriate, comply with cleanup standards, provide for compliance monitoring, use permanent solutions to the maximum extent practicable, provide for a reasonable restoration time frame, and consider public concerns.

# 2.0 Summary of Site Conditions

## 2.1 Historical Operations and Use

The Site has been used for shipping, shipbuilding, ship repairs and other maritime-related industrial purposes since approximately 1879. Historically, various above ground storage tanks (ASTs), a rail spur, and associated buildings including machine shops, welding shops and equipment sheds were located at the Site to support industrial operations (Figure 2.1). Historical records indicate that a bulk oil storage and distribution facility with at least six ASTs was in operation in the central upland portion of the Site and that Pacific Tow Boat leased this portion of the Site to Standard Oil in between 1946 and 1969 who operated the bulk oil storage and distribution facility after which it was sold to the Dillingham Corporation. The Port acquired portions of the Site from the mid-1940s to the mid-1970s. By the mid-1970s, the structures associated with the bulk oil storage and distribution facility had been removed.

The southwest portion of the Site was historically used for residential purposes from the early 1900s until the late 1960s. In this area, the ground surface in this area was lower that the surrounding areas by several feet. Following the purchase of this area by the Port in 1975, the grade was raised to match the surrounding area using dredged sediments from the Guemes Channel. In about 1976, DCI began to lease the Site from the Port and has continued to operate the shipyard facility since that time.

Prior to 2008, multiple piers and docks and two marine railways used to lift vessels out of the water were located in the Marine Area (Figure 2.1). The west marine railway, located between the East Pier and Pier 1, was removed in the early 1990s. The east marine railway located between the East Pier and Pier 2 was removed in 2008 as part of the Project Pier 1 redevelopment activities. The Project Pier 1 redevelopment activities included the removal of L and East Docks, the east marine railway and associated marine structures, dredging of approximately 170,000 cubic yards of sediment to achieve removal of contaminated sediments and the current navigational depth of the Marine Area, installation of 670 linear feet of sheet pile bulkhead (open cell bulkhead) to reconfigure the southern shoreline, placement of 250 linear feet of riprap along the Marine Area's east boundary and construction of the Central Pier.

## 2.2 Current Conditions, Utilities and Use

Many of the historical structures/facilities noted in the previous section have been demolished and removed. The DCI lease area currently has three warehouses (No. 4, 9 and 10), sand shed, shop, paint storage shed, stormwater treatment facility and guard station at the main entrance located at the interception of Q Avenue and 3rd Street (Figure 1.3). In addition, multiple modular shelters are used at the Site. The location of these modular shelters varies and is dependent on DCI operations to support vessel construction and maintenance activities.

Typical of industrialized waterfronts, sections of the shoreline adjacent to the Site are armored with riprap or are separated from the Marine Area with sheet pile bulkheads to prevent erosion. In the Upland Area, the ground surface is mostly paved with asphalt or concrete. In limited portions of the Upland Area, the ground surface consists of a crushed gravel working surface that is maintained for fabrication layout and equipment storage.

There is little or no stormwater run-on to the Site, and precipitation falling onto the DCI lease area is captured by a network of stormwater drains and is treated at the facility prior to permitted discharge to Guemes Channel or the City of Anacortes (City) sanitary sewer. In the limited areas that are unpaved, stormwater infiltrates into the ground.

DCI currently has connections for power, water, sewer, and communications which extend into the adjacent rights-of-way (ROW), including Commercial Street and 3rd Avenue. DCI also maintains utilities including compressed air and electrical to support vessel construction and marine maintenance operations.

## 2.3 Future Land Use

At present, the property parcels containing the Site and adjacent properties are zoned by the City for industrial use (Manufacturing/Shipping [MS]) and are characterized by marine shipping, warehousing, bulk material storage, transportation, and other industrial uses. Although the specific future use of the Site is dependent on the operations of the Port's lessees, it is likely to continue to be for industrial purposes including shipbuilding, ship repairs and other maritime-related industrial business. Currently, the Port maintains a lease with DCI that extends through 2055 (an additional 34 years).

## 2.4 Environmental Studies and Previous Cleanup Actions

Various investigation and cleanup activities have been conducted at the Site since approximately 1991. The RI/FS report (GeoEngineers 2022a) describes previous environmental studies and cleanup actions performed as independent remedial actions prior to 2008, Ecology Agreed Order RI activities and the results of the 2008 Marine Area Interim Action. The purpose of the RI was to collect, develop, and evaluate sufficient information to allow the selection of an appropriate cleanup action for the Site. The purpose of the 2008 Marine Area Interim action was to remove sediment contamination within the Marine Area to allow the Port's Project Pier 1 Redevelopment to dredge to improve navigation. More recent soil sampling data (March 2021) collected following completion of the RI/FS is presented in Appendix A of this CAP. The March 2021 sampling event was completed to verify the completeness of previous cleanup actions performed at the Site.

Environmental studies performed to evaluate Site conditions for the Upland and Marine Areas, previous cleanup actions and interim action dredging activities are summarized in the following sections.

### 2.4.1 Marine Area Environmental Studies and Interim Action

Environmental investigations completed to assess sediment quality in and near the Marine Area included:

- Phase 2 Environmental Assessment (Otten Engineering 1997)
- Dredge Material Characterization (Anchor 2004)
- Marine Area Surface Dioxin Study (Floyd|Snider 2007)
- Fidalgo Bay Sediment Investigation (SAIC 2008)
- Ecology Agreed Order Remedial Investigation (GeoEngineers 2010)

These sediment investigations have resulted in the collection of surface samples ranging between 0 and 20 centimeters (cm) below the mudline at 20 locations and the collection of subsurface samples ranging between 3 and 7 feet below the mudline surface at 10 locations. Sediment samples were submitted for a combination of analyses including total organic carbon (TOC), total volatile solids (TVS), total solids (TS), and grain size, ammonia, sulfides, Sediment Management Standard (SMS) metals, semi-volatile organic compound (SVOCs), polycyclic aromatic hydrocarbons (PAHs), volatile organic compound (VOCs), polychlorinated biphenyls (PCBs), pesticides, tributyltin (TBT), and dioxins and furans.

In 2008, under the terms of Agreed Order No. DE-07TCPHQ-5080, the Port performed an interim action in the Marine Area in conjunction with the Port's Project Pier 1 Redevelopment to remove contaminated sediment from the Marine Area identified by the RI and previous studies. In addition, contaminated soil from the Upland Area based on sample results from environmental studies (summarized below) were removed as part of the installation of new underground utility infrastructure at the Site. The interim action included dredging to remove contaminated sediment deposits and up to 30 feet of native glaciomarine deposits. Confirmational sampling indicates that no identified sediment contamination above cleanup levels remains at the Site and no further action is required for sediments.

Sediment sampling locations within the Marine Area and the limits of the 2008 Interim Action are shown on Figure 2.2. Sediment stratigraphy prior to and following Marine Area dredging completed as part of the Interim Action and Project Pier 1 Redevelopment is shown on Figure 2.3.

### 2.4.2 Upland Area Studies and Cleanup Actions

Environmental investigations completed to assess soil and groundwater conditions in the Upland Area included:

- Phase 2 Environmental Site Assessment (Otten Engineering 1997)
- EPA Site Inspection (Weston 2001)
- Remedial Investigation Study (Landau 2002)
- Groundwater Characterization Study (Floyd|Snider 2007)
- Ecology Agreed Order Remedial investigation (GeoEngineers 2010)
- Supplemental Groundwater Investigation (GeoEngineers 2014)
- Upland Soil Data Gap Investigation (GeoEngineers 2015)
- Semi-Annual Groundwater Investigation (GeoEngineers 2018)
- Final RI/FS Report (Geoengineers 2022a)
- Supplemental Soil Investigation Data Report (Geoengineers 2022b)

Initial soil sampling in October 1991 following the removal of two underground storage tanks (USTs) located near the south end of L (Figure 2.1). During the removal of these tanks, approximately 20 cubic yards of petroleum impacted soil was removed from this area and transferred from the Site for landfill disposal. Verification sample results were reported below cleanup levels at the final excavation limits confirming the removal of the petroleum impacted soil observed during tank removal activities.

Between July 1997 and October 2001, additional investigations were performed at the Site to evaluate soil and groundwater conditions. As part of these environmental studies, a total of 98 soil samples were collected from 42 locations. In addition, two rounds of groundwater monitoring were completed at four wells between early September and late October 2001. Samples were submitted for a combination of chemical analysis including total/dissolved metals, gasoline-, diesel- and heavy oil-range petroleum hydrocarbons, VOCs, SVOCs including PAHs, pesticides and PCBs based on review of historical activities at the Site. Based on the investigation results, two separate cleanup actions were performed to address soil contamination:

- **2001 Hydraulic Winch Cleanup Action** – In 2001, a hydraulic winch and its timber frame located near the south end of the east marine railway were removed from the Site. During removal of this structure and associate components, approximately 30 cubic yards of petroleum impacted soil were excavated and transferred from the Site for landfill disposal. Verification samples at the final excavation limits were obtained to confirm the removal of the petroleum impacted soil observed during removal of the hydraulic winch and associated timber frame.
- **2002 Petroleum and Marine Railway Cleanup Actions** – In 2002, the Port completed cleanup actions to address known soil contamination in the Petroleum Cleanup Action Area extending from the aluminum shop (building formerly identified as the equipment

maintenance shed) to the former bulk fuel storage ASTs; and the Marine Railway Cleanup Action Area located near the eastern marine railway structure. Cleanup actions to remove soil contamination (approximately 1,650 cubic yards) in these areas were completed under Ecology's Voluntary Cleanup Program (VCP). Verification samples at the final excavation limits were obtained to confirm the removal of the petroleum impacted soil from these areas.

Although verification sampling completed as part of these previous cleanup actions confirmed the removal of the petroleum-related contamination from these areas, the technical quality of these data could not be independently verified because the original laboratory data was not available for the RI/FS. As a result, the Port performed additional sampling and analysis within these areas in 2021 to confirm the previous removal of the petroleum-related contamination and to demonstrate that the previous removals meet the overall cleanup action objectives for the Site. Supplemental soil sampling activities are summarized in Appendix A. The supplemental soil sample results are below cleanup levels and confirms the completeness of the previous cleanup actions.

As described above, approximately 572 cubic yards of arsenic contaminated soil located on the east side of the site was removed during the 2008 Interim Action. Following completion of the 2008 Interim Action and reconfiguration of the DCI shoreline, the Upland Area Agreed Order RI soil and groundwater sampling activities were performed by the Port. The soil RI included the collection of samples from the Site using a combination of hollow stem auger (HSA) drilling, direct push (DP) drilling, test pit (TP) and hand auger (HA) drilling technologies. In June 2008, subsurface soil samples were collected from eleven HSA explorations, ten test pit explorations and three hand auger explorations to meet the objectives of the Ecology-approved RI/FS Work Plan.

In addition, the Port completed quarterly groundwater monitoring at MW-1 through MW-7 between May 2012 and February 2013 to evaluate whether previously identified contaminants in soil were adversely effecting groundwater. The results of the quarterly groundwater monitoring activities identified concentrations of arsenic, nickel and carcinogenic PAHs (cPAHs) exceeding cleanup levels established in the RI/FS Report for groundwater during one or more quarterly monitoring events. In 2014, a supplemental soil investigation was completed to further characterize the nature and extent of these contaminants in soil. During this supplemental soil investigation, 43 DP explorations were completed to further evaluate subsurface soil conditions.

Due to inconclusive evidence linking contaminant exceedances identified in soil to contaminant exceedances in groundwater, four additional rounds of groundwater monitoring were completed between February 2016 and August 2017 on a semi-annual basis to further evaluate the potential source of soil contamination to groundwater. In addition, a new monitoring well (MW-8) was installed north of MW-1 to serve as the point of compliance. To avoid potential

utilities, structural obstructions and minimize impacts to DCI's operations, MW-8 was positioned within Warehouse 9 located west of the Syncrolift Pier in an area which soil and groundwater conditions had not been previously evaluated. Three additional DP explorations were completed in July 2018 to evaluate soil conditions adjacent to and upgradient from monitoring well MW-8 based on the detected concentrations of arsenic and cPAHs in groundwater at this location.

Soil and groundwater sampling locations and the location of previous cleanup action areas are shown on Figure 2.4. Soil stratigraphy at the Site based on the result of the RI and previous studies is shown on Figure 2.5.

## 2.5 Human Health and Environmental Concerns

In accordance with WAC 173-340-700(5), the following criteria were considered when developing cleanup levels for a medium at the Site to evaluate human health and environmental concerns:

- Current and potential exposure pathways and potential receptors.
- Current and potential land resource use.
- Nature and extent of contamination.

These criteria also provide the substantive components of the Conceptual Site Model (CSM), as defined in WAC 173-340-200. Mediums, potential contaminant source, release and transport mechanisms, and exposure routes for the Site are illustrated in Figure 2.6.

Potential exposure pathways and receptors, and contaminants under evaluation for the Upland Area mediums (soil and groundwater) are summarized below. Further details and sources of the information presented in this section are provided in the RI/FS Report (GeoEngineers 2022a). Measures to protect surface water and sediment are included when determining appropriate cleanup levels and points of compliance for groundwater and soils.

Sediment was evaluated during the remedial investigation and subsequent interim actions. Sediment data results showed contamination above cleanup levels was discharged to Guemes Channel. This prompted an interim action dredge in 2008. Based on the sediment sample results representative of the post-dredge condition, contaminant concentrations exceeding SMS cleanup levels in sediment were removed from the Marine Area. Due to the completeness of the 2008 Interim Action dredging and subsequent dredging of up to 30 additional feet of underlying native material, no current sediment contamination is known to be present. Therefore, as the result of the 2008 Interim Action, no further action is proposed for sediment.

Sediment contamination shows that stormwater to surface water is a transport pathway for the site. Several upgrades and site modifications now treat or limit stormwater discharge to

Guemes Channel. Storm water either infiltrates into the remaining gravel surfaces and is contained in groundwater behind a bulkhead, or it is collected, treated, and discharged to Guemes Channel under a National Pollutant Discharge Elimination System (NPDES) permit.

### 2.5.1 Soil Conceptual Site Model

#### 2.5.1.1 Soil Conditions

Site soils consist of multiple layers of fill overlying native marine sediment and glacial deposits. Recent fill deposits included material placed as part of the Project Pier 1 Redevelopment activities resulting in the expansion of the Upland Area northward of the historical shoreline after completion of the interim action dredging. To facilitate the infilling of this area, an open cell bulkhead was installed and the area behind the wall was backfilled to match the surrounding upland grade with clean imported material to meet the project design requirements. In other portions of the Site, historical fill deposits comprised of layers of sand, silty sand and silt with variable gravel content ranging from approximately 2 to 16 feet thick were likely placed during initial shoreline development in the 1960s to extend the historical shoreline northward. Contained in the historical fill deposits are occasional debris including concrete asphalt, brick and wood fragments. Historical fill deposits generally increase in thickness north of 3rd Street. Clean fill was also placed in the previously completed cleanup action excavations.

The southwestern portion of the Site was used for residential purposes from before 1925 until after approximately 1966 and was topographically lower than the surrounding ground surface until 1975. In 1975, this area was infilled with up to 7 feet of layered silt, clay and silty sand deposits with occasional wood debris and is commonly referred to as the 1975 Earth Fill Area.

Underlying the fill materials across the Site are native beach sands overlying glacial deposits. The beach sand deposits are typically poorly sorted and loose in nature and vary in thickness from 2 to 4 feet. Glacial deposits consist of a medium dense glaciomarine drift with varying amounts of silt, sand, and gravel that extend to all depths explored.

#### 2.5.1.2 Potential Contaminant Source

Potential sources of soil contaminants at the Site include 1) surface leaks/spills from current and/or historical Site operations, 2) contaminated fill material placed during historical infilling of the Site, and 3) atmospheric deposition from off-site sources. Potential transport/secondary release mechanisms from the contaminated soil include leaching to groundwater and the migration of contaminants in groundwater to surface water through discharges at the shoreline.

#### 2.5.1.3 Exposure Pathways and Receptors

The shoreline adjacent to the Site is armored with riprap or sheet pile bulkhead. In the Upland Area, the ground surface is mostly paved with asphalt or concrete. In limited portions of the

Upland Area, the ground surface consists of a crushed gravel working surface that is maintained for fabrication layout and equipment storage. A terrestrial ecological evaluation (TEE) determined that the existing land surface (asphalt, concrete, compacted gravel, buildings, etc.) at the Site and surrounding area make substantial wildlife exposure unlikely. During a visit in August 2008 to observe the condition of the Site, Ecology confirmed that the working surface provided little to no habitat value. Additional paving of the previous gravel surfaces has occurred since that time, further reducing the potential for habitat at the Site. Currently, the Site contains little to no vegetation that would serve as riparian or terrestrial habitat.

Based on current and future Site use, potential exposure pathways and receptors for contaminants in soil include:

- Contact (dermal, incidental ingestion or inhalation) by Site workers (including workers excavating soil); and
- Leaching of contaminants contained within the soil column to groundwater.

Visitors and terrestrial wildlife are not considered potential receptors of concern because access is limited to authorized personnel performing work at the Site, and because pavement and gravel working surfaces limit the area of suitable terrestrial habitat.

#### 2.5.1.4 Cleanup Level and Point of Compliance

The Site meets the definition of an industrial property under MTCA (WAC 173-340-200) as it is zoned for industrial use and is used for industrial purposes. The surrounding properties are also zoned and used for industrial land use purposes. The Site also meets the requirements for use of industrial cleanup levels for soil as hazardous substances remaining at the property do not pose a threat to human health and the environment in nearby non-industrial areas (WAC 173-340-745[1][a][iii]). Residential areas are not located in proximity to the Site and the land use in the surrounding area restricts access to the Site. Access to the Site is also restricted through fencing and secure gates.

Based on zoning, current and anticipated future land use, soil cleanup levels were developed based on the most applicable conservative (lowest) published values from the following:

- MTCA standard Method C soil cleanup levels for industrial land use – soil direct contact (WAC 173-340-745(5)(b)(iii)(B)).
- MTCA Method A soil cleanup levels for industrial land use (WAC 173-340-745[3]) are used for analytes without Method C soil cleanup levels, which include lead and petroleum hydrocarbons.
- Soil to groundwater transport pathway cleanup level using the MTCA fixed parameter three-phase partitioning model (WAC 173-340-747[4]) using default assumptions provided in WAC 173-340-747(4)(b) (Equation 747-1 and Equation 747-2) for saturated zone soils and

Ecology default model input parameter values (soil organic carbon-water partition coefficient [Koc] and Henry's Law constants [H]).

- MTCA guidance document Polycyclic Aromatic Hydrocarbons and Benzo[a]pyrene: Changes to MTCA Default Cleanup levels for 2017 that provides updated toxicity values for benzo[a]pyrene and cPAH mixtures. This was developed to support Ecology's Cleanup Levels and Risk Calculation tool and revised on July 2021.

In accordance with WAC 173-340-705(6), the cleanup levels were adjusted as necessary based on background concentrations and practical quantitation limits (PQLs) such that the soil cleanup level shall not be set at a level below the natural background concentration or the PQL, whichever is higher. Natural background concentrations (except for arsenic) are referenced from Ecology Publication 94-115 "Natural Background Soil Metals Concentrations in Washington State" (Ecology 1994) using 90$^{th}$ percentile values published for the Puget Sound Basin. Natural background for arsenic is established in regulation and published as the MTCA Method A value. Soil PQLs are referenced from an Ecology-accredited laboratory.

Because soil cleanup levels developed for the Site are based on the protection of surface water via groundwater and protection of sediment via groundwater transport pathways, the point of compliance for the soil is throughout the soil column in accordance with WAC 173-340-740(6)(b).

#### 2.5.1.5 Contaminants

Soil contaminants were identified by comparing soil analytical results to cleanup levels at the point of compliance described above. All analytical data (including previously collected samples) collected from the Site that could be verified for technical quality were used to evaluate soil conditions. When evaluating cPAH mixtures (benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, and dibenzo(a,h)anthracene), toxicity equivalency quotients (TEQs) were calculated for each sample with the corresponding result compared to the most conservative cleanup level for benzo(a)pyrene (WAC 173-340-708).

As a result of the screening process, soil concentrations of arsenic, nickel and cPAHs were detected at concentrations greater than the cleanup levels presented in the following table and are identified as Site indicator hazardous substances for soil.

**Table 2.1: Soil Cleanup Levels**

| COC | Cleanup Level | Unit |
|---|---|---|
| **Arsenic** | 20 | mg/kg |
| **Nickel** | 48 | mg/kg |

| | | |
|---|---|---|
| **Total cPAH TEQ – Vadose Zone** | 2 | mg/kg |
| **Total cPAH TEQ – Saturated Zone** | 0.1 | mg/kg |

Notes:
TEQ – toxic equivalency quotient
mg/kg – milligrams per kilogram

In the eastern portion of the Site, arsenic and nickel were detected at concentrations greater than the cleanup level in fill deposits from the ground surface down to a depth of approximately 8 feet below ground surface (bgs). In the north central portion of the Site, arsenic and nickel exceeded the cleanup level in fill deposits from the ground surface down to a depth of approximately 10 feet bgs. In the south and central portions of the Site, total cPAH TEQ concentrations exceeded the soil cleanup level in historical fill deposits between approximately 5 and 13 feet bgs. In the south-central portion of the Site, arsenic exceeded the soil cleanup levels in historical fill deposits from between approximately 5 and 8 feet bgs. In the western portion of the Site, arsenic and nickel exceeded the cleanup level in fill deposits from the ground surface down to a depth of approximately 10 feet bgs. Results of samples collected at the Site from the underlying native surface show that the Upland Area cleanup level exceedances are limited to the overlying fill soil and do not extend to the underlying native surface.

In addition, the results of previous environmental studies identified concentrations of gasoline-, diesel- and/or heavy oil-range petroleum hydrocarbons exceeding CULs in historical fill deposits from the ground surface to a depth of approximately 8 feet bgs in the central and eastern portions of the Site. As previously discussed, the independent cleanup actions performed by the Port in these areas resulted in the removal of petroleum-related contamination, and also likely resulted in the removal of arsenic, nickel and cPAH contamination within these areas. Supplemental soil investigation results presented in Appendix A confirm the completeness of these previous cleanup actions. Therefore, gasoline-, diesel- and/or heavy oil-range petroleum hydrocarbons are no longer considered Site contaminants for soil.

The nature and extent of arsenic, nickel and cPAHs in soil at the Site is illustrated on Figures 2.7 through 2.9.

### 2.5.2 Groundwater Conceptual Site Model

#### 2.5.2.1 Groundwater Conditions

One shallow water-bearing hydrogeologic unit was identified at the Site. The shallow water-bearing unit occurs in the fill material at a depth of approximately 3 to 10 feet bgs (3 to 19 feet saturated thickness) across the Site. The confining unit, which underlies the shallow water-bearing unit, consists of native glaciomarine silt, sand and gravel deposits.

The predominant groundwater flow direction for the shallow water-bearing unit is to the north toward Guemes Channel. Tidal study results indicate that there is limited communication between tidally influenced marine water (Guemes Channel) and shallow groundwater at the Site except within approximately 150 feet of the shoreline. As part of the 2008 Interim Action, an open cell bulkhead was installed in the central portion of the Site to extend the Upland Area northward and create additional land to facilitate DCI operations. As a result, the open cell bulkhead (which now separates the Upland Area from the Marine Area) provides a physical barrier that restricts the direct discharge of groundwater north to Guemes Channel.

#### 2.5.2.2 Potential Contamination Sources

The primary source of groundwater contaminants at the Site is leachate from contaminated soil. Site contaminants can be transported from the source areas and distributed by dispersive (solution) and advective (movement) transport mechanisms within the saturated zone. Capillary and adsorption forces are also present at and above the water table, causing contaminants to be retained in and onto fine-grain soils located above and below the saturated zone. These forces are affected by factors such as soil grain size, soil permeability, soil porosity, sorption/retardation characteristics of the soil, the volume of the release, and biodegradation of the contaminants.

Potential transport/secondary release mechanisms from contaminated groundwater include groundwater discharge into the adjacent marine surface water body (Guemes Channel) and contaminant volatilization into soil gas.

#### 2.5.2.3 Groundwater Exposure Pathways and Receptors

In accordance with WAC 173-340-720(2), groundwater in the area of the Site is not a viable source of drinking water and is considered non-potable. Specifically, the groundwater at the Site is not a viable source of drinking water based on the following criteria:

- WAC 173-340-720(2)(a): Groundwater at the Site and surrounding area does not serve as a current source of drinking water.
- WAC 173-340-720(2)(b): Groundwater at the Site and surrounding area is not a potential future source of drinking water due to high concentrations of total dissolved solids (TDS) in samples collected from onsite monitoring wells. Specifically, samples collected from the monitoring wells have an average TDS concentration greater than 500 milligrams per liter (mg/L) which is the United States Environmental Protection Agency (USEPA) drinking water standard.
- WAC 173-340-720(2)(c): Based on the proximity to Guemes Channel (which is not classified as a domestic water supply) and groundwater-flow gradients at the Site, it is unlikely that hazardous substances will be transported from the Site to a current or potential future source of drinking water.

- WAC 173-340-720(2)(d): Groundwater at the Site and surrounding area is also considered non-potable due to the proximity of Marine Area/Guemes Channel (a surface water body not used as a domestic water supply), discharge of groundwater to the Marine Area, and the hydraulic connectivity between the groundwater and Marine Area demonstrated by the Tidal Study for the Site (GeoEngineers 2022a).

Based on the current and future Site use, potential exposure pathways and receptors for contaminants in groundwater include:

- Contact (dermal or incidental ingestion) by Site workers (including workers excavating soil below the water table);
- Contact (dermal or incidental ingestion) by aquatic receptors to impacted groundwater that may discharge to the Marine Area resulting in acute or chronic effects; and
- Ingestion of aquatic organisms affected by the discharge of impacted groundwater to the Marine Area.

#### 2.5.2.4 Groundwater Cleanup Levels

According to WAC 173-340-720(1)(a), groundwater cleanup levels shall be based on estimates of the highest beneficial use and the reasonable maximum exposure expected to occur under both current and potential future site use conditions, unless it qualifies under WAC 173-340-720(2) for a different beneficial use. This site qualifies for a different beneficial use for reasons described in section 2.5.2.3. In particular, the Site meets the definition of an industrial property under WAC 173-340-200, and, groundwater at, or potentially affected by, the Site is not used for drinking water and is not a reasonable future source of drinking water due to its proximity to marine surface water and the availability of a municipal water supply.

Based on zoning, current and anticipated future land use and proximity to marine surface water (Guemes Channel), groundwater cleanup levels were developed based on WAC 173-340-720(6)(c)(i)(E) that states cleanup levels will not exceed the surface water cleanup levels derived under WAC 173-340-730. The most conservative (lowest) published values from available state and federal surface water criteria according to WAC 173-340-730(3), were evaluated to develop cleanup levels including:

- Water Quality Standards for Surface Waters of the State of Washington. These marine surface water criteria for protection of aquatic life (acute and chronic exposures) and human health (fish consumption) are published in WAC 173-201A.
- Federal Marine Water Quality Criteria for Washington State. These criteria are from United States Environmental Protection Agency's (EPA's) Final Revision of Federal Human Health Criteria Applicable to Washington from 40 CFR 131.45 (EPA 2016).

- Federal National Recommended Water Quality Criteria. These marine surface water criteria for protection of aquatic life (acute and chronic exposures) and human health (fish consumption) are established under Section 304 of the Clean Water Act.
- MTCA Method B standard formula values (for carcinogens and non-carcinogens) protective of human health (consumption of aquatic organisms) (WAC 173-340-730[3]).
- Surface water criteria are not currently available for gasoline-, diesel, and oil-range petroleum hydrocarbons. Therefore, as recommended in WAC 173-340-730(3)(b)(iii)(C), the MTCA Method A groundwater cleanup levels for gasoline-, diesel, and oil-range petroleum hydrocarbons were used as the MTCA Method B surface water cleanup levels for these analytes.
- Groundwater to sediment transport pathway cleanup level assuming equilibrium partitioning between sediment and groundwater in sediment pore spaces using Ecology's Lower Duwamish Waterway Preliminary Cleanup Level Workbook Supplemental Information document dated December 2018 to calculate groundwater concentrations protective of dry weight sediment cleanup objective (SCO) criteria.
- Groundwater to indoor air or vapor intrusion transport pathway based on values for industrial land use. As described above, the Site meets the definition of an industrial property under MTCA (WAC 173-340-200) as it is zoned for industrial use and is being used for industrial purposes now and for the foreseeable future.

In accordance with WAC 173-340-705(6), the cleanup levels were adjusted as necessary based on background concentrations and PQLs such that groundwater cleanup level shall not be set at a level below the natural background concentration or the PQL, whichever is higher. Natural background concentrations are based on Washington State groundwater background concentrations for metals (PTI 1989). Groundwater PQLs are referenced from an Ecology-accredited laboratory.

A conditional point of compliance was established downgradient and as close as technically possible to the remaining soil contamination. All wells will be located within the property boundary to monitor groundwater discharges prior to discharging to surface water.

#### 2.5.2.5 Groundwater Contaminants

Groundwater contaminants were identified by comparing soil analytical results to the groundwater cleanup levels at the conditional point of compliance described above. Analytical data (including previously collected samples) collected from the Site that could be verified for technical quality were used to evaluate groundwater conditions. As with soil, TEQs were calculated when evaluating cPAH mixtures for each sample with the corresponding result compared to the most conservative screening level for benzo(a)pyrene (WAC 173-340-708).

As a result of the screening process, concentrations of arsenic, nickel and cPAHs were detected at concentrations greater than cleanup levels presented in the following table and are identified as Site contaminants for groundwater. Contaminants including chromium, diesel-range petroleum, and oil-range petroleum (*see* Table 3.2) were identified as groundwater contaminants in the Agreed Order. Data results showed all contaminants below cleanup levels due to prior cleanup actions and site modifications such as paving. Additional contaminants were identified and found above cleanup levels during the RI/FS including arsenic, nickel, and total cPAHs. These are identified as indicator hazardous substances for groundwater in the Consent Decree and will be addressed via the final cleanup action.

**Table 2.2: Groundwater Cleanup Levels**

| COC | Cleanup Level | Unit |
|---|---|---|
| **Arsenic** | 8 | µg/L |
| **Nickel** | 8.2 | µg/L |
| **Total cPAH TEQ** | 0.01 | µg/L |

Notes:
TEQ – toxic equivalency quotient
µg/L – micrograms per liter

At upgradient monitoring well locations (MW-1, MW-4, MW-5 and MW-7), concentrations of total/dissolved arsenic and nickel, and cPAHs were detected greater than the groundwater cleanup level in monitoring well MW-7 located in the southeast portion of the Site during one or more of the last four most recent monitoring events. Concentrations of arsenic, nickel and cPAHs were not detected greater than the cleanup levels at the other upland monitoring well locations during the last four monitoring events.

At the downgradient (conditional point of compliance) monitoring well locations (MW-2, MW-3, MW-6 and MW-8), the following contaminants were detected at concentrations greater than the groundwater cleanup level since completion of the 2015/2016 Upland Area paving activities previously discussed:

- **Arsenic** – Total and dissolved arsenic was detected at concentrations greater than the groundwater cleanup level at MW-8 located in the northwest portion of the Site beneath Warehouse 9. However, soil sampling and analysis to further evaluate soil conditions in the vicinity of MW-8 did not identify any potential source materials for arsenic in saturated soil adjacent to or upgradient of this location.
- **Nickel** – Dissolved nickel was detected at a concentration of 8.3 micrograms per liter (µg/L) which marginally exceeded the groundwater cleanup level of 8.2 µg/L at shoreline monitoring well location MW-2B during the February 2017 monitoring event. However,

total nickel at this location was not detected greater than the groundwater cleanup level during this event and dissolved nickel did not exceed the groundwater cleanup level in subsequent monitoring events at this location.

- **Total cPAHs TEQ** – Concentrations of total cPAHs were detected at a level greater than the groundwater cleanup level during one or more monitoring events at MW-8 located in the northwest portion of the Site beneath Warehouse 9. However similar to arsenic, soil sampling and analysis to further evaluate soil conditions in the vicinity of MW-8 did not identify potential source materials for cPAHs in saturated soil adjacent to or upgradient of this location.

A comparison of the initial (2008 to 2013) groundwater monitoring results to the recent semi-annual groundwater monitoring results (2016 to 2017) show that the paved surfaces are limiting stormwater infiltration to soil and therefore, limiting leaching and subsequent migration of contaminants through the soil column to groundwater. In addition, these data support the conclusion that contaminants that remain in place in saturated zone soils have stabilized and are not migrating downgradient toward the Guemes Channel since paving was completed. Trend plots for groundwater COCs including arsenic, nickel and cPAHs for monitoring wells MW-1 through MW-8 are shown on Figures 2.10 through 2.12.

# 3.0 Cleanup Requirements

The MTCA cleanup regulations provide that a cleanup action must comply with cleanup levels for identified hazardous substances in media of concern, points of compliance, and applicable or relevant and appropriate requirements (ARARs) based on federal and state laws (WAC 173-340-710). Identified hazardous substances, cleanup levels, points of compliance, and ARARs for the selected cleanup remedy are summarized in the following sections.

## 3.1 Indicator Hazardous Substances

Under MTCA, “indicator hazardous substances" means the subset of hazardous substances present at a Site for monitoring and analysis during any phase of remedial action for the purpose of characterizing the Site or establishing cleanup requirements for that Site. Consistent with WAC 173-340-703, when defining cleanup requirements at a Site that is contaminated with a relatively large number of contaminants, Ecology may eliminate from consideration those hazardous substances that contribute a small percentage of the overall threat to human health and the environment. The remaining contaminants can then serve as indicator hazardous substances for purposes of defining Site cleanup requirements.

As outlined in Sections 2.5.1 and 2.5.2, soil and groundwater contaminants exceeding cleanup levels at the Site include arsenic, nickel and cPAHs. These contaminants are selected as indicator hazardous substances (IHSs) for the Site requiring cleanup action consideration. The cleanup levels for soil and groundwater are presented in Tables 2-1 and 2-2, respectively.

Based on the CSM and information presented to Ecology (RI/FS; Appendix A), the following mediums and associated cleanup levels are not considered IHSs for the site.

Sediment: The Port developed cleanup levels for sediment contaminants listed in the agreed order to determine the nature and extent of contamination and to evaluate the effectiveness of the interim cleanup action. Table 3-1 summarizes the cleanup levels for contaminants listed in the agreed order. Cleanup levels were also developed for additional sediment contaminants found during the remedial investigation. Details and cleanup levels for all contaminants are provided in the RI/FS. The interim cleanup actions summarized in section 2.4 removed contamination to below cleanup levels in site sediment. Due to the completeness of the interim action, contaminants listed in table 3-1 and the RI/FS no longer contribute to the overall threat to human health and the environment in sediment. No further action in sediment is necessary; therefore, cleanup levels for the final cleanup action are not established for sediment.

Table 3.1. Sediment Cleanup Levels

| COC | Cleanup Level | Units | Cleanup Level | Units | Cleanup Level | Units |
|---|---|---|---|---|---|---|

| | Protection of benthic organisms (Organic Carbon 0.5% to 3.5%) | | Protection of benthic organisms (Organic Carbon <0.5% or >3.5%) | | Subtidal Sediment (below -3 ft MLLW) | |
|---|---|---|---|---|---|---|
| Copper | 390 | mg/kg | 390 | mg/kg | 180,000 | mg/kg |
| Lead | 450 | mg/kg | 450 | mg/kg | 21 | mg/kg |
| Zinc | 410 | mg/kg | 410 | mg/kg | 1,400,000 | mg/kg |
| Arsenic | 57 | mg/kg | 57 | mg/kg | 11 | mg/kg |
| Mercury | 0.41 | mg/kg | 0.41 | mg/kg | 0.2 | mg/kg |
| Total LPAH | 370 | (mg/kg OC normalized) | 5,200 | µg/kg | -- | -- |
| Total HPAH | 960 | (mg/kg OC normalized) | 12,000 | µg/kg | -- | -- |
| Total cPAH TEQ | -- | -- | -- | -- | 21 | µg/kg |
| Total PCB | 12 | (mg/kg OC normalized) | 0.13 | | 0.0035 | mg/kg |
| bis(2-ethylhexyl) phthalate | 47 | (mg/kg OC normalized) | 1,300 | µg/kg | 290 | mg/kg |
| dibenzofuran | 15 | (mg/kg OC normalized) | 540 | µg/kg | 4,100 | mg/kg |
| Total dioxin/furan TEQ | -- | -- | -- | -- | 5 | ng/kg |

Soil and groundwater: The Port developed cleanup levels for groundwater and soil contaminants listed in the agreed order to evaluate the nature and extent of contamination, the effectiveness of independent and interim cleanup actions, and to determine an appropriate final cleanup action for the site. Table 3.2 summarizes the cleanup levels for contaminants listed in the Agreed Order. Cleanup levels were also developed for additional contaminants found during the remedial investigation. Details and cleanup levels for all contaminants are provided in the RI/FS and Appendix A. Previous cleanup actions conducted in the Upland Area are summarized in section 2.4.

Verification sampling showed soils and groundwater meet cleanup level requirements for contaminants listed in Table 3.2 and the RI/FS except for the indicator hazardous substances. These contaminants no longer contribute to the overall threat to human health and the environment; therefore, they are not included as indicator hazardous substances for the medium evaluated.

Table 3.2. Soil and Groundwater Cleanup Levels

| COC | Cleanup Level | Units |
|---|---|---|
| **Soil (vadose and saturated zone)** | | |
| Total petroleum hydrocarbons – Gasoline range | 100 | mg/Kg |
| Total petroleum hydrocarbons – Diesel range | 2,000 | mg/Kg |
| **Groundwater** | | |
| Total petroleum hydrocarbons – Diesel range | 500 | µg/L |
| Total petroleum hydrocarbons – Oil range | 500 | µg/L |
| Chromium | 50 | µg/L |

## 3.2 Cleanup Standards

Cleanup standards consist of 1) cleanup levels that are protective of human health and the environment; and 2) the point of compliance at which the cleanup levels must be met. The final media-specific cleanup levels and points of compliance are summarized below.

### 3.2.1 Soil

In accordance with WAC 173-340-745 where Ecology has determined that industrial land use represents the reasonable maximum exposure, soil cleanup levels shall be based on estimates of the reasonable maximum exposure expected to occur under both current and future site use conditions. Based on zoning, and current and anticipated future land use, the Site meets the definition of an industrial property (WAC 173-340-200). For industrial land use, soil cleanup levels must be as stringent as:

- Concentrations established under applicable state and federal laws.
- Concentrations protective of direct human contact with soil.
- Concentrations protective of groundwater as surface water.

Cleanup levels presented in the RI/FS (GeoEngineers 2022a) to screen the environmental data based on human health and environmental considerations (summarized in Section 2.5) were developed in accordance with MTCA requirements and take into account future land use, ecological risk considerations and constitute the final soil cleanup levels for the Site. Final soil cleanup levels for IHSs are presented in Table 2.1.

### 3.2.2 Groundwater

In accordance with WAC 173-340-720, groundwater cleanup levels shall be based on estimates of the highest beneficial use and the reasonable maximum exposure expected to occur under both current and potential future site use conditions. Because groundwater at, or potentially affected by, the Site is not used for drinking water at this time and is not a reasonable future source of drinking water due to its proximity to marine surface water and the availability of a municipal water supply, groundwater at the Site is non-potable. Therefore, the next highest beneficial use is as surface water and must be as stringent as:

- Concentrations established under applicable state and federal laws.
- Concentrations protective of direct human contact with groundwater.
- Concentrations protective of surface water.
- Concentrations protective of sediment.

CULs presented in the RI/FS (GeoEngineers 2022a) to screen the environmental data based on human health and environmental considerations (summarized in Section 2.5) were developed in accordance with MTCA requirements and take into account future land use, ecological risk considerations and constitute the final groundwater cleanup levels for the Site. Final groundwater cleanup levels for contaminants are presented in Table 2.2.

## 3.3 Points of Compliance

Under MTCA, the point of compliance is the point or location on a site where the cleanup levels must be attained. This section describes the points of compliance for groundwater and soil.

Soil: Under MTCA, the standard point of compliance for the soil cleanup levels based upon human health via direct contact is throughout the Site from the ground surface to 15 feet bgs per WAC 173-340-740(6)(d). This depth represents a reasonable estimate of the depth of soil that could be excavated and distributed at the soil surface as a result of site development activities. For cleanup actions that involve containment of hazardous substances, however, the soil cleanup levels will typically not have to be met at the point of compliance if the following criteria are demonstrated as required under WAC 173-340-740(6)(f):

- The selected remedy is permanent to the maximum extent practicable using the procedures in -360;

- The cleanup action is protective of human health;
- The cleanup action is demonstrated to be protective of terrestrial ecological receptors under -7490 and -7494;
- Institutional controls are put in place under -440 that prohibit or limit activities that could interfere with the long-term integrity of the containment system;
- Compliance monitoring under -410 and periodic reviews under -430 are designed to ensure the long-term integrity of the containment system; and
- The types, levels and amount of hazardous substances remaining on-site and the measures that will be used to prevent migration and contact with those substances are specified in the cleanup action plan.

The proposed cleanup action, which includes containment of some impacted soils above cleanup levels beneath buildings or pavement, meets the requirements for this alternative point of compliance.

Groundwater: Under MTCA, the standard point of compliance for groundwater is throughout the site from the uppermost level of the saturated zone extending vertically to the lowest most depth that could potentially affect the site. Because the groundwater cleanup levels are based on protection of marine surface water and not protection of groundwater as a drinking water source, the conditional point of compliance was established downgradient and as close as technically possible to the remaining soil contamination. All wells will be located within the property boundary to monitor groundwater discharges prior to discharging to surface water. Existing wells or new wells located between the upland source areas and the marine surface waters will be used to demonstrate compliance at this conditional point of compliance.

## 3.4 Applicable and Relevant and Appropriate Regulatory Requirements

### 3.4.1 Applicable Requirements

MTCA requires the cleanup standards to be “at least as stringent as all applicable state and federal laws” (WAC 173-340-700(6)(a)). Cleanup levels and points of compliance met applicable laws as described above. Besides establishing minimum requirements for cleanup standards, other regulatory requirements must be identified by the person conducting the cleanup and considered in the selection and implementation of the cleanup action. This section details the known and identified applicable state and federal laws that may impose certain technical and procedural requirements for performing cleanup actions. These requirements are described in WAC 173-340-710. Pursuant to WAC 173-340-710(2), Ecology has reviewed the identified

applicable requirements and determined the following regulations are applicable as described below.

### 3.4.2 Relevant and Appropriate Requirements

In addition, relevant and appropriate requirements include those cleanup standards, standards of control, and other environmental requirements, criteria, or limitations established under state or federal law that, while not legally applicable to the hazardous substance, cleanup action, location, or other circumstance at a site, address problems or situations sufficiently similar to those encountered at the site that their use is well suited to the particular site. WAC 173-340-710 through 173-340-760 identifies several requirements Ecology considers relevant and appropriate for establishing cleanup standards. Pursuant to WAC 173-340-710(2), Ecology did not identify additional relevant and appropriate regulations.

### 3.4.3 Exemptions

The cleanup action at the Site will be performed pursuant to MTCA under the terms of a Consent Decree between Ecology and the Port. Certain state law requirements, and the procedural requirements of any laws requiring or authorizing local government permits or approvals for the remedial action are exempt under RCW 70A.305.090(1) in accordance with WAC 173-340-710(9)(b).

Persons conducting a remedial action under an order or decree are exempt from the procedural requirements of the following Revised Code of Washington (RCW) laws:

- Chapter 70.94 [Washington State Clean Air Act]
  - *Limited exemption: Non-federally delegated permits only*
- Chapter 70.95 [Washington State Solid Waste Management Act]
- Chapter 70.105 [Washington State Hazardous Waste Management Act
  - *Limited exemption: State only-designated dangerous waste*
- Chapter 77.55 [Washington State Construction Projects in Water Act]
- Chapter 90.48 [Washington State Water Pollution Control]
  - *Limited exemption: Non-federally delegated state waste discharge permit only*
- Chapter 90.58 [Washington State Shoreline Management Act]
- Laws requiring or authorizing local government permits or approvals for the remedial action

However, the Port must comply with the substantive requirements of any state law or local government permit/approval which is exempt under this provision in accordance with WAC 173-340-710(9)(c). Ecology has reviewed the identified exemptions and determined the substantive requirements.

### 3.4.4 Continuing Obligation

Per WAC 173-340-710(9)(e), the Port has a continuing obligation to determine whether additional permits or approvals or substantive requirements are required. In the event that either the person conducting the remedial action or Ecology becomes aware of additional permits or approvals or substantive requirements that apply to the remedial action, they shall promptly notify the other party of this knowledge. Ecology, or the potentially liable person at Ecology's request, shall consult with the state or local agency on these additional requirements. Ecology shall make the final determination on the application of any additional substantive requirements at the Site, following consultation with appropriate state and local regulators.

#### 3.4.4.1 Applicable Regulatory Requirements and Exemptions

**Solid and Hazardous Waste Management**

The Washington Hazardous Waste Management Act and the implementing regulations, the Dangerous Waste Regulations (Chapter 173-303 WAC), will apply if dangerous wastes are generated during the cleanup action. The PLP is required to designate waste and if dangerous waste is present, manage and dispose of the dangerous waste based on generator status and the requirements set forth by your chosen permitted disposal facility. Records describing designation and final disposal should be included in the construction completion report.

*Exemption:* The PLP is exempt from the procedural requirements for state only-designated dangerous waste set forth in RCW 70.105 but must meet the substantive requirements for designating state-only dangerous waste.

Related regulations include state and federal requirements for solid waste handling and disposal facilities (40 Code of Federal Regulations [CFR] 241, 257; Chapter 173-350 and -351 WAC) and land disposal restrictions (40 CFR 268; WAC 173-303-340).

*Exemption:* The PLP is exempt from the procedural requirements for solid waste set forth in RCW 70.95. The PLP must follow the substantive requirements for waste designation, handling, and disposal of solid waste set forth by the receiving facility. The receiving facility must provide permission to dispose of waste at the facility prior to delivering waste to the intended destination.

**State Environmental Policy Act**

The State Environmental Policy Act (SEPA) (Revised Code of Washington [RCW] 43.21C; WAC 197-11) and the SEPA procedures (WAC 173-802) are intended to ensure that state and local government officials consider environmental values when making decisions. Prior to taking any action on a proposal, including initiating a remedial construction activity, agencies must follow specific procedures to ensure that appropriate consideration has been given to the environment. This includes issuing an environmental determination and holding a public comment period. If there is a probable significant adverse environmental impact associated

with the project, then a Determination of Significance is issued and an Environmental Impact Statement (EIS) is required. If there is no probable significant adverse environmental impact associated with the project, then a Determination of Non-Significance is issued.

A SEPA environmental checklist was prepared by the Port for the proposed cleanup actions. The Port is the lead SEPA agency for this action. Ecology reviewed the SEPA checklist and the Port issued a Determination of Non-Significance which was released for public review and comment.

### Shoreline Management Act

The Shoreline Management Act (SMA; RCW 90.58) and its implementing regulations establish requirements for substantial developments occurring within water areas of the state or within 200 feet of the shoreline. Local shoreline management plans are adopted under state regulations, creating an enforceable state law.

*Exemption:* The PLP is exempt from the procedural requirements set forth for Shorelands under RCW 90.58. However, the PLP must follow the substantive requirements. The City of Anacortes has set forth requirements based on local considerations such as shoreline use, economic development, public access, circulation, recreation, conservation, and historical and cultural features. The PLP must work with the City of Anacortes to meet the substantive requirements set forth in their Shoreline Master Program prior to initiating the cleanup action. The Shoreline Master Program must be consistent with the policies and requirements of the Shoreline Management Act and the State Shoreline Master Program Guidelines. .

### Water Pollution Control Act

Per WAC 173-340-710(7)(a), hazardous substances that are directly or indirectly released or proposed to be released to waters of the state shall be provided with all known, available and reasonable methods of treatment consistent with the requirements of chapters 90.48. Although State Waste Discharge Permits are exempt from procedural requirements, NPDES permits issued under 90.48 are required and may need to be implemented under a separate Agreed Order administered by Ecology's Water Quality Program.

Based on consultation with Ecology's Water Quality Program, the cleanup action will not require a construction stormwater general permit under the following conditions. Construction activities will disturb less than 1-acre. Construction stormwater generated during the planned remedial action will be separated from DCI's stormwater collection system, contained on-site, and managed using approved best management practices. A discharge authorization will be obtained from the City of Anacortes to discharge stormwater to the City of Anacortes sanitary sewer following appropriate treatment to meet discharge standards.

The Construction Quality Assurance Project Plan (CQAPP) will document planned best management practice procedures designed to prevent stormwater pollution by controlling erosion of exposed soil and by containing soil stockpiles and other materials that could

contribute pollutants to stormwater. It is anticipated that a CQAPP will be prepared as part of the remedial design process and supplemented as appropriate by the remediation contractor.

If conditions change then the Port must consult with Ecology to determine if a stormwater permit is required under the new conditions.

### Clean Air Act

Air emission permits are required at MTCA cleanup sites if air emissions are sufficient enough to trigger the need for Title V air operating permits (7661A), prevention of significant deterioration permits (7475), or nonattainment new source review permits (7502(c)(5)). These permits are mandated by the Federal Clean Air Act (42 U.S.C.) and are required because an exemption would result in the state's loss of federal authorization to implement these permitting requirements in Washington. The local agency, the Northwest Clean Air Agency, determined a Title V permit is not required.

The cleanup action may generate dust from site grading or excavation work. Controls would need to be in place during construction (e.g., wetting or covering exposed soils and stockpiles), as necessary, to meet the substantive restrictions on off-site transport of airborne particulates by the local agency.

### Archeological and Historical Preservation

The Archeological and Historical Preservation Act (16 USCA 496a-1) is applicable if any subject materials are discovered during remedial design or site grading and excavation/dredging activities.

The Port is using Remedial Action Grant money to fund up to 50% of the cleanup at the Site. Pursuant to Executive Order 21-02, all state agencies implementing or assisting capital projects using funds appropriated in the State's biennial Capital Budget are to consider how future proposed projects may impact significant cultural and historic places. To do so, agencies are required to notify the Department of Archaeology and Historic Preservation (DAHP), the Governor's Office of Indian Affairs (GOIA), and concerned tribes and afford them an opportunity to review and provide comments about potential project impacts.

Based on the results of a recent (October 2020) cultural resources survey and previous findings for the Site, the DAHP is requiring the development of an Inadvertent Discovery Plan. They also require an archeological monitor be present during ground disturbance activities completed near the fill/native soil contact given the proximity of these previous discoveries.

### Health and Safety

Site cleanup-related construction activities will need to be performed in accordance with the requirements of the Washington Industrial Safety and Health Act (WISHA; RCW 49.17) and the federal Occupational Safety and Health Act (OSHA; 29 CFR 1910, 1926). These applicable

regulations include requirements that workers are to be protected from exposure to contaminants and that excavations are to be properly shored.

### Minimum Standards for Construction and Maintenance of Wells

Groundwater monitoring wells will need to be installed as a part of the post-construction water quality confirmation monitoring. The new wells will be constructed in accordance with the requirements of WAC 173-160 to further ensure protection of groundwater resources at the Site.

### Local Permitting

The City of Anacortes Land Disturbance and Grading Permit, Noise Ordinance, Publicly Owned Treatment Water (POTW) Discharge Authorization, and Stormwater Management Program are applicable to the site based on construction generating activities outlined in this CAP.

*Exemption:* Because the Site cleanup action will be performed under a Consent Decree, compliance with substantive requirements of the City of Anacortes permits, discharge authorizations and ordinances will be necessary.

# 4.0 Cleanup Action Selection and Analysis

Development and evaluation of cleanup action alternatives performed in the RI/FS are summarized in the following sections.

## 4.1 Areas Requiring Cleanup Action Evaluation

The RI soil data obtained by GeoEngineers between June 2008 and June 2021 from subsurface explorations and soil data from previous environmental studies were used to delineate the nature and extent of IHSs at the Site. Areas requiring cleanup action evaluation are shown on Figure 4.1 and summarized below.

- **Metals** – Arsenic and/or nickel was detected at concentrations exceeding soil cleanup levels at the Site as follows:
    - In the eastern portion of the Site, arsenic and nickel exceeded soil cleanup levels in historical fill deposits from the ground surface down to a depth of approximately 8 feet bgs.
    - In the north central portion of the Site, arsenic and nickel exceeded soil cleanup levels in historical fill deposits from the ground surface down to a depth of approximately 10 feet bgs.
    - In the south-central portion of the Site, arsenic exceeded the soil cleanup levels in historical fill deposits from between approximately 5 and 8 feet bgs.
    - In the western portion of the Site, nickel exceeded the soil cleanup levels in the 1975 Earth fill area deposits from the ground surface down to a depth of approximately 10 feet bgs.

Results of soil/sediment samples collected at the Site from the underlying native surface show that the observed arsenic and nickel exceedance are contained within the overlying fill soil. Although present, concentrations of arsenic and nickel in soil are not exacerbating contamination of the groundwater except for MW-7 based on the groundwater monitoring data summarized above. At all other locations, groundwater monitoring data shows decreasing concentrations possibly associated with 2015/2016 paving completed by DCI. Decreasing concentrations demonstrates hydraulic connectivity, but the paving modifications appear to have lowered the infiltration of stormwater and potential for leaching, thus lowering the potential contribution from soil contaminants to groundwater.

- **Total cPAH TEQ** – Concentrations of cPAHs were detected at concentrations exceeding soil cleanup levels as follows:
    - In the central portion of the Site, total cPAH TEQ concentrations exceeded the soil cleanup level in historical fill deposits between approximately 5 and 13 feet bgs.

Results of soil/sediment samples collected at the Site from the underlying native surface show that the observed cPAHs exceedance are contained within the overlying fill soil. Although soil at the Site contain total cPAH TEQ concentrations greater than the soil cleanup level, groundwater monitoring data (summarized above) shows that the observed soil contamination is not adversely affecting groundwater at the Site and that the contaminant concentration in groundwater is stable or is decreasing over-time.

## 4.2 Remedial Technologies and Cleanup Action Alternatives Considered

Potentially applicable remedial technologies for identified IHSs in Upland Area media of concern (i.e., soil and groundwater) were screened and evaluated for developing cleanup action alternatives in accordance with MTCA requirements (WAC 173-340-350). The screening process identified the most appropriate technologies and process options for addressing IHSs in soil and groundwater based on their implementability, reliability, and relative cost. Based on the results of screening, the following remedial technologies for soil and groundwater were retained for development of cleanup action alternatives:

- Institutional controls including environmental covenants, land use restrictions, groundwater use restrictions, fencing and signage.
- Containment and capping including low permeability caps comprised of asphalt or concrete pavement with drainage controls to restrict groundwater flow and contaminant migration.
- In situ treatment including stabilization.
- Monitored natural attenuation of contaminants in groundwater through natural processes.
- Removal of contaminants through soil excavation and offsite permitted disposal.

From the remedial technology screening process, six alternatives were developed for the Site to address soil and groundwater contamination that meet the MTCA threshold requirements including compliance with the cleanup standards and applicable laws, prevision for a reasonable restoration time frame, and use of permanent solutions to the maximum extent practicable.

For the Upland Area, the following alternatives varied as follows:

- **Alternative 1 (Containment and Compliance Monitoring)** considered containment technologies in conjunction with institutional controls to address Site contaminants. Capping in the form of asphalt paving is proposed for unpaved portions of the Site to further prevent stormwater infiltration through the soil column and mobility of contaminants in the subsurface. Long-term monitoring would then be performed to

evaluate groundwater conditions to assess natural attenuation of Site contaminants and verify compliance with the cleanup standards.

- **Alternative 2 (Partial Source Area Removal)** considered the removal of the contaminant source areas, an estimated 3,600 bank cubic yards of soil, located in the southeast portion of the Site which is generally centered around sampling location SB-12 followed by Site restoration. At this location, concentrations of metals (arsenic and nickel) in soil exceed three times (3x) the cleanup level. Empirical evidence from groundwater monitoring data suggests that observed soil contamination at this location is adversely impacting groundwater while in other portions of the Site, observed contaminant concentrations are limiting groundwater impacts. As with the previous alternative, existing containment barriers as well as institutional controls would then be utilized to address remaining IHSs remaining in place and that long-term monitoring would be performed to evaluate groundwater conditions to assess natural attenuation of Site contaminants and verify compliance with the cleanup standards.
- **Alternative 3 (Source Area In Situ Treatment)** considered the use of in situ treatment technologies to stabilize contaminants in soil within the identified source areas (IHSs exceeding three times the soil cleanup level) to reduce the potential for leaching and contaminant migration in groundwater. As with previous alternatives, existing containment barriers as well as institutional controls would then be utilized to address remaining IHSs remaining in place and that long-term monitoring would be performed to evaluate groundwater conditions to assess natural attenuation of Site contaminants and verify compliance with the cleanup standards.
- **Alternative 4 (Source Area Removal)** considered the removal of the identified source areas, an estimated 9,000 bank cubic yards of soil, in which IHSs exceed three times the soil cleanup level. Existing containment barriers as well as institutional controls would then be utilized to address IHSs detected at concentrations less than three times the cleanup level remaining in place at the Site. In addition, long-term monitoring would be performed to evaluate groundwater conditions to assess natural attenuation of Site contaminants and verify compliance with the cleanup standards.
- **Alternative 5 (Site-Wide In Situ Treatment)** considered the use of in situ treatment technologies to stabilize identified contaminants in soil throughout the Site and to reduce the potential for leaching and contaminant migration in groundwater. Existing containment barriers as well as institutional controls would then be utilized to address remaining IHSs remaining in place and that long-term monitoring would be performed to evaluate groundwater conditions to assess natural attenuation of Site contaminants and verify compliance with the cleanup standards.
- **Alternative 6 (Site-Wide Removal)** considered the removal of identified soil contamination throughout the Site, an estimated 39,000 bank cubic yards of soil. Compliance monitoring

would then be performed to verify the effectiveness of the cleanup action. Due to the completeness of this alternative, engineering and institutional controls would not be required.

Each of the cleanup action alternatives were screened relative to MTCA threshold and other requirements in accordance with WAC 173-340-360(2)(a) and (2)(b), and evaluated according to disproportionate cost analysis (DCA) procedures in WAC 173-340-360(3)(e). Results of the evaluation identified Alternative 2 as the preferred alternative, because it meets threshold requirements, uses permanent solutions to the maximum extent practicable, considers public concerns, provides a reasonable restoration time frame, and is not disproportionate in cost.

Cleanup action alternatives are summarized in Table 4.1. Evaluation of the alternatives and results of the DCA are presented in Tables 4.2 and 4.3, respectively. Specific details regarding alternative development and evaluation are presented in the RI/FS Report (GeoEngineers 2022a).

## 4.3 Selected Remedy

Based on the comparative analysis presented in the RI/FS, Alternative 2 (shown on Figure 4.2) provides the greatest environmental benefit that is not disproportionate in cost relative to the other alternatives evaluated. This alternative for the Site relies on the existing empirical data that groundwater located downgradient of the impacted soils is not adversely impacted (i.e., does not exceed MTCA cleanup levels) by the presence of the identified soil contamination and will reduce risk to potential human and ecological receptors through:

- Removal of contaminated soil volume within the readily accessible portion of the Site (i.e., open space area in the southeast portion of the DCI lease area) exceeding soil cleanup levels;
- Use of existing engineering controls such as concrete and asphalt surfaces to isolate the remaining soil contamination at the Site from human and ecological receptors;
- Long-term monitoring of groundwater to confirm compliance with the cleanup standard at the conditional point of compliance (shoreline) and assess natural attenuation performance; and,
- Implementation of institutional controls (Environmental Covenant).

Implementation of this cleanup action will remove approximately 3,600 bank cubic yards of soil containing IHSs at concentrations greater than the soil cleanup levels where groundwater is being adversely impacted. The volume of contaminated soil remaining in place above cleanup levels and located upstream of groundwater showing a decreasing trend in IHS concentrations since paving was complete (estimated to be approximately 35,400 bank cubic yards) will be managed by engineering and institutional controls.

The Port conducted a 170,000 cy sediment dredge that resulted in the removal of some of the contaminated sediment. Approximately 26,000 cy of soil and sediment were removed during the subsequent interim action cleanup. An additional approximately 1,700 cy of soil were removed during independent cleanup actions.

The selected cleanup action meets the minimum requirements under WAC 173-340-360(2)(a) as follows:

- **Protects Human Health and the Environment** – The selected remedy will protect human health and the environment on both a short-term and long-term basis. The remedy will permanently reduce the identified risks presently posed to groundwater quality and direct contact through a combination of source area removal, containment and natural attenuation.
- **Complies with Cleanup Standards** – The selected remedy will comply with the cleanup standards for groundwater and soil at the point of compliance within a reasonable time frame.
- **Complies with Applicable State and Federal Laws** – The selected remedy will comply with all state and federal laws and regulations.
- **Provides Compliance Monitoring** – The selected remedy will include compliance monitoring for soil and groundwater to assess the effectiveness and permanence of the remedy.

The cleanup action also meets the other requirements under WAC 173-340-360(2)(b), as follows:

- **Uses Permanent Solutions to the Maximum Extent Practicable** – The selected remedy utilizes source removal in conjunction with engineering and institutional controls which will remove the contaminant mass impacting groundwater and isolate the remaining contaminant mass which has been demonstrated to be stable in the subsurface and not impacting groundwater in the subsurface to preventing direct contact.
- **Provides for Reasonable Restoration Time Frame** – The restoration time frame for the selected remedy is estimated to be 1 – 2 years, based on the expected time for groundwater to achieve compliance with cleanup levels in the source area and for institutional controls to be established. Engineering controls to isolate the remaining contamination are already in place at the Site.
- **Considers Public Concerns** – The RI/FS Report and this document will be presented to the Public for review and comment prior to implementation. Additionally, residual contamination remaining in place below the paved surfaces are contained within the DCI lease area which is secured and prevents visitors from entering the Site. Local residents and homeowners will not be affected given the industrial nature and zoning of the adjacent properties.

# 5.0 Description of the Cleanup Action

As discussed in Section 4.4, the selected cleanup action comprises a combination of cleanup actions, which are generally described below. More specific plans will be developed in an Engineering Design Report (EDR), which will be prepared for Ecology approval prior to implementation of the cleanup action.

## 5.1 Excavation and Off-Site Disposal of Contaminated Soil

Soil in which concentrations of arsenic and nickel exceed soil cleanup levels will be excavated within the southeastern portion of the Site that is readily accessible (away from primary DCI operation areas and structures) and transported from the Site for disposal at a permitted landfill facility. Based on the results of previous environmental investigations, approximately 1,500 square yards of asphalt will be removed to access approximately 3,600 bank cubic yards of contaminated soil exceeding three times the soil cleanup level using commonly available excavation techniques. During remedial excavation activities existing utility infrastructure (power, phone, sewer, water, etc.) will remain undisturbed and protected in place to the extent practicable. In addition, excavation slopes and/or shoring will be required to protect adjacent utilities and DCI infrastructure.

Soil generated by the remedial excavation will be designated under WAC 173-303 and appropriately transported from the Site to an approved landfill facility for permitted disposal. Landfill disposal authorization will be obtained using the chemical analytical results from the existing environmental studies. However, additional characterization of the waste stream may be required by the receiving facility. Additional soil characterization, if required, will be completed during remedial design.

During backfilling activities, structurally suitable material will be placed in lifts throughout the remedial excavation area and compacted to meet compaction requirements determined during remedial design.

## 5.2 Containment of In-place Contamination

Under MTCA, the standard point of compliance for the soil cleanup levels based upon human health via direct contact is throughout the Site from the ground surface to 15 feet bgs per WAC 173-340-740(6)(d). This depth represents a reasonable estimate of the depth of soil that could be excavated and distributed at the soil surface as a result of site development activities. For cleanup actions that involve containment of hazardous substances, however, the soil cleanup levels will typically not have to be met at the point of compliance if the following criteria are demonstrated as required under WAC 173-340-740(6)(f):

- The selected remedy is permanent to the maximum extent practicable using the procedures in -360;
- The cleanup action is protective of human health;
- The cleanup action is demonstrated to be protective of terrestrial ecological receptors under -7490 and -7494;
- Institutional controls are put in place under -440 that prohibit or limit activities that could interfere with the long-term integrity of the containment system;
- Compliance monitoring under -410 and periodic reviews under -430 are designed to ensure the long-term integrity of the containment system; and
- The types, levels and amount of hazardous substances remaining on-site and the measures that will be used to prevent migration and contact with those substances are specified in the cleanup action plan.

The selected cleanup action for the Site is expected to remove the source area in the southeast portion of the Site minimizing disturbance to existing infrastructure (buildings, laydown, syncrolift rail, and utilities) and DCI operations. Following completion of the cleanup action, contamination will remain in place beneath portions of central and western DCI lease area at concentrations exceeding the soil cleanup levels. As described above and in accordance with -440, the selected cleanup alternative relies on utilizing existing engineering controls (i.e. asphalt and concrete surface cap, sheet pile bulkhead) for the purpose of removing exposure and discharge pathways. In accordance with -410 and -440, areas in which residual soil contamination remains in place will continue to be addressed using confirmational groundwater monitoring, cap integrity assessment reports and an environmental covenant (discussed in the following sections).

Use of existing paved surfaces will prevent direct contact exposures to contaminants that will remain in-place. In conjunction with the engineering controls, institutional controls that require maintenance of the paved surface as a physical barrier in perpetuity will be implemented as described below. Because the interim action and reconfiguration of the shoreline as part of the Project Pier 1 Redevelopment resulted in the removal of previously identified contamination north of the proposed remedial excavation area, a protective barrier is not required as part of the remedy in this area to prevent direct contact with residual contamination remaining in soil. However, the existing gravel working surface will be maintained for use by DCI operations using best management practices (BMPs). Ecology will be notified of any future development of the Site. Notification will include documentation describing measures to ensure the proper management of contaminated soil and/or groundwater (if encountered) and ensure that proper worker protection and safety is maintained. Ecology must review and concur prior to any work being performed. Specific details regarding long-term monitoring and maintenance of

the soil cap and procedures for worker protection and the management of contaminated soil and/or groundwater will be described in an Engineering and Institutional Controls Monitoring and Maintenance Plan (EICMMP) that will be prepared following implementation of the selected remedy (further discussed in Section 4.8).

## 5.3 Monitored Natural Attenuation

Natural attenuation means a variety of physical, chemical or biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume or concentration of hazardous substances in the environment. A cleanup action that includes natural attenuation and conforms to the expectation in WAC 173-340-370(7) can be considered an active remedial measure. Ecology expects that natural attenuation of hazardous substances may be appropriate at sites where:

a. Source control has been conducted to the maximum extent practicable;

b. Leaving contaminants on-site during the restoration time frame does not pose an unacceptable threat to human health or the environment;

c. There is evidence that natural biodegradation or chemical degradation is occurring and will continue to occur at a reasonable rate at the site; and

d. Appropriate monitoring requirements are conducted to ensure that the natural attenuation process is taking place and that human health and the environment are protected.

As outlined in Section 4.0 Cleanup Action Selection and Analysis, the feasibility study and disproportionate cost analysis concluded that the alternative selected will include source control to the maximum extent practicable per WAC 173-340-370(7)(a). In accordance with -370(7)(c), groundwater monitoring results following paving activities by DCI between 2015 and 2016 show decreasing concentrations of IHSs, in some cases below cleanup levels. This indicates that the paved surfaces are limiting the infiltration, leaching and subsequent migration of soil contaminants to groundwater as evidenced by the monitoring data at the conditional point of compliance and in central and western upgradient wells. Per -370(7)(b), decreases in concentrations in monitoring wells downstream of the source were demonstrated within two years from completion of paving activities. Additional source control removal of the highest concentrations of contamination around the well with the highest groundwater concentration in combination with the paving/concrete cap engineering controls. The data show that contaminants in soil currently in place within the saturated zone are stable and limited from migrating down gradient toward the Guemes Channel since the paving was completed. It is expected that the existing paving and concrete will serve as a cap for the remaining contamination in place and maintenance of the existing paved surfaces will continue to limit infiltration and potential leaching of residual contamination. The existing monitoring

wells located in this area will be used to evaluate natural attenuation. In accordance with -370(7)(d), a Compliance Monitoring Plan (CMP) will be developed for Ecology's review and concurrence as part of the remedial design detailing the sampling and analysis procedures and quality control measures appropriate to ensure that the natural attenuation process continues and is protective of human health and the environment.

## 5.4 Institutional and Other Property Controls

Institutional controls are measures undertaken to limit or prohibit activities that may interfere with the integrity of the cleanup action or that may result in exposures to hazardous substances at the Site. Institutional controls in the form of an Environmental Covenant will be required for all parcels within the Site boundary where contaminated soil above a cleanup level remains and where groundwater is above cleanup levels. The environmental covenants will be filed following implementation of the selected remedy.

The Environmental Covenant will impose restrictions on future uses of the Site containing residual contamination consistent with industrial land use and will prohibit the use of groundwater as drinking water.

Ecology will prepare the Environmental Covenant consistent with WAC 173-340-440 and RCW 64.70 and in consultation with the property owner. In addition to the Environmental Covenant, Property controls will include an EICMMP for any future ground-disturbing activities on the Property. The EICMMP will contain at least the following elements:

- A description of soil conditions on the Property including identification of specific areas and depths where contamination remains in place and at what concentration(s).
- Specific soil handling and management procedures for future subsurface work in areas where contaminated soils remain in place beneath the cap.
- Procedures for identifying, processing, and disposing of contaminated soils encountered during development activities in areas not expected to be contaminated.
- BMPs to prevent soil erosion to the storm drain system or directly to sediment in the Marine Area.
- Health and safety protocols specific to the soil handling and management procedures.
- Protocols for notifying Ecology of planned (or proposed) ground-disturbing activities as well as any instances in which a site control measure fails resulting in a release or new exposure pathway.
- Protocols for providing necessary data to agencies involved in environmental permitting for future construction activities.

- A description of remedial elements (e.g., pavement and monitoring wells) that will require routine inspection and maintenance.
- The procedures specified in the EICMMP will be applicable to future property redevelopment or maintenance that involves removal or disturbance of the in-place contaminated soil or disturbance of surface soils or other ground cover that may create a future erosion pathway, if warranted. In conjunction with the institutional controls and capping, other engineering controls may be implemented to prevent potential exposure to hazardous substances remaining in place following remedy implementation.

## 5.5 Compliance Monitoring

Compliance monitoring and contingency responses (as needed) will be implemented in accordance with WAC 173-340-410, Compliance Monitoring Requirements. Detailed requirements will be described in the CMP to be prepared as a part of the EDR. The objective of the CMP is to confirm that cleanup standards have been achieved, and also to confirm the long-term effectiveness of cleanup actions at the Site. The plan will contain discussions on duration and frequency of monitoring, the trigger for contingency response actions, and the rationale for termination of monitoring. The three types of compliance monitoring to be conducted include:

- **Protection Monitoring** to confirm that human health and the environment are adequately protected during the implementation of the cleanup action;
- **Performance Monitoring** to confirm that the cleanup action has attained cleanup standards and other performance standards; and
- **Confirmation Monitoring** to confirm the long-term effectiveness of the cleanup action once performance standards have been attained.

Compliance monitoring activities are described in Sections 5.5.1 through 5.5.3 below.

### 5.5.1 Protection Monitoring

Protection monitoring will include monitoring of worker health and safety and environmental protection practices such as stormwater, erosion, and sediment controls. The purpose of protection monitoring is to confirm that human health and the environment are adequately protected during the cleanup action. Personnel engaged in work that involves hazardous material excavation and handling will be required to comply with the provisions of WAC 173-340-810 (MTCA Cleanup Regulation, Worker Safety and Health) and be Hazardous Waste Operations and Emergency Response (HAZWOPER), OSHA, and WISHA certified. In addition, spill prevention and pollution control measures will be implemented and maintained throughout the duration of the cleanup action including all necessary stormwater management, surface water runoff control, temporary erosion and sediment control measures to meet the substantive requirements of the applicable local, state and federal regulations.

### 5.5.2 Performance Monitoring

Performance monitoring will involve collecting soil samples from the base and sidewalls of the remedial excavation to confirm the removal of soil exceeding the remediation goal of three times the cleanup level (Table 2.1) in the southeast portion of the DCI lease area. Performance monitoring activities will include the collection of discrete grab samples from the final limits of the remedial excavations, with the sampling density appropriately tailored to the location and size of the excavation. The confirmatory soil samples will be submitted for analysis of IHSs on a short turnaround to verify whether the remediation goal at the final limits of the remedial excavation has been achieved or to document remaining contaminant mass in portions of the Site that are not accessible (i.e., beneath existing utility or building infrastructure).

### 5.5.3 Confirmation Monitoring

To evaluate groundwater conditions within the remedial excavation area and verify that the selected cleanup action is protective of groundwater at the point of compliance, existing and/or new monitoring wells will be installed at the Site and sampled for IHSs. The exact number and location of the monitoring wells will be determined following completion of remedial actions based on the final dimensions of the excavation area and concurrence by Ecology.

Groundwater within the vicinity of the cleanup action area will be sampled following completion of the excavation. Samples will occur on a quarterly basis (either from retained or newly installed monitoring wells following remedial activities) until cleanup levels are met and then for a minimum of four consecutive quarters to confirm concentrations remain below cleanup levels. Additionally, groundwater in other portions of the Site will be monitored to evaluate contaminant stability and compliance with the cleanup standards. Groundwater samples will be analyzed for groundwater IHSs (Table 2.2), including total and dissolved arsenic and nickel, and cPAHs to ensure that groundwater within and/or downgradient of areas in which contaminated soils remain in place meet the cleanup standards for the Site.

## 5.6 Contingencies

Because the remedial action includes contained in-place soils, contingency measures are necessary to protect human health and the environment in the event the containment measures fail. Contingency measures will be included in the CMP and will contain the following:

- A section on contingency response actions and the groundwater confirmation monitoring triggers that will initiate a response.
- Contingency response action plan in the event the containment is breached for any reason. Ecology will be consulted, and measures will be taken to immediately stop activities and protect the contained in-place soil from further disturbance. Temporary measures to prevent re-mobilizing IHSs will be implemented until the breach can be fixed.

- Contingency response action plan to address the following. As the site remedy relies on limiting infiltration to prevent mobilization of contaminants into groundwater, activities that are adjacent but offsite will also need to be identified and assessed to determine if the activity will alter the groundwater infiltration and flow rate in a way that compromises the effectiveness of the engineering controls. Additional monitoring to confirm that engineering controls remain effective may be required.

## 5.6 Inadvertent Discovery of Cultural Resources

There is potential for encountering archaeological materials during excavation where native beach deposits are encountered. The cleanup action primarily addressed contaminated fill material, but portions of the excavation may encounter the fill-native interface. Where the excavation reaches the fill-native interface layer, an archeological monitor who meets the Secretary of Interior's qualifications (36 CFR Part 61) will be onsite to observe the excavation activities. If potential archaeological resources are identified during construction, work will be stopped immediately, and the Port and Ecology notified. If it is determined that the discovery is not culturally significant, work activities will resume.

An Inadvertent Discovery Monitoring Plan (IDP) will be developed as part the EDR detailing the procedures required in the event that potential archaeological resources or a suspected discovery is encountered. In general, the following steps shall be taken:

1. **Stop Work and Protect the Discovery Site.** If any agency employee, contractor, or subcontractor believes that he or she has uncovered any cultural resources, all work within a minimum of 30 feet of the discovery ("discovery site") will be stopped to provide for its total security, protection and integrity. The discovery site shall be secured, and vehicles, equipment, and unauthorized personnel will not be permitted to traverse the discovery site. Work may continue in other areas of the project.

2. **Notify the Port.** The agency employee, contractor, or subcontractor individual making the discovery will immediately notify the Port's representative who will in turn, notify the Port of the potential discovery.

3. **Notify the Project Archaeologist.** Immediately following the work stoppage and notification to the Port, the Project Archaeologist will be contacted by the Port.

4. **Identify the Find.** The Project Archaeologist, in coordination with the Port, is responsible for ensuring that appropriate steps have been taken to protect the discovery site. The Project Archaeologist will be qualified as a professional archaeologist under the Secretary of Interior's Professional Qualification Standards (as outlined in 36 CFR Part 61). As such, the Project Archaeologist shall be qualified to examine the find to determine if it is of cultural significance. If the discovery is determined not to be of cultural significance, work may proceed at the discovery site with no further delay.

5. **Notify Additional Parties.** If the discovery is determined by the Project Archaeologist to be a cultural resource, the Port or its designee will notify Ecology, the DAHP, the Samish Indian Nation, Swinomish Indian Tribal Community and the Lummi Nation. Confidentiality of the find will be maintained by Project leads and their contractors. In the event human remains are identified, law enforcement also will be notified.

6. **Obtain Consent to Proceed with Construction.** Construction work will not recommence at the discovery site until an approved treatment has been completed and the Tribes, DAHP, and/or jurisdictional agencies, as appropriate, have provided written or verbal consent to proceed. Treatment is the act of mitigating an adverse effect or a change in a historic property's qualifying characteristics in such a way as to diminish its integrity, or how one goes about implementing the mitigation measure(s) agreed upon in consultation.

7. **Submit Treatment Report to DAHP's WISAARD Database.** WISAARD is the state's digital repository for architectural and archaeological resources and reports.

## 5.7 Potential Habitat Restoration Opportunities

Under the Puget Sound Initiative, MTCA cleanup actions are expected, where appropriate, to coincidentally enhance and/or restore habitat. Given the industrial nature of the upland area of the Site and that no critical habitat is present, habitat restoration opportunities have not been identified for the selected cleanup action. Habitat restoration was completed in conjunction with the Port's Project Pier 1 Development which included the Marine Area interim action. Included was the creation of the O Avenue and Wymans restoration sites along the Guemes Channel near to the Site.

## 5.8 Five-Year Review

Because the selected cleanup action described above will result in hazardous substances remaining at the Site at concentrations exceeding cleanup levels, the cleanup level for one or more IHSs is based on a practical quantitation limit as provided for under WAC 173-340-707, and because environmental covenants are included as part of the remedy, Ecology will review the selected cleanup action described in this CAP every 5 years to ensure protection of human health and the environment. Consistent with the requirements of WAC 173-340-420, the 5-year review shall include the following:

- A review of the title of the real property subject to the environmental covenant to verify that the covenant is properly recorded.
- A review of available monitoring data to verify the effectiveness of completed cleanup actions, including engineered caps and institutional controls, in limiting exposure to hazardous substances remaining at the Site.

- A review of new scientific information for individual hazardous substances or mixtures present at the Site.
- A review of new applicable state and federal laws for hazardous substances present at the Site.
- A review of current and projected future land and resource uses at the Site.
- A review of the availability and practicability of more permanent remedies.
- A review of the availability of improved analytical techniques to evaluate compliance with cleanup levels.

Ecology will publish a notice of all periodic reviews in the Site Register and will provide an opportunity for review and comment by the potentially liable persons and the public.

# 6.0 References

Anchor Environmental, L.L.C. (Anchor). 2004. Sampling and Analysis Data Report, Supplemental Sediment Characterization, Dakota Creek Industries Shipyard Facility/Pier 1 Redevelopment Area, Anacortes, Washington. Prepared for Seattle District, US Army Corps of Engineers. October.

Ecology. 2021. Polycyclic Aromatic Hydrocarbons and Benzo[a]pyrene: Changes to MTCA Default Cleanup Levels for 2017. Supporting material for Cleanup Levels and Risk Calculation (CLARC). Revised July 2021. Floyd|Snider. 2007. Dakota Creek Industries Shipyard Facility, Sediment Sampling Data Report. Prepared for Port of Anacortes. January 3.

GeoEngineers Inc. (GeoEngineers). 2010. Remedial Investigation Data Report, Dakota Creek Industries, Anacortes, Washington. Prepared for the Port of Anacortes. October 11.

GeoEngineers Inc. (GeoEngineers). 2014. Email Correspondence RE: Dakota Creek Site: status check meeting and document request & status check/site visit meeting 3/5/2014 February 21.

GeoEngineers Inc. (GeoEngineers). 2015. Email Correspondence RE: Dakota Creek Shipyard Cleanup April 10.

GeoEngineers Inc. (GeoEngineers). 2018. Groundwater Monitoring Report, Dakota Creek Industries, Anacortes, Washington, Ecology Agreed Order No. DE-07TCPHQ-5080. Prepared for the Washington State Department of Ecology on Behalf of Port of Anacortes. August 6.

GeoEngineers Inc. (GeoEngineers). 2022a. Remedial Investigation/Feasibility Study Report, Dakota Creek Industries, Anacortes, Washington, Ecology Agreed Order No. DE-07TCPHQ-5080. Prepared for the Washington State Department of Ecology on Behalf of Port of Anacortes. April 27.

GeoEngineers Inc. (GeoEngineers). 2022b. Supplemental Soil Investigation Data Report, Dakota Creek Industries, Anacortes, Washington, Ecology Agreed Order No. DE-07TCPHQ-5080. Prepared for the Washington State Department of Ecology on Behalf of Port of Anacortes. June 3.

Landau Associates (Landau). 2002. Remedial Investigation/Feasibility Study, Dakota Creek Industries, Inc. Anacortes, Washington. Prepared for Port of Anacortes. March 20.

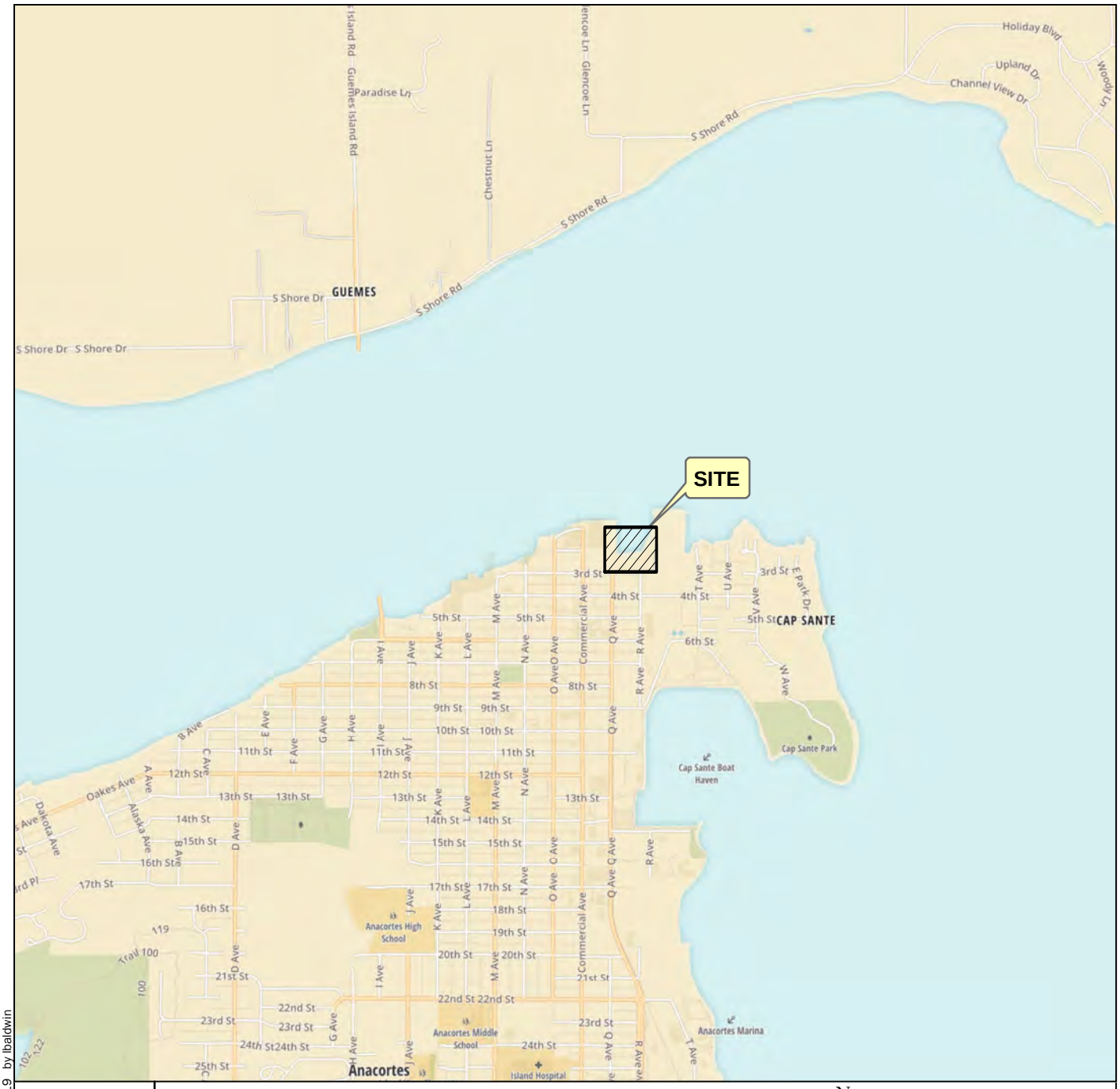
Otten Engineering (Otten). 1997. Phase 2 Environmental Assessment, Dakota Creek Industries Site and Former Wastewater Treatment Plant Site, Port of Anacortes, Anacortes, Washington. Prepared for Port of Anacortes. October 1.

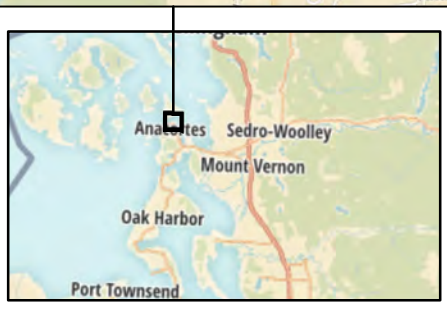
Science Application International Corporation (SAIC). 2008. Fidalgo Bay Sediment Investigation Data Report, Anacortes, Washington. Prepared for the Washington State Department of Ecology. March 14.

Weston. 2001. Dakota Creek Industries Shipyard Site Inspection Final Sampling and Quality Assurance Plan. Prepared for the U.S. Environmental Protection Agency, Contract No. 68-S0-01-02. June.

# Appendices

# Appendix A. Supplemental Soil Investigation Data Report




N
W E
S

2,000 0 2,000

Feet

## Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Mapbox Open Street Map, 2016

Projection: NAD 1983 UTM Zone 10N

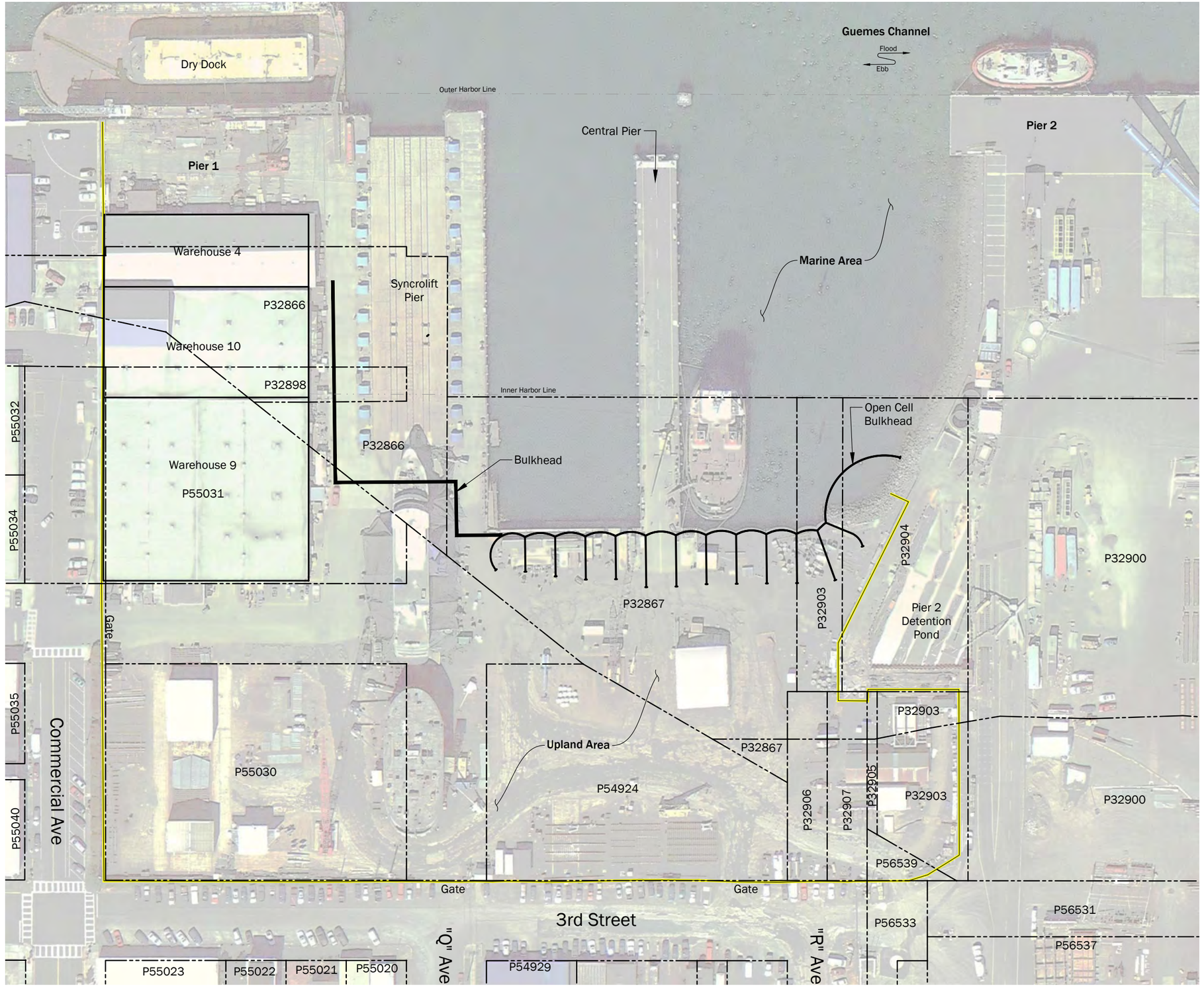
**Vicinity Map**

Dakota Creek Industries
Anacortes, Washington

GeoEngineers

**Figure 1.1**

C:\Users\lbaldwin\Desktop\Templates\VicinityMap.mxd Date Exported: 02/27/19 by lbaldwin




P:\5\5147006\CAD\14\Draft Cleanup Action Plan\5147006l4_F01.2_Parcel Map.dwg TAB:F01.2 Date Exported: 05/06/21 - 23:40 by hmara

## Legend

- Dakota Creek Industries (DCI) Property Boundary
- P32904 — Skagit County Parcel Boundary and Number

## Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Aerial from Google Earth Pro dated 8/2011.

Projection: WA State Plane, North Zone, NAD83, US Foot

N W E S

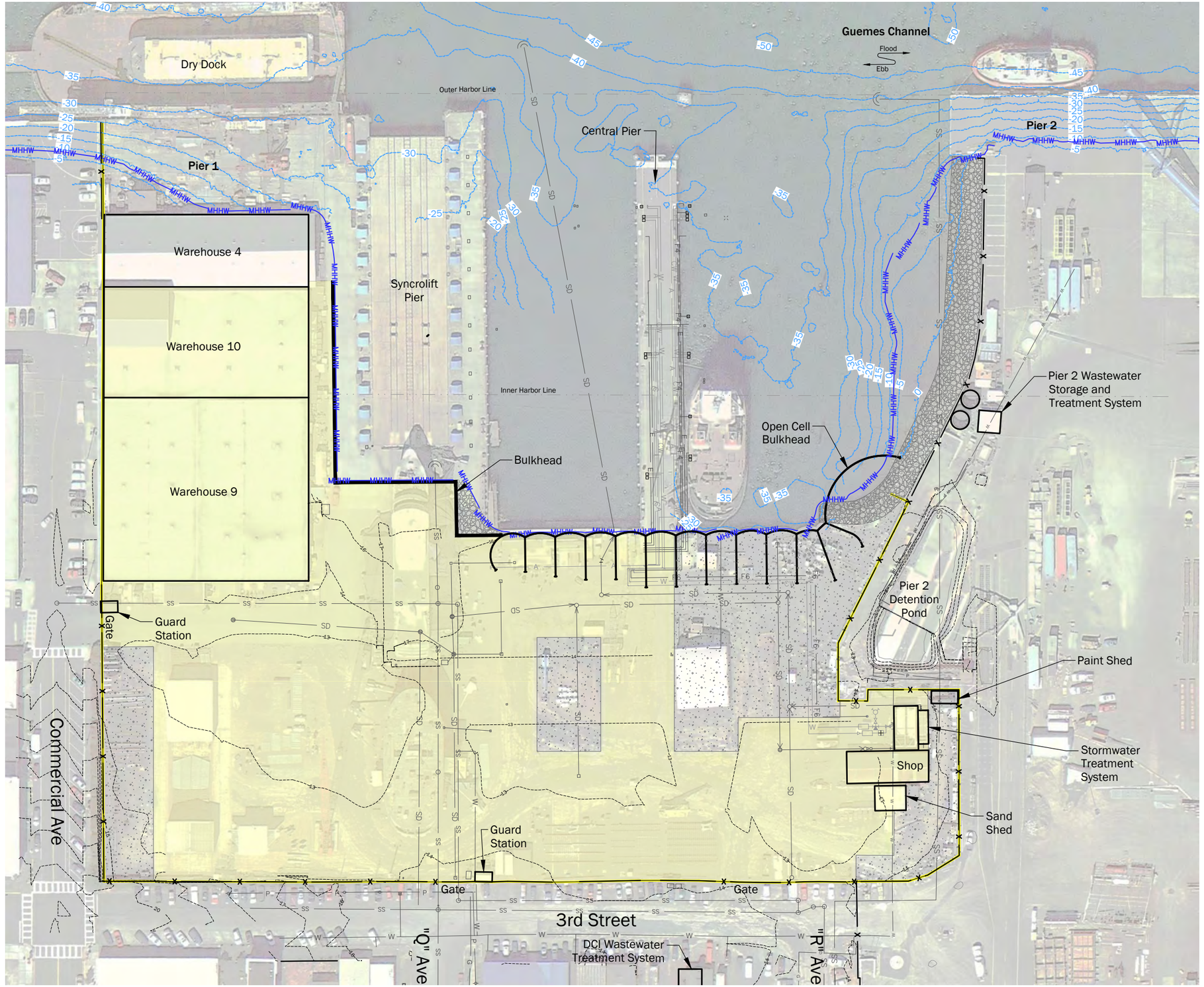
100 0 100
Feet

**Parcel Map**

Dakota Creek Industries
Anacortes, Washington

GeoEngineers

**Figure 1.2**




## Legend

- Dakota Creek Industries (DCI) Property Boundary
- Existing Fence
- Compressed Air
- Comm Line
- Electrical
- Fireline 4
- Fireline 6
- Sanitary Sewer
- Stormwater Drain
- Water
- Cold Water
- Power
- Catch Basin
- Manhole
- Outfall
- Gravel
- Concrete/Asphalt Pavement or Asphalt for Building
- Rip Rap
- Topographic Contour
- Bathymetric Contour
- Mean Higher High Water (MHHW)

## Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Aerial from Google Earth Pro dated 8/2011.
Projection:
Horizontal Datum: WA State Plane, North Zone, NAD83, US Foot
Vertical Datum: Mean Low Low Water (MLLW)

N
W E
S

100 0 100
Feet

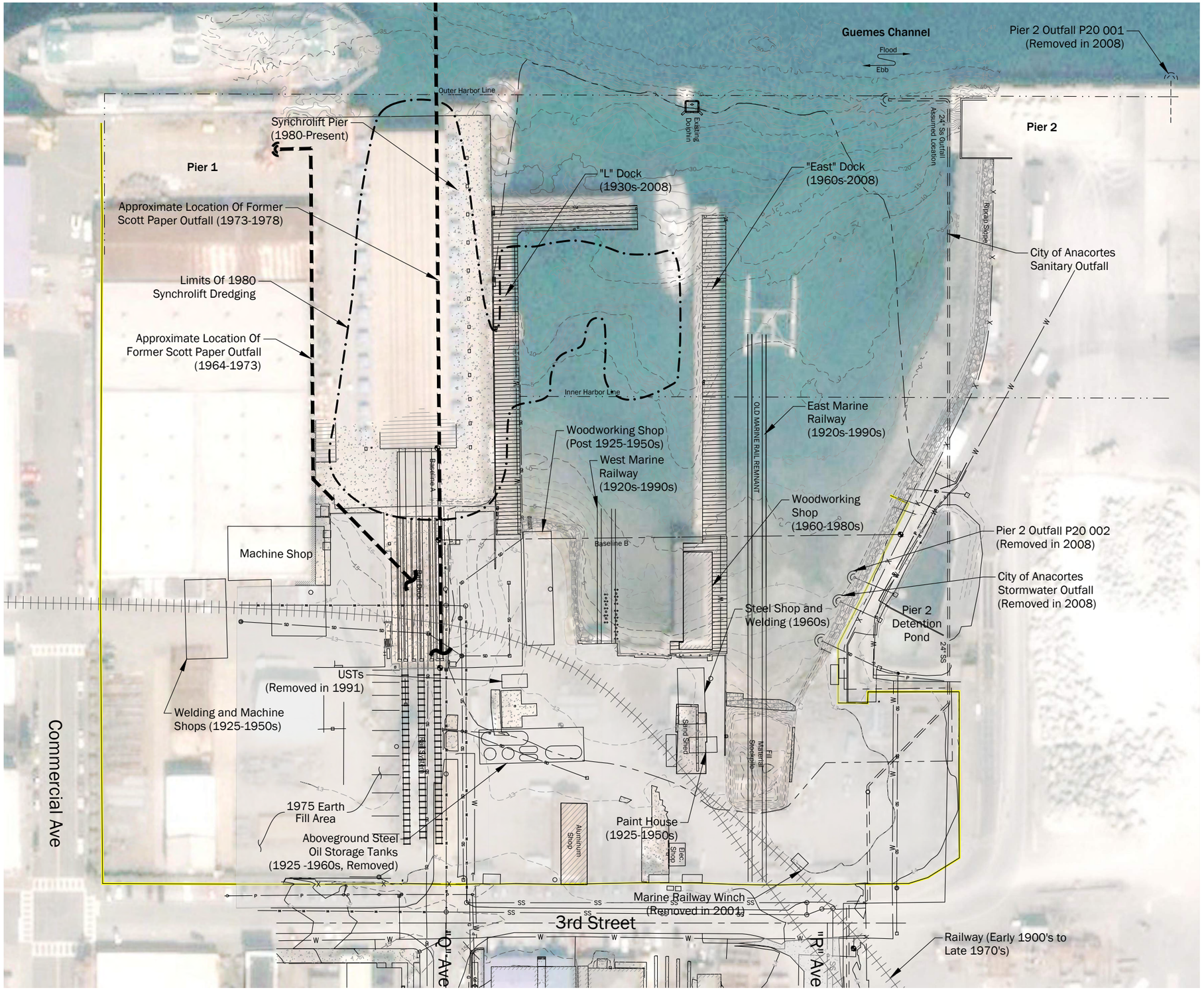
**Current Property Layout and Features**

Dakota Creek Industries
Anacortes, Washington

GeoEngineers

**Figure 1.3**

P:\5\5147006\CAD\14\Draft Cleanup Action Plan\5147006l4_F01.3_Current Property Layout.dwg TAB:F01.3 Date Exported: 05/06/21 - 23:41 by hmara




## Legend

- Dakota Creek Industries (DCI) Property Boundary
- Existing Fence
- Catch Basin
- Sewer Manhole
- Storm Manhole
- Gravel
- Concrete
- Rip Rap
- Approximate Synchrolift Dredge Limits
- Elevation Contour
- Approximate Footprint of Historical Structures - Labels Indicate Function and Time Period in Existence.
- Sanitary Sewer

## Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: AutoCAD drawing entitled "Existing Conditions and Project Control", file name 064065.01-1.14.dwg, by PND Engineers, Inc., dated September 2007.
Aerial from Google Earth Pro dated 9/6/2006.

Projection:
Horizontal Datum: WA State Plane, North Zone, NAD83, US Foot
Vertical Datum: Mean Low Low Water (MLLW)

N
W E
S

100 0 100
Feet

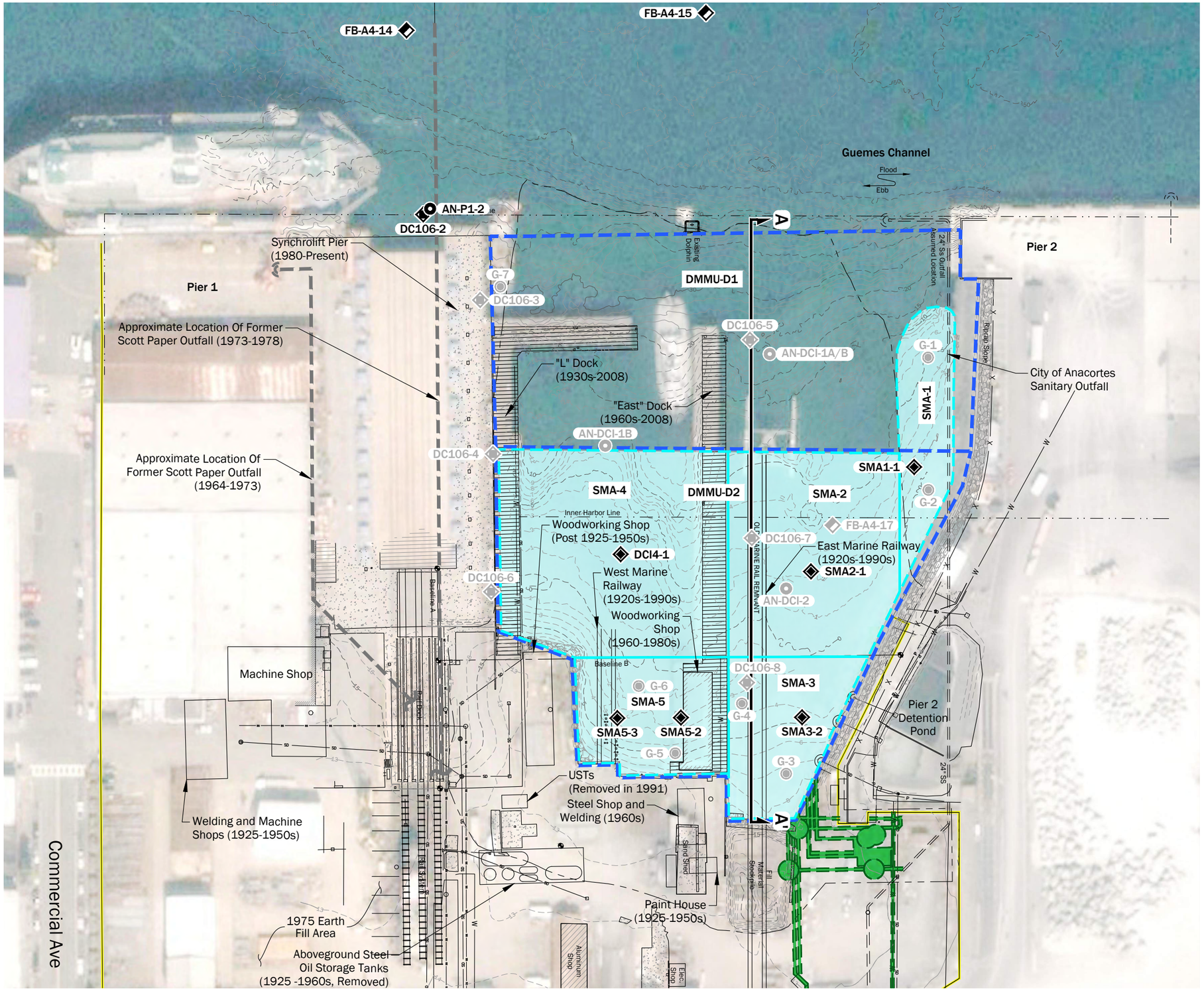
# Historical Property Layout and Features

Dakota Creek Industries
Anacortes, Washington

GeoEngineers

Figure 2.1

P:\5\5147006\CAD\14\Draft Cleanup Action Plan\5147006I4_F02.1_Historical Property Layout.dwg TAB:F02.1 Date Exported: 05/06/21 - 23:42 by hmara




## Legend

- Dakota Creek Industries (DCI) Property Boundary
- Marine Area Dredge Boundary (GeoEngineers 2008)
- Marine Area Interim Action Boundary
- Upland Area Interim Action Boundary

Sample Location Representing Pre-Dredge Sediment Conditions

- Supplemental Dredged Material Characterization (Anchor 2004)
- DCI Basin Surface Sediment Dioxin Study (Floyd|Snider 2007)
- Fidalgo Bay Sediment Study (SAIC 2008)
- Sediment Remedial Investigation (GeoEngineers 2008)

Sample Location Representing Post-Dredge Sediment Conditions

- Fidalgo Bay Sediment Study (SAIC 2008)
- Interim Action (GeoEngineers 2008)

A — A' Cross Section A-A' (See Figure 2.3)

## Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: AutoCAD drawing entitled "Existing Conditions and Project Control", file name 064065.01-1.14.dwg, by PND Engineers, Inc., dated September 2007.
Aerial from Google Earth Pro dated 9/6/2006.

Projection: WA State Plane, North Zone, NAD83, US Foot

N W E S

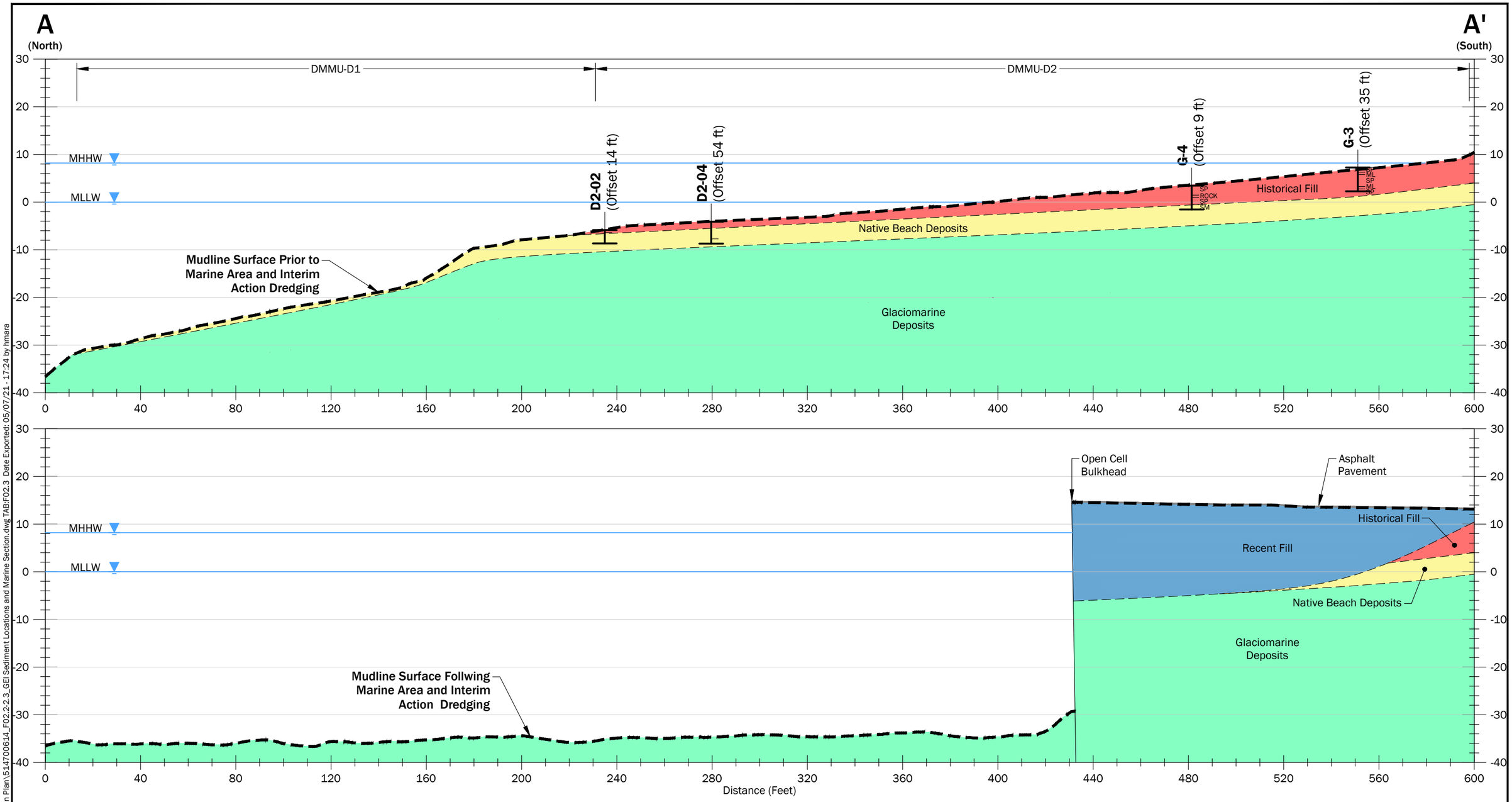
100 0 100
Feet

**Marine Area Sediment Sampling Locations**

Dakota Creek Industries
Anacortes, Washington

GeoEngineers | Figure 2.2

P:\5\5147006\CAD\14\Draft Cleanup Action Plan\5147006I4_F02.2-2.3_GEI Sediment Locations and Marine Section.dwg TAB:F02.2 Date Exported: 05/07/21 - 10:56 by hmara




P:\5\5147006\CAD\14\Draft Cleanup Action Plan\5147006614_F02.2-2.3_GEI Sediment Locations and Marine Section.dwg TAB:F02.3 Date Exported: 05/07/21 - 17:24 by hmara

Notes:

1. The subsurface conditions shown are based on interpolation between widely spaced explorations and should be considered approximate; actual subsurface conditions may vary from those shown.
2. This figure is for informational purposes only. It is intended to assist in the identification of features discussed in a related document. Data were compiled from sources as listed in this figure. The data sources do not guarantee these data are accurate or complete. There may have been updates to the data since the publication of this figure. This figure is a copy of a master document. The hard copy is stored by GeoEngineers, Inc. and will serve as the official document of record.

Datum: NAVD 88, unless otherwise noted.

**Legend**

- Recent Fill (Imported Sand and Gravel)
- Historical Fill (Layered Sand and Silt/Clay with Occasional Wood Debris)
- Native Beach Deposits (Poorly Sorted Sand with Occasional Shell Fragments)
- Glaciomarine Deposits (Glacially Consolidated Very Dense Sand and Hard Silt)

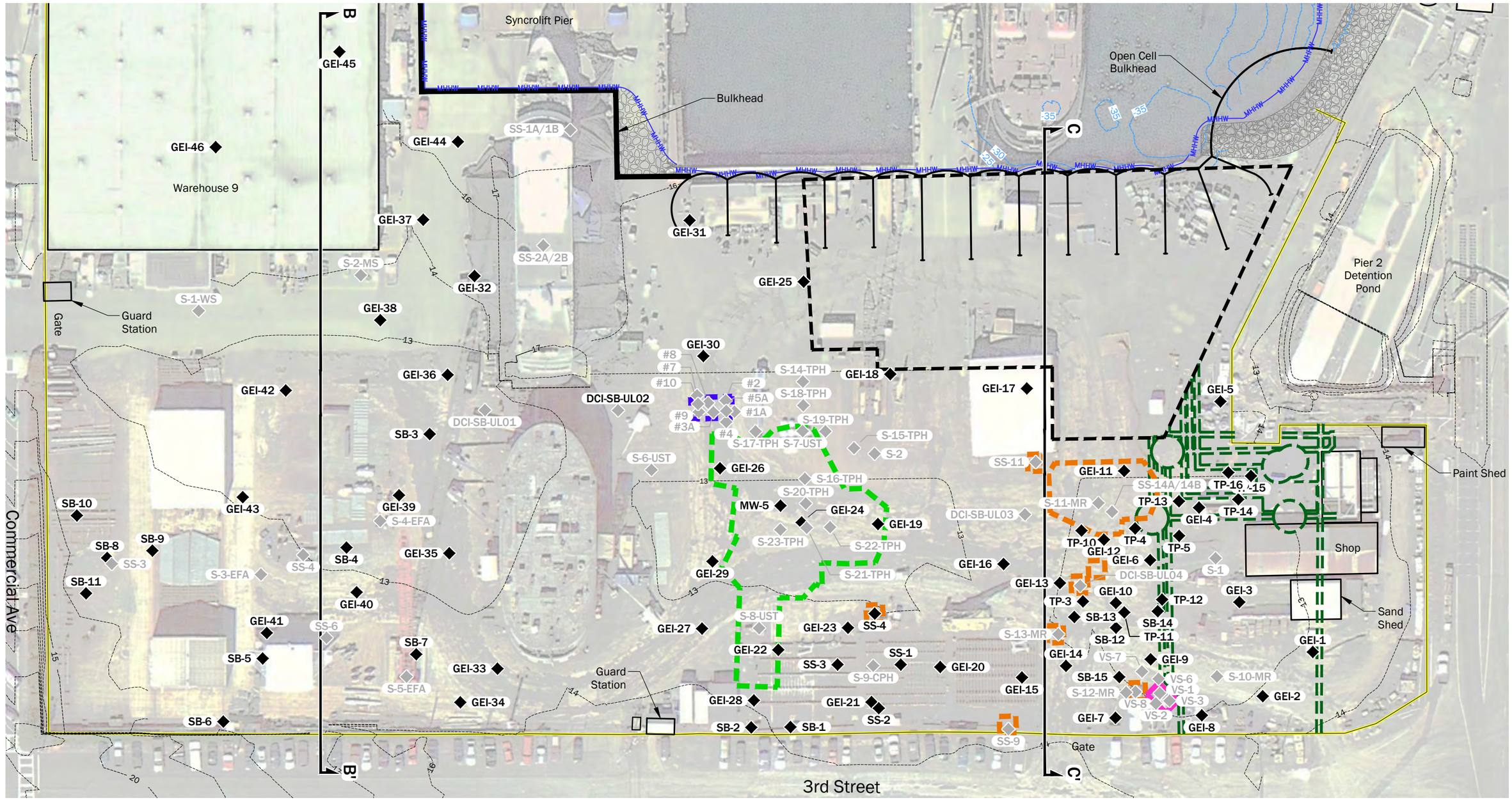
40 0 40
Horizontal Scale in Feet
20 0 20
Vertical Scale in Feet
Vertical Exaggeration: 2X

**Marine Area Cross Sections**

Dakota Creek Industries
Anacortes, Washington

GeoEngineers

**Figure 2.3**




Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Aerial from Google Earth Pro dated 8/2011.

Projection: WA State Plane, North Zone, NAD83, US Foot

**Legend**

- Dakota Creek Industries (DCI) Property Boundary
- 1991 Cleanup Action Area
- 2001 Marine Railway Winch Cleanup Action Area
- 2002 Petroleum Cleanup Action Area
- 2002 Marine Railway Cleanup Action Area
- 2008 Upland Area Interim Action Area
- 2008 Marine Area Interim Action Area
- Remedial Investigation Soil Sampling Location
- Historical Soil Sampling Location
- B B' Cross Section Location (See Figure 2.5)

N W E S

60 0 60
Feet

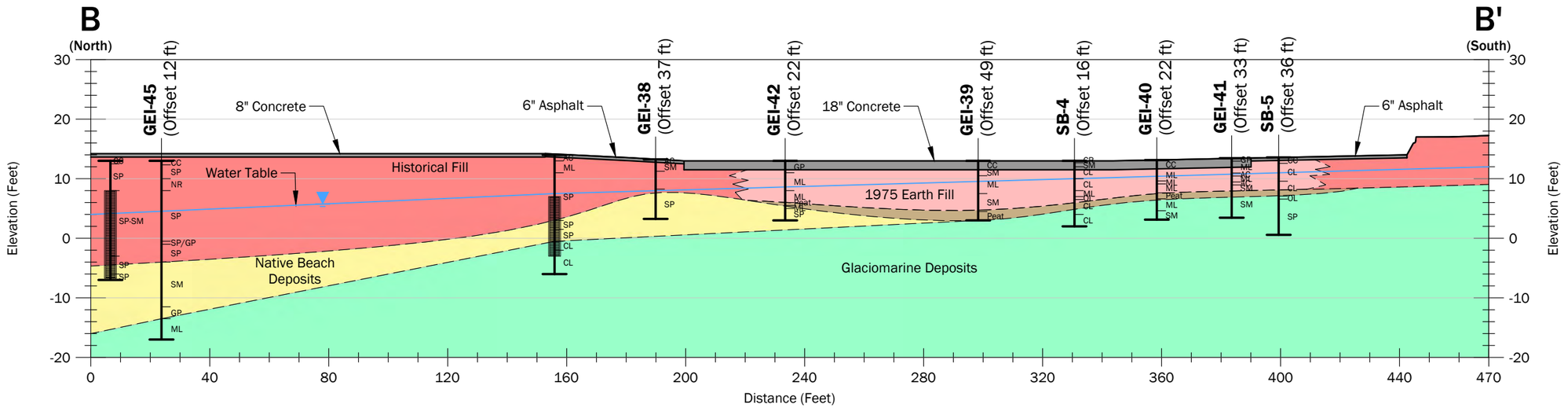
# Upland Area Soil and Groundwater Sampling Locations and Cleanup Action Areas

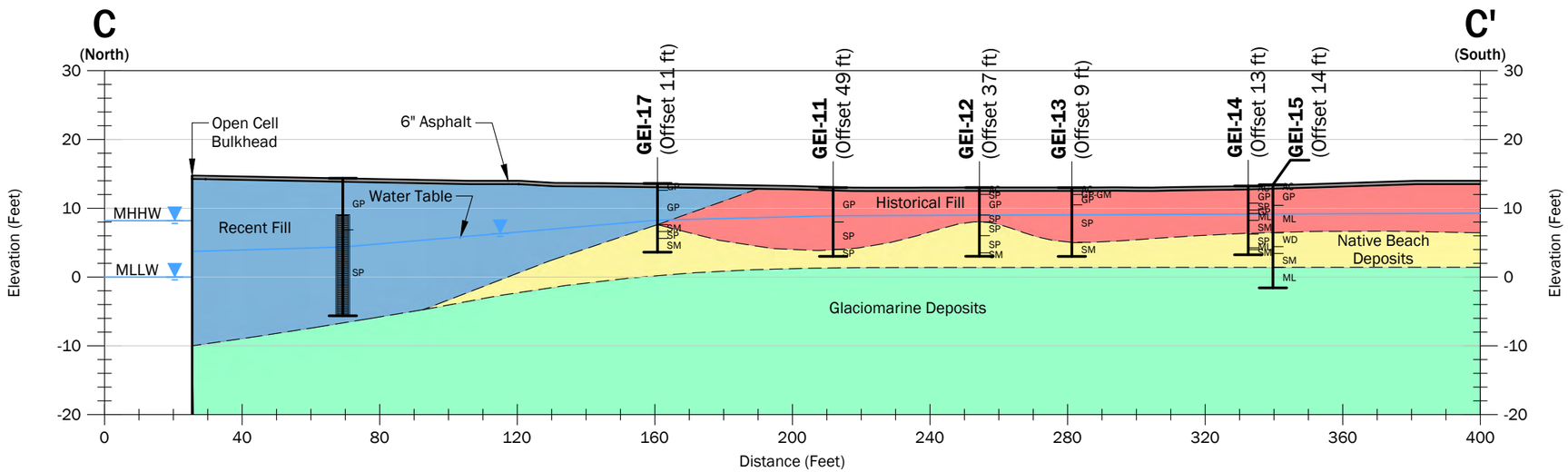
Dakota Creek Industries
Anacortes, Washington

GeoEngineers

Figure 2.4

P:\5\5147006\CAD\14\Draft Cleanup Action Plan\5147006I4_F02.4-2.5_Soil and GW Locations and Upland Sections.dwg TAB:F02.4 Date Exported: 05/07/21 - 17:14 by hmara

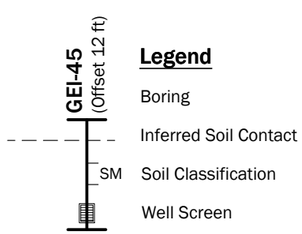



## Notes:

1. The subsurface conditions shown are based on interpolation between widely spaced explorations and should be considered approximate; actual subsurface conditions may vary from those shown.
2. This figure is for informational purposes only. It is intended to assist in the identification of features discussed in a related document. Data were compiled from sources as listed in this figure. The data sources do not guarantee these data are accurate or complete. There may have been updates to the data since the publication of this figure. This figure is a copy of a master document. The hard copy is stored by GeoEngineers, Inc. and will serve as the official document of record.

Datum: NAVD 88, unless otherwise noted.




**Legend**

- Boring
- Inferred Soil Contact
- Soil Classification
- Well Screen

- Recent Fill (Imported Sand and Gravel)
- Historical Fill (Layered Sand and Silt/Clay with Occasional Wood, Brick and Concrete Debris)
- 1975 Earth Fill (Layered silt and clay with Variable Sand and Gravel Content)
- Native Saltmarsh Deposits (Organic Silt)
- Native Beach Deposits (Poorly Sorted Sand with Occasional Gravel)
- Glaciomarine Deposits (Glacially Consolidated Very Dense Sand and Hard Silt)

40 0 40
Horizontal Scale in Feet

20 0 20
Vertical Scale in Feet
Vertical Exaggeration: 2X

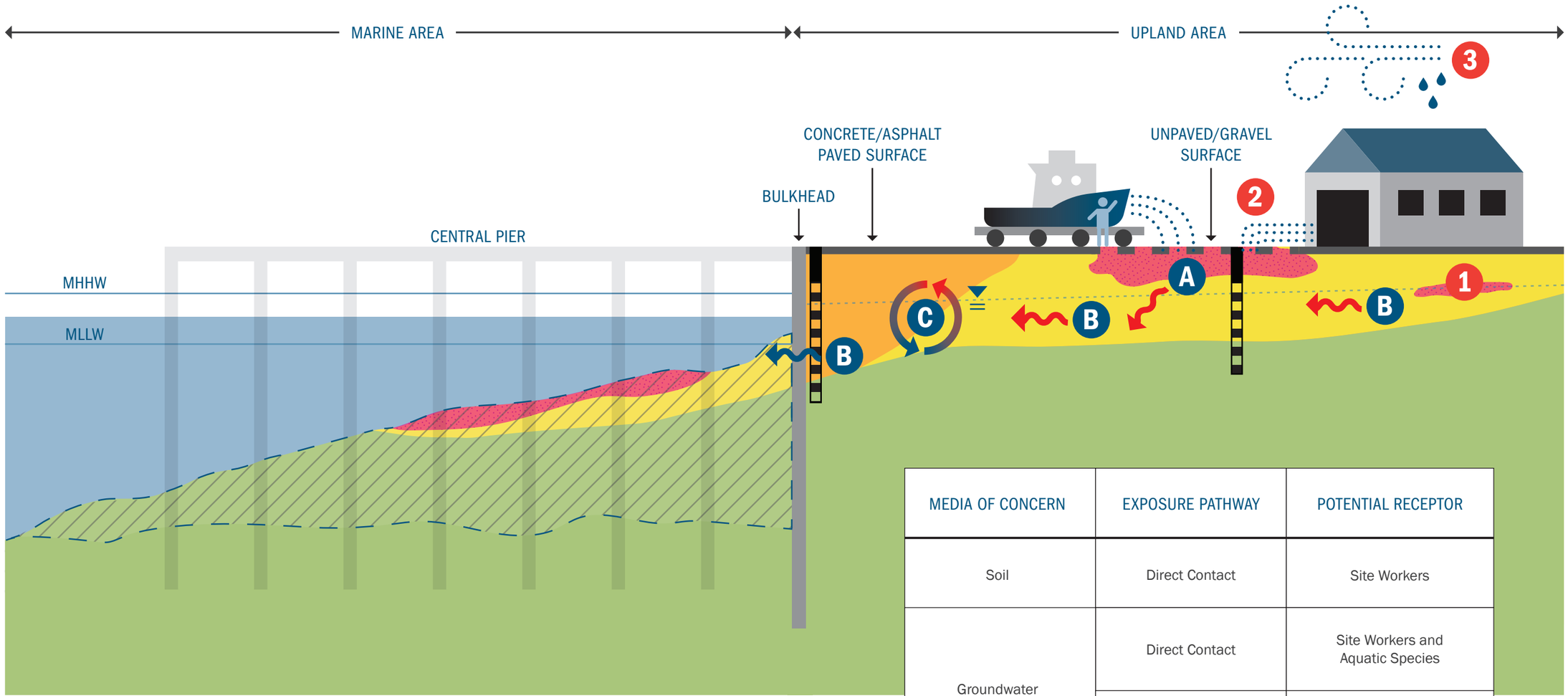
**Upland Area Cross Sections**

Dakota Creek Industries
Anacortes, Washington

GeoEngineers

**Figure 2.5**

P:\5\5147006\CAD\14\Draft Cleanup Action Plan\5147006I4_F02.4-2.5_Soil and GW Locations and Upland Sections.dwg TAB:F02.5 Date Exported: 05/07/21 - 16:28 by hmara




| MEDIA OF CONCERN | EXPOSURE PATHWAY | POTENTIAL RECEPTOR |
|---|---|---|
| Soil | Direct Contact | Site Workers |
| Groundwater | Direct Contact | Site Workers and Aquatic Species |
| | Ingestion | Consumption of Marine Organisms |

## Legend

- Potential Contaminant Transport Pathway
- MHHW Mean Higher High Water
- MLLW Mean Lower Low Water
- Monitoring Well

## Stratigraphy

- Imported Clean Fill - Placed Following 2002 Independent Cleanup Action or 2008 Interim Action Activities
- Artificial Fill
- Native Deposits (Glaciomarine Drift and Beach Sands)
- Contaminants
- Removed During 2008 Interim Action and Marine Area Dredging

## Sources of Contamination

1. Historical Contaminated Fill - Fill contains debris including concrete asphalt, brick and wood fragments suggesting that they may have been re-used from other industrial sources
2. Industrial-Related Operations - Direct discharge of paint chips, grinding and blast grit residues to the ground from vessel maintenance and repair activities.
3. Atmospheric Deposition - Ongoing and historic combustion of fossil fuels from residents, machinery (boiler, power, etc.), vehicles, marine vessels, and wood burning.

## Environmental Transport

- A Infiltration and Leaching (Unpaved Areas Only)
- B Shallow Unconfined Aquifer Solute Transport
- C Tidal Mixing

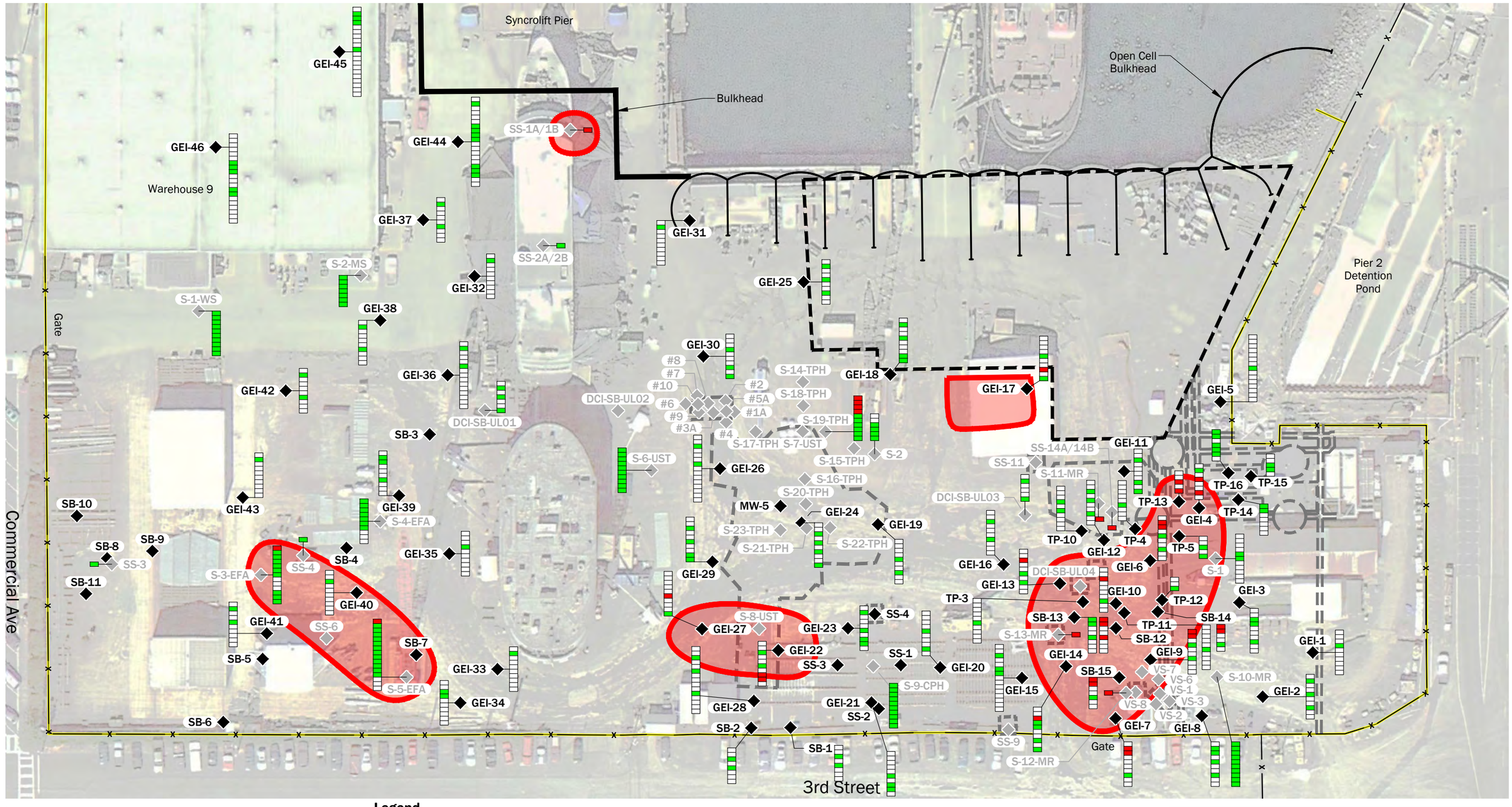
**Current Site Configuration**

Dakota Creek Industries
Anacortes, Washington

GeoEngineers

**Figure 2.6**

P:\5\5147006\Graphics_Misc\5147006613 Current Site Configuration.ai Exported 4/24/19 by spride




Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Aerial from Google Earth Pro dated 8/2011.

Projection: WA State Plane, North Zone, NAD83, US Foot

**Legend**

- Dakota Creek Industries (DCI) Property Boundary
- Previous Upland Soil Excavation and Backfill Area (See Figure 2.4)
- Previous Marine Area Dredge and Backfill Area (See Figure 2.2)
- Remedial Investigation Soil Sampling Location
- Historical Soil Sampling Location
- Soil Boring - Each Box Represents a 1-Foot Sample Interval
- No Soil Data
- Result Less Than Proposed Cleanup Level
- Result Exceeds Proposed Cleanup Level
- Approximate Extent of Proposed Soil Cleanup Level Exceedance

bgs = below ground surface

N W E S

60 0 60
Feet

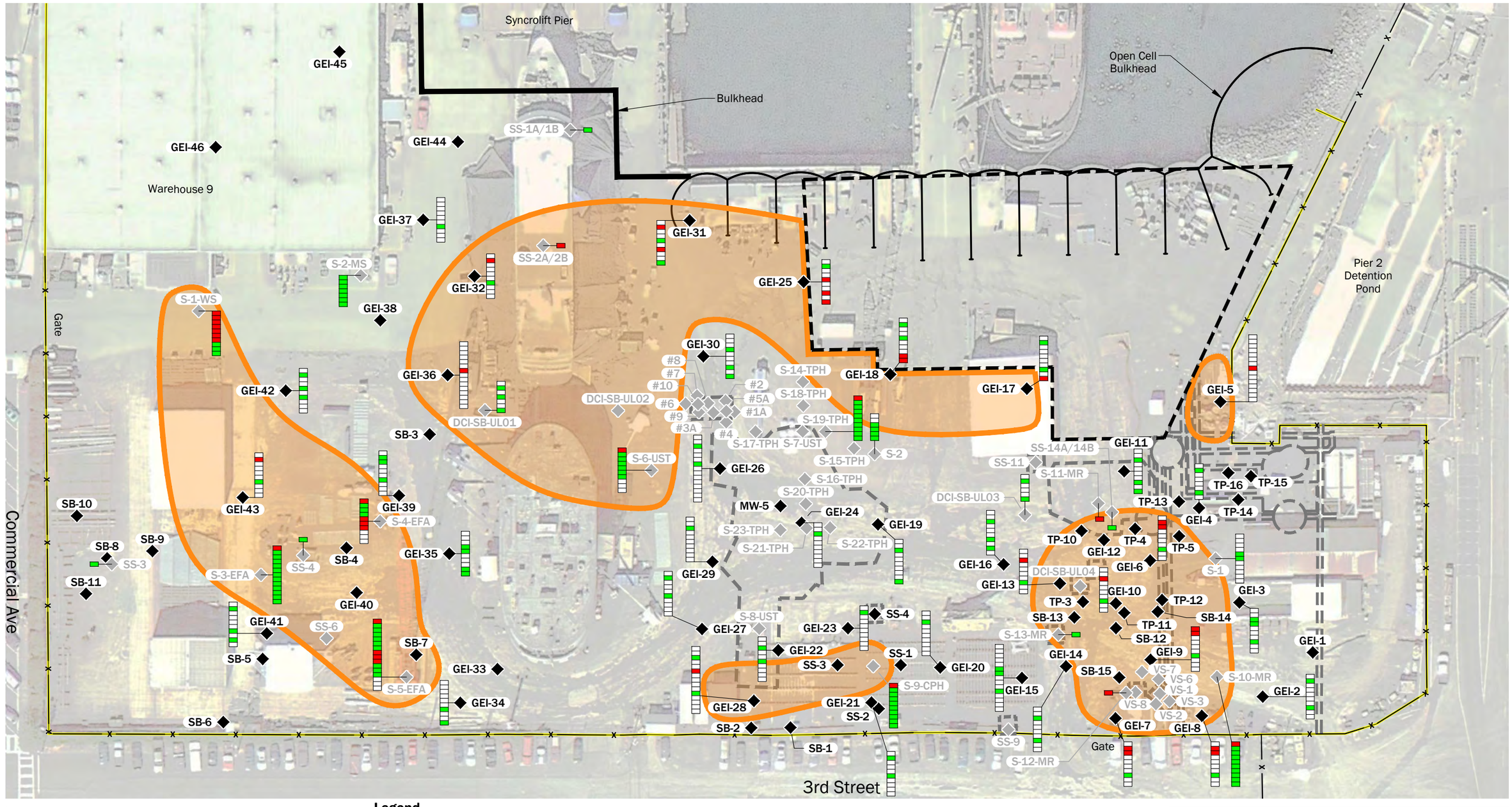
**Summary of Soil Arsenic Results**

Dakota Creek Industries
Anacortes, Washington

GeoEngineers

**Figure 2.7**

P:\5\5147006\CAD\14\Draft Cleanup Action Plan\5147006614_F02.7_Extent of Arsenic Contamination.dwg TAB:F02.7 Date Exported: 05/07/21 - 17:18 by hmara




Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Aerial from Google Earth Pro dated 8/2011.

Projection: WA State Plane, North Zone, NAD83, US Foot

**Legend**

- Dakota Creek Industries (DCI) Property Boundary
- Previous Upland Soil Excavation and Backfill Area (See Figure 2.4)
- Previous Marine Area Dredge and Backfill Area (See Figure 2.2)
- Remedial Investigation Soil Sampling Location
- Historical Soil Sampling Location
- Soil Boring - Each Box Represents a 1-Foot Sample Interval
- No Soil Data
- Result Less Than Proposed Cleanup Level
- Result Exceeds Proposed Cleanup Level
- Approximate Extent of Proposed Soil Cleanup Level Exceedance

bgs = below ground surface

N W E S

60 0 60
Feet

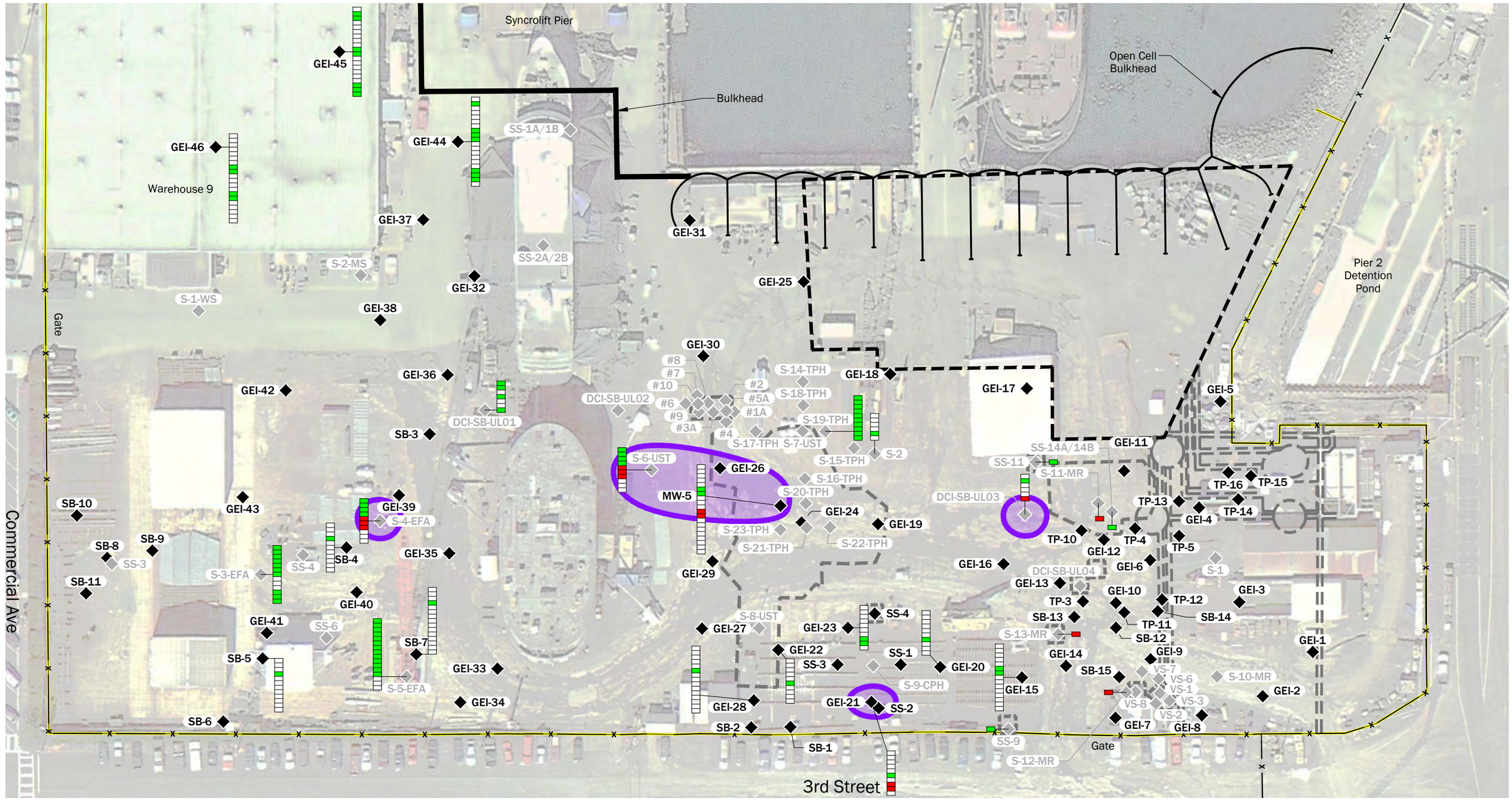
**Summary of Soil Nickel Results**

Dakota Creek Industries
Anacortes, Washington

GeoEngineers

**Figure 2.8**

P:\5\5147006\CAD\14\Draft Cleanup Action Plan\5147006l4_F02.8_Extent of Nickel Contamination.dwg TAB:F02.8 Date Exported: 05/07/21 - 17:18 by hmara




Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Aerial from Google Earth Pro dated 8/2011.

Projection: WA State Plane, North Zone, NAD83, US Foot

**Legend**

- Dakota Creek Industries (DCI) Property Boundary
- Previous Upland Soil Excavation and Backfill Area (See Figure 2.4)
- Previous Marine Area Dredge and Backfill Area (See Figure 2.2)
- Remedial Investigation Soil Sampling Location
- Historical Soil Sampling Location
- Soil Boring - Each Box Represents a 1-Foot Sample Interval
- No Soil Data
- Result Less Than Proposed Cleanup Level
- Result Exceeds Proposed Cleanup Level
- Approximate Extent of Proposed Soil Cleanup Level Exceedance

bgs = below ground surface

N W E S

60 0 60
Feet

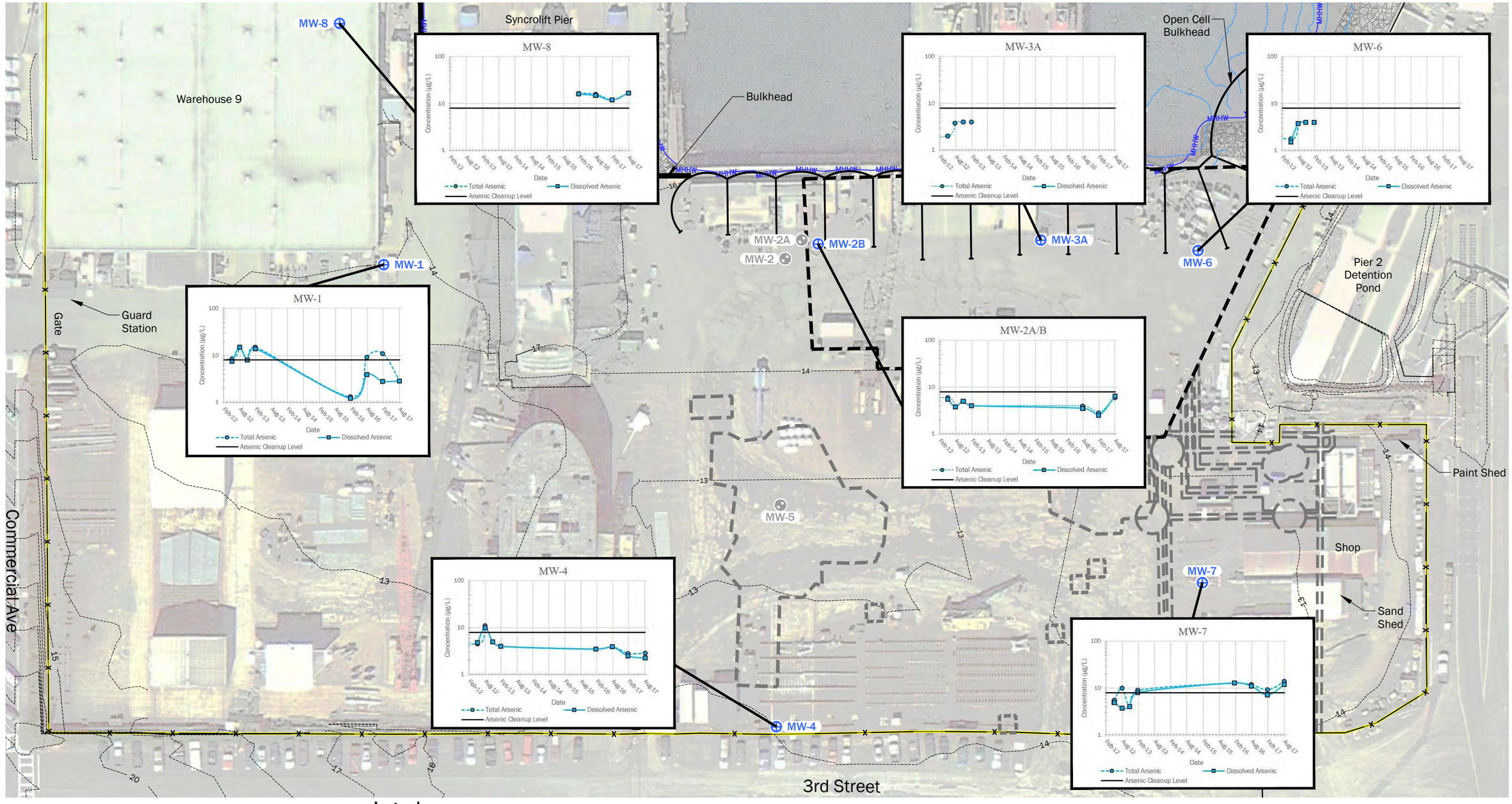
**Summary of Soil PAHs Results**

Dakota Creek Industries
Anacortes, Washington

GeoEngineers

**Figure 2.9**

P:\5\5147006\CAD\14\Draft Cleanup Action Plan\5147006f14_F02.9_Extent of PAHs Contamination.dwg TAB:F02.9 Date Exported: 05/07/21 - 17:17 by hmara




Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Aerial from Google Earth Pro dated 8/2011.

Projection:
Horizontal Datum: WA State Plane, North Zone, NAD83, US Foot
Vertical Datum: Mean Low Low Water (MLLW)

**Legend**

- Dakota Creek Industries (DCI) Property Boundary
- Previous Upland Soil Excavation and Backfill Area (See Figure 2.4)
- Previous Marine Area Dredge and Backfill Area (See Figure 2.2)
- MW-1 — Monitoring Well Location (Active)
- MW-2A — Monitoring Well Location (Abandoned)

N W E S

60 0 60
Feet

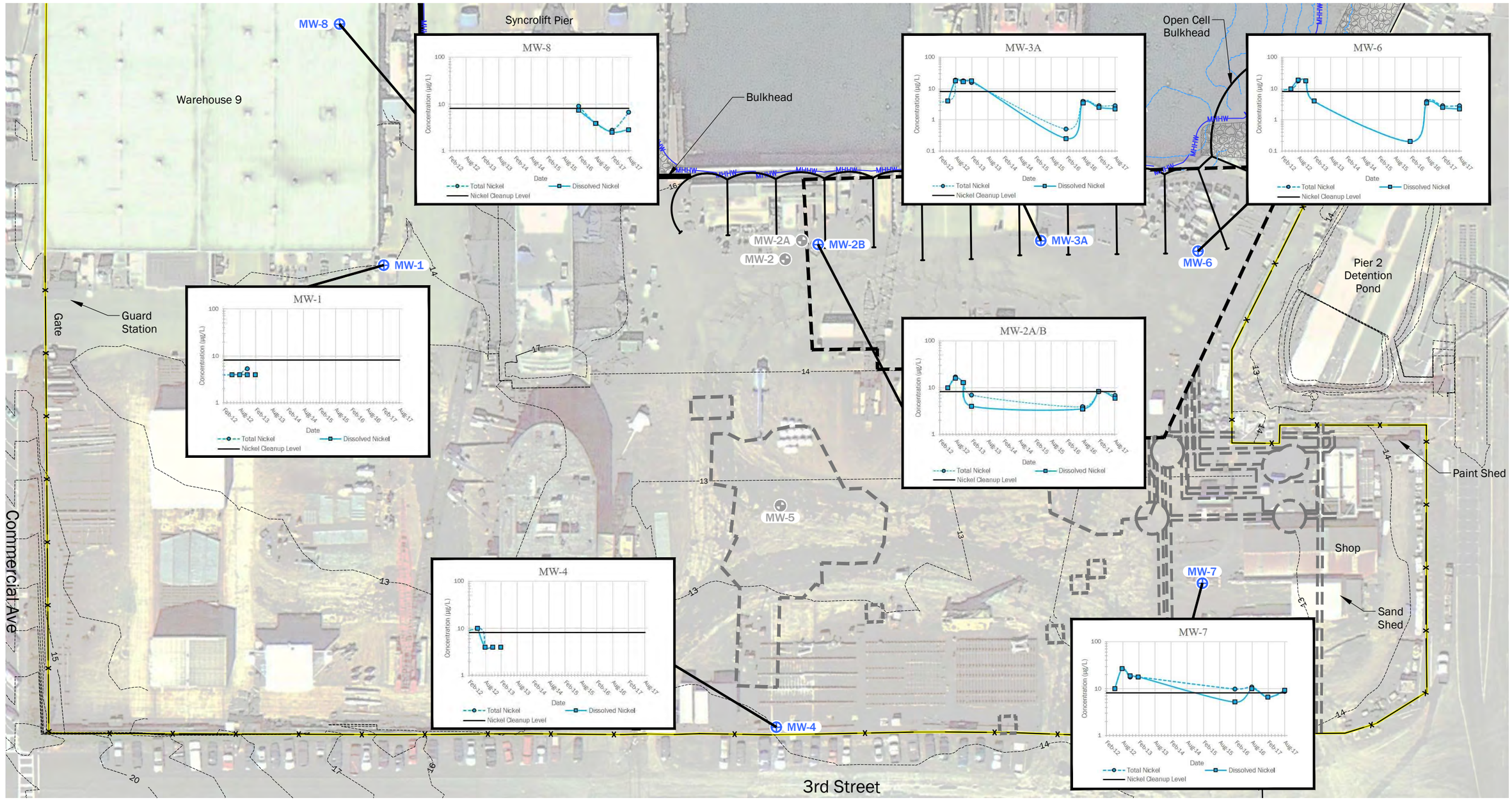
**Summary of Groundwater Arsenic Results**

Dakota Creek Industries
Anacortes, Washington

GeoEngineers

**Figure 2.10**

P:\5\5147006\CAD\14\Draft Cleanup Action Plan\5147006614_F02.10_Summary of Arsenic in GW.dwg TAB:F02.10 Date Exported: 05/07/21 - 17:17 by hmara




Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Aerial from Google Earth Pro dated 8/2011.

Projection:
Horizontal Datum: WA State Plane, North Zone, NAD83, US Foot
Vertical Datum: Mean Low Low Water (MLLW)

**Legend**

- Dakota Creek Industries (DCI) Property Boundary
- Previous Upland Soil Excavation and Backfill Area (See Figure 2.4)
- Previous Marine Area Dredge and Backfill Area (See Figure 2.2)
- MW-1 — Monitoring Well Location (Active)
- MW-2A — Monitoring Well Location (Abandoned)

N W E S

60 0 60
Feet

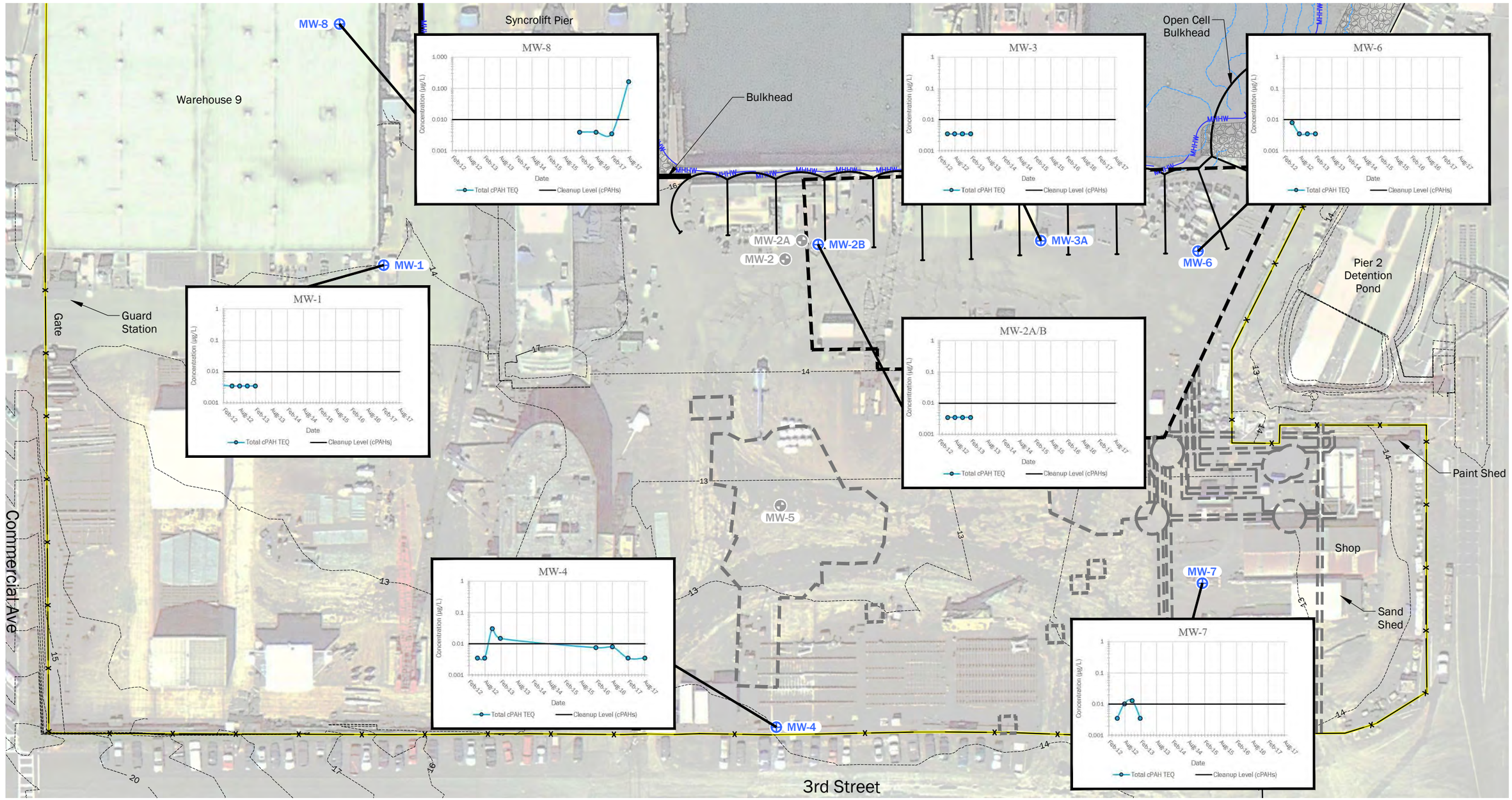
**Summary of Groundwater Nickel Results**

Dakota Creek Industries
Anacortes, Washington

GeoEngineers

**Figure 2.11**

P:\51\51470061CAD\14\Draft Cleanup Action Plan\514700614_F02.11_Summary of Nickel in GW.dwg TAB:F02.11 Date Exported: 05/07/21 - 17:16 by hmara




Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Aerial from Google Earth Pro dated 8/2011.

Projection:
Horizontal Datum: WA State Plane, North Zone, NAD83, US Foot
Vertical Datum: Mean Low Low Water (MLLW)

**Legend**

- Dakota Creek Industries (DCI) Property Boundary
- Previous Upland Soil Excavation and Backfill Area (See Figure 2.4)
- Previous Marine Area Dredge and Backfill Area (See Figure 2.2)
- MW-1 — Monitoring Well Location (Active)
- MW-2A — Monitoring Well Location (Abandoned)

N W E S

60 0 60
Feet

**Summary of Groundwater Total cPAH TEQ Results**

Dakota Creek Industries
Anacortes, Washington

GeoEngineers

**Figure 2.12**

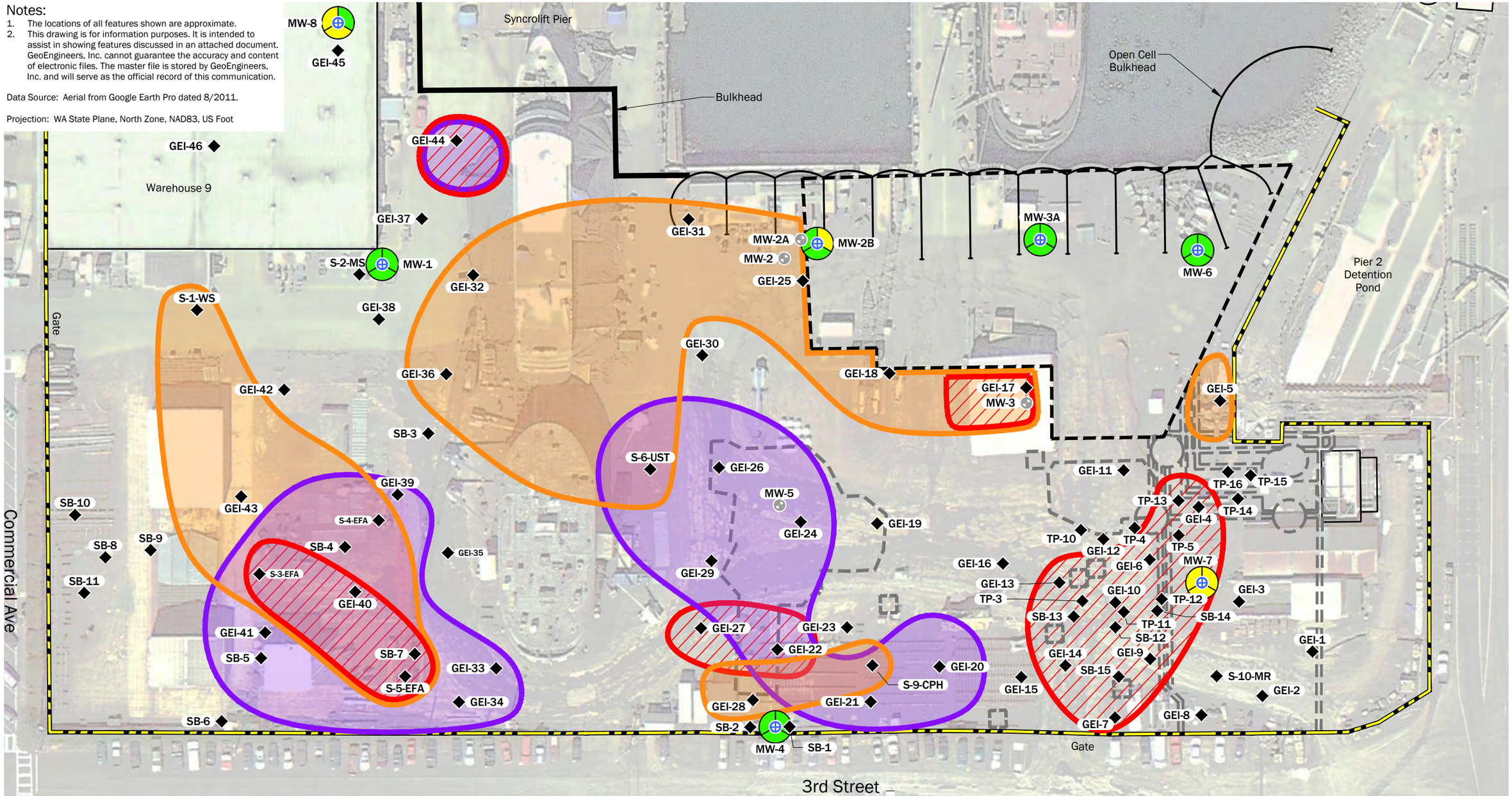
P:\5\5147006\CAD\14\Draft Cleanup Action Plan\5147006f14_F02.12_Summary of CPAHs in GW.dwg TAB:F02.12 Date Exported: 05/07/21 - 17:19 by hmara

## Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Aerial from Google Earth Pro dated 8/2011.

Projection: WA State Plane, North Zone, NAD83, US Foot




## Legend

- Dakota Creek Industries (DCI) Property Boundary
- Previous Upland Soil Excavation and Backfill Area (See Figure 2.4)
- Previous Marine Area Dredge and Backfill Area (See Figure 2.2)
- MW-1 — Monitoring Well Location (Active)
- MW-2A — Monitoring Well Location (Abandoned)
- Soil Sampling Location

Summary of Soil RI Sampling Results

- Approximate Extent of Arsenic Preliminary Soil Cleanup Level Exceedance
- Approximate Extent of Nickel Preliminary Soil Cleanup Level Exceedance
- Approximate Extent of cPAH Preliminary Soil Cleanup Level Exceedance

Summary of Groundwater RI Monitoring Results[1]

Dissolved Arsenic — Dissolved Nickel — Total cPAH TEQ

- Not Detected Greater Than the Groundwater Preliminary Cleanup Level
- Exceeded Groundwater Preliminary Cleanup Level During One or More Monitoring Events

[1]Summary of groundwater monitoring results for the previous four monitoring events in which sample was submitted for chemical analysis.

N W E S

60 0 60
Feet

# Areas Requiring Clean Action Evaluation

Dakota Creek Industries
Anacortes, Washington

GeoEngineers

Figure 4.1

P:\5\51470006\CAD\14\Draft Cleanup Action Plan\514700614_F04.1_Summary of Upland Area.dwg TAB:F04.1 Date Exported: 05/07/21 - 17:28 by hmara

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Aerial from Google Earth Pro dated 8/2011.

Projection: WA State Plane, North Zone, NAD83, US Foot

MW-8

Syncrolift Pier

**Containment: Maintain Existing Sheet Pile Wall to Restrict Flow and Discharge of Groundwater to Surface Water**

Open Cell Bulkhead

**Groundwater Monitoring: Monitor Groundwater Conditions at Each Well Location Over Time to Evaluate Compliance with Cleanup Standards and Natural Attenuation**

MW-1

MW-2B

MW-3A

MW-6

Pier 2 Detention Pond

Gate

Guard Station

**Containment: Maintain Existing Pavement Cover to Prevent Direct Exposure, Stormwater Infiltration and Contaminant Leaching/Migration**

**Removal: Perform Remedial Excavation to Remove Contaminants Using Standard Earthwork Equipment Followed by Site Restoration**

Paint Shed

Shop

MW-7

Sand Shed

Commercial Ave

Guard Station

MW-4

Gate

**Institutional Control: Maintain Existing Fencing and Security Procedures to Restrict Public Access**

**Institutional Control: Install Warning Signs to Notify Workers of Potential Heath Risks of Site Contaminants Remaining In Place**

3rd Street

## Legend

- Dakota Creek Industries (DCI) Property Boundary
- Previous Upland Soil Excavation and Backfill Area (See Figure 2.4)
- Previous Marine Area Dredge and Backfill Area (See Figure 2.2)
- Existing Bulkhead
- Existing Fence
- Existing Asphalt/Concrete Pavement
- Area in Which Metals (Arsenic and/or Nickel) in Soil Exceed The Preliminary Cleanup Level
- Area in Which Total cPAH TEQ in Soil Exceed The Preliminary Cleanup Level
- Contaminant Source Area - Area in Which Metals (Arsenic and/or Nickel) Exceed Three Times the Preliminary Soil Cleanup Level
- Soil Removal Area
- Proposed New Asphalt Pavement
- MW-1 Proposed Compliance Groundwater Monitoring Well Location

cPAHs = carcinogenic aromatic hydrocarbons

TEQ = toxic equivalency

N W E S

60 0 60

Feet

**Preferred Cleanup Action Alternative (Alternative 2 - Partial Source Removal)**

Dakota Creek Industries
Anacortes, Washington

GeoEngineers

**Figure 4.2**

P:\5\5147006\CAD\14\Draft Cleanup Action Plan\5147006f14_F04.2_Cleanup Action Alt 2.dwg TAB:F04.2 Date Exported: 05/07/21 - 17:29 by hmara

# Table 4.1

## Cleanup Action Alternative Descriptions

### Dakota Creek Industries

### Anacortes, Washington

| Matrix | Contaminants of Concern (COCs) | Cleanup Action Objectives (CAOs) | Cleanup Action Alternative Components | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | **Alternative 1 - Containment and Compliance Monitoring** | **Alternative 2 - Partial Source Area Removal** | **Alternative 3 - Source Area In Situ Treatment** | **Alternative 4 - Source Area Removal** | **Alternative 5 - Site-Wide In Situ Treatment** | **Alternative 6 - Site-Wide Removal** |
| Soil and Groundwater | ■ Arsenic<br>■ Nickel<br>■ Total cPAH TEQ | ■ Prevent contact (dermal or incidental ingestion) by workers, visitors and other Site users with hazardous substances in soil and groundwater.<br>■ Prevent leaching of hazardous substances through the soil column to groundwater.<br>■ Prevent contact (dermal or incidental ingestion) by aquatic receptors to impacted groundwater that may discharge to the Marine Area resulting in acute or chronic effects.<br>■ Prevent the ingestion of aquatic organisms affected by the discharge of impacted groundwater to the Marine Area by higher trophic level ecological receptors. | ■ Maintenance of existing physical containment barriers including surface pavement and sheet pile bulkhead to prevent stormwater infiltration and contaminant leaching/ migration through the soil column as well as to provide a physical barrier to prevent direct contact to Site COCs.<br>■ Installation of new physical containment barrier (i.e., asphalt/concrete pavement) to further prevent stormwater infiltration and contaminant leaching/migration through the soil column as well as to provide a physical barrier to prevent direct contact to Site COCs.<br>■ Compliance Groundwater Monitoring<br>■ Institutional Controls<br>■ Annual Cap Inspection | ■ Asphalt demolition, soil removal and offsite disposal of COCs in the southwest Source Area generally centered around location SB-12.<br>■ Verification Soil Sampling<br>■ Site Restoration<br>■ Maintenance of existing physical containment barriers including surface pavement and sheet pile bulkhead to prevent stormwater infiltration and contaminant leaching/ migration through the soil column as well as to provide a physical barrier to prevent direct contact to Site COCs.<br>■ Compliance Groundwater Monitoring<br>■ Institutional Controls<br>■ Annual Cap Inspection | ■ Installation of new physical containment barrier (i.e., asphalt/concrete pavement) to further prevent stormwater infiltration and contaminant leaching/migration through the soil column as well as to provide a physical barrier to prevent direct contact to Site COCs.<br>■ Maintenance of existing physical containment barriers including surface pavement and sheet pile bulkhead to prevent stormwater infiltration and contaminant leaching/ migration through the soil column as well as to provide a physical barrier to prevent direct contact to Site COCs.<br>■ In situ soil treatment through injection of chemical reagents to immobilize/treat COCs in Source Areas generally centered around locations SB-12, GEI-17 and GEI-22.<br>■ Institutional Controls<br>■ Performance/Compliance Groundwater Monitoring<br>■ Institutional Controls<br>■ Annual Cap Inspection | ■ Asphalt demolition, soil removal and offsite disposal of COCs in Source Areas generally centered around SB-12, GEI-17 and GEI-22.<br>■ Verification Soil Sampling<br>■ Site Restoration<br>■ Maintenance of existing physical containment barriers including surface pavement and sheet pile bulkhead to prevent stormwater infiltration and contaminant leaching/ migration through the soil column as well as to provide a physical barrier to prevent direct contact to Site COCs.<br>■ Compliance Groundwater Monitoring<br>■ Institutional Controls<br>■ Annual Cap Inspection | ■ Installation of new physical containment barrier (i.e., asphalt/concrete pavement) to further prevent stormwater infiltration and contaminant leaching/migration through the soil column as well as to provide a physical barrier to prevent direct contact to Site COCs.<br>■ Maintenance of existing physical containment barriers including surface pavement and sheet pile bulkhead to prevent stormwater infiltration and contaminant leaching/ migration through the soil column as well as to provide a physical barrier to prevent direct contact to Site COCs.<br>■ In situ soil treatment through injection of chemical reagents to immobilize/treat COCs throughout the Site.<br>■ Performance/Compliance Groundwater Monitoring<br>■ Institutional Controls<br>■ Annual Cap Inspection | ■ Asphalt demolition, soil removal and offsite disposal of COCs throughout the Site.<br>■ Verification Soil Sampling<br>■ Site Restoration<br>■ Compliance Groundwater Monitoring |
| Estimated Alternative Cost (+50%/-30%)[1] | | | $1,180,000 | $2,120,000 | $2,610,000 | $4,390,000 | $7,030,000 | $15,060,000 |
| Estimated Volume of Contaminated Soil Removed/Treated | | | N/A | 3,600 bcy | 9,000 bcy | 9,000 bcy | 46,500 bcy | 46,500 bcy |
| Estimated Restoration Time frame | | | 1-2 Years[2] | 1-2 Years[2] | 2-3 Years[2] | 2-3 Years[2] | 3-4 Years[2] | 3-4 Years[2] |

**Notes:**

[1] Alternative cost estimates are presented in Appendix A.

[2] Compliance groundwater monitoring is expected to occur over a 5 year time frame (minimum). Additional long-term monitoring may be required to verify compliance with cleanup standards.

cPAH = Carcinogenic Polycyclic Aromatic Hydrocarbons

TEQ = Toxicity Equivalence

COC = Contaminant of Concern

bcy = bank (in-place) cubic yards

% = percent

N/A = Not Applicable

# Table 4.2

## Evaluation of Cleanup Action Alternatives

### Dakota Creek Industries Feasibility Report

### Anacortes, Washington

| Evaluation Criteria | Alternative 1 - Containment and Compliance Monitoring | Alternative 2 - Partial Source Area Removal | Alternative 3 - Source Area In Situ Treatment |
|---|---|---|---|
| **Compliance with MTCA Threshold Criteria** | | | |
| Protection of Human Health and the Environment | **Yes** - Alternative would protect human health and the environment through a combination of containment technologies and institutional controls. | **Yes** - Alternative would protect human health and the environment through a combination of source area removal, containment technologies, and institutional controls. | **Yes** - Alternative would protect human health and the environment through a combination of source area in situ treatment, containment technologies, and institutional controls. |
| Compliance With Cleanup Standards | **Yes** - Alternative is expected to comply with cleanup standards. This alternative utilizes containment technologies and institutional controls to prevent exposure to contaminants in the subsurface. Compliance would rely on long-term monitoring and maintenance of institutional controls. Future development of property could potentially require additional environmental cleanup or special provisions. | **Yes** - Alternative is expected to comply with cleanup standards. This alternative utilizes partial source area removal, containment technologies, and institutional controls to prevent exposure to contaminants in the subsurface. Compliance would rely on long-term monitoring and maintenance of institutional controls. Future development of property could potentially require additional environmental cleanup or special provisions. | **Yes** - Alternative is expected to comply with cleanup standards. This alternative utilizes in situ treatment and containment technologies, and institutional controls to prevent exposure to contaminants in the subsurface. Compliance would rely on long-term monitoring and maintenance of institutional controls. Future development of property could potentially require additional environmental cleanup or special provisions. |
| Compliance With Applicable State and Federal Regulations | **Yes** - Alternative complies with applicable state and federal regulations. | **Yes** - Alternative complies with applicable state and federal regulations. | **Yes** - Alternative complies with applicable state and federal regulations. |
| Provision for Compliance Monitoring | **Yes** - Alternative includes provisions for compliance monitoring. | **Yes** - Alternative includes provisions for compliance monitoring. | **Yes** - Alternative includes provisions for compliance monitoring. |
| **Restoration Time Frame** | | | |
| Restoration Time Frame | A significant portion of the containment barriers are currently in place. Additional containment in the form of asphalt paving of existing gravel surfaces is expected to occur over a 1-2 year period. Monitoring of containment elements (i.e., asphalt/concrete pavement and sheet pile wall) and groundwater conditions to document compliance with cleanup objectives. Compliance groundwater monitoring is expected to occur over a 5 year time frame (minimum). Additional long-term monitoring may be required to verify compliance with cleanup standards. | A significant portion of the containment barriers are currently in place. The removal of COCs in southeast source area followed by restoration is expected to occur over a 1-2 year period. Monitoring of containment elements (i.e., existing asphalt/concrete pavement and sheet pile wall) and groundwater conditions Site to document compliance with cleanup objectives. Compliance groundwater monitoring in portions of the Site containing residual contamination is expected to occur over a 5 year time frame (minimum). Additional long-term monitoring may be required to verify compliance with cleanup standards. | A significant portion of the containment barriers are currently in place. Additional containment in the form of asphalt paving of existing gravel surfaces and the injection of chemical reagents to treat source areas COCs are expected to occur over a 2-3 year period. More than one injection event may be necessary. Monitoring of containment elements (i.e., asphalt/concrete pavement and sheet pile wall) and groundwater conditions to document compliance with cleanup objectives. Compliance groundwater monitoring is expected to occur over a 5 year time frame (minimum). Additional long-term monitoring may be required to verify compliance with cleanup standards. |
| **Relative Benefits Ranking (Scored from 1-lowest to 10-highest)** | | | |
| Protectiveness | **Score = 2**<br><br>Achieves a moderate-low level of protectiveness as all portions of the Site containing COCs receive a protective containment barriers under this alternative to prevent potential human exposure and/or stormwater infiltration. However, contamination will be left onsite throughout the uplands in a heavy industrial and active site. | **Score = 6**<br><br>Achieves a moderate-high level of protectiveness s this alternative improves overall environmental quality onsite by removing the source area with elevated contaminant levels in soil and groundwater greater than the PCULs in the eastern portion of the Site. The remaining residual contamination will utilize existing asphalt and sheetpile wall barriers to prevent worker exposure under this alternative. Short-term on-site and off-site risk of exposure are slightly increased due to removal action and off-site disposal of contaminated soil over | **Score = 5**<br><br>Achieves a moderate level of protectiveness as all portions of the Site containing COCs receive a protective containment barrier under this alternative. Achieves a higher score then Alternative 1 since this alternative improves overall environmental quality through in situ treatment of COCs in identified Source Areas. However, there is no contaminant mass removal under this alternative, therefore receives a slightly lower score than Alternative 2. |

| Evaluation Criteria | Alternative 1 - Containment and Compliance Monitoring | Alternative 2 - Partial Source Area Removal | Alternative 3 - Source Area In Situ Treatment |
|---|---|---|---|
| Permanence | **Score = 2** | **Score = 6** | **Score = 5** |
| | Achieves a low level of permanence since COCs remain in-place and/or untreated. Alternative 1 relies on the installation of additional pavement combined with other technologies to reduce the mobility of COCs. | Achieves a moderate level of permanence. The alternative receives a higher score as compared to Alternative 1 and 3 due to the removal and off-site disposal of COCs which provides a relatively higher level reduction in the toxicity, mobility or volume of COCs. | Achieves a moderate level of permanence since under this alternative due to the treatment/stabilization of COCs in Source Areas through in situ technologies combined with other technologies to reduce the toxicity, mobility or volume of COCs. However the site is located along the shoreline of a marine system and it is relying on effective monitoring of the cap to remain in place and undamaged in a heavy industrial site. Therefore receives a lower score than Alternative 2. |
| Long-Term Effectiveness | **Score = 2** | **Score = 6** | **Score = 6** |
| | Provides a level of certainty in long-term effectiveness as all areas containing COCs receive a protective impermeable cap, which reduces exposure risk and contaminant leaching from vadose to saturated zone. However, relies on diligence of entity where history of leadership changes, frequent leasee modifications, and heavy industrial activity damage has been shown to alter priorities and increase risk of exposure. This puts a heavy and unidentified cost on PLP related to approval under the EC, reporting and repair costs along with potential contaminant release while exposed. | Provides a higher level of certainty in long-term effectiveness over Alternative 1 due to the permanent removal of COCs in the southeastern Source Area. However, it requires the central and western portions of the upland to remain under institutional controls which needs to be monitored in a heavy industrial and active site. | Provides a moderate level of certainty in long-term effectiveness. Slightly higher score than Alternative 2 is achieved due to in situ treatment of COCs within each of the Source Areas. However, it received a lower score than Alternative 4 as decreasing metals mobility through in situ reduction can be reversed under certain conditions. |
| Management of Short-Term Risks | **Score = 8** | **Score = 7** | **Score = 8** |
| | Achieves a high level of confidence in managing short-term risk to human health and environment since this alternative involves construction of pavement. Exposure risk to Site COCs during pavement construction is low to negligible. | Achieves a moderate level of confidence in managing short-term risk due to degree of health and safety risks associated with heavy earthwork construction, and potential for exposure to COCs during removal, on-site management, transport and disposal of contaminated material. Receives a slightly higher score than Alternative 4 due to the lesser degree of soil disturbance. | Achieves a moderate-high level of confidence in managing short-term risk as there is some potential for exposure to contamination during in-situ injection of reagents as well as other construction related risks. Since in situ treatment is limited to the Source Areas, the short-term risk are limited. |
| Technical and Administrative Implementability | **Score = 7** | **Score = 6** | **Score = 6** |
| | Achieves a high level of implementability since this alternative involves construction of an asphalt cap, which is a proven remedial technology. | Achieves a moderate level of implementability due to the design and coordination associated with implementation of soil removal. Implementation will be challenging since it will likely impact current site use at the property. | Achieves a moderate level of implementability due to the design and coordination associated with implementation of in situ treatment technologies. Implementation will be challenging since it may impact current site use at the Property. |
| Consideration of Public Concerns | **Score = 3** | **Score = 7** | **Score = 6** |
| | Residual contamination remaining in place below containment features could result in concerns by the public and nearby property owners and potentially affect the future development and Site use. However, the further addition of asphalt pavement to reduce the potential for contaminant migration and exposure would slightly reduce public concerns. | Residual contamination remaining in place below containment features could result in concerns by the public and nearby property owners and potentially affect the future development and Site use. However, the removal of source material to reduce the potential for contaminant migration and exposure would reduce public concerns. | Residual contamination remaining in place below containment features could result in concerns by the public and nearby property owners and potentially affect the future development and Site use. However, the further addition of asphalt pavement and in situ treatment of source areas to reduce the potential for contaminant migration and exposure would reduce public concerns. |

**Notes:**

COC = Contaminant of Concern

MTCA = Model Toxics Control Act

# Table 4.2

## Evaluation of Cleanup Action Alternatives

### Dakota Creek Industries Feasibility Report

### Anacortes, Washington

| Evaluation Criteria | Alternative 4 - Source Area Removal | Alternative 5 - Site-Wide In Situ Treatment | Alternative 6 - Site-Wide Removal |
|---|---|---|---|
| **Compliance with MTCA Threshold Criteria** | | | |
| Protection of Human Health and the Environment | **Yes** - Alternative would protect human health and the environment through a combination of source area removal, containment technologies, and institutional controls. | **Yes** - Alternative would protect human health and the environment through a combination of site-wide in situ treatment, containment technologies, and institutional controls. | **Yes** - Alternative would protect human health and the environment through complete source removal. |
| Compliance With Cleanup Standards | **Yes** - Alternative is expected to comply with cleanup standards. This alternative utilizes source area removal, containment technologies, and institutional controls to prevent exposure to contaminants in the subsurface. Compliance would rely on long-term monitoring and maintenance of institutional controls. Future development of property could potentially require additional environmental cleanup or special provisions. | **Yes** - Alternative is expected to comply with cleanup standards. This alternative utilizes site-wide in situ treatment, containment technologies, and institutional controls to prevent exposure to contaminants in the subsurface. Compliance would rely on long-term monitoring and maintenance of institutional controls. Future development of property could potentially require additional environmental cleanup or special provisions. | **Yes** - Alternative is expected to comply with cleanup standards to the greatest extent practicable. All contaminant exceedance will be removed for offsite disposal. |
| Compliance With Applicable State and Federal Regulations | **Yes** - Alternative complies with applicable state and federal regulations. | **Yes** - Alternative complies with applicable state and federal regulations. | **Yes** - Alternative complies with applicable state and federal regulations. |
| Provision for Compliance Monitoring | **Yes** - Alternative includes provisions for compliance monitoring. | **Yes** - Alternative includes provisions for compliance monitoring. | **Yes** - Alternative includes provisions for compliance monitoring. |
| **Restoration Time Frame** | | | |
| Restoration Time Frame | A significant portion of the containment barriers are currently in place. Additional containment in the form of asphalt paving of existing gravel surfaces and the removal of COCs in identified source areas followed by restoration are expected to occur over a 2-3 year period. Monitoring of containment elements (i.e., asphalt/concrete pavement and sheet pile wall) and groundwater conditions to document compliance with cleanup objectives. Compliance groundwater monitoring to evaluate residual contamination in other portions of the Site is expected to occur over a 5 year time frame (minimum). Additional long-term monitoring may be required to verify compliance with cleanup standards. | A significant portion of the containment barriers are currently in place. The injection of chemical reagents to treat COCs Site-wide are expected to occur over a 3-4 year period. In situ treatment activities may require phasing during implementation to reduce disturbances to the DCI operations as well as more than one injection event if necessary. Monitoring of containment elements (i.e., asphalt/ concrete pavement and sheet pile wall) and groundwater conditions to document compliance with cleanup objectives. Compliance groundwater monitoring is expected to occur over a 5 year time frame (minimum). Additional long-term monitoring may be required to verify compliance with cleanup standards. | Complete removal of COCs Site-wide followed by restoration are expected to occur over a 3-4 year period. Removal activities may require phasing during implementation to reduce disturbances to the DCI operations. Compliance groundwater monitoring to verify the effectiveness of the cleanup action is expected to occur over a 1-2 year period following removal. |
| **Relative Benefits Ranking (Scored from 1-lowest to 10-highest)** | | | |
| | **Score = 7** | **Score = 8** | **Score = 9** |
| Protectiveness | Achieves a moderate-high level of protectiveness as all portion of the Site containing COCs receive a protective containment barrier under this alternative. Therefore, this alternative receives a slightly higher score than Alternative 2. This alternative improves overall environmental quality onsite by removing COCs in Source Areas through removal. Similar to Alternative 2, short-term on-site and off-site risk of exposure are increased due to removal action and off-site disposal. | Achieves a high level of protectiveness as all COCs are treated/stabilized through in-situ treatment. Overall environmental quality on Site is increased as well as exposure risk to contamination are reduced to high degree under this alternative. No risk of exposure off-site as contamination is not removed. | Achieves a high level of protectiveness as all COCs are removed from the site thereby increasing the overall environmental quality on site to the highest degree. However, short-term on-site and off-site risk of exposure are increased due to removal action and off-site disposal. Therefore gets a slightly higher score than Alternative 5. |

| Evaluation Criteria | Alternative 4 - Source Area Removal | Alternative 5 - Site-Wide In Situ Treatment | Alternative 6 - Site-Wide Removal |
|---|---|---|---|
| Permanence | **Score = 7**<br>Achieves a moderate-high level of permanence. The alternative receives a higher score due to the removal and off-site disposal of Source Area COCs which provides a relatively higher level reduction in the toxicity, mobility or volume of COCs than Alternative 3. | **Score = 8**<br>Achieves a high level of permanence by reducing toxicity, mobility and volume of COCs through Site-wide in-situ treatment of all COCs. | **Score = 10**<br>Achieves highest level of permanent reduction of mass, toxicity, and mobility of hazardous substances throughout the Site through removal and off-site permitted disposal. This alternative would eliminate/minimize to the need to perform additional cleanup actions. |
| Long-Term Effectiveness | **Score = 7**<br>Provides a high level of certainty in long-term effectiveness due to the permanent removal of COCs in the Source Areas in addition to other technologies implemented similar to Alternative 2. However, it requires the entire upland to remain under institutional controls which needs to be monitored in a heavy industrial and active site. | **Score = 8**<br>Provides a high level of certainty in long-term effectiveness due to the site-wide treatment/stabilization of COCs. However, it requires the entire upland to remain under institutional controls which needs to be monitored in a heavy industrial and active site. | **Score = 10**<br>Achieves highest level of long-term effectiveness through removal of hazardous substances from the Site to the greatest degree feasible and utilizes approved off-site disposal facilities for final disposition |
| Management of Short-Term Risks | **Score = 5**<br>Achieves a moderate level of confidence in managing short-term risk due to degree of health and safety risks associated with heavy earthwork construction, and potential for exposure to COCs during removal, on-site management, transport and disposal of contaminated material. | **Score = 4**<br>Achieves a moderate-high level of confidence in managing short-term risk as there is some potential for exposure to contamination during in-situ injection of reagents as well as other construction related risks. Since in situ treatment is to be performed site-wide under this alternative, the short-term risk are higher than the risk associated with in situ treatment of Source Areas under Alternative 3. Therefore is scored slightly lower than Alternative 3. | **Score = 3**<br>Achieves a low level of confidence in managing short-term risk due to degree of health and safety risks associated with heavy earthwork construction, and potential for exposure to COCs during removal, on-site management, transport and disposal of contaminated material. Achieves a lower score than Alternative 4 due to higher volume of contaminated material that will be removed under this alternative. |
| Technical and Administrative Implementability | **Score = 6**<br>Achieves a moderate level of implementability due to the design and coordination associated with implementation of soil removal. Implementation will be challenging since it will likely impact current site use at the property. | **Score = 5**<br>Achieves a low-moderate level of implementability due to the design and coordination associated with implementation of in situ treatment technologies. Receives a lower score than Alternative 3 since the extent of in situ treatment is larger making implementation more challenging. | **Score = 4**<br>Achieves a low-moderate level of implementability due to the design and coordination associated with implementation of soil removal. Receives a lower score than Alternative 4 since the extent of soil removal is larger making implementation more challenging. |
| Consideration of Public Concerns | **Score = 7**<br>Residual contamination remaining in place below containment features could result in concerns by the public and nearby property owners and potentially affect the future development and Site use. However, the further addition of asphalt pavement and removal of source areas to reduce the potential for contaminant migration and exposure would reduce public concerns. | **Score = 9**<br>Site-wide in situ treatment to reduce the potential for contaminant migration and exposure would produce minimum public concerns. However, there may be public concern for the temporary disruptions to Site operations and increased traffic resulting from construction activities. However, long-term public concerns are expected to be low. | **Score = 8**<br>Soil contamination would be removed to the extent practical under this alterative. However, there may be public concern for the temporary disruptions to Site operations, increased traffic resulting from construction activities and potential spills during transport of contaminated soil to the landfill. However, long-term public concerns are expected to be low. |

**Notes:**

COC = Contaminant of Concern

# Table 4.3

## Cleanup Action Alternative Evaluation Summary and Ranking

**Dakota Creek Industries**

**Anacortes, Washington**

| Remedial Alternative | Alternative 1 - Containment and Compliance Monitoring | Alternative 2 - Partial Source Area Removal | Alternative 3 - Source Area In Situ Treatment | Alternative 4 - Source Area Removal | Alternative 5 - Site-Wide In Situ Treatment | Alternative 6 - Site-Wide Removal |
|---|---|---|---|---|---|---|
| **Evaluation** | | | | | | |
| Compliance with MTCA Threshold Criteria | Yes | Yes | Yes | Yes | Yes | Yes |
| Restoration Time Frame | 1-2 Years[1] | 1-2 Years[1] | 2-3 Years[1] | 2-3 Years[1] | 3-4 Years[1] | 3-4 Years |
| Estimated Volume of Contaminated Soil Removed/Treated | N/A | 3,600 bcy | 9,000 bcy | 9,000 bcy | 46,500 bcy | 46,500 bcy |
| **Relative Benefits Ranking[2]** | | | | | | |
| Protectiveness (weighted as 30%) | 0.6 | 1.8 | 1.5 | 2.1 | 2.4 | 2.7 |
| Permanence (weighted as 20%) | 0.4 | 1.2 | 1 | 1.4 | 1.6 | 2 |
| Long-Term Effectiveness (weighted as 20%) | 0.4 | 1.2 | 1.2 | 1.4 | 1.6 | 2 |
| Management of Short-Term Risks (weighted as 10%) | 0.8 | 0.7 | 0.8 | 0.5 | 0.4 | 0.3 |
| Technical and Administrative Implementability (weighted as 10%) | 0.7 | 0.6 | 0.6 | 0.6 | 0.5 | 0.4 |
| Consideration of Public Concerns (weighted as 10%) | 0.3 | 0.7 | 0.6 | 0.7 | 0.9 | 0.8 |
| **Overall Weighted Benefit Score** | **3.20** | **6.20** | **5.70** | **6.70** | **7.40** | **8.20** |
| **Disproportionate Cost Analysis** | | | | | | |
| Probable Remedy Cost (+50%/-30%, rounded) | $1,180,000 | $2,120,000 | $2,610,000 | $4,390,000 | $7,030,000 | $15,060,000 |
| Practicability of Remedy | Practicable | Practicable | Practicable | Practicable | Practicable | Practicable |
| Remedy Permanent to Maximum Extent Practicable | Yes | Yes | Yes | Yes | Yes | Yes |
| Relative Benefit Ranking to Remedial Cost (Benefit/$1M) | 2.71 | 2.92 | 2.18 | 1.53 | 1.05 | 0.54 |
| Costs Disproportionate to Incremental Benefits | No | No | Yes | Yes | Yes | Yes |
| **Overall Alternative Ranking** | **2nd** | **1st** | **3rd** | **4th** | **5th** | **6th** |

**Note:**

[1] Compliance groundwater monitoring is expected to occur over a 5 year time frame (minimum). Additional long-term monitoring may be required to verify compliance with cleanup standards.

[2] Weightings were established by Ecology as referenced in their Opinion Letter dated December 28, 2009.

MTCA = Model Toxics Control Act

bcy = bank (in-place) cubic yards

% = percent

# Appendices

# Appendix A. Supplemental Soil Investigation Data Report

# Supplemental Soil Investigation Data Report

Dakota Creek Industries
Anacortes, Washington
Ecology Agreed Order No. DE-07TCPHQ-5080

*for*
**Washington State Department of Ecology on Behalf of Port of Anacortes**

June 3, 2021

GeoEngineers

2101 4th Avenue, Suite 950
Seattle, Washington
206.728.2674

# Supplemental Soil Investigation Data Report

# Dakota Creek Industries
# Anacortes, Washington
# Ecology Agreed Order No. DE-07TCPHQ-5080

**File No. 5147-006-14**

**June 3, 2021**

Prepared for:

Washington State Department of Ecology
PO Box 47600
Olympia, Washington 98504-7600

Attention: Arianne Fernandez

On Behalf of:

Port of Anacortes
100 Commercial Avenue
Anacortes, Washington 98221

Prepared by:

GeoEngineers, Inc.
2101 4th Avenue, Suite 950
Seattle, Washington 98121
206.728.2674

Robert S. Trahan, LG
Senior Environmental Scientist

John M. Herzog, PhD, LG
Principal

RST:JMH:ch

# Table of Contents



**LIST OF TABLES**



**LIST OF FIGURES**



**APPENDICES**

## 1.0 INTRODUCTION

This document provides the data results for the Supplemental Soil Investigation completed at the Dakota Creek Industries Site (Site) located in Anacortes, Washington. The Site is formally referenced in the Washington State Department of Ecology (Ecology) databases as Anacortes Port of Dakota Creek (Ecology Facility Site Identification No. 2670) and is located at 115 Q Avenue in Anacortes, Washington (Figure 1). The Site is owned by the Port of Anacortes (Port) and is currently leased to Dakota Creek Industries (DCI) who uses the property for shipbuilding and repair. Ecology is managing the Site as part of the Fidalgo and Padilla Bay component of their Puget Sound Initiative program.

Pursuant to Ecology Agreed Order No. DE-07TCPHQ-5080 dated December 2007 (AO), remedial investigation (RI) and Feasibility Study (FS) activities are being completed by the Port to evaluate Site conditions, supplement and fill identified data gaps, determine the nature and extent of contamination in sediment, soil and groundwater and determine cleanup alternatives for the Site. Results of previous sampling and analysis efforts, evaluation of remedial alternatives and selection of a preferred cleanup action for the Site are summarized in the RI/FS Report (GeoEngineers 2020).

On completion of their review of the RI/FS Report, Ecology determined that additional sampling and analysis was required in the Upland Area to confirm the completeness of previously completed cleanup actions because the technical quality of verification sampling data could not be independently validated.

The sample collection and chemical analysis data described below are being used to fill this identified data gap and confirm the completeness of the previously completed cleanup actions.

## 2.0 BACKGROUND

### 2.1. Location and Description

The Site is located at 115 Q Avenue in Anacortes, Washington and is an industrial facility used as a shipyard. The Site is comprised of both upland and marine areas and is bounded by the Port of Anacortes Pier 1 to the west and Pier 2 to the east, 3rd Street on the south, and the Guemes Channel to the north.

DCI currently leases the Site from the Port for shipbuilding and maintenance operations. The Site includes a portion of the Port's Pier 1 Marine Terminal (Pier 1), a centrally located outfitting dock (Central Pier), a synchrolift, upland fabrication areas, shops, a sandblast grit storage shed, warehouses and storage areas. The northern portion of Pier 1 (which is a deep-water moorage terminal) is used by DCI to support dry dock operations.

### 2.2. Regulatory Framework

On December 12, 2007, the Port entered Agreed Order No. DE-07TCPHQ-5080 with Ecology. Under the Agreed Order, RI activities were completed by the Port in accordance with the Ecology-approved RI/FS Work Plan to supplement and fill identified data gaps in existing data for the Site, and to determine the nature and extent of contamination in sediment, soil and groundwater. Environmental data collected from the Site is used in the RI and FS as required by the AO.

As a result of their review of the Draft RI/FS for the Site, Ecology required completion of supplemental sampling by the Port to confirm the completeness of previously completed 1991 UST cleanup action, 2001 Hydraulic Winch cleanup action, and 2002 Petroleum and Marine Railway Cleanup. The supplemental sampling was completed in accordance with the Ecology-approved RI/FS Work Plan Addendum (GeoEngineers, 2021). The results of the Supplemental Soil Investigation are being used to confirm the completeness of these previous cleanup actions and to support selection of the preferred cleanup action alternative for the Site.

### 2.3. Previous Upland Area Cleanup Actions

Cleanup actions previously completed in the Upland Area of the Site include:

- **1991 UST Cleanup Action** – In 1991, two USTs located near the south end of L dock were removed from the Site for permanent closure. During the removal of these tanks, approximately 20 cubic yards of petroleum impacted soil was removed from this area and transferred from the Site for landfill disposal. Verification samples at the final excavation limits were obtained to confirm the removal of the petroleum impacted soil observed during tank removal activities.
- **2001 Hydraulic Winch Cleanup Action** – In 2001, a hydraulic winch and its timber frame located near the south end of the east marine railway were removed from the Site. During removal of this structure and associate components, approximately 30 cubic yards of petroleum impacted soil were excavated and transferred from the Site for landfill disposal. Verification samples at the final excavation limits were obtained to confirm the removal of the petroleum impacted soil observed during removal of the hydraulic winch and associated timber frame.
- **2002 Petroleum and Marine Railway Cleanup Actions** – In 2002, the Port completed cleanup actions to address known soil contamination in the Petroleum Cleanup Action Area extending from the aluminum shop (building formerly identified as the equipment maintenance shed) to the former bulk fuel storage above ground storage tanks; and the Marine Railway Cleanup Action Area located near the eastern marine railway structure. Cleanup actions to remove soil contamination (approximately 1,650 cubic yards) in these areas were completed under Ecology's Voluntary Cleanup Program (VCP). Verification samples at the final excavation limits were obtained to confirm the removal of the petroleum impacted soil form these areas.

Although verification sampling completed as part of these previous cleanup actions confirmed the removal of the petroleum-related contamination from these areas, the technical quality of these data could not be verified due to the unavailability of the original laboratory data. As a result, Ecology has requested that additional sampling and analysis be performed for these areas to confirm the removal of the petroleum-related contamination and that the data be used to support selection of the preferred remedial alternative for the Site.

## 3.0 SUPPLEMENTAL SOIL INVESTIGATION

Additional investigation activities were completed in the Upland Area to further characterize soil conditions on March 18, 2021. As part of the investigation, sampling was performed within the footprint of the previously completed remedial excavations at the Site which extended to depths greater than 1 foot (i.e., remedial excavations extending beneath the former gravel working surface). In general, soil samples were collected from immediately below the base of the previous remedial excavations to match the previous

verification sample interval. The samples that were collected were submitted to an Ecology-accredited laboratory for analysis of contaminants of concern (COCs) previously identified for these areas including gasoline-, diesel- and heavy oil-range petroleum hydrocarbons and/or cPAHs.

Soil sampling and analysis activities included:

- Completion of seven (7) continuous soil borings using direct-push drilling (DP) methods to document soil conditions.
- Collection of soil samples for chemical analysis representative of the previous remedial excavation limit.

The locations of the previous cleanup action areas and sample locations to verify the completeness of the removal actions are shown on Figure 2. Sample locations were positioned within the previously completed remedial excavation footprints to provide adequate spatial coverage as well as to avoid utility conflicts and limit impacts to DCI operations. Soil sample collection and analysis completed as part of this supplemental investigation are summarized in the following sections.

### 3.1. Underground Utility Locate

Prior to drilling, an underground utility locate was performed to clear potential utilities and/or underground physical hazards within a 25-foot radius of each location.

### 3.2. Surveying

GeoEngineers field personnel recorded the soil boring locations, and other pertinent information, using hand-held Trimble global positioning system (GPS) unit during sampling activities. The accuracy of the measured horizontal coordinates is within approximately 3 feet.

### 3.3. Soil Sample Collection and Processing

Soil borings were completed to depths ranging between approximately 10 and 15 feet below ground surface (bgs) using a truck-mounted DP drilling rig owned and operated by a licensed driller in the State of Washington (Cascade Drilling). During drilling activities, a representative from GeoEngineers' staff was present to examine, field screen and classify the soils encountered and prepare a detailed boring log of each exploration. Boring logs detailing field screening results and soil types encountered are presented in Appendix A.

Based on the field screening results, soil types encountered and the estimated depth of the previous remedial excavations, selected samples were collected at each location to match the previous verification sample intervals. The samples were individually homogenized and placed into the appropriate laboratory-supplied sample containers. Samples for volatile analysis (i.e., gasoline) were collected from undisturbed soil at the center of the sampling interval prior to homogenization using United States Environmental Protection Agency (EPA) Method 5035A sampling procedures, consistent with Ecology guidance to reduce volatilization and biodegradation of the sample constituents. Immediately upon collection, the samples were placed into a cooler with ice and logged on the chain-of-custody using quality assurance and control procedures in accordance with the RI/FS Work Plan (GeoEngineers 2008).

### 3.4. Soil Sample Laboratory Analysis

Soil samples were submitted to OnSite Environmental, Inc. (OnSite) in Redmond, Washington, for a combination of the following chemical analysis:

- Gasoline-range petroleum hydrocarbons by NWTPH-Gx.
- Heavy oil- and diesel-range petroleum hydrocarbons by NWTPH-Dx using an acid-silica gel cleanup.
- Benzene, toluene, ethylbenzene and xylenes (BTEX) by EPA 8260.
- cPAHs by EPA 8270-SIM.

### 3.5. Decontamination

The drilling equipment was decontaminated before beginning each exploration using a pressure washer. Decontamination procedures for this equipment consisted of the following:

- Wash with non-phosphate detergent solution (Liqui-Nox® and distilled water),
- Rinse with distilled water, and
- Place the decontaminated equipment on clean plastic sheeting or in a plastic bag.

Field personnel limited cross-contamination by changing gloves between sampling events. Wash water used to decontaminate the sampling equipment was placed in a sealed and labeled 35-gallon drum pending permitted offsite disposal.

### 3.6. Disposal of Investigation Derived Materials

Soil cuttings from borings completed during this investigation was placed in a labeled and sealed 35-gallon drum. The drum is being stored temporarily at a secure location pending permitted offsite disposal.

Incidental waste generated during sampling activities includes items such as gloves, plastic sheeting, paper towels and similar expended and discarded field supplies were considered *de minimis* and were disposed of at local trash receptacle pending landfill disposal.

## 4.0 SOIL SAMPLING RESULTS

Chemical analytical results are summarized in Table 1. Based on a review of the chemical analytical data, COCs either were not detected or were detected at concentrations less than the PCULs established for the Site.

The laboratory data presented in Appendix B were subjected to an EPA-defined Stage 2B validation (EPA Document 540-R-2017-01; EPA, 2017) and were determined to be acceptable for their intended use as qualified. The data validation review is presented in Appendix C.

## 5.0 CULTURAL RESOURCE MONITORING

Based on the consultation for the Site, the Department of Archaeology and Historic Preservation (DAHP) required that an archeological monitor be present during ground disturbance activities completed near the fill/native soil contact.

During the Supplemental Soil Investigation, a representative from Columbia Geotechnical Associates (Columbia) was present to observe soil encountered from each boring for evidence of potential cultural resource in accordance with an Ecology-approved Inadvertent Discover Monitoring Plan. A review of the soil borings by Columbia did not identify signs of cultural material or other evidence of historic or pre-historic use of the Site. Based on these findings, Columbia concluded that the Supplemental Soil Investigation did not affect or otherwise impact recorded or unrecorded cultural resources.

## 6.0 CONCLUSIONS

Remedial excavations were previously performed at the Site to remove soil contamination associated within the 1991 UST cleanup action, 2001 Hydraulic Winch cleanup action, and 2002 Petroleum and Marine Railway cleanup action areas. However, the technical quality of verification sampling data could not be independently validated due to the unavailability of the original laboratory data. As a result, supplemental soil sampling and analysis was performed on March 18, 2021 at the base of the previous excavations in accordance with the Ecology-approved RI/FS Work Plan Addendum to confirm the completeness of the previously completed cleanup actions. Chemical analytical data results identified that soils at the base of the previously completed investigations meet the cleanup levels of the Site and that soil contamination in these cleanup area areas was successfully removed. No additional consideration as to the completeness of these previous cleanup actions is warranted.

## 7.0 LIMITATIONS

This report has been prepared for the exclusive use of the Port of Anacortes, their authorized agents and regulatory agencies in their evaluation of the Dakota Creek Industries Site in Anacortes, Washington. No other party may rely on the product of our services unless we agree in advance and in writing to such reliance.

## 8.0 REFERENCES

GeoEngineers 2008, "Final Work Plan, Remedial Investigation/Feasibility Study and Interim Action Work Plan – Dakota Creek Industries," prepared for the Washington Department of Ecology on behalf of the Port of Anacortes, April 1, 2008.

GeoEngineers 2020, "Remedial Investigation/Feasibility Study Report, Dakota Creek Industries, Anacortes, Washington, Ecology Agreed Order No. DE-07TCPHQ-5080," prepared for the Washington Department of Ecology on behalf of the Port of Anacortes, April 27, 2020.

Lenz, Brett (Lenz) 2020, "A Cultural Resources Review of the Dakota Creek Industries Site, Skagit County, WA," prepared for the Port of Anacortes, November 2020.

United States Environmental Protection Agency (EPA) 2017, "Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, EPA-540-R-2017-01," Office of Emergency and Remedial Response, US Environmental Protection Agency, Washington, DC, dated January 2017.

# Table 1

## Chemical Analytical Soil Data

### Dakota Creek Industries

### Anacortes, Washington

| Sample Location[1] | Units | GEI-47 | GEI-48 | GEI-49 | GEI-50 | GEI-51 | GEI-52 | GEI-53 | Proposed Soil Cleanup Level[2] | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Identification** | | **GEI-47-9.0** | **GEI-48-8.0** | **GEI-49-11.0** | **GEI-50-9.0** | **GEI-51-12.0** | **GEI-52-10.0** | **GEI-53-7.0** | | |
| **Date Sampled** | | **03/18/21** | **03/18/21** | **03/18/21** | **03/18/21** | **03/18/21** | **03/18/21** | **03/18/21** | | |
| **Sample Interval** | | **9-10 feet** | **8-9 feet** | **11-12 feet** | **9-10 feet** | **12-13 feet** | **10-11 feet** | **7-8 feet** | | |
| **Sample Horizon** | | **Saturated** | **Vadose** | **Saturated** | **Saturated** | **Saturated** | **Saturated** | **Vadose** | | |
| **Field Screening** | | | | | | | | | | |
| Water Sheen | n/a | NS | NS | NS | NS | NS | NS | NS | NE | NE |
| Headspace Vapors | ppm | <1 | <1 | <1 | <1 | <1 | <1 | <1 | NE | NE |
| **Petroleum Hydrocarbons** | | | | | | | | | | |
| Gasoline-Range | mg/kg | 5.7 U | -- | 6.3 U | 5.8 U | 6.6 U | 9.9 U | -- | 30 | 30 |
| Diesel-Range | mg/kg | 30 U | 31 U | 30 U | 30 U | 31 U | 39 U | 27 U | 2,000 | 2,000 |
| Heavy Oil-Range | mg/kg | 60 U | 61 U | 60 U | 60 U | 61 U | 78 U | 55 U | 2,000 | 2,000 |
| **BETX Compounds** | | | | | | | | | | |
| Benzene | mg/kg | 0.00084 U | -- | 0.00097 U | 0.00091 U | 0.001 U | 0.0014 U | -- | 2,400 | 2,400 |
| Ethylbenzene | mg/kg | 0.0042 U | -- | 0.0049 U | 0.0046 U | 0.0052 U | 0.0068 U | -- | 350,000 | 350,000 |
| Toluene | mg/kg | 0.00084 U | -- | 0.00097 U | 0.00091 U | 0.001 U | 0.0014 U | -- | 280,000 | 280,000 |
| Xylenes | mg/kg | 0.0017 U | -- | 0.0019 U | 0.0018 U | 0.0021 U | 0.0027 U | -- | 700,000 | 700,000 |
| **Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)** | | | | | | | | | | |
| Benzo[a]anthracene | mg/kg | -- | -- | -- | -- | -- | -- | **0.087** | 1.14 | 0.06 |
| Benzo[a]pyrene | mg/kg | -- | -- | -- | -- | -- | -- | **0.084** | 0.31 | 0.02 |
| Benzo[b]fluoranthene | mg/kg | -- | -- | -- | -- | -- | -- | **0.095** | 3.94 | 0.20 |
| Benzo[k]fluoranthene | mg/kg | -- | -- | -- | -- | -- | -- | **0.035** | 39.36 | 1.97 |
| Chrysene | mg/kg | -- | -- | -- | -- | -- | -- | **0.079** | 127.36 | 6.37 |
| Dibenz[a,h]anthracene | mg/kg | -- | -- | -- | -- | -- | -- | **0.010** | 0.57 | 0.03 |
| Indeno[1,2,3-c,d]pyrene | mg/kg | -- | -- | -- | -- | -- | -- | **0.053** | 11.10 | 0.56 |
| cPAHs TEQ (ND = 0.5RL) | mg/kg | -- | -- | -- | -- | -- | -- | **0.113** | 0.31 | 0.016 |

**Notes:**

[1] Soil sampling locations are shown on Figure 2.

[2] Soil cleanup level is referenced from the Remedial Investigation/Feasibility Study Report (GeoEngineers 2021).

MTCA = Washington State Model Toxics Control Act

mg/kg = milligrams per kilogram

-- = not analyzed

NE = not established

RL = reporting limit

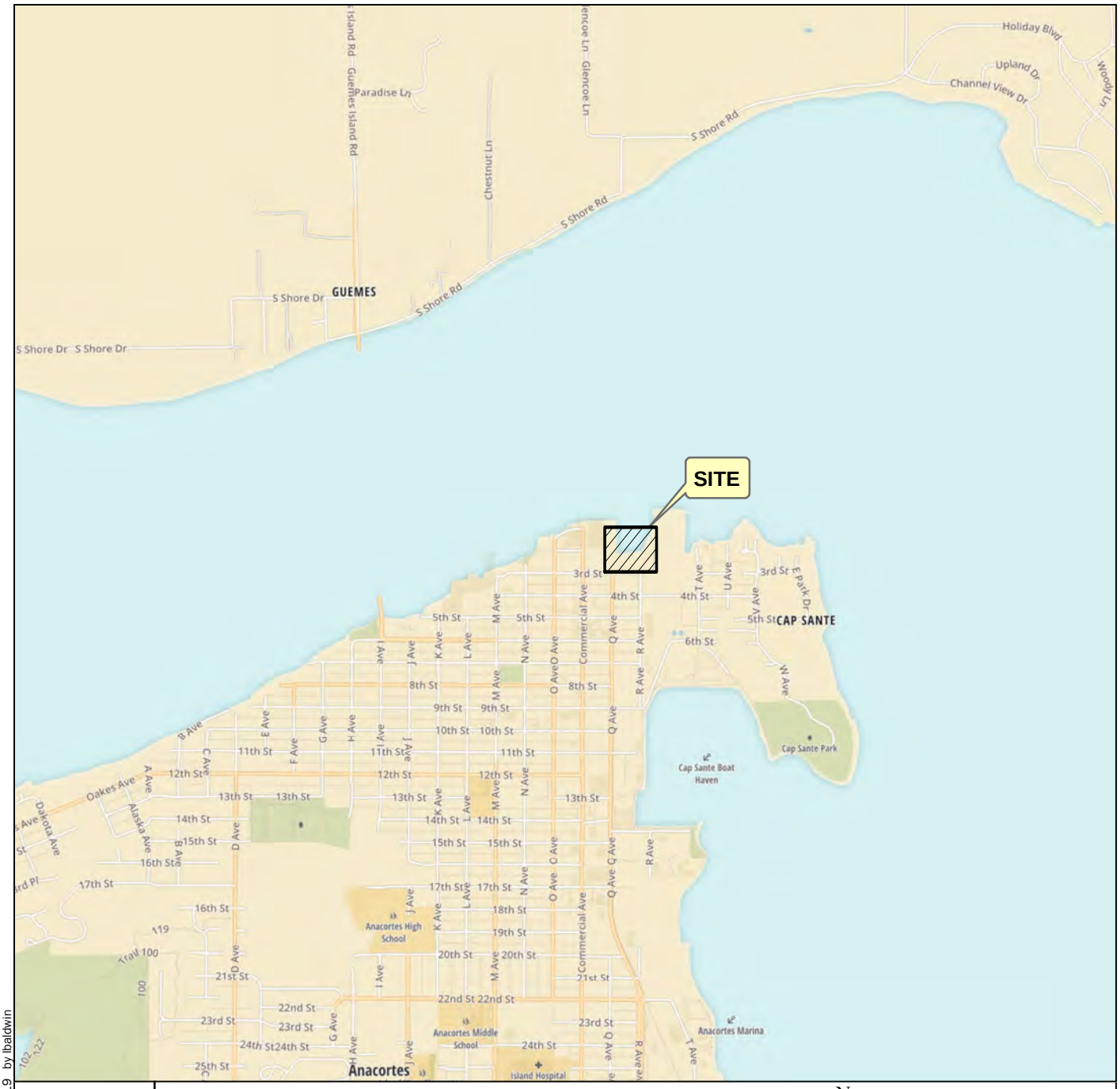
TEQ = toxic equivalent concentration

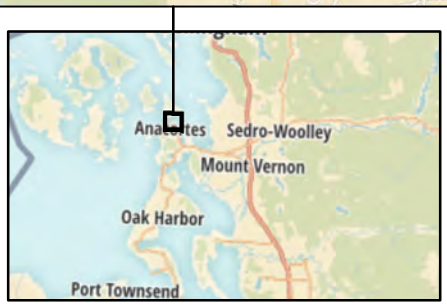
NS = no sheen

ppm = parts per million

U = The analyte was not detected at a concentration greater than the value identified.

**Bold** font type indicates the analyte was detected at the reported concentration.




N
W E
S

2,000 0 2,000

Feet

## Vicinity Map

Dakota Creek Industries
Anacortes, Washington

GeoEngineers

**Figure 1**

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Mapbox Open Street Map, 2016

Projection: NAD 1983 UTM Zone 10N

C:\Users\lbaldwin\Desktop\Templates\VicinityMap.mxd Date Exported: 02/27/19 by lbaldwin

## Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Aerial from Google Earth Pro dated 8/2011.

Projection: WA State Plane, North Zone, NAD83, US Foot

N W E S

60 0 60
Feet

Syncrolift Pier
Open Cell Bulkhead
Warehouse 9
Guard Station
Gate
Pier 2 Detention Pond
Stormwater Treatment System
Paint Shed
Shop
Sand Shed
GEI-47
GEI-48
GEI-49
GEI-50
GEI-51
GEI-52
GEI-53
Guard Station
Gate
Commercial Ave
3rd Street

### Legend

- Dakota Creek Industries (DCI) Property Boundary
- Previous Marine Area Dredge and Backfill Area
- Existing Bulkhead
- x — Existing Fence
- Proposed Soil Sample Location to Verify the Completeness of Previously Completed Soil Removal Actions
- UST Removal Enclosure Area (A-1 1991)
- Marine Railway Winch Removal Area (Landau 2001)
- Petroleum Cleanup Action Area (Landau 2002)
- Marine Railway Cleanup Action Area (Landau 2002)
- A — Compressed Air
- C — Comm Line
- E — Electrical
- F4 — Fireline 4
- F6 — Fireline 6
- SS — Sanitary Sewer
- SD — Stormwater Drain
- W — Water
- CW — Cold Water
- P — Power
- Catch Basin
- Manhole
- Outfall

# Site Plan

Dakota Creek Industries
Anacortes, Washington

GeoEngineers

Figure 2

\\geoengineers.com\WAN\Projects\5\5147006\CAD\14\Draft Supplemental Soil Investigation Report\5147006l3_F02_Site Plan.dwg TAB:F02 Date Exported: 04/29/21 - 17:46 by mwoods

# APPENDIX A
## Boring Logs

## SOIL CLASSIFICATION CHART

| MAJOR DIVISIONS | | | SYMBOLS GRAPH | SYMBOLS LETTER | TYPICAL DESCRIPTIONS |
|---|---|---|---|---|---|
| COARSE GRAINED SOILS | GRAVEL AND GRAVELLY SOILS | CLEAN GRAVELS (LITTLE OR NO FINES) | | GW | WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES |
| | | | | GP | POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES |
| | MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE | GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES) | | GM | SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES |
| | | | | GC | CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES |
| MORE THAN 50% RETAINED ON NO. 200 SIEVE | SAND AND SANDY SOILS | CLEAN SANDS (LITTLE OR NO FINES) | | SW | WELL-GRADED SANDS, GRAVELLY SANDS |
| | | | | SP | POORLY-GRADED SANDS, GRAVELLY SAND |
| | MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE | SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES) | | SM | SILTY SANDS, SAND - SILT MIXTURES |
| | | | | SC | CLAYEY SANDS, SAND - CLAY MIXTURES |
| FINE GRAINED SOILS | SILTS AND CLAYS | LIQUID LIMIT LESS THAN 50 | | ML | INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY |
| | | | | CL | INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS |
| | | | | OL | ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY |
| MORE THAN 50% PASSING NO. 200 SIEVE | SILTS AND CLAYS | LIQUID LIMIT GREATER THAN 50 | | MH | INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS |
| | | | | CH | INORGANIC CLAYS OF HIGH PLASTICITY |
| | | | | OH | ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY |
| HIGHLY ORGANIC SOILS | | | | PT | PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS |

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

## ADDITIONAL MATERIAL SYMBOLS

| SYMBOLS GRAPH | SYMBOLS LETTER | TYPICAL DESCRIPTIONS |
|---|---|---|
| | AC | Asphalt Concrete |
| | CC | Cement Concrete |
| | CR | Crushed Rock/ Quarry Spalls |
| | SOD | Sod/Forest Duff |
| | TS | Topsoil |

### Groundwater Contact

Measured groundwater level in exploration, well, or piezometer

Measured free product in well or piezometer

### Graphic Log Contact

Distinct contact between soil strata

Approximate contact between soil strata

### Material Description Contact

Contact between geologic units

Contact between soil of the same geologic unit

### Sampler Symbol Descriptions

2.4-inch I.D. split barrel

Standard Penetration Test (SPT)

Shelby tube

Piston

Direct-Push

Bulk or grab

Continuous Coring

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

"P" indicates sampler pushed using the weight of the drill rig.

"WOH" indicates sampler pushed using the weight of the hammer.

### Laboratory / Field Tests

| | |
|---|---|
| %F | Percent fines |
| %G | Percent gravel |
| AL | Atterberg limits |
| CA | Chemical analysis |
| CP | Laboratory compaction test |
| CS | Consolidation test |
| DD | Dry density |
| DS | Direct shear |
| HA | Hydrometer analysis |
| MC | Moisture content |
| MD | Moisture content and dry density |
| Mohs | Mohs hardness scale |
| OC | Organic content |
| PM | Permeability or hydraulic conductivity |
| PI | Plasticity index |
| PL | Point load test |
| PP | Pocket penetrometer |
| SA | Sieve analysis |
| TX | Triaxial compression |
| UC | Unconfined compression |
| VS | Vane shear |

### Sheen Classification

| | |
|---|---|
| NS | No Visible Sheen |
| SS | Slight Sheen |
| MS | Moderate Sheen |
| HS | Heavy Sheen |

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

# Key to Exploration Logs

GeoEngineers

Figure A-1

| | | | | | |
|---|---|---|---|---|---|
| Drilled Start 3/18/2021 End 3/18/2021 | Total Depth (ft) 15 | Logged By NRS<br>Checked By RST | Driller Cascade Drilling LP | Drilling Method Direct-Push | |
| Surface Elevation (ft) 13.5<br>Vertical Datum MLLW | | Hammer Data Pneumatic | | Drilling Equipment Tracked DP Probe Rig | |
| Easting (X) 1209726.25<br>Northing (Y) 559639.25 | | System Datum WA State Plane North (US Feet) | | Groundwater not observed at time of exploration | |

Notes:

| Elevation (feet) | Depth (feet) | FIELD DATA: Interval | Recovered (in) | Blows/foot | Collected Sample | Sample Name Testing | Graphic Log | Group Classification | MATERIAL DESCRIPTION | Sheen | Headspace Vapor (ppm) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | 54 | | | | | AC | Approximately 6 inches of asphalt concrete | | | |
| | | | | | | | | CR | Crushed asphalt | | | |
| | | | | | | | | SM | Dark gray silty fine to coarse sand with gravel (dry) (fill) | NS | <1 | |
| | | | | | | | | | | NS | <1 | |
| | | | | | | | | SM | Brown silty fine to coarse sand with occasional gravel (dry) | NS | <1 | |
| 10 | | | | | | | | SM | Brown silty fine to coarse sand with gravel (moist) | NS | <1 | |
| | 5 | | 36 | | | | | | | NS | <1 | |
| | | | | | | | | SM | Black silty fine to medium sand with occasional organic layering (moist) | NS | <1 | |
| | | | | | | | | | | NS | <1 | |
| | | | | | | | | SM | Light gray silty fine to medium sand (moist) | NS | <1 | |
| 5 | | | | | GEI-47-9.0 | | | SM | Brown silty fine to medium sand (wet) | NS | <1 | |
| | 10 | | 60 | | | | | | | NS | <1 | |
| | | | | | | | | | | NS | <1 | |
| | | | | | | | | | | NS | <1 | |
| | | | | | | | | | | NS | <1 | |
| 0 | | | | | | | | | | NS | <1 | |
| | | | | | | | | SP-SM | Dark gray fine to medium sand with silt lens (wet) | | | |
| | 15 | | | | | | | SP | Dark gray fine to medium sand (wet) | | | |

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on hand-held GPS. Vertical approximated based on 2014 David Evans Associates Survey.

# Log of Boring GEI-47

GeoEngineers

Project: Dakota Creek Industries
Project Location: Anacortes, Washington
Project Number: 5147-006-14

Figure A-2
Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Drilled: Start 3/18/2021 End 3/18/2021 | Total Depth (ft): 10 | Logged By: NRS Checked By: RST | Driller: Cascade Drilling LP | Drilling Method: Direct-Push | |
| Surface Elevation (ft) Vertical Datum: 13 MLLW | | Hammer Data: Pneumatic | | Drilling Equipment: Tracked DP Probe Rig | |
| Easting (X): 1210000.73 Northing (Y): 559451.86 | | System Datum: WA State Plane North (US Feet) | | Groundwater not observed at time of exploration | |

Notes:

| Elevation (feet) | Depth (feet) | FIELD DATA: Interval | Recovered (in) | Blows/foot | Collected Sample | Sample Name Testing | Graphic Log | Group Classification | MATERIAL DESCRIPTION | Sheen | Headspace Vapor (ppm) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | 60 | | | | | AC | Approximately 6 inches of asphalt concrete | | | |
| | | | | | | | | CC | Crushed concrete (dry) | | | |
| | | | | | | | | SM | Gray silty fine to coarse sand with gravel (dry) (fill) | NS | <1 | |
| 10 | | | | | | | | SM | Brown silty fine to coarse sand with occasional gravel (dry) | NS | <1 | |
| | | | | | | | | ML | Dark gray silt (moist) | NS | <1 | |
| | 5 | | 48 | | | | | | | NS | <1 | |
| | | | | | | | | SM | Light brown silty fine to coarse sand (moist) | | | |
| | | | | | | | | SM | Gray silty fine to coarse sand with occasional gravel (moist) | NS | <1 | |
| | | | | | | | | SM | Dark brown silty fine to coarse sand with occasional gravel (moist) | NS | 2.1 | |
| 5 | | | | | GEI-48-8.0 | | | SM | Brown silty fine to coarse sand (moist) | NS | <1 | |
| | | | | | | | | | | NS | <1 | |
| | 10 | | | | | | | | Becomes wet | | | |

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on hand-held GPS. Vertical approximated based on 2014 David Evans Associates Survey.

# Log of Boring GEI-48

GeoEngineers

Project: Dakota Creek Industries
Project Location: Anacortes, Washington
Project Number: 5147-006-14

Figure A-3
Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Drilled Start 3/18/2021 End 3/18/2021 | Total Depth (ft) 15 | Logged By NRS<br>Checked By RST | Driller Cascade Drilling LP | Drilling Method Direct-Push | |
| Surface Elevation (ft) 13.25<br>Vertical Datum MLLW | | Hammer Data Pneumatic | | Drilling Equipment Tracked DP Probe Rig | |
| Easting (X) 1209768.43<br>Northing (Y) 559598.56 | | System Datum WA State Plane North (US Feet) | | Groundwater not observed at time of exploration | |

Notes:

| Elevation (feet) | Depth (feet) | FIELD DATA: Interval | Recovered (in) | Blows/foot | Collected Sample | Sample Name Testing | Graphic Log | Group Classification | MATERIAL DESCRIPTION | Sheen | Headspace Vapor (ppm) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | 0 | | | | | AC | Approximately 6 inches of asphalt concrete | | | |
| | | | | | | | | NR | Rock in shoe; no recovery | | | |
| | 5 | | 54 | | | | | SM | Light brown silty fine to coarse sand with occasional gravel (dry) (fill) | NS | <1 | |
| | | | | | | | | | | NS | <1 | |
| | | | | | | | | | | NS | <1 | |
| | | | | | | | | SM | Dark gray silty fine to coarse sand (moist) | NS | <1 | |
| | | | | | | | | SM | Gray silty fine to coarse sand (moist) | NS | <1 | |
| | | | | | | | | | Becomes wet | NS | <1 | |
| | 10 | | 60 | | | GEI-49-11.0 | | | | NS | <1 | |
| | | | | | | | | | | NS | <1 | |
| | | | | | | | | SM | Dark gray silty fine to medium sand (wet) | NS | 3.2 | Heavy $H_2S$ odor |
| | | | | | | | | ML | Dark gray silt with organic matter (moist) | | | |
| | | | | | | | | ML | Gray silt with sand (moist) | NS | <1 | |
| | 15 | | | | | | | | | | | |

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on hand-held GPS. Vertical approximated based on 2014 David Evans Associates Survey.

# Log of Boring GEI-49

GeoEngineers

Project: Dakota Creek Industries
Project Location: Anacortes, Washington
Project Number: 5147-006-14

Figure A-4
Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Drilled Start 3/18/2021 End 3/18/2021 | Total Depth (ft) 15 | Logged By NRS<br>Checked By RST | Driller Cascade Drilling LP | Drilling Method Direct-Push | |
| Surface Elevation (ft) 13<br>Vertical Datum MLLW | | Hammer Data Pneumatic | | Drilling Equipment Tracked DP Probe Rig | |
| Easting (X) 1209799.82<br>Northing (Y) 559561.74 | | System Datum WA State Plane North (US Feet) | | Groundwater not observed at time of exploration | |

Notes:

| Elevation (feet) | Depth (feet) | FIELD DATA: Interval | Recovered (in) | Blows/foot | Collected Sample | Sample Name Testing | Graphic Log | Group Classification | MATERIAL DESCRIPTION | Sheen | Headspace Vapor (ppm) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | 60 | | | | | AC | Approximately 6 inches of asphalt concrete | | | |
| | | | | | | | | CC | Approximately 6 inches of concrete cement | | | |
| | | | | | | | | SM | Dark gray silty fine to coarse sand with gravel (dry) (fill) | SS | <1 | |
| | | | | | | | | | | NS | <1 | |
| 10 | | | | | | | | | | NS | <1 | |
| | | | | | | | | | | NS | <1 | |
| | | | | | | | | SM | Brown silty fine to coarse sand with gravel (dry) | | | |
| | | | | | | | | SM | Brown silty fine to coarse sand (moist) | | | |
| | 5 | | 36 | | | | | SM | Brown silty fine to coarse sand (moist) | SS | 2.1 | |
| | | | | | | | | | | NS | <1 | |
| | | | | | | | | | | NS | <1 | |
| 5 | | | | | | | | | | NS | <1 | |
| | | | | | | GEI-50-9.0 | | SP-SM | Gray silty fine to coarse sand (wet) | NS | <1 | |
| | | | | | | | | | | NS | <1 | |
| | 10 | | 60 | | | | | ML | Gray-brown layered silt with organic matter (wet) | NS | <1 | |
| | | | | | | | | | | NS | <1 | |
| | | | | | | | | SP-SM | Dark gray silty fine to coarse sand with gravel (wet) | NS | <1 | |
| 0 | | | | | | | | | Grades to light gray | NS | <1 | |
| | | | | | | | | | | NS | <1 | |
| | 15 | | | | | | | | | | | |

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on hand-held GPS. Vertical approximated based on 2014 David Evans Associates Survey.

# Log of Boring GEI-50

GeoEngineers

Project: Dakota Creek Industries
Project Location: Anacortes, Washington
Project Number: 5147-006-14

Figure A-5
Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Drilled Start 3/18/2021 End 3/18/2021 | Total Depth (ft) 15 | Logged By NRS Checked By RST | Driller Cascade Drilling LP | Drilling Method Direct-Push | |
| Surface Elevation (ft) 13 Vertical Datum MLLW | | Hammer Data Pneumatic | | Drilling Equipment Tracked DP Probe Rig | |
| Easting (X) 1209760.69 Northing (Y) 559545.98 | | System Datum WA State Plane North (US Feet) | | Groundwater not observed at time of exploration | |
| Notes: | | | | | |

| Elevation (feet) | Depth (feet) | FIELD DATA: Interval | Recovered (in) | Blows/foot | Collected Sample | Sample Name Testing | Graphic Log | Group Classification | MATERIAL DESCRIPTION | Sheen | Headspace Vapor (ppm) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | 48 | | | | | AC | Approximately 6 inches of asphalt concrete | | | |
| | | | | | | | | CR | Crushed asphalt | | | |
| | | | | | | | | SM | Brown silty fine to coarse sand with gravel (dry) (fill) | NS | <1 | |
| | | | | | | | | | | NS | <1 | |
| 10 | | | | | | | | SM | Light brown silty fine to coarse sand with occasional gravel (dry) | NS | <1 | |
| | | | | | | | | | | NS | <1 | |
| | 5 | | 36 | | | | | | Becomes moist | SS | 4.2 | |
| | | | | | | | | | | NS | <1 | |
| 5 | | | | | | | | SM | Dark gray silty fine to coarse sand with gravel (moist) | NS | <1 | |
| | | | | | | | | | | NS | <1 | |
| | | | | | | | | | Becomes wet | NS | <1 | |
| | | | | | | | | SM | Dark gray to gray silty fine to medium sand (wet) | | | |
| | 10 | | 60 | | | | | | | NS | <1 | |
| | | | | | | | | | Grades to light gray | NS | <1 | |
| | | | | | GEI-51-12.0 | | | | | NS | <1 | |
| 0 | | | | | | | | | | NS | <1 | |
| | | | | | | | | | Grades to dark gray, increased silt | | | |
| | | | | | | | | | | NS | <1 | |
| | | | | | | | | ML | Gray silt with sand (moist) | | | |
| | 15 | | | | | | | | | | | |

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on hand-held GPS. Vertical approximated based on 2014 David Evans Associates Survey.

# Log of Boring GEI-51

GeoEngineers

Project: Dakota Creek Industries
Project Location: Anacortes, Washington
Project Number: 5147-006-14

Figure A-6
Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Drilled Start 3/18/2021 End 3/18/2021 | Total Depth (ft) 15 | Logged By NRS<br>Checked By RST | Driller Cascade Drilling LP | Drilling Method Direct-Push | |
| Surface Elevation (ft) 13<br>Vertical Datum MLLW | | Hammer Data Pneumatic | | Drilling Equipment Tracked DP Probe Rig | |
| Easting (X) 1209747.08<br>Northing (Y) 559501.71 | | System Datum WA State Plane North (US Feet) | | Groundwater not observed at time of exploration | |

Notes:

| Elevation (feet) | Depth (feet) | FIELD DATA: Interval | Recovered (in) | Blows/foot | Collected Sample | Sample Name Testing | Graphic Log | Group Classification | MATERIAL DESCRIPTION | Sheen | Headspace Vapor (ppm) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | 60 | | | | | AC | Approximately 6 inches of asphalt concrete | | | |
| | | | | | | | | CC | Crushed concrete (dry) | | | |
| | | | | | | | | SM | Brown silty fine to medium sand (dry) (fill) | NS | <1 | |
| 10 | | | | | | | | ML | Gray-dark gray silt with sand and gravel (moist) | NS | <1 | |
| | | | | | | | | | | SS | 2.4 | |
| | 5 | | 36 | | | | | SM | Gray silty fine to medium sand with trace gravel (moist) | NS | <1 | |
| | | | | | | | | | | NS | <1 | |
| 5 | | | | | | | | | | NS | <1 | |
| | | | | | | | | PEAT | Peat with silt (moist) | NS | 8.3 | |
| | | | | | | | | SM | Light gray-gray silty fine to medium sand (moist) | NS | <1 | |
| | 10 | | 60 | | GEI-52-10.0 | | | | Becomes wet | NS | <1 | |
| | | | | | | | | ML | Gray silt with sand and trace gravel (wet) | NS | <1 | |
| 0 | | | | | | | | | | NS | <1 | |
| | | | | | | | | ML | Light gray silt with sand (wet) | NS | <1 | |
| | 15 | | | | | | | | | | | |

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on hand-held GPS. Vertical approximated based on 2014 David Evans Associates Survey.

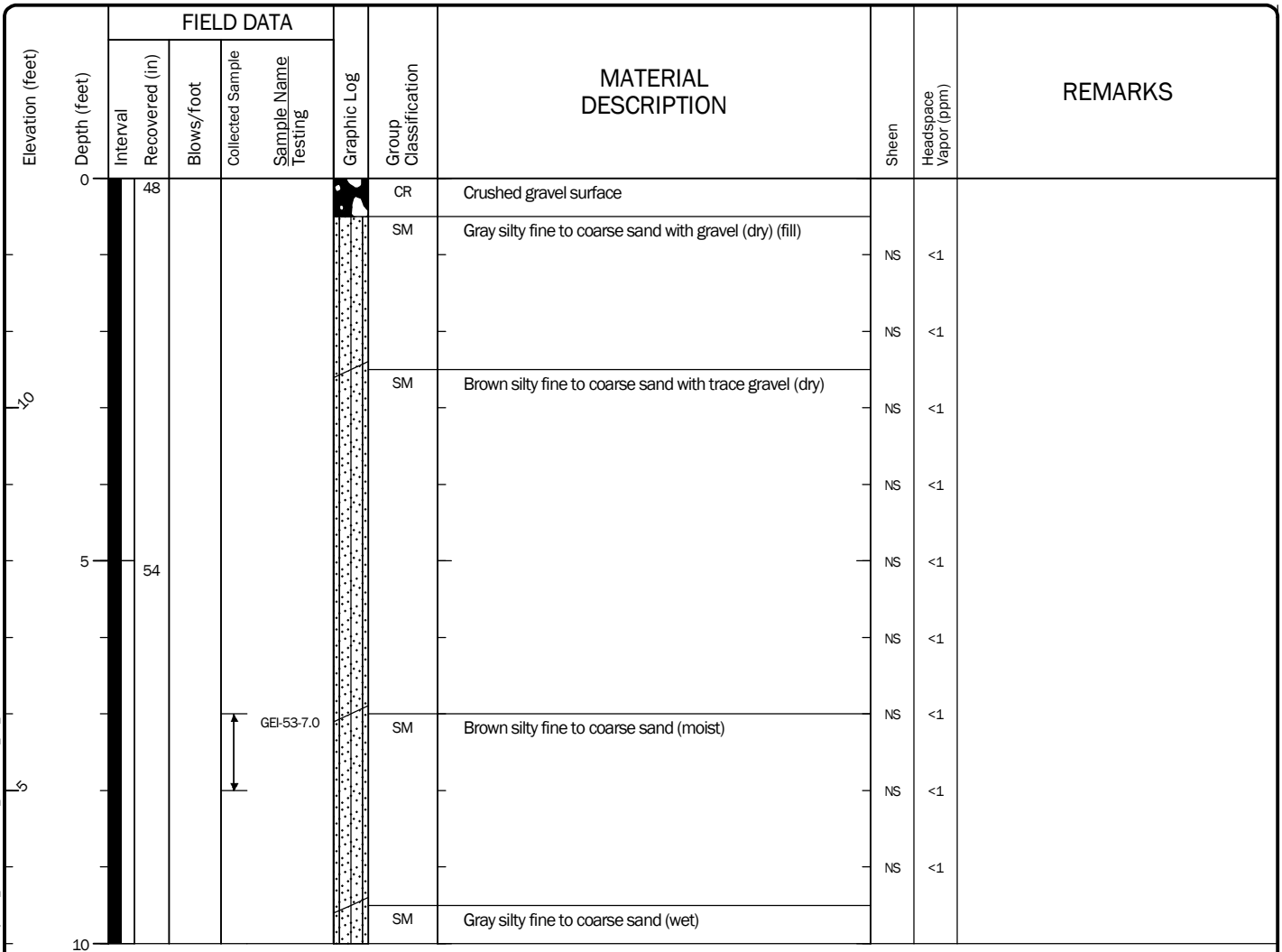
# Log of Boring GEI-52

GeoEngineers

Project: Dakota Creek Industries
Project Location: Anacortes, Washington
Project Number: 5147-006-14

Figure A-7
Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Drilled Start 3/18/2021 End 3/18/2021 | Total Depth (ft) 10 | Logged By NRS Checked By RST | Driller Cascade Drilling LP | Drilling Method Direct-Push | |
| Surface Elevation (ft) 13 Vertical Datum MLLW | | Hammer Data Pneumatic | | Drilling Equipment Tracked DP Probe Rig | |
| Easting (X) 1209965.75 Northing (Y) 559578.87 | | System Datum WA State Plane North (US Feet) | | Groundwater not observed at time of exploration | |
| Notes: | | | | | |




Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on hand-held GPS. Vertical approximated based on 2014 David Evans Associates Survey.

# Log of Boring GEI-53

GeoEngineers

Project: Dakota Creek Industries
Project Location: Anacortes, Washington
Project Number: 5147-006-14

Figure A-8
Sheet 1 of 1

# APPENDIX B
## Laboratory Data Packages

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

March 29, 2021

Robert Trahan
GeoEngineers, Inc.
2101 4th Avenue, Suite 950
Seattle, WA 98121

Re: Analytical Data for Project 5147-006-14
Laboratory Reference No. 2103-219

Dear Robert:

Enclosed are the analytical results and associated quality control data for samples submitted on March 18, 2021.

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 29, 2021
Samples Submitted: March 18, 2021
Laboratory Reference: 2103-219
Project: 5147-006-14

**Case Narrative**

Samples were collected on March 18, 2021 and received by the laboratory on March 18, 2021. 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.

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 29, 2021
Samples Submitted: March 18, 2021
Laboratory Reference: 2103-219
Project: 5147-006-14

**ANALYTICAL REPORT FOR SAMPLES**

| Client ID | Laboratory ID | Matrix | Date Sampled | Date Received | Notes |
|---|---|---|---|---|---|
| GEI-47-9.0 | 03-219-01 | Soil | 3-18-21 | 3-18-21 | |
| GEI-48-8.0 | 03-219-02 | Soil | 3-18-21 | 3-18-21 | |
| GEI-49-11.0 | 03-219-03 | Soil | 3-18-21 | 3-18-21 | |
| GEI-50-9.0 | 03-219-04 | Soil | 3-18-21 | 3-18-21 | |
| GEI-51-12.0 | 03-219-05 | Soil | 3-18-21 | 3-18-21 | |
| GEI-52-10.0 | 03-219-06 | Soil | 3-18-21 | 3-18-21 | |
| GEI-53-7.0 | 03-219-07 | Soil | 3-18-21 | 3-18-21 | |

Date of Report: March 29, 2021
Samples Submitted: March 18, 2021
Laboratory Reference: 2103-219
Project: 5147-006-14

**GASOLINE RANGE ORGANICS**
**NWTPH-Gx**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-47-9.0** | | | | | |
| Laboratory ID: | 03-219-01 | | | | | |
| Gasoline | **ND** | 5.7 | NWTPH-Gx | 3-22-21 | 3-22-21 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *88* | *58-129* | | | | |
| **Client ID:** | **GEI-49-11.0** | | | | | |
| Laboratory ID: | 03-219-03 | | | | | |
| Gasoline | **ND** | 6.3 | NWTPH-Gx | 3-22-21 | 3-22-21 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *84* | *58-129* | | | | |
| **Client ID:** | **GEI-50-9.0** | | | | | |
| Laboratory ID: | 03-219-04 | | | | | |
| Gasoline | **ND** | 5.8 | NWTPH-Gx | 3-22-21 | 3-22-21 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *86* | *58-129* | | | | |
| **Client ID:** | **GEI-51-12.0** | | | | | |
| Laboratory ID: | 03-219-05 | | | | | |
| Gasoline | **ND** | 6.6 | NWTPH-Gx | 3-22-21 | 3-22-21 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *87* | *58-129* | | | | |
| **Client ID:** | **GEI-52-10.0** | | | | | |
| Laboratory ID: | 03-219-06 | | | | | |
| Gasoline | **ND** | 9.9 | NWTPH-Gx | 3-22-21 | 3-22-21 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *105* | *58-129* | | | | |

Date of Report: March 29, 2021
Samples Submitted: March 18, 2021
Laboratory Reference: 2103-219
Project: 5147-006-14

**DIESEL AND HEAVY OIL RANGE ORGANICS**
**NWTPH-Dx**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-47-9.0** | | | | | |
| Laboratory ID: | 03-219-01 | | | | | |
| Diesel Range Organics | **ND** | 30 | NWTPH-Dx | 3-19-21 | 3-22-21 | X1 |
| Lube Oil Range Organics | **ND** | 60 | NWTPH-Dx | 3-19-21 | 3-22-21 | X1 |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *85* | *50-150* | | | | |
| **Client ID:** | **GEI-48-8.0** | | | | | |
| Laboratory ID: | 03-219-02 | | | | | |
| Diesel Range Organics | **ND** | 31 | NWTPH-Dx | 3-19-21 | 3-22-21 | X1 |
| Lube Oil Range Organics | **ND** | 62 | NWTPH-Dx | 3-19-21 | 3-22-21 | X1 |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *80* | *50-150* | | | | |
| **Client ID:** | **GEI-49-11.0** | | | | | |
| Laboratory ID: | 03-219-03 | | | | | |
| Diesel Range Organics | **ND** | 30 | NWTPH-Dx | 3-19-21 | 3-22-21 | X1 |
| Lube Oil Range Organics | **ND** | 60 | NWTPH-Dx | 3-19-21 | 3-22-21 | X1 |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *61* | *50-150* | | | | |
| **Client ID:** | **GEI-50-9.0** | | | | | |
| Laboratory ID: | 03-219-04 | | | | | |
| Diesel Range Organics | **ND** | 30 | NWTPH-Dx | 3-19-21 | 3-22-21 | X1 |
| Lube Oil Range Organics | **ND** | 60 | NWTPH-Dx | 3-19-21 | 3-22-21 | X1 |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *56* | *50-150* | | | | |
| **Client ID:** | **GEI-51-12.0** | | | | | |
| Laboratory ID: | 03-219-05 | | | | | |
| Diesel Range Organics | **ND** | 31 | NWTPH-Dx | 3-19-21 | 3-22-21 | X1 |
| Lube Oil Range Organics | **ND** | 61 | NWTPH-Dx | 3-19-21 | 3-22-21 | X1 |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *85* | *50-150* | | | | |
| **Client ID:** | **GEI-52-10.0** | | | | | |
| Laboratory ID: | 03-219-06 | | | | | |
| Diesel Range Organics | **ND** | 39 | NWTPH-Dx | 3-19-21 | 3-22-21 | X1 |
| Lube Oil Range Organics | **ND** | 78 | NWTPH-Dx | 3-19-21 | 3-22-21 | X1 |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *77* | *50-150* | | | | |

Date of Report: March 29, 2021
Samples Submitted: March 18, 2021
Laboratory Reference: 2103-219
Project: 5147-006-14

**DIESEL AND HEAVY OIL RANGE ORGANICS**
**NWTPH-Dx**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-53-7.0** | | | | | |
| Laboratory ID: | 03-219-07 | | | | | |
| Diesel Range Organics | **ND** | 27 | NWTPH-Dx | 3-19-21 | 3-22-21 | X1 |
| Lube Oil Range Organics | **ND** | 55 | NWTPH-Dx | 3-19-21 | 3-22-21 | X1 |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *78* | *50-150* | | | | |

Date of Report: March 29, 2021
Samples Submitted: March 18, 2021
Laboratory Reference: 2103-219
Project: 5147-006-14

**VOLATILE ORGANICS EPA 8260D**

Matrix: Soil
Units: mg/kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-47-9.0** | | | | | |
| Laboratory ID: | 03-219-01 | | | | | |
| Benzene | ND | 0.00084 | EPA 8260D | 3-19-21 | 3-19-21 | |
| Toluene | ND | 0.0042 | EPA 8260D | 3-19-21 | 3-19-21 | |
| Ethylbenzene | ND | 0.00084 | EPA 8260D | 3-19-21 | 3-19-21 | |
| m,p-Xylene | ND | 0.0017 | EPA 8260D | 3-19-21 | 3-19-21 | |
| o-Xylene | ND | 0.00084 | EPA 8260D | 3-19-21 | 3-19-21 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Dibromofluoromethane* | *99* | *74-131* | | | | |
| *Toluene-d8* | *101* | *78-128* | | | | |
| *4-Bromofluorobenzene* | *98* | *71-130* | | | | |

Date of Report: March 29, 2021
Samples Submitted: March 18, 2021
Laboratory Reference: 2103-219
Project: 5147-006-14

**VOLATILE ORGANICS EPA 8260D**

Matrix: Soil
Units: mg/kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-49-11.0** | | | | | |
| Laboratory ID: | 03-219-03 | | | | | |
| Benzene | ND | 0.00097 | EPA 8260D | 3-23-21 | 3-23-21 | |
| Toluene | ND | 0.0049 | EPA 8260D | 3-23-21 | 3-23-21 | |
| Ethylbenzene | ND | 0.00097 | EPA 8260D | 3-23-21 | 3-23-21 | |
| m,p-Xylene | ND | 0.0019 | EPA 8260D | 3-23-21 | 3-23-21 | |
| o-Xylene | ND | 0.00097 | EPA 8260D | 3-23-21 | 3-23-21 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Dibromofluoromethane* | *100* | *74-131* | | | | |
| *Toluene-d8* | *102* | *78-128* | | | | |
| *4-Bromofluorobenzene* | *101* | *71-130* | | | | |

Date of Report: March 29, 2021
Samples Submitted: March 18, 2021
Laboratory Reference: 2103-219
Project: 5147-006-14

**VOLATILE ORGANICS EPA 8260D**

Matrix: Soil
Units: mg/kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-50-9.0** | | | | | |
| Laboratory ID: | 03-219-04 | | | | | |
| Benzene | ND | 0.00091 | EPA 8260D | 3-19-21 | 3-19-21 | |
| Toluene | ND | 0.0046 | EPA 8260D | 3-19-21 | 3-19-21 | |
| Ethylbenzene | ND | 0.00091 | EPA 8260D | 3-19-21 | 3-19-21 | |
| m,p-Xylene | ND | 0.0018 | EPA 8260D | 3-19-21 | 3-19-21 | |
| o-Xylene | ND | 0.00091 | EPA 8260D | 3-19-21 | 3-19-21 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Dibromofluoromethane* | *100* | *74-131* | | | | |
| *Toluene-d8* | *101* | *78-128* | | | | |
| *4-Bromofluorobenzene* | *95* | *71-130* | | | | |

Date of Report: March 29, 2021
Samples Submitted: March 18, 2021
Laboratory Reference: 2103-219
Project: 5147-006-14

**VOLATILE ORGANICS EPA 8260D**

Matrix: Soil
Units: mg/kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-51-12.0** | | | | | |
| Laboratory ID: | 03-219-05 | | | | | |
| Benzene | ND | 0.0010 | EPA 8260D | 3-19-21 | 3-19-21 | |
| Toluene | ND | 0.0052 | EPA 8260D | 3-19-21 | 3-19-21 | |
| Ethylbenzene | ND | 0.0010 | EPA 8260D | 3-19-21 | 3-19-21 | |
| m,p-Xylene | ND | 0.0021 | EPA 8260D | 3-19-21 | 3-19-21 | |
| o-Xylene | ND | 0.0010 | EPA 8260D | 3-19-21 | 3-19-21 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Dibromofluoromethane* | *100* | *74-131* | | | | |
| *Toluene-d8* | *99* | *78-128* | | | | |
| *4-Bromofluorobenzene* | *97* | *71-130* | | | | |

Date of Report: March 29, 2021
Samples Submitted: March 18, 2021
Laboratory Reference: 2103-219
Project: 5147-006-14

**VOLATILE ORGANICS EPA 8260D**

Matrix: Soil
Units: mg/kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-52-10.0** | | | | | |
| Laboratory ID: | 03-219-06 | | | | | |
| Benzene | ND | 0.0014 | EPA 8260D | 3-19-21 | 3-19-21 | |
| Toluene | ND | 0.0068 | EPA 8260D | 3-19-21 | 3-19-21 | |
| Ethylbenzene | ND | 0.0014 | EPA 8260D | 3-19-21 | 3-19-21 | |
| m,p-Xylene | ND | 0.0027 | EPA 8260D | 3-19-21 | 3-19-21 | |
| o-Xylene | ND | 0.0014 | EPA 8260D | 3-19-21 | 3-19-21 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Dibromofluoromethane* | *103* | *74-131* | | | | |
| *Toluene-d8* | *99* | *78-128* | | | | |
| *4-Bromofluorobenzene* | *93* | *71-130* | | | | |

Date of Report: March 29, 2021
Samples Submitted: March 18, 2021
Laboratory Reference: 2103-219
Project: 5147-006-14

**PAHs EPA 8270E/SIM**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GE1-53-7.0** | | | | | |
| Laboratory ID: | 03-219-07 | | | | | |
| Benzo[a]anthracene | **0.087** | 0.0073 | EPA 8270E/SIM | 3-19-21 | 3-19-21 | |
| Chrysene | **0.079** | 0.0073 | EPA 8270E/SIM | 3-19-21 | 3-19-21 | |
| Benzo[b]fluoranthene | **0.095** | 0.0073 | EPA 8270E/SIM | 3-19-21 | 3-19-21 | |
| Benzo(j,k)fluoranthene | **0.035** | 0.0073 | EPA 8270E/SIM | 3-19-21 | 3-19-21 | |
| Benzo[a]pyrene | **0.084** | 0.0073 | EPA 8270E/SIM | 3-19-21 | 3-19-21 | |
| Indeno(1,2,3-c,d)pyrene | **0.053** | 0.0073 | EPA 8270E/SIM | 3-19-21 | 3-19-21 | |
| Dibenz[a,h]anthracene | **0.0097** | 0.0073 | EPA 8270E/SIM | 3-19-21 | 3-19-21 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *90* | *46 - 113* | | | | |
| *Pyrene-d10* | *99* | *45 - 114* | | | | |
| *Terphenyl-d14* | *100* | *49 - 121* | | | | |

Date of Report: March 29, 2021
Samples Submitted: March 18, 2021
Laboratory Reference: 2103-219
Project: 5147-006-14

**GASOLINE RANGE ORGANICS**
**NWTPH-Gx**
**QUALITY CONTROL**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **METHOD BLANK** | | | | | | |
| Laboratory ID: | MB0322S1 | | | | | |
| Gasoline | **ND** | 5.0 | NWTPH-Gx | 3-22-21 | 3-22-21 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *87* | *58-129* | | | | |

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **DUPLICATE** | | | | | | | | | | | |
| Laboratory ID: | 03-219-01 | | | | | | | | | | |
| | ORIG | DUP | | | | | | | | | |
| Gasoline | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| *Surrogate:* | | | | | | | | | | | |
| *Fluorobenzene* | | | | | | *88* | *87* | *58-129* | | | |

Date of Report: March 29, 2021
Samples Submitted: March 18, 2021
Laboratory Reference: 2103-219
Project: 5147-006-14

**DIESEL AND HEAVY OIL RANGE ORGANICS**
**NWTPH-Dx**
**QUALITY CONTROL**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **METHOD BLANK** | | | | | | |
| Laboratory ID: | MB0319S1 | | | | | |
| Diesel Range Organics | **ND** | 25 | NWTPH-Dx | 3-19-21 | 3-22-21 | X1 |
| Lube Oil Range Organics | **ND** | 50 | NWTPH-Dx | 3-19-21 | 3-22-21 | X1 |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *87* | *50-150* | | | | |

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|
| **DUPLICATE** | | | | | | | | | | |
| Laboratory ID: | SB0319S1 | | | | | | | | | |
| | ORIG | DUP | | | | | | | | |
| Diesel Fuel #2 | **103** | **83.5** | NA | NA | | NA | NA | 21 | NA | X1 |
| Lube Oil Range | **ND** | **ND** | NA | NA | | NA | NA | NA | NA | X1 |
| *Surrogate:* | | | | | | | | | | |
| *o-Terphenyl* | | | | | | *94* *72* | *50-150* | | | |

Date of Report: March 29, 2021
Samples Submitted: March 18, 2021
Laboratory Reference: 2103-219
Project: 5147-006-14

**DIESEL AND HEAVY OIL RANGE ORGANICS**
**NWTPH-Dx**
**CONTINUING CALIBRATION SUMMARY**

| Lab ID | True Value (ppm) | Calc. Value | Percent Difference | Control Limits |
|---|---|---|---|---|
| CCV0322R-T2 | 100 | 108 | -7.8 | +/-15% |
| CCV0322R-T3 | 100 | 105 | -4.9 | +/-15% |

Date of Report: March 29, 2021
Samples Submitted: March 18, 2021
Laboratory Reference: 2103-219
Project: 5147-006-14

**VOLATILE ORGANICS EPA 8260D**
**QUALITY CONTROL**

Matrix: Soil
Units: mg/kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **METHOD BLANK** | | | | | | |
| Laboratory ID: | MB0319S1 | | | | | |
| Benzene | ND | 0.0010 | EPA 8260D | 3-19-21 | 3-19-21 | |
| Toluene | ND | 0.0050 | EPA 8260D | 3-19-21 | 3-19-21 | |
| Ethylbenzene | ND | 0.0010 | EPA 8260D | 3-19-21 | 3-19-21 | |
| m,p-Xylene | ND | 0.0020 | EPA 8260D | 3-19-21 | 3-19-21 | |
| o-Xylene | ND | 0.0010 | EPA 8260D | 3-19-21 | 3-19-21 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Dibromofluoromethane* | *98* | *74-131* | | | | |
| *Toluene-d8* | *99* | *78-128* | | | | |
| *4-Bromofluorobenzene* | *97* | *71-130* | | | | |
| Laboratory ID: | MB0323S1 | | | | | |
| Benzene | ND | 0.0010 | EPA 8260D | 3-23-21 | 3-23-21 | |
| Toluene | ND | 0.0050 | EPA 8260D | 3-23-21 | 3-23-21 | |
| Ethylbenzene | ND | 0.0010 | EPA 8260D | 3-23-21 | 3-23-21 | |
| m,p-Xylene | ND | 0.0020 | EPA 8260D | 3-23-21 | 3-23-21 | |
| o-Xylene | ND | 0.0010 | EPA 8260D | 3-23-21 | 3-23-21 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Dibromofluoromethane* | *104* | *74-131* | | | | |
| *Toluene-d8* | *99* | *78-128* | | | | |
| *4-Bromofluorobenzene* | *101* | *71-130* | | | | |

Date of Report: March 29, 2021
Samples Submitted: March 18, 2021
Laboratory Reference: 2103-219
Project: 5147-006-14

**VOLATILE ORGANICS EPA 8260D**
**QUALITY CONTROL**

Matrix: Soil
Units: mg/kg

| Analyte | Result | | Spike Level | | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|
| **SPIKE BLANKS** | | | | | | | | | | |
| Laboratory ID: | SB0319S1 | | | | | | | | | |
| | SB | SBD | SB | SBD | SB | SBD | | | | |
| 1,1-Dichloroethene | **0.0487** | **0.0465** | 0.0500 | 0.0500 | 97 | 93 | 55-126 | 5 | 17 | |
| Benzene | **0.0570** | **0.0551** | 0.0500 | 0.0500 | 114 | 110 | 65-121 | 3 | 16 | |
| Trichloroethene | **0.0548** | **0.0536** | 0.0500 | 0.0500 | 110 | 107 | 74-126 | 2 | 16 | |
| Toluene | **0.0573** | **0.0556** | 0.0500 | 0.0500 | 115 | 111 | 71-121 | 3 | 16 | |
| Chlorobenzene | **0.0559** | **0.0545** | 0.0500 | 0.0500 | 112 | 109 | 72-123 | 3 | 16 | |
| *Surrogate:* | | | | | | | | | | |
| *Dibromofluoromethane* | | | | | *101* | *104* | *74-131* | | | |
| *Toluene-d8* | | | | | *100* | *101* | *78-128* | | | |
| *4-Bromofluorobenzene* | | | | | *106* | *106* | *71-130* | | | |
| Laboratory ID: | SB0323S1 | | | | | | | | | |
| | SB | SBD | SB | SBD | SB | SBD | | | | |
| 1,1-Dichloroethene | **0.0413** | **0.0436** | 0.0500 | 0.0500 | 83 | 87 | 55-126 | 5 | 17 | |
| Benzene | **0.0433** | **0.0468** | 0.0500 | 0.0500 | 87 | 94 | 65-121 | 8 | 16 | |
| Trichloroethene | **0.0502** | **0.0514** | 0.0500 | 0.0500 | 100 | 103 | 74-126 | 2 | 16 | |
| Toluene | **0.0435** | **0.0464** | 0.0500 | 0.0500 | 87 | 93 | 71-121 | 6 | 16 | |
| Chlorobenzene | **0.0476** | **0.0486** | 0.0500 | 0.0500 | 95 | 97 | 72-123 | 2 | 16 | |
| *Surrogate:* | | | | | | | | | | |
| *Dibromofluoromethane* | | | | | *99* | *96* | *74-131* | | | |
| *Toluene-d8* | | | | | *96* | *96* | *78-128* | | | |
| *4-Bromofluorobenzene* | | | | | *101* | *102* | *71-130* | | | |

Date of Report: March 29, 2021
Samples Submitted: March 18, 2021
Laboratory Reference: 2103-219
Project: 5147-006-14

**PAHs EPA 8270E/SIM**
**QUALITY CONTROL**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **METHOD BLANK** | | | | | | |
| Laboratory ID: | MB0319S1 | | | | | |
| Benzo[a]anthracene | **ND** | 0.0067 | EPA 8270E/SIM | 3-19-21 | 3-19-21 | |
| Chrysene | **ND** | 0.0067 | EPA 8270E/SIM | 3-19-21 | 3-19-21 | |
| Benzo[b]fluoranthene | **ND** | 0.0067 | EPA 8270E/SIM | 3-19-21 | 3-19-21 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0067 | EPA 8270E/SIM | 3-19-21 | 3-19-21 | |
| Benzo[a]pyrene | **ND** | 0.0067 | EPA 8270E/SIM | 3-19-21 | 3-19-21 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0067 | EPA 8270E/SIM | 3-19-21 | 3-19-21 | |
| Dibenz[a,h]anthracene | **ND** | 0.0067 | EPA 8270E/SIM | 3-19-21 | 3-19-21 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *90* | *46 - 113* | | | | |
| *Pyrene-d10* | *95* | *45 - 114* | | | | |
| *Terphenyl-d14* | *99* | *49 - 121* | | | | |

Date of Report: March 29, 2021
Samples Submitted: March 18, 2021
Laboratory Reference: 2103-219
Project: 5147-006-14

**PAHs EPA 8270E/SIM**
**QUALITY CONTROL**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **MATRIX SPIKES** | | | | | | | | | | | |
| Laboratory ID: | 03-193-01 | | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | | |
| Benzo[a]anthracene | **0.0745** | **0.0747** | 0.0833 | 0.0833 | ND | 89 | 90 | 56 - 136 | 0 | 25 | |
| Chrysene | **0.0739** | **0.0735** | 0.0833 | 0.0833 | ND | 89 | 88 | 49 - 130 | 1 | 22 | |
| Benzo[b]fluoranthene | **0.0753** | **0.0696** | 0.0833 | 0.0833 | ND | 90 | 84 | 51 - 135 | 8 | 26 | |
| Benzo(j,k)fluoranthene | **0.0722** | **0.0775** | 0.0833 | 0.0833 | ND | 87 | 93 | 56 - 124 | 7 | 23 | |
| Benzo[a]pyrene | **0.0728** | **0.0724** | 0.0833 | 0.0833 | ND | 87 | 87 | 54 - 133 | 1 | 26 | |
| Indeno(1,2,3-c,d)pyrene | **0.0716** | **0.0719** | 0.0833 | 0.0833 | ND | 86 | 86 | 52 - 134 | 0 | 20 | |
| Dibenz[a,h]anthracene | **0.0726** | **0.0726** | 0.0833 | 0.0833 | ND | 87 | 87 | 58 - 127 | 0 | 17 | |
| *Surrogate:* | | | | | | | | | | | |
| *2-Fluorobiphenyl* | | | | | | *76* | *74* | *46 - 113* | | | |
| *Pyrene-d10* | | | | | | *94* | *97* | *45 - 114* | | | |
| *Terphenyl-d14* | | | | | | *98* | *96* | *49 - 121* | | | |

Date of Report: March 29, 2021
Samples Submitted: March 18, 2021
Laboratory Reference: 2103-219
Project: 5147-006-14

**% MOISTURE**

| Client ID | Lab ID | % Moisture | Date Analyzed |
|---|---|---|---|
| **GEI-47-9.0** | 03-219-01 | **16** | 3-19-21 |
| **GEI-48-8.0** | 03-219-02 | **20** | 3-19-21 |
| **GEI-49-11.0** | 03-219-03 | **17** | 3-19-21 |
| **GEI-50-9.0** | 03-219-04 | **17** | 3-19-21 |
| **GEI-51-12.0** | 03-219-05 | **19** | 3-19-21 |
| **GEI-52-10.0** | 03-219-06 | **36** | 3-19-21 |
| **GEI-53-7.0** | 03-219-07 | **9** | 3-19-21 |

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.

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.

Z -

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

# Chain of Custody

Page 1 of 1

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: GEOENGINEERS INC.
Project Number: 5147-006-14
Project Name: DAKOTA CREEK INDUSTRIES
Project Manager: ROBERT TRAVIS
Sampled by: NATE SOLOMON

**Turnaround Request (in working days)**
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
☐ _____ (other)

**Laboratory Number:** 03-219

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX 8260 | NWTPH-Gx | NWTPH-Dx (☒ Acid / SG Clean-up) | Volatiles 8260C | Halogenated Volatiles 8260C | EDB EPA 8011 (Waters Only) | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082A | Organochlorine Pesticides 8081B | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA Metals | Total MTCA Metals | TCLP Metals | HEM (oil and grease) 1664A | cPAH EPA 8270-SIM | | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GEI-47-~~10.0~~ 9.0 | 03.18.21 | 0945 | SOIL | 5 | | X | | X | | | | | | | | | | | | | | | | | | X |
| 2 | GEI-48-8.0 | | 1310 | | 1 | | | | X | | | | | | | | | | | | | | | | | | |
| 3 | GEI-49-11.0 | | 1020 | | 5 | | X | | X | | | | | | | | | | | | | | | | | | |
| 4 | GEI-50-9.0 | | 1155 | | 5 | | X | | X | | | | | | | | | | | | | | | | | | |
| 5 | GEI-51-12.0 | | 1115 | | 5 | | X | | X | | | | | | | | | | | | | | | | | | |
| 6 | GEI-52-10.0 | | 1055 | | 5 | | X | | X | | | | | | | | | | | | | | | | | | |
| 7 | GEI-53-7.0 | | 1240 | | 1 | | | | X | | | | | | | | | | | | | | X | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GeoEngineers | 03.18.21 | 1015 |
| Received | | OSE | 3/18/21 | 1615 |
| Relinquished | | | | |
| Received | | | | |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

**Comments/Special Instructions**

Data Package: Standard ☐ Level III ☐ Level IV ☐

Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☐

22

# Sample/Cooler Receipt and Acceptance Checklist

Client: GES

Client Project Name/Number: 5147-006-14

OnSite Project Number: 03-219

Initiated by: MV

Date Initiated: 3/18/21

## 1.0 Cooler Verification

| | | | | | |
|---|---|---|---|---|---|
| 1.1 Were there custody seals on the outside of the cooler? | Yes | (No) | N/A | 1 2 3 4 | |
| 1.2 Were the custody seals intact? | Yes | No | (N/A) | 1 2 3 4 | |
| 1.3 Were the custody seals signed and dated by last custodian? | Yes | No | (N/A) | 1 2 3 4 | |
| 1.4 Were the samples delivered on ice or blue ice? | (Yes) | No | N/A | 1 2 3 4 | |
| 1.5 Were samples received between 0-6 degrees Celsius? | (Yes) | No | N/A | Temperature: 6 | |
| 1.6 Have shipping bills (if any) been attached to the back of this form? | Yes | (N/A) | | | |
| 1.7 How were the samples delivered? | (Client) | Courier | UPS/FedEx | OSE Pickup | Other |

## 2.0 Chain of Custody Verification

| | | | | |
|---|---|---|---|---|
| 2.1 Was a Chain of Custody submitted with the samples? | (Yes) | No | | 1 2 3 4 |
| 2.2 Was the COC legible and written in permanent ink? | (Yes) | No | | 1 2 3 4 |
| 2.3 Have samples been relinquished and accepted by each custodian? | (Yes) | No | | 1 2 3 4 |
| 2.4 Did the sample labels (ID, date, time, preservative) agree with COC? | (Yes) | No | | 1 2 3 4 |
| 2.5 Were all of the samples listed on the COC submitted? | (Yes) | No | | 1 2 3 4 |
| 2.6 Were any of the samples submitted omitted from the COC? | Yes | (No) | | 1 2 3 4 |

## 3.0 Sample Verification

| | | | | | |
|---|---|---|---|---|---|
| 3.1 Were any sample containers broken or compromised? | Yes | (No) | | 1 2 3 4 | |
| 3.2 Were any sample labels missing or illegible? | Yes | (No) | | 1 2 3 4 | |
| 3.3 Have the correct containers been used for each analysis requested? | (Yes) | No | | 1 2 3 4 | |
| 3.4 Have the samples been correctly preserved? | Yes | No | (N/A) | 1 2 3 4 | |
| 3.5 Are volatiles samples free from headspace and bubbles greater than 6mm? | Yes | No | (N/A) | 1 2 3 4 | |
| 3.6 Is there sufficient sample submitted to perform requested analyses? | (Yes) | No | | 1 2 3 4 | |
| 3.7 Have any holding times already expired or will expire in 24 hours? | Yes | (No) | | 1 2 3 4 | |
| 3.8 Was method 5035A used? | (Yes) | No | N/A | 1 2 3 4 | |
| 3.9 If 5035A was used, which sampling option was used (#1, 2, or 3). | # | 1 | N/A | 1 2 3 4 | |

**Explain any discrepancies:**

| |
|---|
| |
| |
| |
| |
| |
| |

1 - Discuss issue in Case Narrative

2 - Process Sample As-is

3 - Client contacted to discuss problem

4 - Sample cannot be analyzed or client does not wish to proceed

# RAW DATA

- Gasoline Range Organics NWTPH-Gx
- Diesel and Heavy Oil Range Organics NWTPH-Dx
- Volatiles EPA 8260D
- PAHs EPA 8270E/SIM

# Gasoline Range Organics
# NWTPH-Gx Data

Quantitation Report (Not Reviewed)

Signal #1 : E:\BTEX\DATA\D210322\0322005.D\FID1A.CH Vial: 5
Signal #2 : E:\BTEX\DATA\D210322\0322005.D\FID2B.CH
Acq On : 22 Mar 2021 16:14 Operator:
Sample : 03-219-01s Inst : Daryl
Misc : Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: events.e IntFile Signal #2: EVENTS2.E

Quant Time: Mar 22 16:41 2021 Quant Results File: 210104B.RES

Quant Method : E:\BTEX\METHODS\210104B.M (Chemstation Integrator)
Title : Fid calibration
Last Update : Mon Mar 15 10:12:08 2021
Response via : Initial Calibration
DataAcq Meth : 210104B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

| | | Compound | R.T. | Response | Conc | Units |
|---|---|---|---|---|---|---|
| | | **System Monitoring Compounds** | | | | |
| 4) | S | FLUOROBENZENE | 6.96 | 1753240 | 30.219 | PPB |
| 5) | S | BROMOFLUOROBENZENE | 12.30 | 1078255 | 33.598 | PPB |
| 12) | S | FLUOROBENZENE #2 | 6.96 | 653766 | 29.156 | PPB |
| 17) | S | BROMOFLUOROBENZENE #2 | 12.30 | 960650 | 32.770 | PPB |
| | | **Target Compounds** | | | | |
| 1) | H | HAWAII GRO C-5-C12 RANGES | 8.55 | 2972866 | 0.042 | PPM |
| 2) | H | Entire GAS Envelope (11-30 | 12.25 | 4003565 | 0.053 | PPM |
| 3) | H | GASOLINE (11-30-20) | 13.55 | 960891 | 0.024 | PPM |
| 7) | H | MINERAL SPIRITS #2 (2-24-2 | 12.28 | 190374 | 0.029 | PPM |
| 8) | H | entire GAS envelope #2 (11 | 12.25 | 347613 | 0.013 | PPM |
| 9) | H | GASOLINE #2 (11-30-20) | 13.55 | 185832 | 0.011 | PPM |
| 10) | | MTBE #2 | 4.69 | 2139 | 0.033 | PPB |
| 11) | | BENZENE #2 | 6.73 | 6876 | 0.151 | PPB |
| 13) | | TOLUENE #2 | 9.10 | 11320 | 0.249 | PPB |
| 14) | | ETHYLBENZENE #2 | 11.07 | 2501 | 0.029 | PPB |
| 15) | | m,p-XYLENE #2 | 11.33 | 5538 | 0.091 | PPB |
| 16) | | o-XYLENE #2 | 11.82 | 3335 | 0.033 | PPB |

(f)=RT Delta > 1/2 Window (m)=manual int

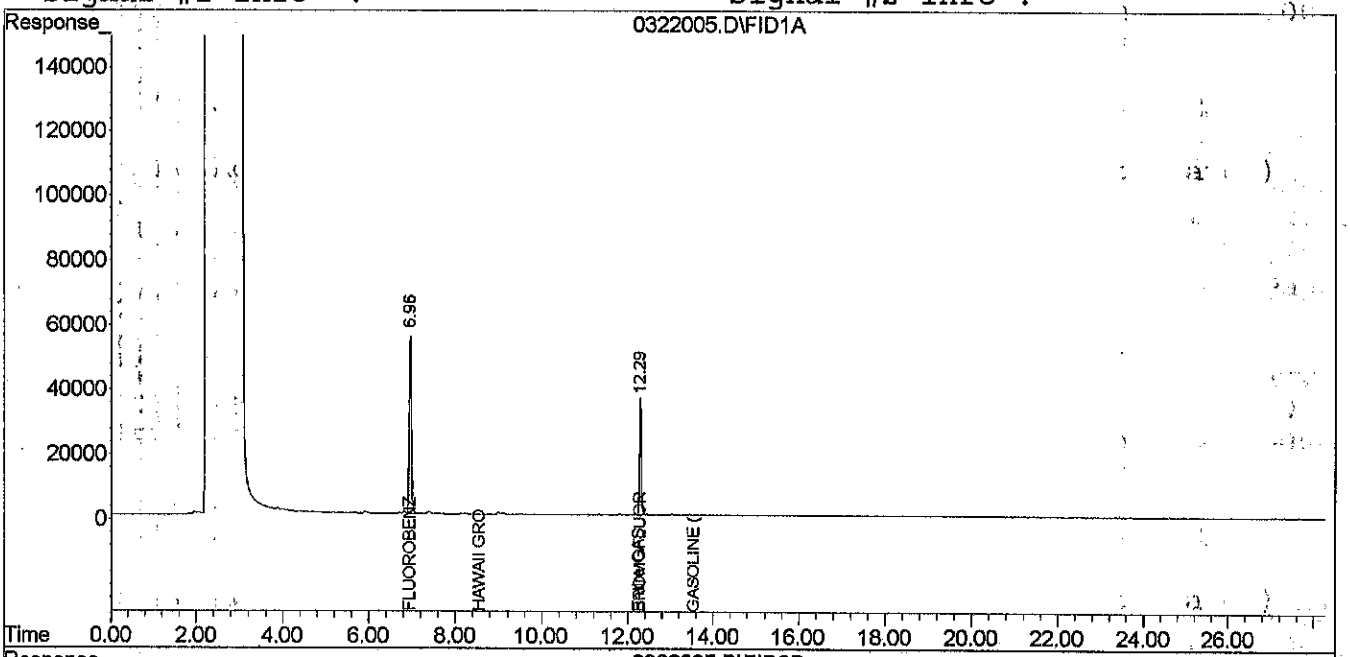
Quantitation Report (Not Reviewed)

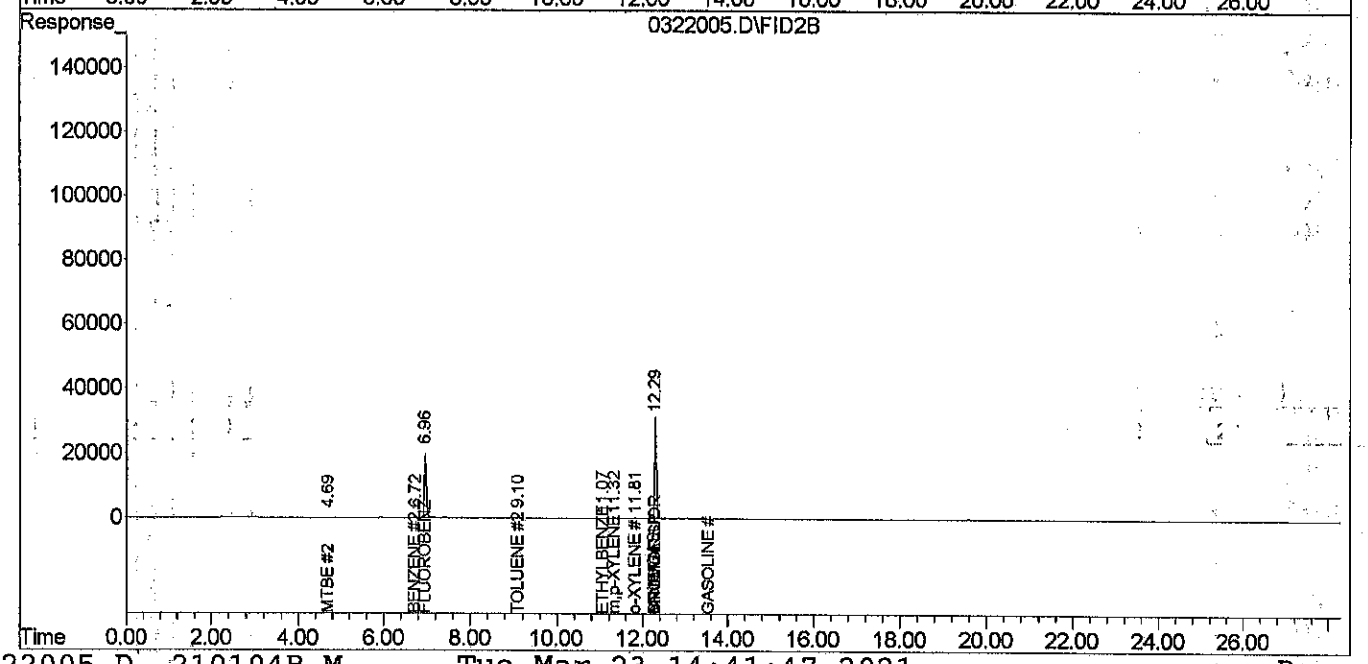
Signal #1 : E:\BTEX\DATA\D210322\0322005.D\FID1A.CH Vial: 5
Signal #2 : E:\BTEX\DATA\D210322\0322005.D\FID2B.CH
Acq On : 22 Mar 2021 16:14 Operator:
Sample : 03-219-01s Inst : Daryl
Misc : Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: events.e IntFile Signal #2: EVENTS2.E

Quant Time: Mar 22 16:41 2021 Quant Results File: 210104B.RES

Quant Method : E:\BTEX\METHODS\210104B.M (Chemstation Integrator)
Title : Fid calibration
Last Update : Mon Mar 15 10:12:08 2021
Response via : Multiple Level Calibration
DataAcq Meth : 210104B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Quantitation Report (Not Reviewed)

Signal #1 : E:\BTEX\DATA\D210322\0322007.D\FID1A.CH Vial: 7
Signal #2 : E:\BTEX\DATA\D210322\0322007.D\FID2B.CH
Acq On : 22 Mar 2021 18:14 Operator:
Sample : 03-219-03s Inst : Daryl
Misc : Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: events.e IntFile Signal #2: EVENTS2.E

Quant Time: Mar 22 18:32 2021 Quant Results File: 210104B.RES

Quant Method : E:\BTEX\METHODS\210104B.M (Chemstation Integrator)
Title : Fid calibration
Last Update : Mon Mar 15 10:12:08 2021
Response via : Initial Calibration
DataAcq Meth : 210104B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

| | | Compound | R.T. | Response | Conc Units |
|---|---|---|---|---|---|
| | | System Monitoring Compounds | | | |
| 4) | S | FLUOROBENZENE | 6.96 | 1673834 | 28.851 PPB |
| 5) | S | BROMOFLUOROBENZENE | 12.30 | 985718 | 30.710 PPB |
| 12) | S | FLUOROBENZENE #2 | 6.96 | 634533 | 28.294 PPB |
| 17) | S | BROMOFLUOROBENZENE #2 | 12.30 | 890841 | 30.389 PPB |
| | | Target Compounds | | | |
| 1) | H | HAWAII GRO C-5-C12 RANGES | 8.55 | 2562505 | 0.034 PPM |
| 2) | H | Entire GAS Envelope (11-30 | 12.25 | 3512067 | 0.045 PPM |
| 3) | H | GASOLINE (11-30-20) | 13.55 | 672340 | 0.013 PPM |
| 7) | H | MINERAL SPIRITS #2 (2-24-2 | 12.28 | 163246 | 0.027 PPM |
| 8) | H | entire GAS envelope #2 (11 | 12.25 | 326081 | 0.012 PPM |
| 9) | H | GASOLINE #2 (11-30-20) | 13.55 | 151912 | 0.008 PPM |
| 10) | | MTBE #2 | 4.69 | 1934 | 0.021 PPB |
| 11) | | BENZENE #2 | 6.73 | 2547 | 0.024 PPB |
| 13) | | TOLUENE #2 | 9.11 | 4995 | 0.044 PPB |
| 14) | | ETHYLBENZENE #2 | 11.09 | 1773 | 0.002 PPB |
| 15) | | m,p-XYLENE #2 | 11.34 | 3543 | 0.029 PPB |
| 16) | | o-XYLENE #2 | 11.82 | 2385 | N.D. PPB |

(f)=RT Delta > 1/2 Window (m)=manual int

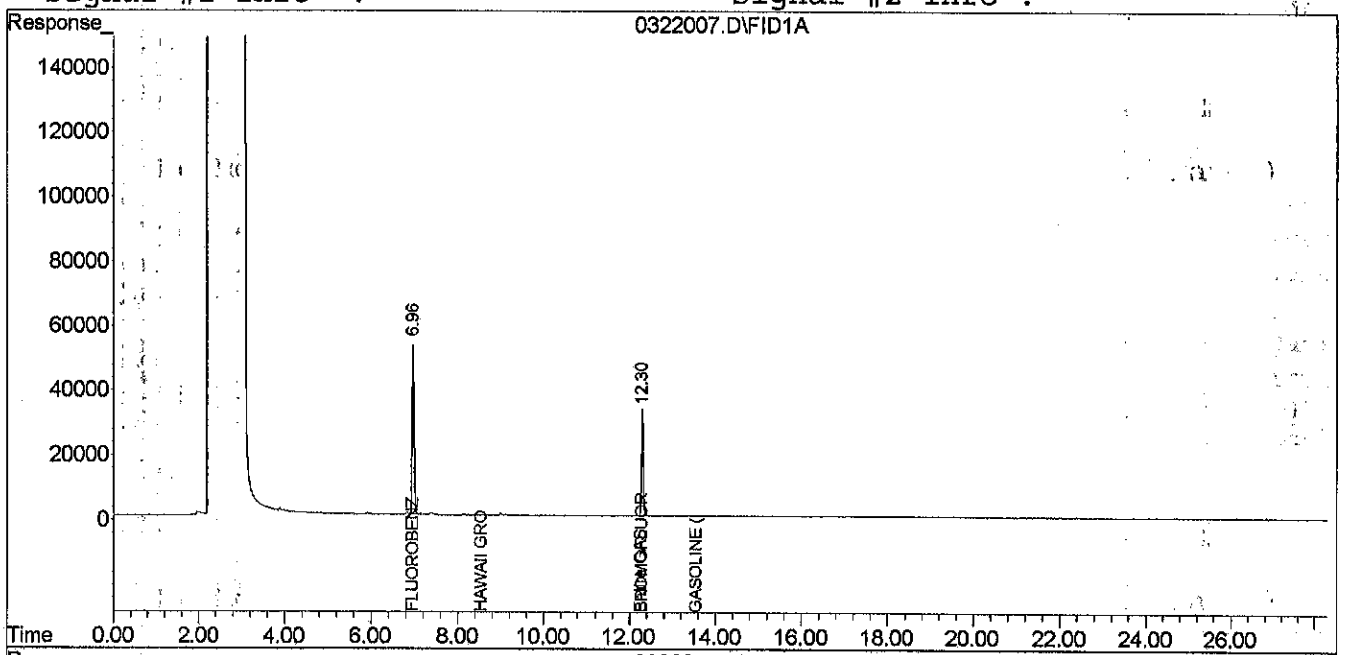
Quantitation Report (Not Reviewed)

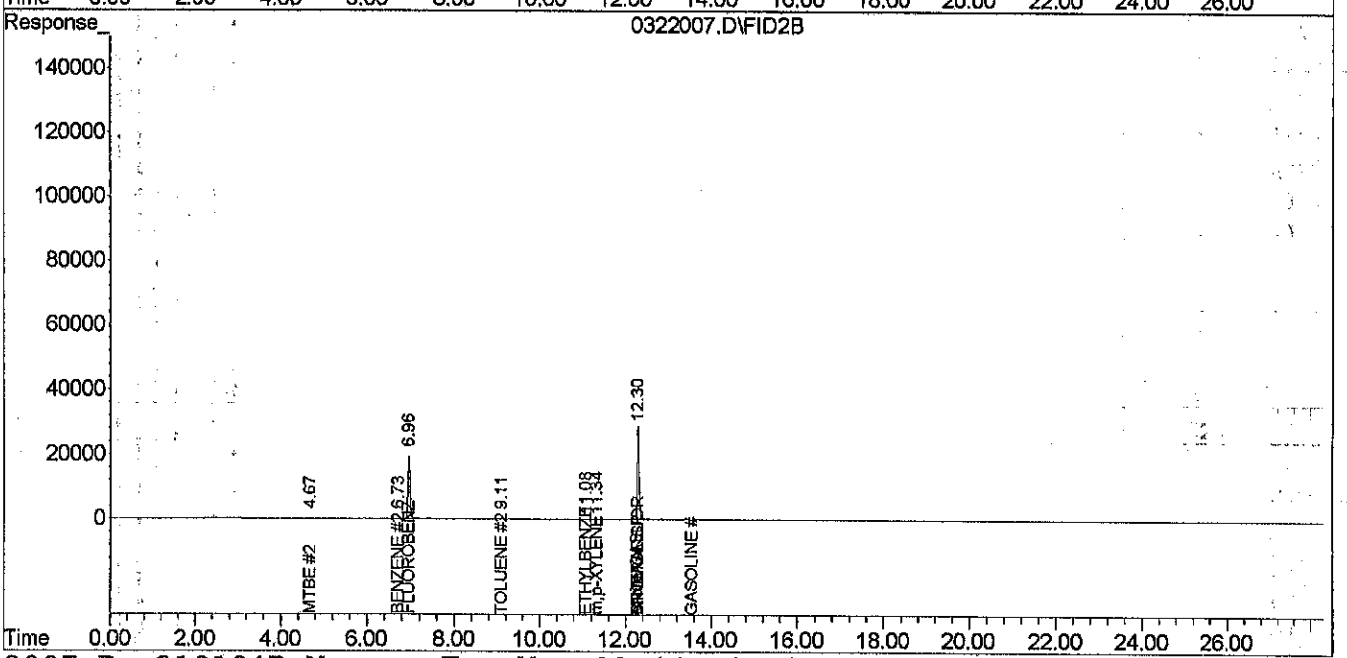
Signal #1 : E:\BTEX\DATA\D210322\0322007.D\FID1A.CH Vial: 7
Signal #2 : E:\BTEX\DATA\D210322\0322007.D\FID2B.CH
Acq On : 22 Mar 2021 18:14 Operator:
Sample : 03-219-03s Inst : Daryl
Misc : Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: events.e IntFile Signal #2: EVENTS2.E

Quant Time: Mar 22 18:32 2021 Quant Results File: 210104B.RES

Quant Method : E:\BTEX\METHODS\210104B.M (Chemstation Integrator)
Title : Fid calibration
Last Update : Mon Mar 15 10:12:08 2021
Response via : Multiple Level Calibration
DataAcq Meth : 210104B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Quantitation Report (Not Reviewed)

Signal #1 : E:\BTEX\DATA\D210322\0322008.D\FID1A.CH Vial: 8
Signal #2 : E:\BTEX\DATA\D210322\0322008.D\FID2B.CH
Acq On : 22 Mar 2021 18:45 Operator:
Sample : 03-219-04s Inst : Daryl
Misc : Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: events.e IntFile Signal #2: EVENTS2.E

Quant Time: Mar 22 19:06 2021 Quant Results File: 210104B.RES

Quant Method : E:\BTEX\METHODS\210104B.M (Chemstation Integrator)
Title : Fid calibration
Last Update : Mon Mar 15 10:12:08 2021
Response via : Initial Calibration
DataAcq Meth : 210104B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

| | | Compound | R.T. | Response | Conc | Units |
|---|---|---|---|---|---|---|
| | | System Monitoring Compounds | | | | |
| 4) | S | FLUOROBENZENE | 6.95 | 1691484 | 29.155 | PPB |
| 5) | S | BROMOFLUOROBENZENE | 12.29 | 1030215 | 32.099 | PPB |
| 12) | S | FLUOROBENZENE #2 | 6.95 | 635677 | 28.345 | PPB |
| 17) | S | BROMOFLUOROBENZENE #2 | 12.29 | 921379 | 31.431 | PPB |
| | | Target Compounds | | | | |
| 1) | H | HAWAII GRO C-5-C12 RANGES | 8.55 | 2222100 | 0.028 | PPM |
| 2) | H | Entire GAS Envelope (11-30 | 12.25 | 3012105 | 0.035 | PPM |
| 3) | H | GASOLINE (11-30-20) | 13.55 | 638837 | 0.012 | PPM |
| 7) | H | MINERAL SPIRITS #2 (2-24-2 | 12.28 | 104232 | 0.022 | PPM |
| 8) | H | entire GAS envelope #2 (11 | 12.25 | 217876 | 0.004 | PPM |
| 9) | H | GASOLINE #2 (11-30-20) | 13.55 | 98740 | 0.003 | PPM |
| 10) | | MTBE #2 | 4.66 | 265 | N.D. | PPB |
| 11) | | BENZENE #2 | 6.72 | 2721 | 0.029 | PPB |
| 13) | | TOLUENE #2 | 9.10 | 7547 | 0.127 | PPB |
| 14) | | ETHYLBENZENE #2 | 11.08 | 1691 | N.D. | PPB |
| 15) | | m,p-XYLENE #2 | 11.32 | 3809 | 0.037 | PPB |
| 16) | | o-XYLENE #2 | 11.83 | 1306 | N.D. | PPB |

(f)=RT Delta > 1/2 Window (m)=manual int.

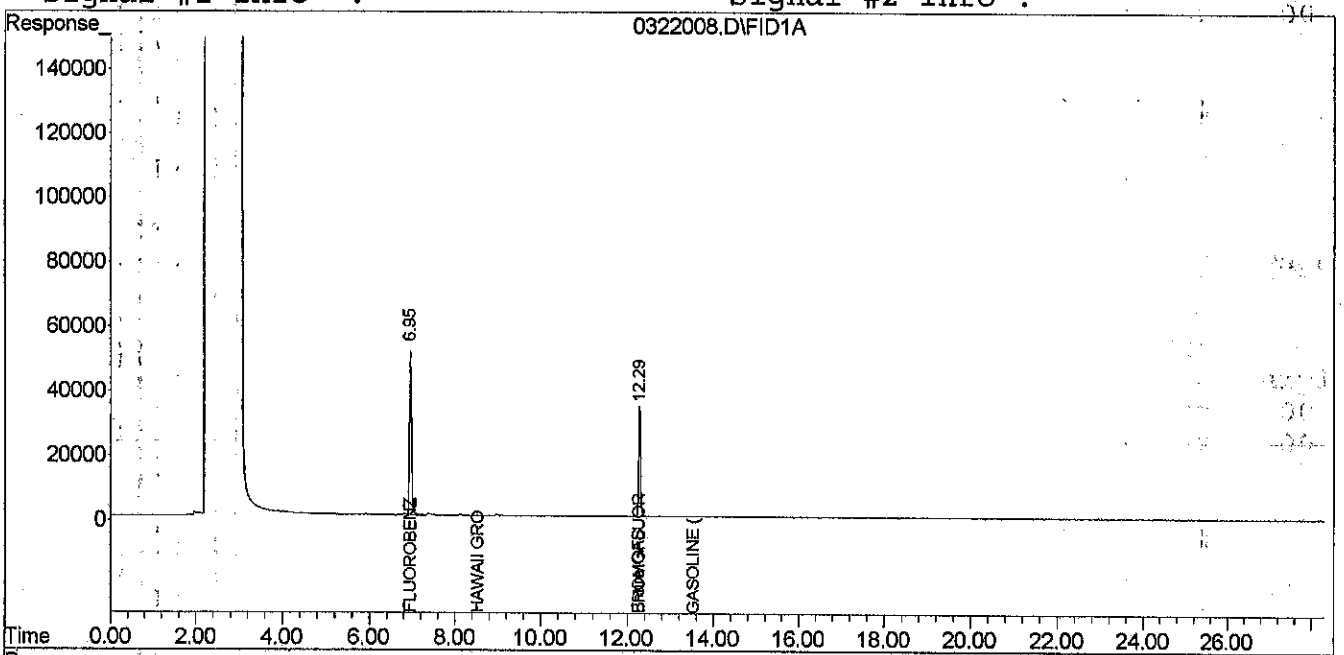
Quantitation Report (Not Reviewed)

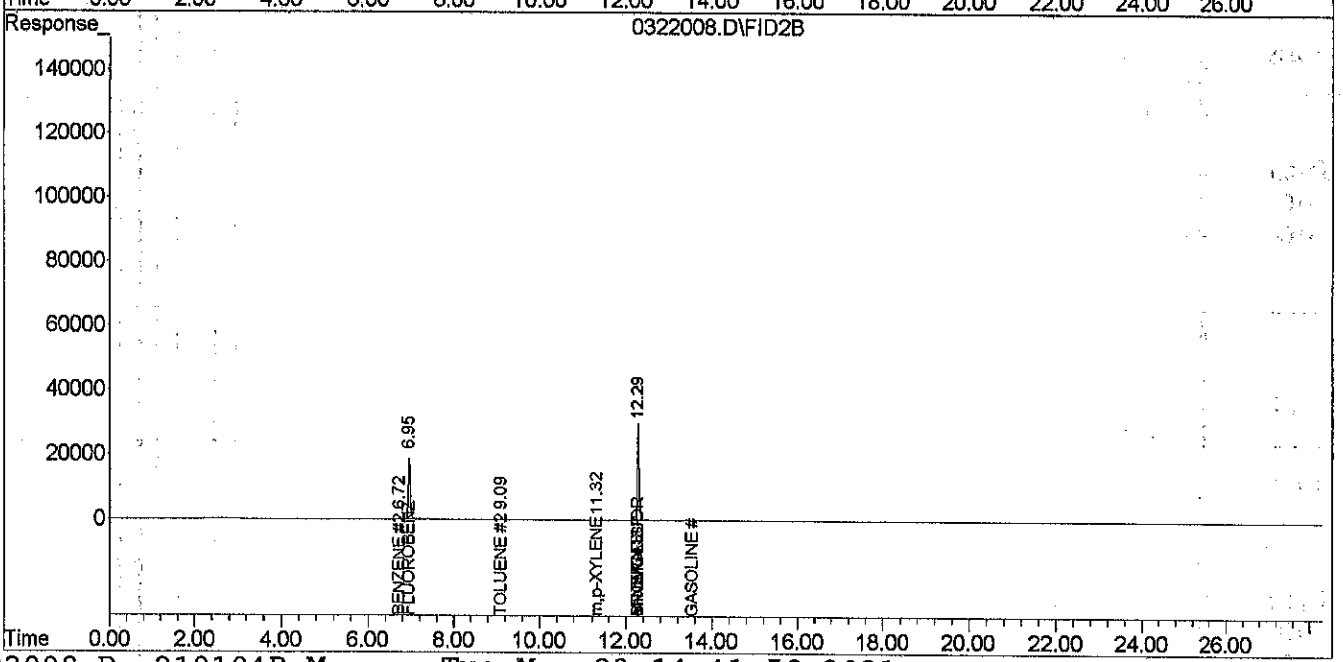
Signal #1 : E:\BTEX\DATA\D210322\0322008.D\FID1A.CH Vial: 8
Signal #2 : E:\BTEX\DATA\D210322\0322008.D\FID2B.CH
Acq On : 22 Mar 2021 18:45 Operator:
Sample : 03-219-04s Inst : Daryl
Misc : Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: events.e IntFile Signal #2: EVENTS2.E

Quant Time: Mar 22 19:06 2021 Quant Results File: 210104B.RES

Quant Method : E:\BTEX\METHODS\210104B.M (Chemstation Integrator)
Title : Fid calibration
Last Update : Mon Mar 15 10:12:08 2021
Response via : Multiple Level Calibration
DataAcq Meth : 210104B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Quantitation Report (Not Reviewed)

Signal #1 : E:\BTEX\DATA\D210322\0322009.D\FID1A.CH Vial: 9
Signal #2 : E:\BTEX\DATA\D210322\0322009.D\FID2B.CH
Acq On : 22 Mar 2021 19:15 Operator:
Sample : 03-219-05s Inst : Daryl
Misc : Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: events.e IntFile Signal #2: EVENTS2.E

Quant Time: Mar 22 19:40 2021 Quant Results File: 210104B.RES

Quant Method : E:\BTEX\METHODS\210104B.M (Chemstation Integrator)
Title : Fid calibration
Last Update : Mon Mar 15 10:12:08 2021
Response via : Initial Calibration
DataAcq Meth : 210104B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

| | | Compound | R.T. | Response | Conc | Units |
|---|---|---|---|---|---|---|
| | | System Monitoring Compounds | | | | |
| 4) | S | FLUOROBENZENE | 6.95 | 1734748 | 29.900 | PPB |
| 5) | S | BROMOFLUOROBENZENE | 12.29 | 1058238 | 32.973 | PPB |
| 12) | S | FLUOROBENZENE #2 | 6.95 | 647726 | 28.886 | PPB |
| 17) | S | BROMOFLUOROBENZENE #2 | 12.29 | 943326 | 32.179 | PPB |
| | | Target Compounds | | | | |
| 1) | H | HAWAII GRO C-5-C12 RANGES | 8.55 | 2216438 | 0.028 | PPM |
| 2) | H | Entire GAS Envelope (11-30 | 12.25 | 2994079 | 0.035 | PPM |
| 3) | H | GASOLINE (11-30-20) | 13.55 | 669729 | 0.013 | PPM |
| 7) | H | MINERAL SPIRITS #2 (2-24-2 | 12.28 | 135273 | 0.024 | PPM |
| 8) | H | entire GAS envelope #2 (11 | 12.25 | 267947 | 0.008 | PPM |
| 9) | H | GASOLINE #2 (11-30-20) | 13.55 | 127600 | 0.006 | PPM |
| 10) | | MTBE #2 | 4.67 | 179 | N.D. | PPB |
| 11) | | BENZENE #2 | 6.72 | 1334 | N.D. | PPB |
| 13) | | TOLUENE #2 | 9.09 | 3614 | N.D. | PPB |
| 14) | | ETHYLBENZENE #2 | 11.08 | 1842 | 0.005 | PPB |
| 15) | | m,p-XYLENE #2 | 11.32 | 2960 | 0.011 | PPB |
| 16) | | o-XYLENE #2 | 11.80 | 2120 | N.D. | PPB |

(f)=RT Delta > 1/2 Window (m)=manual int

Quantitation Report (Not Reviewed)

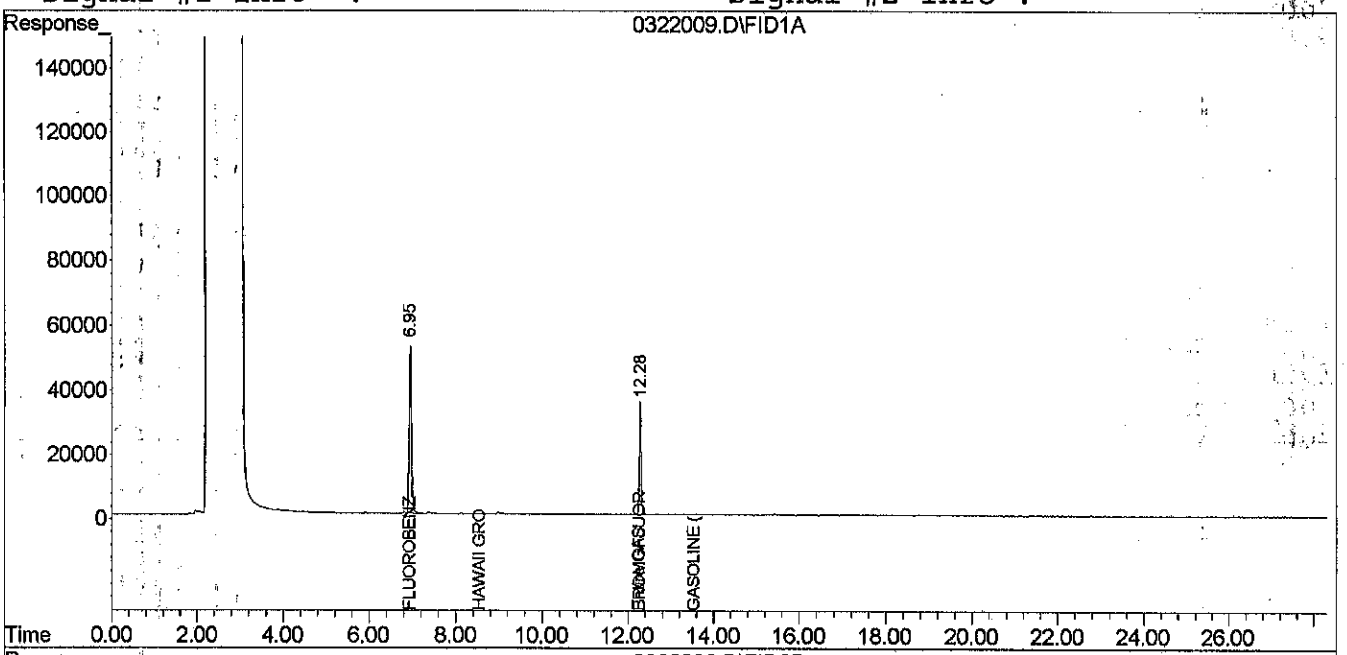
Signal #1 : E:\BTEX\DATA\D210322\0322009.D\FID1A.CH Vial: 9
Signal #2 : E:\BTEX\DATA\D210322\0322009.D\FID2B.CH
Acq On : 22 Mar 2021 19:15 Operator:
Sample : 03-219-05s Inst : Daryl
Misc : Multiplr: 1.00
Sample Amount: 0.00

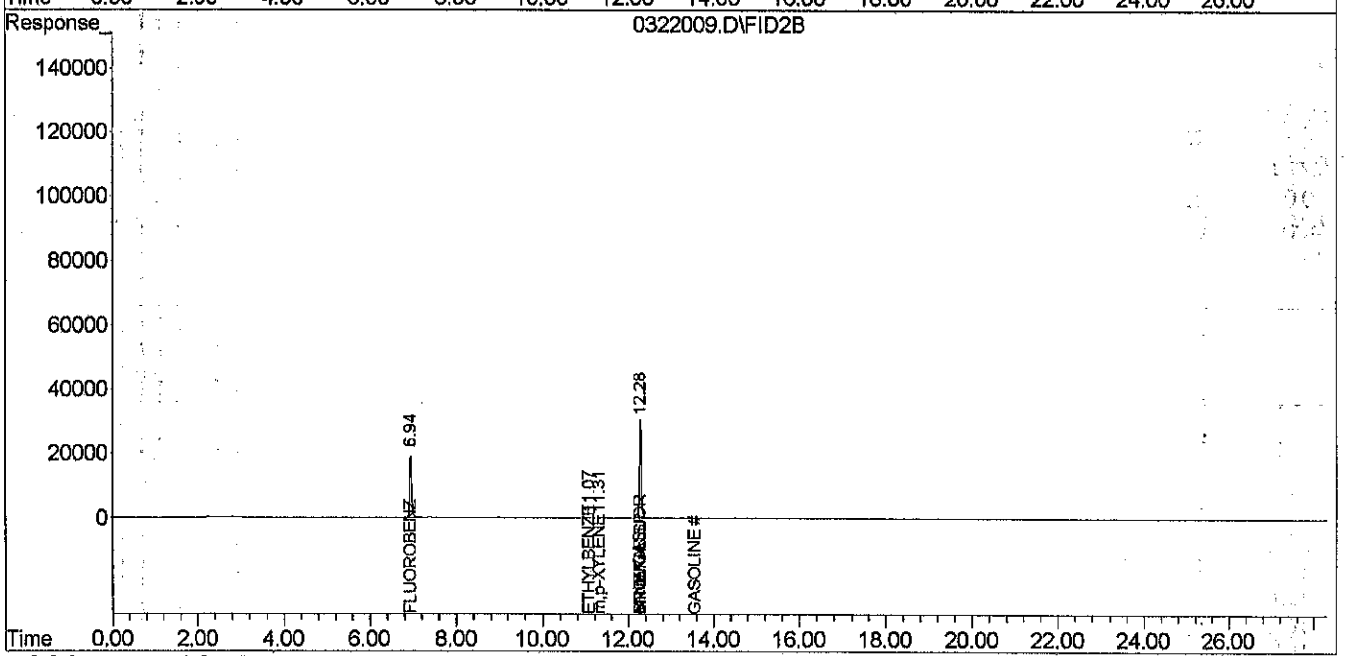
IntFile Signal #1: events.e IntFile Signal #2: EVENTS2.E

Quant Time: Mar 22 19:40 2021 Quant Results File: 210104B.RES

Quant Method : E:\BTEX\METHODS\210104B.M (Chemstation Integrator)
Title : Fid calibration
Last Update : Mon Mar 15 10:12:08 2021
Response via : Multiple Level Calibration
DataAcq Meth : 210104B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Quantitation Report (Not Reviewed)

Signal #1 : E:\BTEX\DATA\D210322\0322010.D\FID1A.CH Vial: 10
Signal #2 : E:\BTEX\DATA\D210322\0322010.D\FID2B.CH
Acq On : 22 Mar 2021 20:00 Operator:
Sample : 03-219-06s Inst : Daryl
Misc : Multiplr: 1.00
Sample Amount: 0.00

IntFile Signal #1: events.e IntFile Signal #2: EVENTS2.E

Quant Time: Mar 22 20:14 2021 Quant Results File: 210104B.RES

Quant Method : E:\BTEX\METHODS\210104B.M (Chemstation Integrator)
Title : Fid calibration
Last Update : Mon Mar 15 10:12:08 2021
Response via : Initial Calibration
DataAcq Meth : 210104B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

| | | Compound | R.T. | Response | Conc | Units |
|---|---|---|---|---|---|---|
| | | System Monitoring Compounds | | | | |
| 4) | S | FLUOROBENZENE | 6.94 | 1788561 | 30.827 | PPB |
| 5) | S | BROMOFLUOROBENZENE | 12.28 | 1078774 | 33.614 | PPB |
| 12) | S | FLUOROBENZENE #2 | 6.94 | 671272 | 29.941 | PPB |
| 17) | S | BROMOFLUOROBENZENE #2 | 12.28 | 965911 | 32.950 | PPB |
| | | Target Compounds | | | | |
| 1) | H | HAWAII GRO C-5-C12 RANGES | 8.55 | 2065020 | 0.025 | PPM |
| 2) | H | Entire GAS Envelope (11-30 | 12.25 | 2783699 | 0.031 | PPM |
| 3) | H | GASOLINE (11-30-20) | 13.55 | 578990 | 0.010 | PPM |
| 7) | H | MINERAL SPIRITS #2 (2-24-2 | 12.28 | 106587 | 0.022 | PPM |
| 8) | H | entire GAS envelope #2 (11 | 12.25 | 229075 | 0.005 | PPM |
| 9) | H | GASOLINE #2 (11-30-20) | 13.55 | 102321 | 0.003 | PPM |
| 10) | | MTBE #2 | 4.72 | 509 | N.D. | PPB |
| 11) | | BENZENE #2 | 6.72 | 1584 | N.D. | PPB |
| 13) | | TOLUENE #2 | 9.09 | 5438 | 0.058 | PPB |
| 14) | | ETHYLBENZENE #2 | 11.02 | 332 | N.D. | PPB |
| 15) | | m,p-XYLENE #2 | 11.32 | 2270 | N.D. | PPB |
| 16) | | o-XYLENE #2 | 11.80 | 745 | N.D. | PPB |

(f)=RT Delta > 1/2 Window (m)=manual int

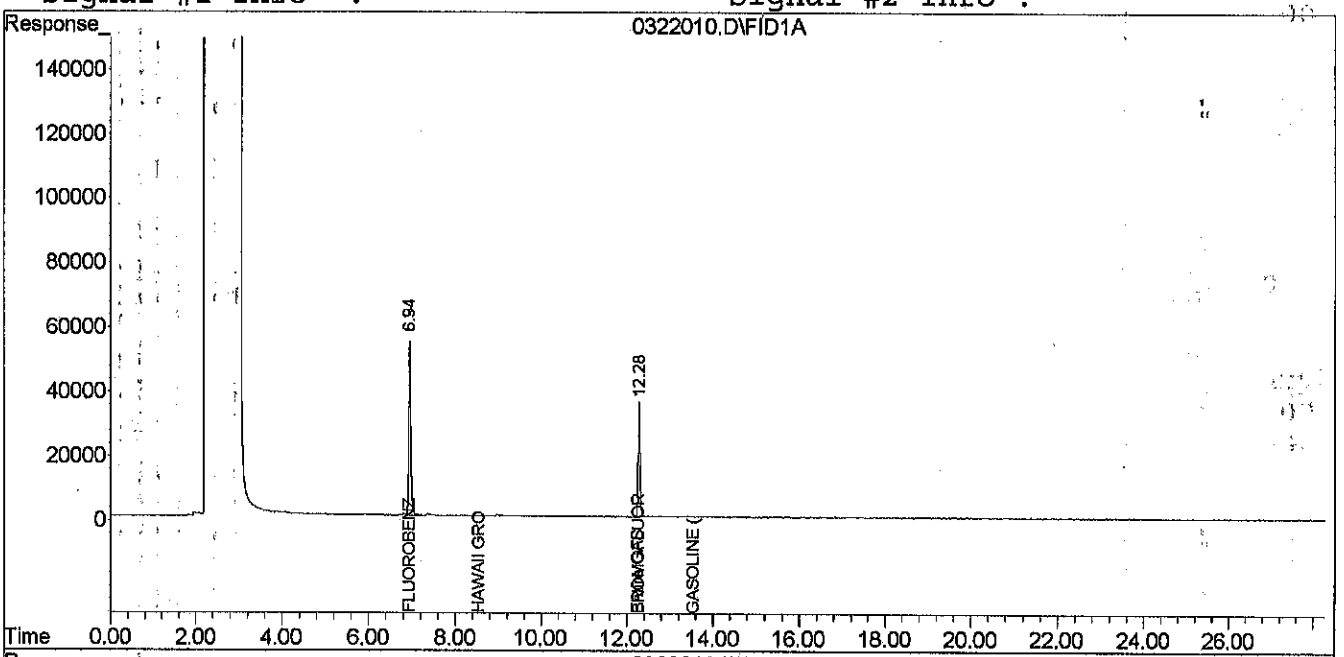
Quantitation Report (Not Reviewed)

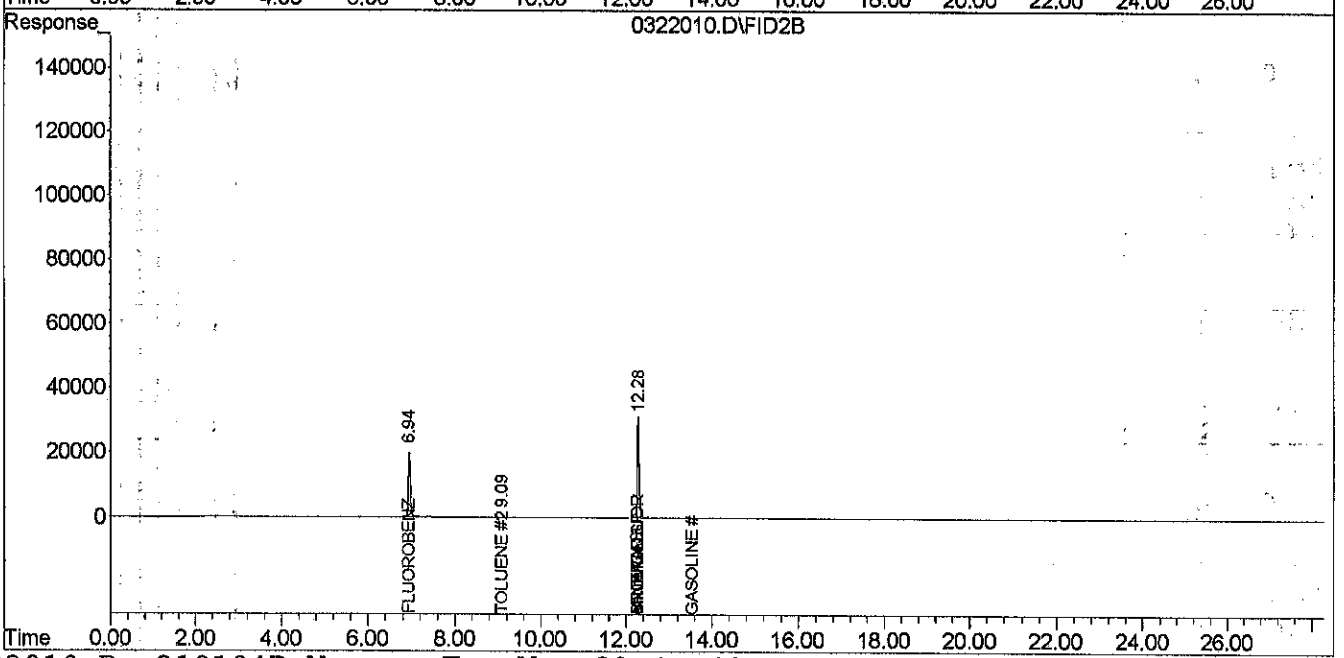
Signal #1 : E:\BTEX\DATA\D210322\0322010.D\FID1A.CH Vial: 10
Signal #2 : E:\BTEX\DATA\D210322\0322010.D\FID2B.CH
Acq On : 22 Mar 2021 20:00 Operator:
Sample : 03-219-06s Inst : Daryl
Misc : Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: events.e IntFile Signal #2: EVENTS2.E

Quant Time: Mar 22 20:14 2021 Quant Results File: 210104B.RES

Quant Method : E:\BTEX\METHODS\210104B.M (Chemstation Integrator)
Title : Fid calibration
Last Update : Mon Mar 15 10:12:08 2021
Response via : Multiple Level Calibration
DataAcq Meth : 210104B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Quantitation Report (QT Reviewed)

Signal #1 : E:\BTEX\DATA\D210322\0322003.D\FID1A.CH Vial: 3
Signal #2 : E:\BTEX\DATA\D210322\0322003.D\FID2B.CH
Acq On : 22 Mar 2021 10:56 Operator:
Sample : MB0322S1 Inst : Daryl
Misc : Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: events.e IntFile Signal #2: EVENTS2.E

Quant Time: Mar 22 11:14 2021 Quant Results File: 210104B.RES

Quant Method : E:\BTEX\METHODS\210104B.M (Chemstation Integrator)
Title : Fid calibration
Last Update : Mon Mar 15 10:12:08 2021
Response via : Initial Calibration
DataAcq Meth : 210104B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

| | | Compound | R.T. | Response | Conc | Units |
|---|---|---|---|---|---|---|
| | | System Monitoring Compounds | | | | |
| 4) | S | FLUOROBENZENE | 6.95 | 2059248 | 35.488 | PPB |
| 5) | S | BROMOFLUOROBENZENE | 12.29 | 1221963 | 38.083 | PPB |
| 12) | S | FLUOROBENZENE #2 | 6.95 | 783262 | 34.960 | PPB |
| 17) | S | BROMOFLUOROBENZENE #2 | 12.29 | 1107073 | 37.765 | PPB |
| | | Target Compounds | | | | |
| 1) | H | HAWAII GRO C-5-C12 RANGES | 8.55 | 2384337 | 0.031 | PPM |
| 2) | H | Entire GAS Envelope (11-30 | 12.25 | 3798006 | 0.050 | PPM |
| 3) | H | GASOLINE (11-30-20) | 13.55 | 851261 | 0.020 | PPM |
| 7) | H | MINERAL SPIRITS #2 (2-24-2 | 12.28 | 170263 | 0.027 | PPM |
| 8) | H | entire GAS envelope #2 (11 | 12.25 | 768918 | 0.042 | PPM |
| 9) | H | GASOLINE #2 (11-30-20) | 13.55 | 195848 | 0.012 | PPM |
| 10) | | MTBE #2 | 4.77 | 354 | N.D. | PPB |
| 11) | | BENZENE #2 | 6.72 | 1614 | N.D. | PPB |
| 13) | | TOLUENE #2 | 9.13 | 29736 | 0.848 | PPB m |
| 14) | | ETHYLBENZENE #2 | 11.07 | 3910 | 0.081 | PPB |
| 15) | | m,p-XYLENE #2 | 11.31 | 7478 | 0.151 | PPB |
| 16) | | o-XYLENE #2 | 11.80 | 4472 | 0.075 | PPB |

(f)=RT Delta > 1/2 Window (m)=manual int

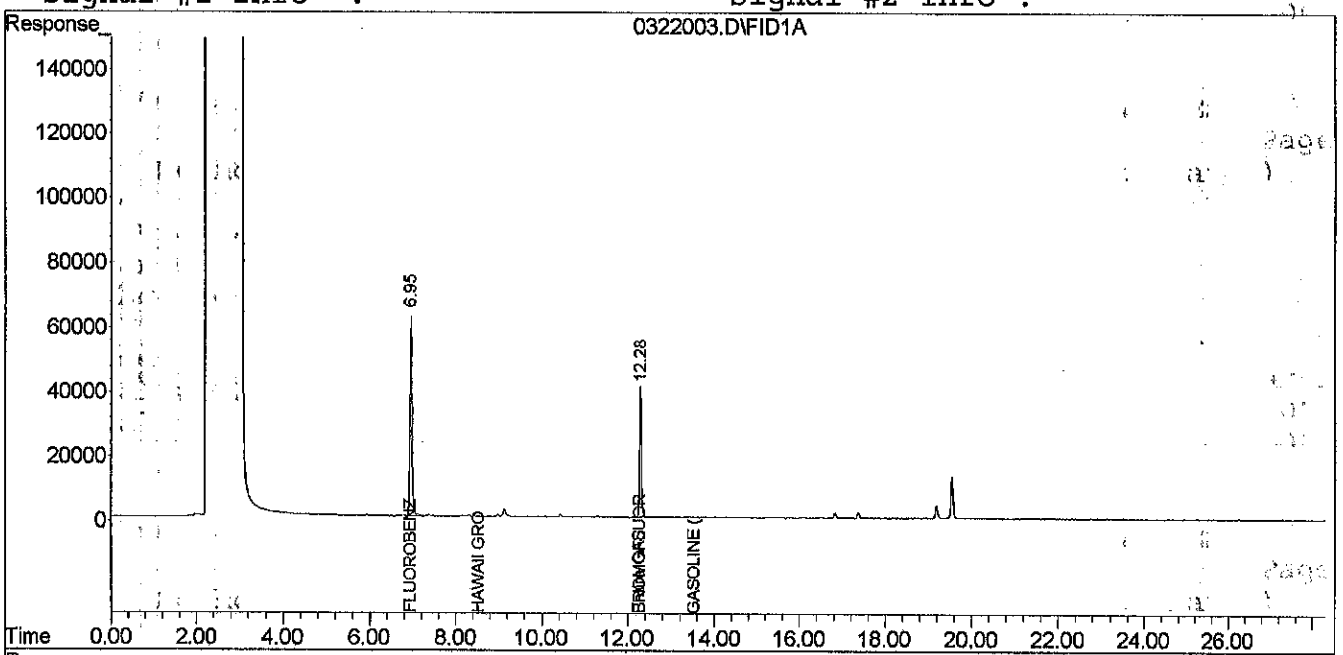
Quantitation Report (QT Reviewed)

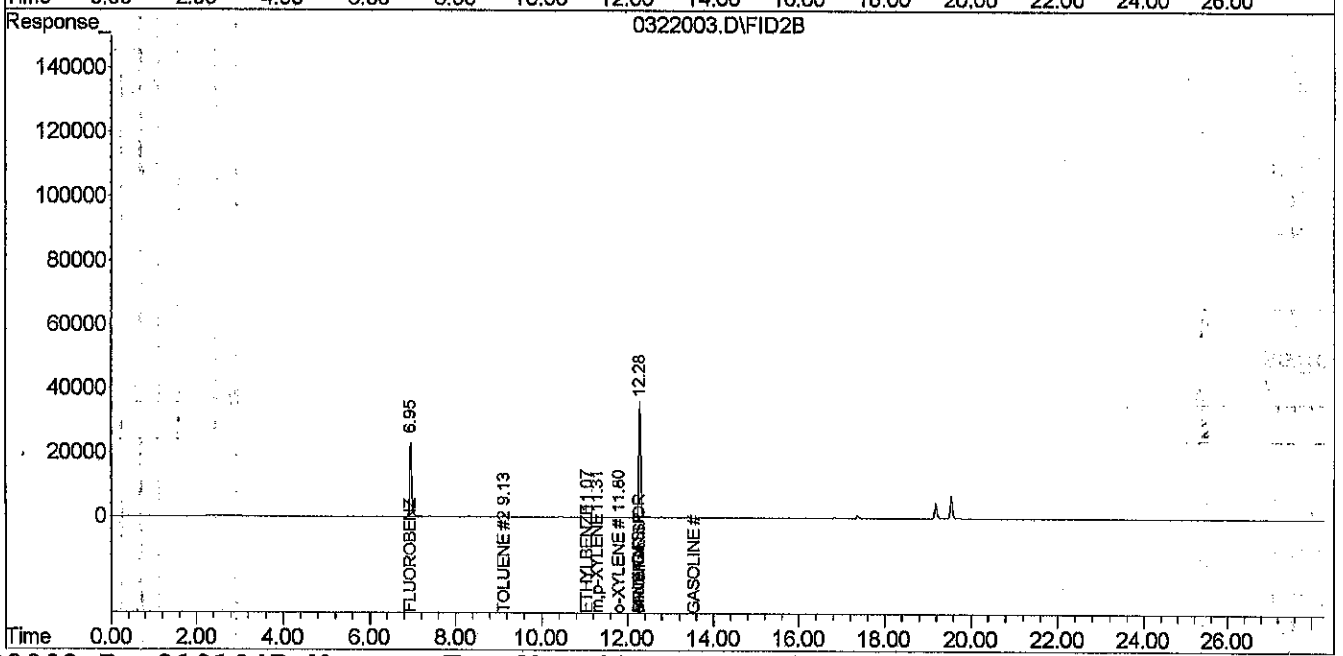
Signal #1 : E:\BTEX\DATA\D210322\0322003.D\FID1A.CH Vial: 3
Signal #2 : E:\BTEX\DATA\D210322\0322003.D\FID2B.CH
Acq On : 22 Mar 2021 10:56 Operator:
Sample : MB0322S1 Inst : Daryl
Misc : Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: events.e IntFile Signal #2: EVENTS2.E

Quant Time: Mar 22 11:14 2021 Quant Results File: 210104B.RES

Quant Method : E:\BTEX\METHODS\210104B.M (Chemstation Integrator)
Title : Fid calibration
Last Update : Mon Mar 15 10:12:08 2021
Response via : Multiple Level Calibration
DataAcq Meth : 210104B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Quantitation Report (Not Reviewed)

Signal #1 : E:\BTEX\DATA\D210322\0322005.D\FID1A.CH Vial: 5
Signal #2 : E:\BTEX\DATA\D210322\0322005.D\FID2B.CH
Acq On : 22 Mar 2021 16:14 Operator:
Sample : 03-219-01s Inst : Daryl
Misc : Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: events.e IntFile Signal #2: EVENTS2.E

Quant Time: Mar 22 16:41 2021 Quant Results File: 210104B.RES

Quant Method : E:\BTEX\METHODS\210104B.M (Chemstation Integrator)
Title : Fid calibration
Last Update : Mon Mar 15 10:12:08 2021
Response via : Initial Calibration
DataAcq Meth : 210104B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

| | | Compound | R.T. | Response | Conc | Units |
|---|---|---|---|---|---|---|
| | | System Monitoring Compounds | | | | |
| 4) | S | FLUOROBENZENE | 6.96 | 1753240 | 30.219 | PPB |
| 5) | S | BROMOFLUOROBENZENE | 12.30 | 1078255 | 33.598 | PPB |
| 12) | S | FLUOROBENZENE #2 | 6.96 | 653766 | 29.156 | PPB |
| 17) | S | BROMOFLUOROBENZENE #2 | 12.30 | 960650 | 32.770 | PPB |
| | | Target Compounds | | | | |
| 1) | H | HAWAII GRO C-5-C12 RANGES | 8.55 | 2972866 | 0.042 | PPM |
| 2) | H | Entire GAS Envelope (11-30 | 12.25 | 4003565 | 0.053 | PPM |
| 3) | H | GASOLINE (11-30-20) | 13.55 | 960891 | 0.024 | PPM |
| 7) | H | MINERAL SPIRITS #2 (2-24-2 | 12.28 | 190374 | 0.029 | PPM |
| 8) | H | entire GAS envelope #2 (11 | 12.25 | 347613 | 0.013 | PPM |
| 9) | H | GASOLINE #2 (11-30-20) | 13.55 | 185832 | 0.011 | PPM |
| 10) | | MTBE #2 | 4.69 | 2139 | 0.033 | PPB |
| 11) | | BENZENE #2 | 6.73 | 6876 | 0.151 | PPB |
| 13) | | TOLUENE #2 | 9.10 | 11320 | 0.249 | PPB |
| 14) | | ETHYLBENZENE #2 | 11.07 | 2501 | 0.029 | PPB |
| 15) | | m,p-XYLENE #2 | 11.33 | 5538 | 0.091 | PPB |
| 16) | | o-XYLENE #2 | 11.82 | 3335 | 0.033 | PPB |

(f)=RT Delta > 1/2 Window (m)=manual int

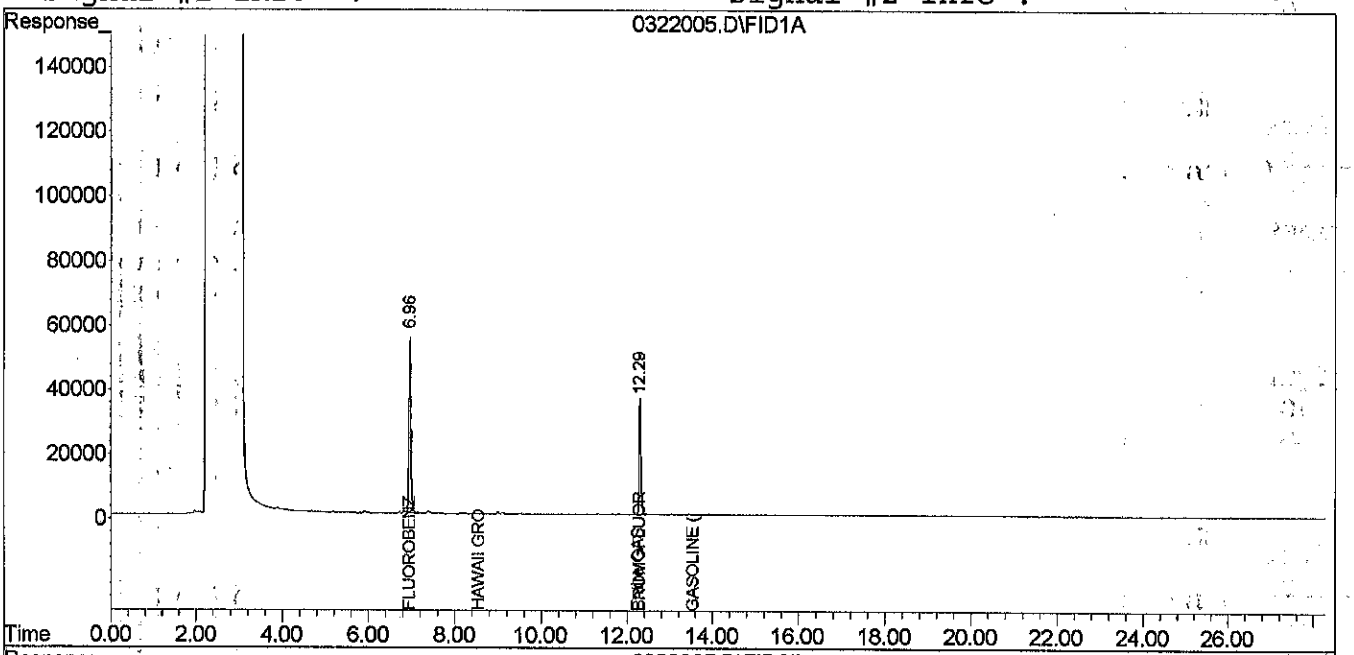
Quantitation Report (Not Reviewed)

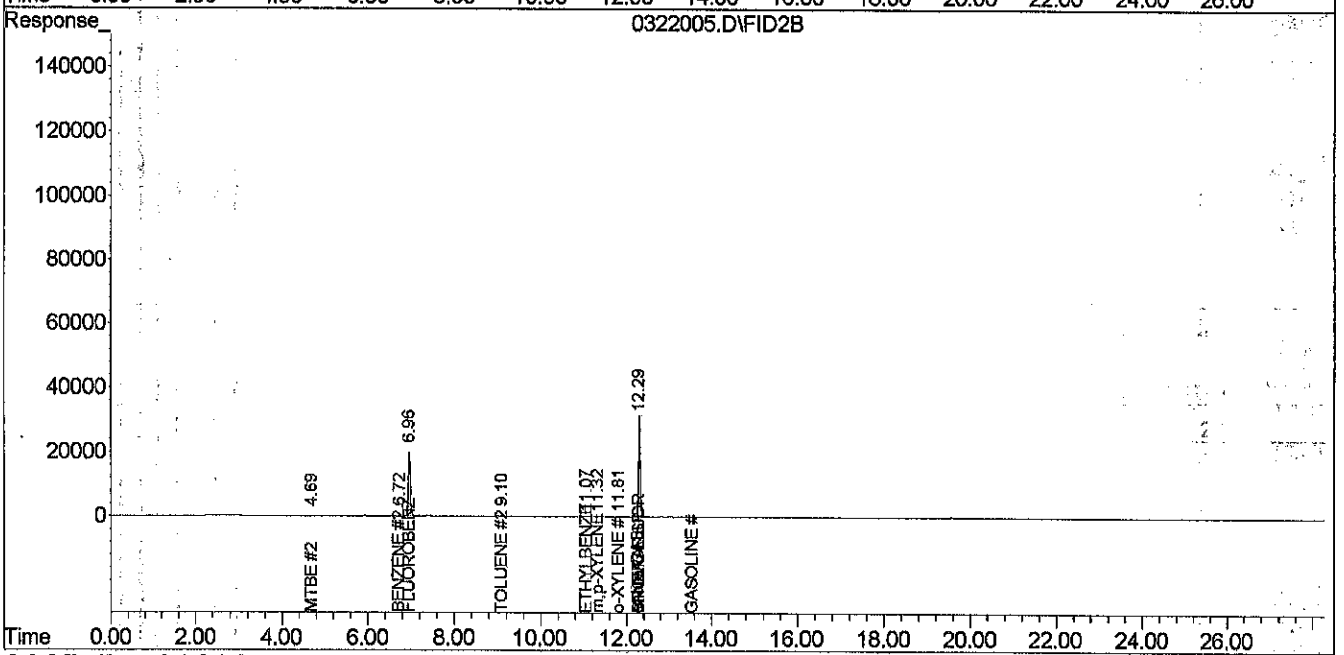
Signal #1 : E:\BTEX\DATA\D210322\0322005.D\FID1A.CH Vial: 5
Signal #2 : E:\BTEX\DATA\D210322\0322005.D\FID2B.CH
Acq On : 22 Mar 2021 16:14 Operator:
Sample : 03-219-01s Inst : Daryl
Misc : Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: events.e IntFile Signal #2: EVENTS2.E

Quant Time: Mar 22 16:41 2021 Quant Results File: 210104B.RES

Quant Method : E:\BTEX\METHODS\210104B.M (Chemstation Integrator)
Title : Fid calibration
Last Update : Mon Mar 15 10:12:08 2021
Response via : Multiple Level Calibration
DataAcq Meth : 210104B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Quantitation Report (Not Reviewed)

Signal #1 : E:\BTEX\DATA\D210322\0322006.D\FID1A.CH Vial: 6
Signal #2 : E:\BTEX\DATA\D210322\0322006.D\FID2B.CH
Acq On : 22 Mar 2021 16:59 Operator:
Sample : 03-219-01s DUP Inst : Daryl
Misc : Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: events.e IntFile Signal #2: EVENTS2.E

Quant Time: Mar 22 17:15 2021 Quant Results File: 210104B.RES

Quant Method : E:\BTEX\METHODS\210104B.M (Chemstation Integrator)
Title : Fid calibration
Last Update : Mon Mar 15 10:12:08 2021
Response via : Initial Calibration
DataAcq Meth : 210104B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

| | | Compound | R.T. | Response | Conc | Units |
|---|---|---|---|---|---|---|
| | | System Monitoring Compounds | | | | |
| 4) | S | FLUOROBENZENE | 6.94 | 1727940 | 29.783 | PPB |
| 5) | S | BROMOFLUOROBENZENE | 12.29 | 1045202 | 32.566 | PPB |
| 12) | S | FLUOROBENZENE #2 | 6.94 | 644551 | 28.743 | PPB |
| 17) | S | BROMOFLUOROBENZENE #2 | 12.29 | 935650 | 31.917 | PPB |
| | | Target Compounds | | | | |
| 1) | H | HAWAII GRO C-5-C12 RANGES | 8.55 | 2169123 | 0.027 | PPM |
| 2) | H | Entire GAS Envelope (11-30 | 12.25 | 2990365 | 0.035 | PPM |
| 3) | H | GASOLINE (11-30-20) | 13.55 | 611100 | 0.011 | PPM |
| 7) | H | MINERAL SPIRITS #2 (2-24-2 | 12.28 | 133000 | 0.024 | PPM |
| 8) | H | entire GAS envelope #2 (11 | 12.25 | 268567 | 0.008 | PPM |
| 9) | H | GASOLINE #2 (11-30-20) | 13.55 | 122726 | 0.005 | PPM |
| 10) | | MTBE #2 | 4.67 | 196 | N.D. | PPB |
| 11) | | BENZENE #2 | 6.72 | 1019 | N.D. | PPB |
| 13) | | TOLUENE #2 | 9.09 | 6787 | 0.102 | PPB |
| 14) | | ETHYLBENZENE #2 | 11.07 | 967 | N.D. | PPB |
| 15) | | m,p-XYLENE #2 | 11.32 | 3637 | 0.032 | PPB |
| 16) | | o-XYLENE #2 | 11.81 | 1924 | N.D. | PPB |

(f)=RT Delta > 1/2 Window (m)=manual int

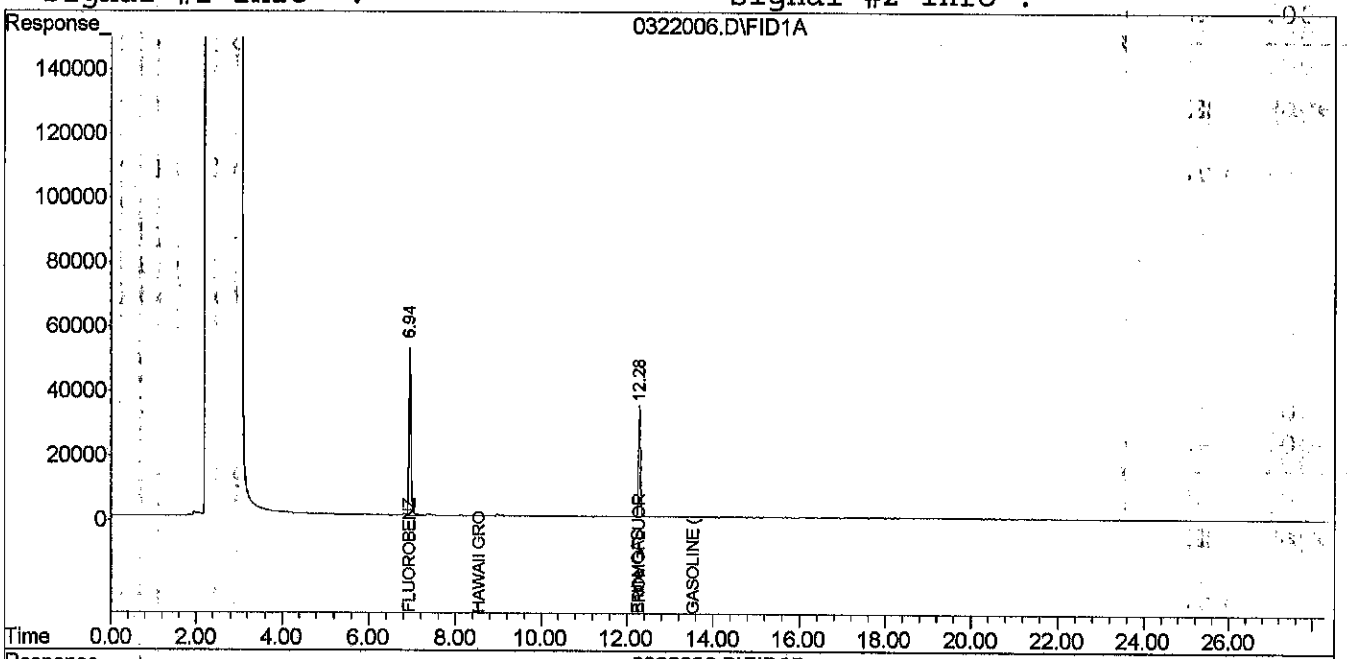
Quantitation Report (Not Reviewed)

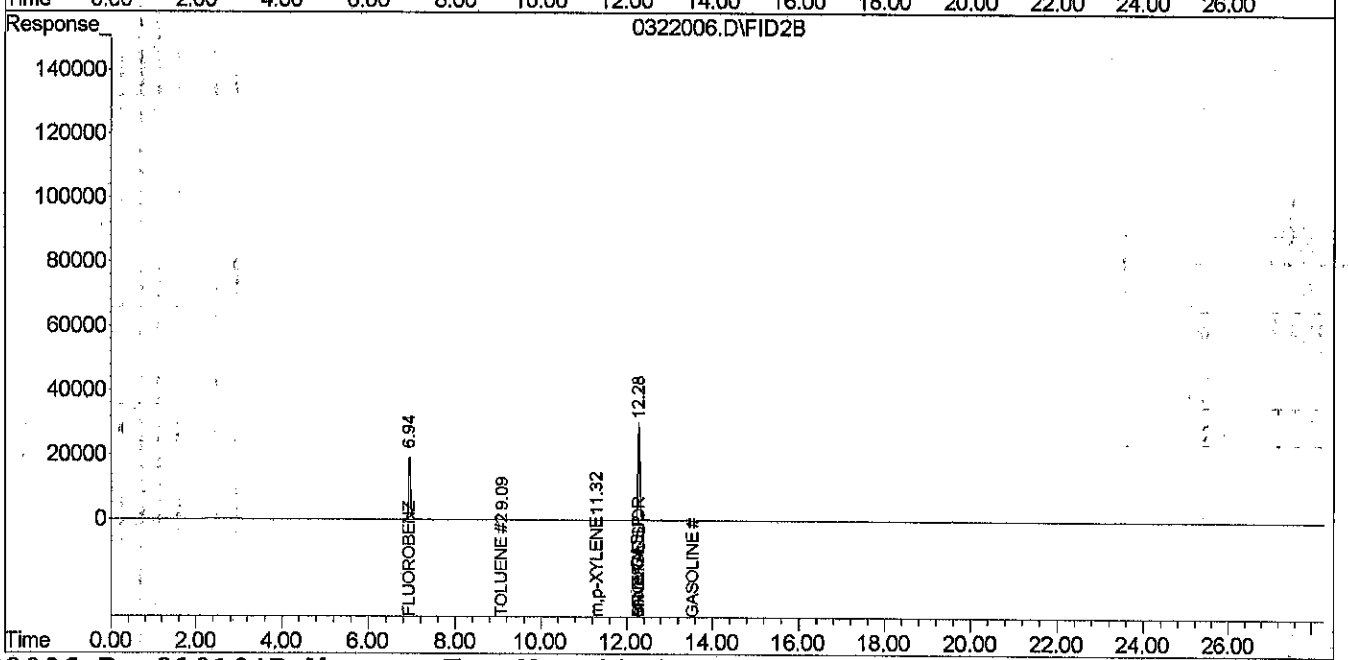
Signal #1 : E:\BTEX\DATA\D210322\0322006.D\FID1A.CH Vial: 6
Signal #2 : E:\BTEX\DATA\D210322\0322006.D\FID2B.CH
Acq On : 22 Mar 2021 16:59 Operator:
Sample : 03-219-01s DUP Inst : Daryl
Misc : Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: events.e IntFile Signal #2: EVENTS2.E

Quant Time: Mar 22 17:15 2021 Quant Results File: 210104B.RES

Quant Method : E:\BTEX\METHODS\210104B.M (Chemstation Integrator)
Title : Fid calibration
Last Update : Mon Mar 15 10:12:08 2021
Response via : Multiple Level Calibration
DataAcq Meth : 210104B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Quantitation Report (Not Reviewed)

Signal #1 : E:\BTEX\DATA\D210322\0322001.D\FID1A.CH Vial: 1
Signal #2 : E:\BTEX\DATA\D210322\0322001.D\FID2B.CH
Acq On : 22 Mar 2021 9:41 Operator:
Sample : CCVD0322G-1 Inst : Daryl
Misc : V2-060-23 Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: events.e IntFile Signal #2: EVENTS2.E

Quant Time: Mar 22 10:02 2021 Quant Results File: 210104B.RES

Quant Method : E:\BTEX\METHODS\210104B.M (Chemstation Integrator)
Title : Fid calibration
Last Update : Mon Mar 15 10:12:08 2021
Response via : Initial Calibration
DataAcq Meth : 210104B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

| | | Compound | R.T. | Response | Conc | Units |
|---|---|---|---|---|---|---|
| | | System Monitoring Compounds | | | | |
| 4) | S | FLUOROBENZENE | 6.95 | 2527484 | 43.551 | PPB |
| 5) | S | BROMOFLUOROBENZENE | 12.29 | 1642265 | 51.201 | PPB |
| 12) | S | FLUOROBENZENE #2 | 6.95 | 905481 | 40.438 | PPB |
| 17) | S | BROMOFLUOROBENZENE #2 | 12.30 | 1244258 | 42.445 | PPB |
| | | Target Compounds | | | | |
| 1) | H | HAWAII GRO C-5-C12 RANGES | 8.55 | 118061765 | 2.276 | PPM |
| 2) | H | Entire GAS Envelope (11-30 | 12.25 | 125143815 | 2.253 | PPM |
| 3) | H | GASOLINE (11-30-20) | 13.55 | 65794016 | 2.292 | PPM |
| 7) | H | MINERAL SPIRITS #2 (2-24-2 | 12.28 | 19673030 | 1.737 | PPM |
| 8) | H | entire GAS envelope #2 (11 | 12.25 | 33542675 | 2.303 | PPM |
| 9) | H | GASOLINE #2 (11-30-20) | 13.55 | 26452986 | 2.346 | PPM |
| 10) | | MTBE #2 | 4.59 | 306601 | 17.443 | PPB |
| 11) | | BENZENE #2 | 6.71 | 801682 | 23.567 | PPB |
| 13) | | TOLUENE #2 | 9.09 | 6618881 | 215.084 | PPB |
| 14) | | ETHYLBENZENE #2 | 11.05 | 1266843 | 46.346 | PPB |
| 15) | | m,p-XYLENE #2 | 11.30 | 6053538 | 187.771 | PPB |
| 16) | | o-XYLENE #2 | 11.80 | 2118414 | 77.272 | PPB |

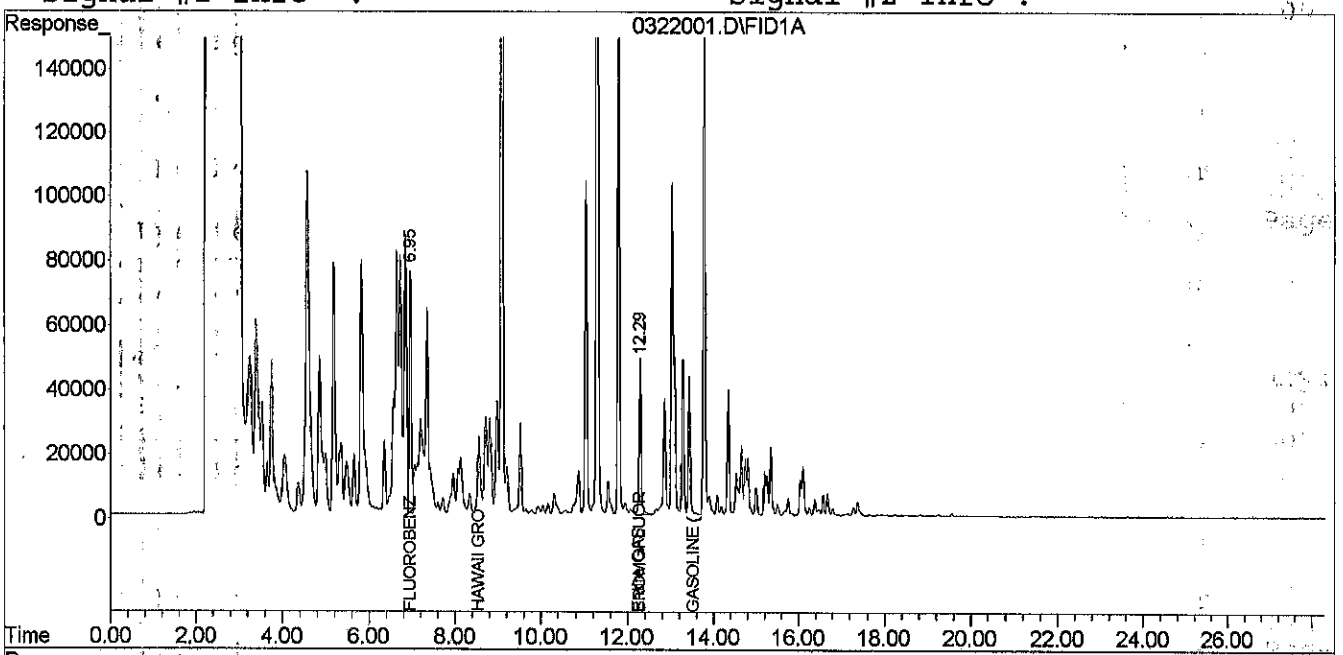
(f)=RT Delta > 1/2 Window (m)=manual int

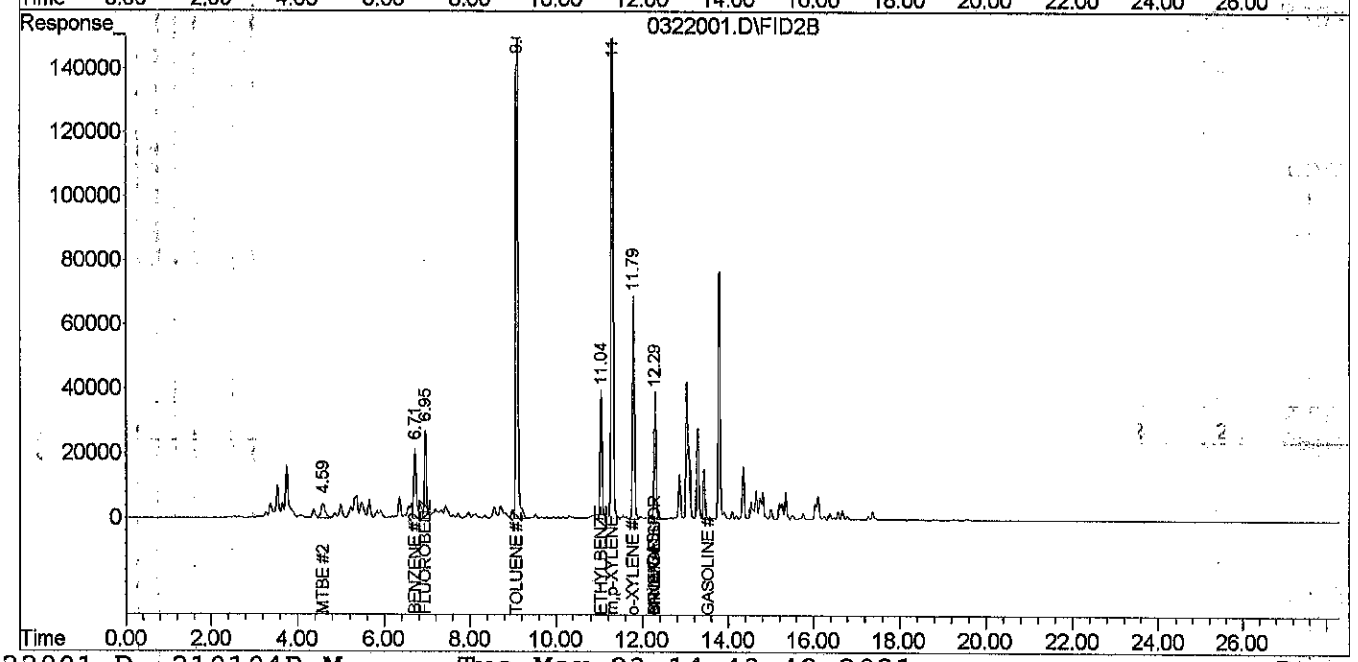
Signal #1 : E:\BTEX\DATA\D210322\0322001.D\FID1A.CH Vial: 1
Signal #2 : E:\BTEX\DATA\D210322\0322001.D\FID2B.CH
Acq On : 22 Mar 2021 9:41 Operator:
Sample : CCVD0322G-1 Inst : Daryl
Misc : V2-060-23 Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: events.e IntFile Signal #2: EVENTS2.E

Quant Time: Mar 22 10:02 2021 Quant Results File: 210104B.RES

Quant Method : E:\BTEX\METHODS\210104B.M (Chemstation Integrator)
Title : Fid calibration
Last Update : Mon Mar 15 10:12:08 2021
Response via : Multiple Level Calibration
DataAcq Meth : 210104B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



Quantitation Report (Not Reviewed)

Signal #1 : E:\BTEX\DATA\D210322\0322011.D\FID1A.CH Vial: 11
Signal #2 : E:\BTEX\DATA\D210322\0322011.D\FID2B.CH
Acq On : 22 Mar 2021 20:30 Operator:
Sample : CCVD0322G-2 Inst : Daryl
Misc : V2-060-23 Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: events.e IntFile Signal #2: EVENTS2.E

Quant Time: Mar 22 20:48 2021 Quant Results File: 210104B.RES

Quant Method : E:\BTEX\METHODS\210104B.M (Chemstation Integrator)
Title : Fid calibration
Last Update : Mon Mar 15 10:12:08 2021
Response via : Initial Calibration
DataAcq Meth : 210104B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :

| | | Compound | R.T. | Response | Conc | Units |
|---|---|---|---|---|---|---|
| | | **System Monitoring Compounds** | | | | |
| 4) | S | FLUOROBENZENE | 6.97 | 140754 | 2.452 | PPB |
| 5) | S | BROMOFLUOROBENZENE | 12.27 | 381029 | 11.837 | PPB |
| 12) | S | FLUOROBENZENE #2 | 6.97 | 42323 | 1.751 | PPB |
| 17) | S | BROMOFLUOROBENZENE #2 | 12.27 | 128635 | 4.388 | PPB |
| | | **Target Compounds** | | | | |
| 1) | H | HAWAII GRO C-5-C12 RANGES | 8.55 | 110968092 | 2.138 | PPM |
| 2) | H | Entire GAS Envelope (11-30 | 12.25 | 116379590 | 2.094 | PPM |
| 3) | H | GASOLINE (11-30-20) | 13.55 | 65905713 | 2.296 | PPM |
| 7) | H | MINERAL SPIRITS #2 (2-24-2 | 12.28 | 20141051 | 1.778 | PPM |
| 8) | H | entire GAS envelope #2 (11 | 12.25 | 33575752 | 2.305 | PPM |
| 9) | H | GASOLINE #2 (11-30-20) | 13.55 | 27244775 | 2.416 | PPM |
| 10) | | MTBE #2 | 4.59 | 255844 | 14.541 | PPB |
| 11) | | BENZENE #2 | 6.70 | 800131 | 23.521 | PPB |
| 13) | | TOLUENE #2 | 9.08 | 6968225 | 226.442 | PPB |
| 14) | | ETHYLBENZENE #2 | 11.03 | 1349520 | 49.375 | PPB |
| 15) | | m,p-XYLENE #2 | 11.29 | 6324176 | 196.169 | PPB |
| 16) | | o-XYLENE #2 | 11.78 | 2220028 | 80.983 | PPB |

(f)=RT Delta > 1/2 Window (m)=manual int

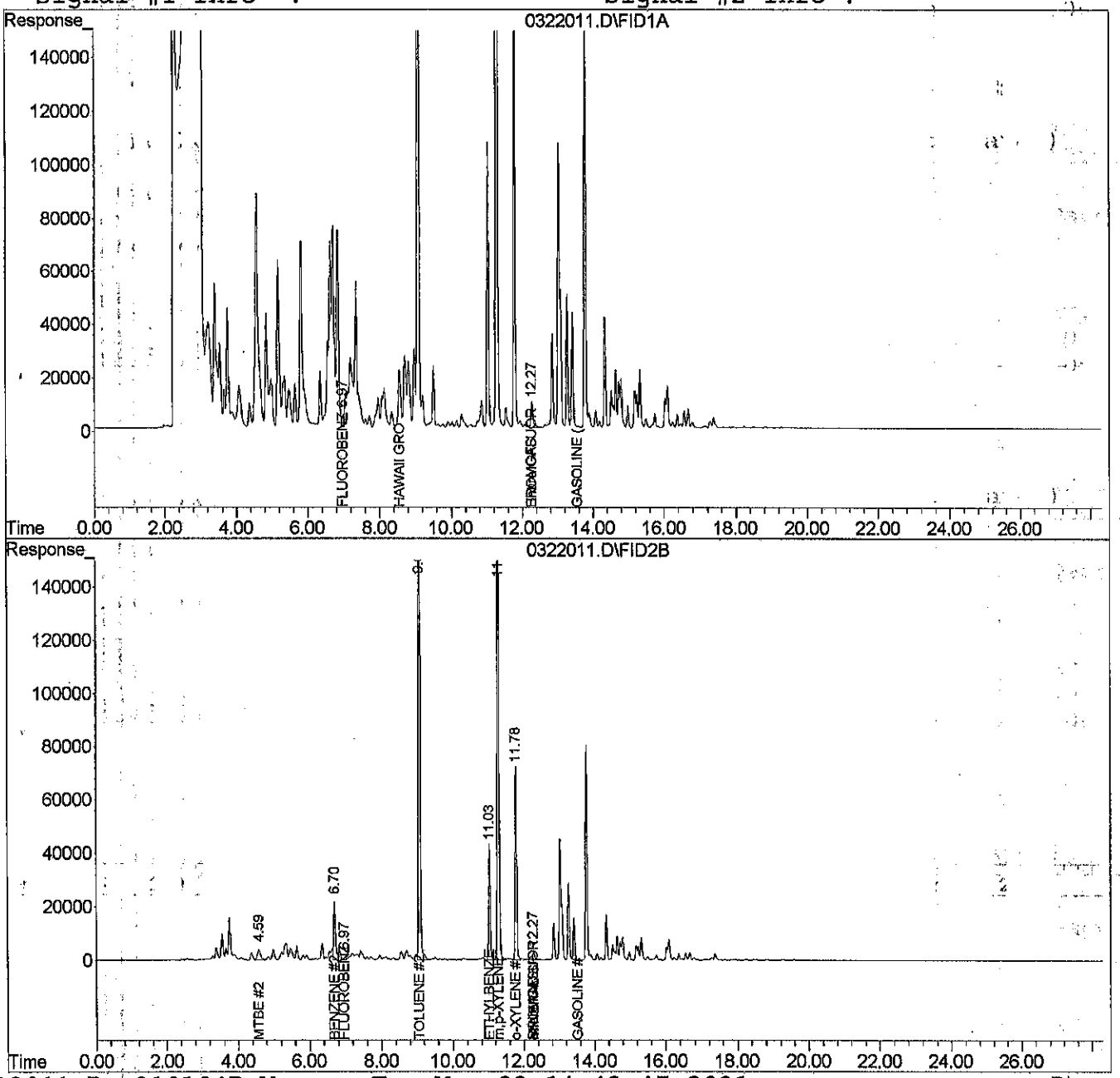
Quantitation Report (Not Reviewed)

Signal #1 : E:\BTEX\DATA\D210322\0322011.D\FID1A.CH Vial: 11
Signal #2 : E:\BTEX\DATA\D210322\0322011.D\FID2B.CH
Acq On : 22 Mar 2021 20:30 Operator:
Sample : CCVD0322G-2 Inst : Daryl
Misc : V2-060-23 Multiplr: 1.00
Sample Amount: 0.00
IntFile Signal #1: events.e IntFile Signal #2: EVENTS2.E

Quant Time: Mar 22 20:48 2021 Quant Results File: 210104B.RES

Quant Method : E:\BTEX\METHODS\210104B.M (Chemstation Integrator)
Title : Fid calibration
Last Update : Mon Mar 15 10:12:08 2021
Response via : Multiple Level Calibration
DataAcq Meth : 210104B.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



# Diesel and Heavy Oil Range Organics
# NWTPH-Dx Data

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\T210322.SEC\
Data File : 0322-T60.D
Signal(s) : FID2B.CH
Acq On : 22 Mar 2021 13:02
Operator : JT
Sample : 03-219-01 ACU
Misc :
ALS Vial : 60 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 22 13:37:52 2021
Quant Method : C:\MSDCHEM\1\METHODS\T200501R.M
Quant Title : GCTPH
QLast Update : Fri Feb 05 08:11:56 2021
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

| Compound | R.T. | Response | Conc Units |
|---|---|---|---|
| System Monitoring Compounds | | | |
| 1) S O-Terphenyl (05-04-20) | 14.437 | 128190736 | 42.284 PPM |
| Spiked Amount 50.000 | | Recovery = | 84.57% |
| Target Compounds | | | |
| 2) H Gasoline | 4.000 | 19058599 | NoCal PPM |
| 3) H Diesel Fuel #1 (05-27... | 10.000 | 21449267 | 3.513 PPM |
| 4) H Diesel Fuel #2 (01-23... | 14.000 | 19596516 | 1.571 PPM |
| 5) H Oil (05-01-20) | 22.000 | 50353024 | 13.655 PPM |
| 6) H Oil Acid Clean (05-01... | 22.000 | 50353024 | 5.052 PPM |
| 7) H Diesel Fuel #2 Combo ... | 14.000 | 16964172 | 1.073 PPM |
| 8) H Oil Combo (05-01-20) | 22.000 | 47179925 | 13.212 PPM |
| 9) H Oil Acid Clean Combo ... | 22.000 | 47179925 | 4.591 PPM |
| 10) H Oil MO Combo (05-01-20) | 22.000 | 44898471 | 13.136 PPM |
| 11) H Oil Acid Clean MO Com... | 22.000 | 44898471 | 4.422 PPM |
| 12) H HAWAII 8015M DF2 (05-... | 14.000 | 19151829 | 2.463 PPM |
| 13) H HAWAII 8015M Oil (05-... | 22.000 | 44325500 | 14.632 PPM |
| 14) H Mineral Oil (05-01-20) | 16.000 | 17991563 | 2.532 PPM |
| 15) H Mineral Oil Combo (05... | 16.000 | 12271805 | 2.365 PPM |
| 16) H Diesel Fuel #2 ACU (0... | 14.000 | 19596516 | 1.057 PPM |
| 17) H Diesel Fuel #2 ACU Co... | 14.000 | 16964172 | 0.611 PPM |

(f)=RT Delta > 1/2 Window

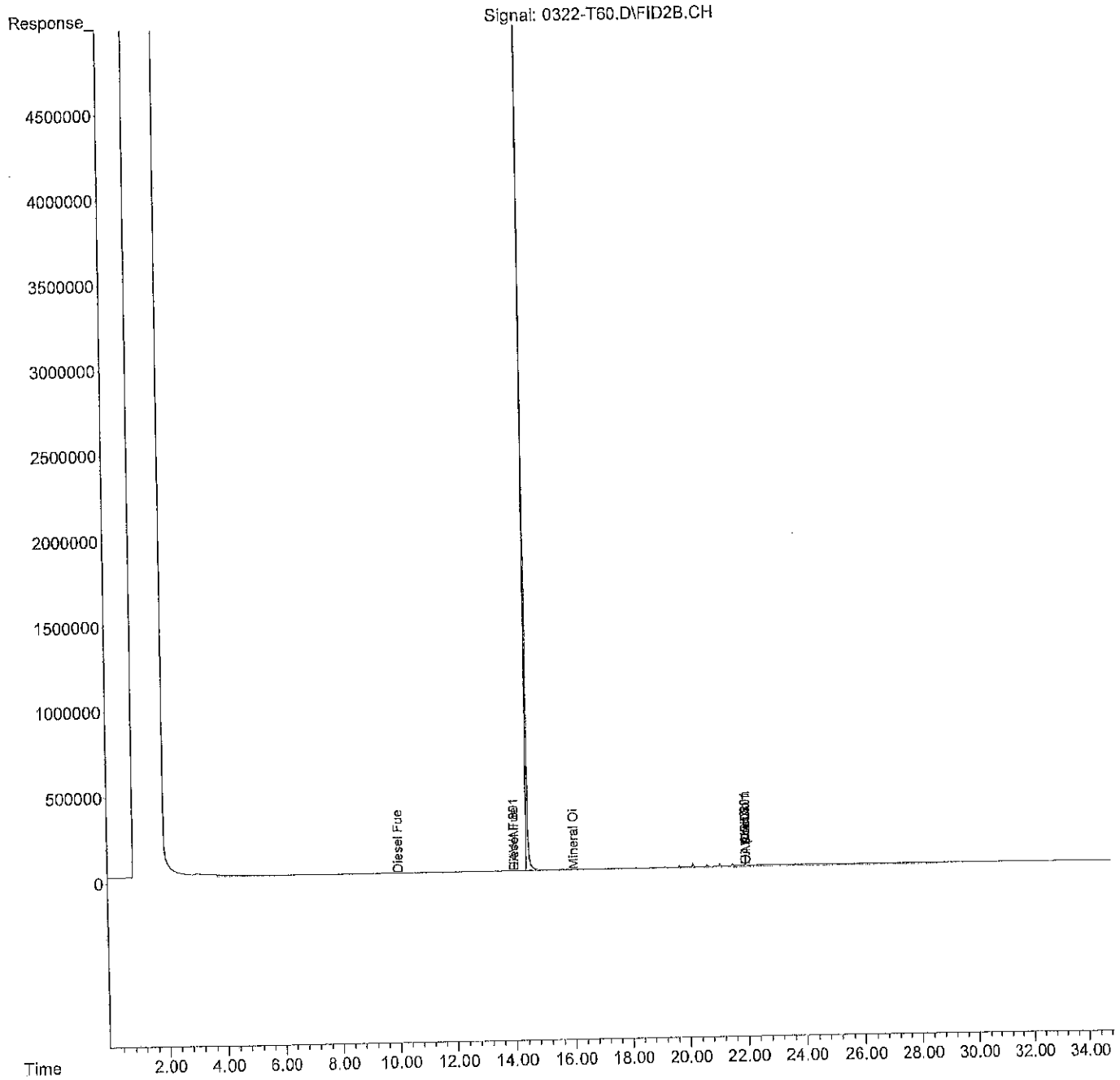
(m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\T210322.SEC\
Data File : 0322-T60.D
Signal(s) : FID2B.CH
Acq On : 22 Mar 2021 13:02
Operator : JT
Sample : 03-219-01 ACU
Misc :
ALS Vial : 60 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 22 13:37:52 2021
Quant Method : C:\MSDCHEM\1\METHODS\T200501R.M
Quant Title : GCTPH
QLast Update : Fri Feb 05 08:11:56 2021
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\T210322.SEC\
Data File : 0322-T61.D
Signal(s) : FID2B.CH
Acq On : 22 Mar 2021 13:44
Operator : JT
Sample : 03-219-02 ACU
Misc :
ALS Vial : 61 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 22 14:20:15 2021
Quant Method : C:\MSDCHEM\1\METHODS\T200501R.M
Quant Title : GCTPH
QLast Update : Fri Feb 05 08:11:56 2021
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

| | Compound | R.T. | Response | Conc Units |
|---|---|---|---|---|
| System Monitoring Compounds | | | | |
| 1) S | O-Terphenyl (05-04-20) | 14.440 | 121152173 | 39.991 PPM |
| Spiked Amount | 50.000 | | Recovery = | 79.98% |
| Target Compounds | | | | |
| 2) H | Gasoline | 4.000 | 18205184 | NoCal PPM |
| 3) H | Diesel Fuel #1 (05-27... | 10.000 | 20727295 | 3.242 PPM |
| 4) H | Diesel Fuel #2 (01-23... | 14.000 | 16389569 | 0.254 PPM |
| 5) H | Oil (05-01-20) | 22.000 | 41324395 | 8.747 PPM |
| 6) H | Oil Acid Clean (05-01... | 22.000 | 41324395 | 1.047 PPM |
| 7) H | Diesel Fuel #2 Combo ... | 14.000 | 14968808 | 0.234 PPM |
| 8) H | Oil Combo (05-01-20) | 22.000 | 39789334 | 9.136 PPM |
| 9) H | Oil Acid Clean Combo ... | 22.000 | 39789334 | 1.268 PPM |
| 10) H | Oil MO Combo (05-01-20) | 22.000 | 38572440 | 9.553 PPM |
| 11) H | Oil Acid Clean MO Com... | 22.000 | 38572440 | 1.504 PPM |
| 12) H | HAWAII 8015M DF2 (05-... | 14.000 | 16042563 | 1.214 PPM |
| 13) H | HAWAII 8015M Oil (05-... | 22.000 | 38069070 | 11.102 PPM |
| 14) H | Mineral Oil (05-01-20) | 16.000 | 13018489 | 0.698 PPM |
| 15) H | Mineral Oil Combo (05... | 16.000 | 9572329 | 1.331 PPM |
| 16) H | Diesel Fuel #2 ACU (0... | 14.000 | 16389569 | N.D. PPM |
| 17) H | Diesel Fuel #2 ACU Co... | 14.000 | 14968808 | N.D. PPM |

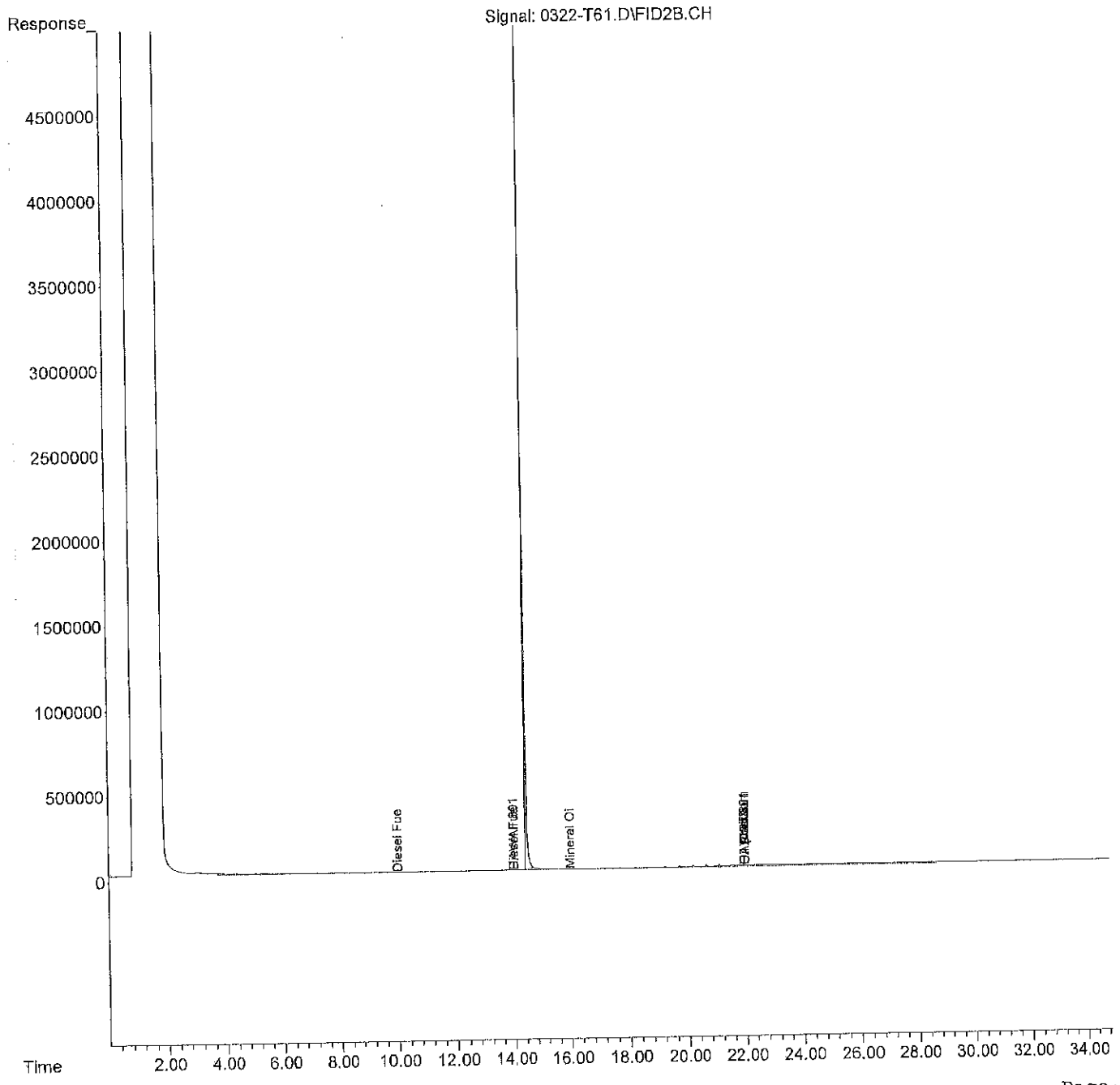
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\T210322.SEC\
Data File : 0322-T61.D
Signal(s) : FID2B.CH
Acq On : 22 Mar 2021 13:44
Operator : JT
Sample : 03-219-02 ACU
Misc :
ALS Vial : 61 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 22 14:20:15 2021
Quant Method : C:\MSDCHEM\1\METHODS\T200501R.M
Quant Title : GCTPH
QLast Update : Fri Feb 05 08:11:56 2021
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\T210322.SEC\
Data File : 0322-T62.D
Signal(s) : FID2B.CH
Acq On : 22 Mar 2021 14:26
Operator : JT
Sample : 03-219-03 ACU
Misc :
ALS Vial : 62 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 22 15:02:35 2021
Quant Method : C:\MSDCHEM\1\METHODS\T200501R.M
Quant Title : GCTPH
QLast Update : Fri Feb 05 08:11:56 2021
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

| | Compound | R.T. | Response | Conc Units |
|---|---|---|---|---|
| | System Monitoring Compounds | | | |
| 1) | S O-Terphenyl (05-04-20) | 14.437 | 92662230 | 30.709 PPM |
| Spiked Amount | 50.000 | | Recovery = | 61.42% |
| | Target Compounds | | | |
| 2) | H Gasoline | 4.000 | 18649307 | NoCal PPM |
| 3) | H Diesel Fuel #1 (05-27... | 10.000 | 36153498 | 9.024 PPM |
| 4) | H Diesel Fuel #2 (01-23... | 14.000 | 35021905 | 7.905 PPM |
| 5) | H Oil (05-01-20) | 22.000 | 45207670 | 10.858 PPM |
| 6) | H Oil Acid Clean (05-01... | 22.000 | 45207670 | 2.770 PPM |
| 7) | H Diesel Fuel #2 Combo ... | 14.000 | 32560014 | 7.635 PPM |
| 8) | H Oil Combo (05-01-20) | 22.000 | 41290162 | 9.964 PPM |
| 9) | H Oil Acid Clean Combo ... | 22.000 | 41290162 | 1.943 PPM |
| 10) | H Oil MO Combo (05-01-20) | 22.000 | 39129027 | 9.868 PPM |
| 11) | H Oil Acid Clean MO Com... | 22.000 | 39129027 | 1.760 PPM |
| 12) | H HAWAII 8015M DF2 (05-... | 14.000 | 34608741 | 8.673 PPM |
| 13) | H HAWAII 8015M Oil (05-... | 22.000 | 38591257 | 11.396 PPM |
| 14) | H Mineral Oil (05-01-20) | 16.000 | 31163278 | 7.389 PPM |
| 15) | H Mineral Oil Combo (05... | 16.000 | 26769887 | 7.923 PPM |
| 16) | H Diesel Fuel #2 ACU (0... | 14.000 | 35021905 | 6.535 PPM |
| 17) | H Diesel Fuel #2 ACU Co... | 14.000 | 32560014 | 6.290 PPM |

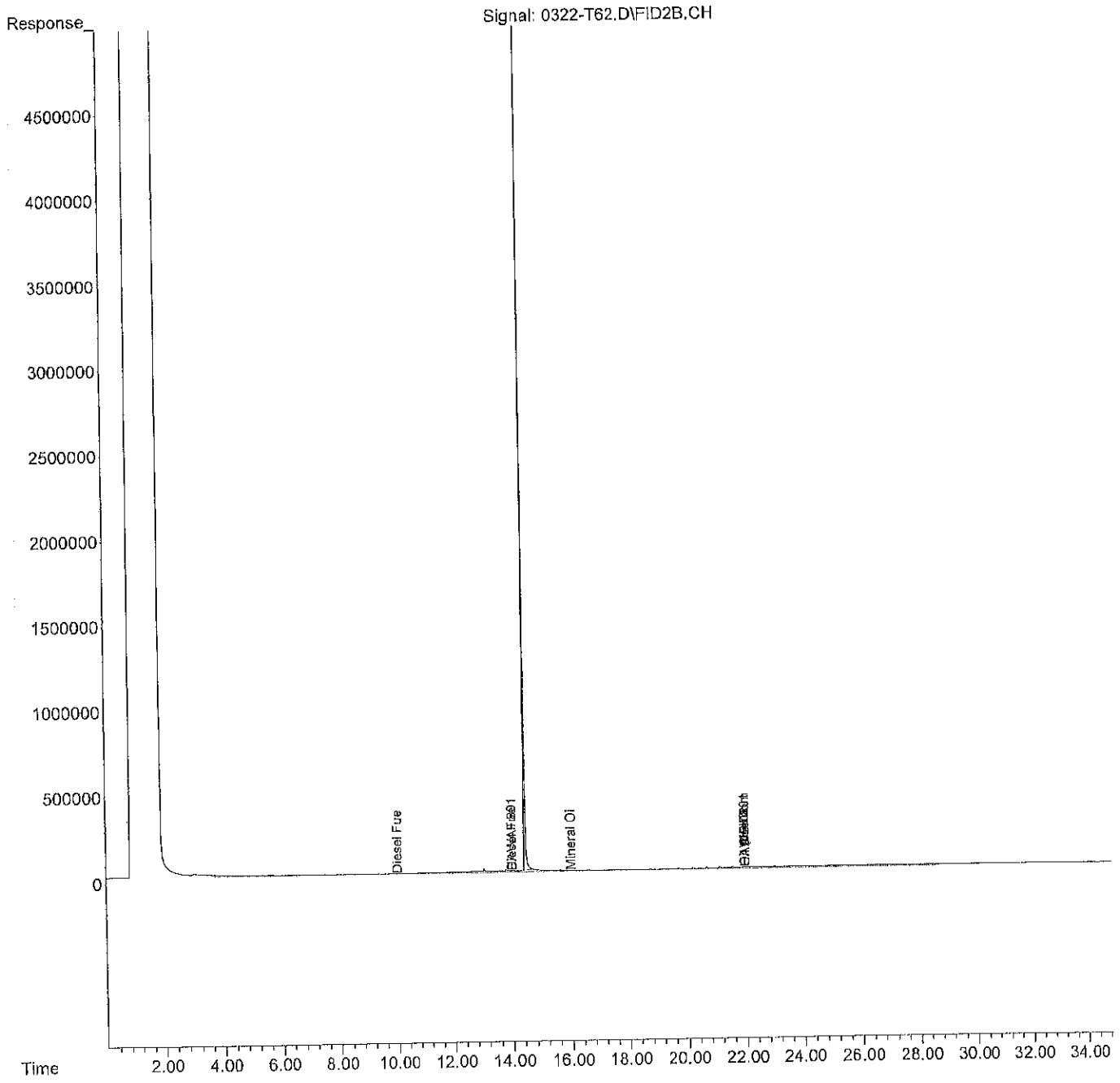
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\T210322.SEC\
Data File : 0322-T62.D
Signal(s) : FID2B.CH
Acq On : 22 Mar 2021 14:26
Operator : JT
Sample : 03-219-03 ACU
Misc :
ALS Vial : 62 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 22 15:02:35 2021
Quant Method : C:\MSDCHEM\1\METHODS\T200501R.M
Quant Title : GCTPH
QLast Update : Fri Feb 05 08:11:56 2021
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\T210322.SEC\
Data File : 0322-T63.D
Signal(s) : FID2B.CH
Acq On : 22 Mar 2021 15:09
Operator : JT
Sample : 03-219-04 ACU
Misc :
ALS Vial : 63 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 22 15:45:11 2021
Quant Method : C:\MSDCHEM\1\METHODS\T200501R.M
Quant Title : GCTPH
QLast Update : Fri Feb 05 08:11:56 2021
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

| Compound | R.T. | Response | Conc Units |
|---|---|---|---|
| System Monitoring Compounds | | | |
| 1) S O-Terphenyl (05-04-20) | 14.436 | 84804985 | 28.149 PPM |
| Spiked Amount 50.000 | | Recovery = | 56.30% |
| Target Compounds | | | |
| 2) H Gasoline | 4.000 | 17439045 | NoCal PPM |
| 3) H Diesel Fuel #1 (05-27... | 10.000 | 20274366 | 3.072 PPM |
| 4) H Diesel Fuel #2 (01-23... | 14.000 | 16871218 | 0.451 PPM |
| 5) H Oil (05-01-20) | 22.000 | 40727686 | 8.423 PPM |
| 6) H Oil Acid Clean (05-01... | 22.000 | 40727686 | 0.782 PPM |
| 7) H Diesel Fuel #2 Combo ... | 14.000 | 15136565 | 0.304 PPM |
| 8) H Oil Combo (05-01-20) | 22.000 | 38911693 | 8.652 PPM |
| 9) H Oil Acid Clean Combo ... | 22.000 | 38911693 | 0.874 PPM |
| 10) H Oil MO Combo (05-01-20) | 22.000 | 37423822 | 8.902 PPM |
| 11) H Oil Acid Clean MO Com... | 22.000 | 37423822 | 0.974 PPM |
| 12) H HAWAII 8015M DF2 (05-... | 14.000 | 16513917 | 1.403 PPM |
| 13) H HAWAII 8015M Oil (05-... | 22.000 | 36917577 | 10.452 PPM |
| 14) H Mineral Oil (05-01-20) | 16.000 | 14033693 | 1.072 PPM |
| 15) H Mineral Oil Combo (05... | 16.000 | 10357741 | 1.632 PPM |
| 16) H Diesel Fuel #2 ACU (0... | 14.000 | 16871218 | 0.090 PPM |
| 17) H Diesel Fuel #2 ACU Co... | 14.000 | 15136565 | N.D. PPM |

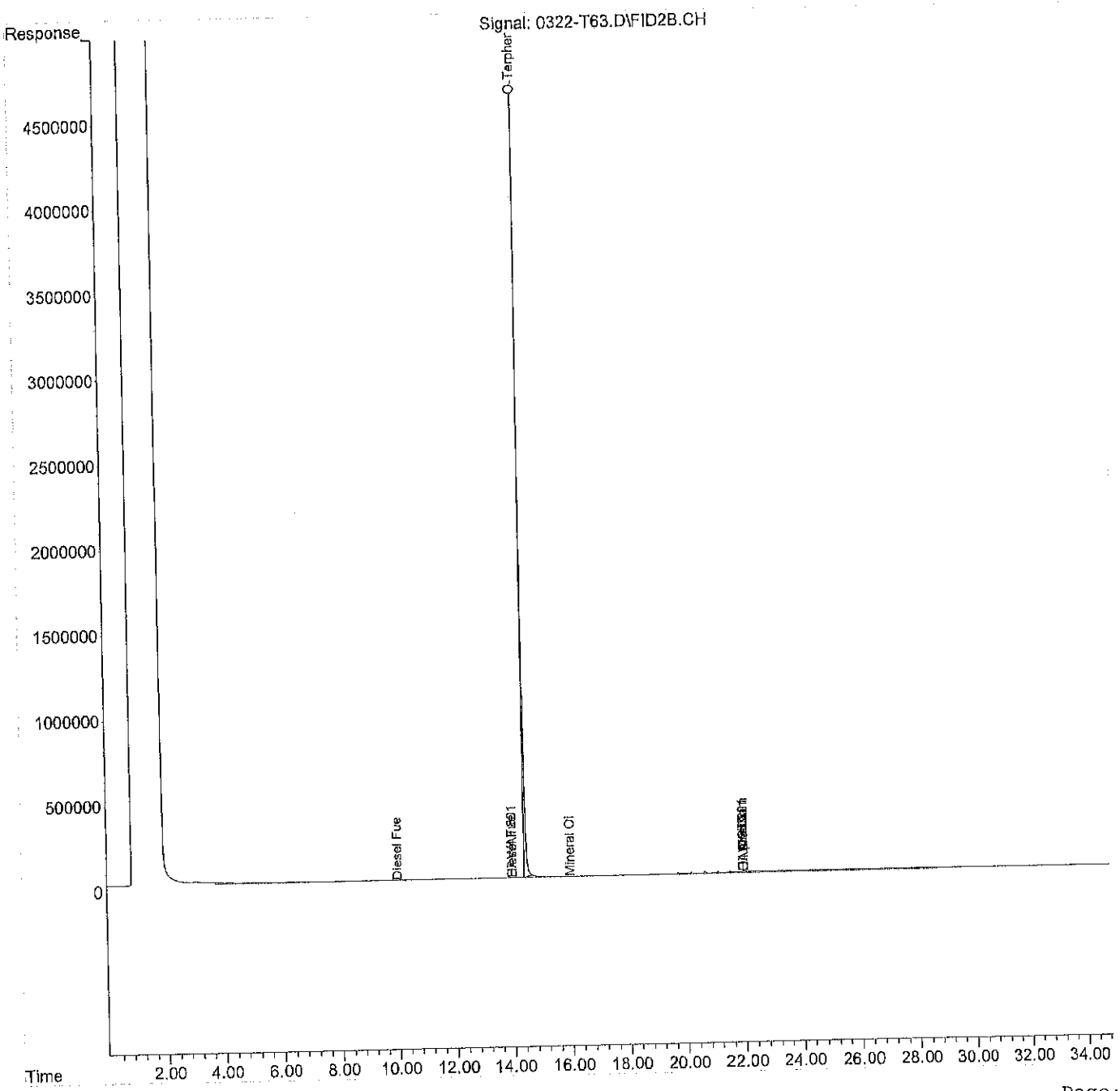
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\T210322.SEC\
Data File : 0322-T63.D
Signal(s) : FID2B.CH
Acq On : 22 Mar 2021 15:09
Operator : JT
Sample : 03-219-04 ACU
Misc :
ALS Vial : 63 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 22 15:45:11 2021
Quant Method : C:\MSDCHEM\1\METHODS\T200501R.M
Quant Title : GCTPH
QLast Update : Fri Feb 05 08:11:56 2021
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\T210322.SEC\
Data File : 0322-T64.D
Signal(s) : FID2B.CH
Acq On : 22 Mar 2021 15:51
Operator : JT
Sample : 03-219-05 ACU
Misc :
ALS Vial : 64 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 22 16:27:26 2021
Quant Method : C:\MSDCHEM\1\METHODS\T200501R.M
Quant Title : GCTPH
QLast Update : Fri Feb 05 08:11:56 2021
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

| Compound | R.T. | Response | Conc Units |
|---|---|---|---|
| System Monitoring Compounds | | | |
| 1) S O-Terphenyl (05-04-20) | 14.441 | 128304357 | 42.321 PPM |
| Spiked Amount 50.000 | | Recovery = | 84.64% |
| Target Compounds | | | |
| 2) H Gasoline | 4.000 | 18398873 | NoCal PPM |
| 3) H Diesel Fuel #1 (05-27... | 10.000 | 32353093 | 7.599 PPM |
| 4) H Diesel Fuel #2 (01-23... | 14.000 | 32872619 | 7.022 PPM |
| 5) H Oil (05-01-20) | 22.000 | 55890291 | 16.666 PPM |
| 6) H Oil Acid Clean (05-01... | 22.000 | 55890291 | 7.509 PPM |
| 7) H Diesel Fuel #2 Combo ... | 14.000 | 29414720 | 6.312 PPM |
| 8) H Oil Combo (05-01-20) | 22.000 | 51454483 | 15.569 PPM |
| 9) H Oil Acid Clean Combo ... | 22.000 | 51454483 | 6.513 PPM |
| 10) H Oil MO Combo (05-01-20) | 22.000 | 48454886 | 15.151 PPM |
| 11) H Oil Acid Clean MO Com... | 22.000 | 48454886 | 6.063 PPM |
| 12) H HAWAII 8015M DF2 (05-... | 14.000 | 32372502 | 7.774 PPM |
| 13) H HAWAII 8015M Oil (05-... | 22.000 | 47848656 | 16.620 PPM |
| 14) H Mineral Oil (05-01-20) | 16.000 | 31468659 | 7.502 PPM |
| 15) H Mineral Oil Combo (05... | 16.000 | 24168477 | 6.926 PPM |
| 16) H Diesel Fuel #2 ACU (0... | 14.000 | 32872619 | 5.772 PPM |
| 17) H Diesel Fuel #2 ACU Co... | 14.000 | 29414720 | 5.145 PPM |

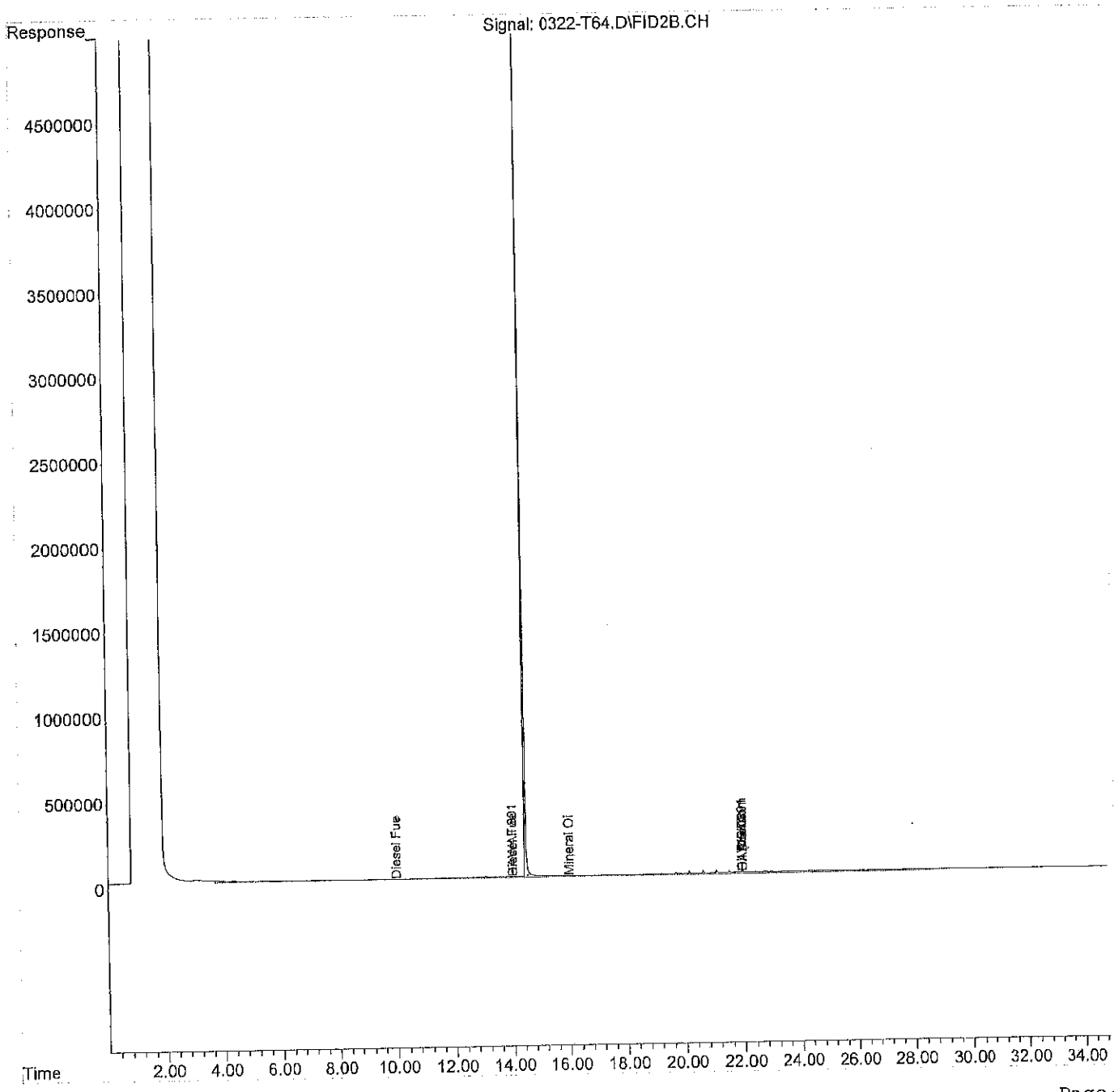
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\T210322.SEC\
Data File : 0322-T64.D
Signal(s) : FID2B.CH
Acq On : 22 Mar 2021 15:51
Operator : JT
Sample : 03-219-05 ACU
Misc :
ALS Vial : 64 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 22 16:27:26 2021
Quant Method : C:\MSDCHEM\1\METHODS\T200501R.M
Quant Title : GCTPH
QLast Update : Fri Feb 05 08:11:56 2021
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\T210322.SEC\
Data File : 0322-T65.D
Signal(s) : FID2B.CH
Acq On : 22 Mar 2021 16:34
Operator : JT
Sample : 03-219-06 ACU
Misc :
ALS Vial : 65 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 22 17:10:33 2021
Quant Method : C:\MSDCHEM\1\METHODS\T200501R.M
Quant Title : GCTPH
QLast Update : Fri Feb 05 08:11:56 2021
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

| Compound | R.T. | Response | Conc Units |
|---|---|---|---|
| System Monitoring Compounds | | | |
| 1) S O-Terphenyl (05-04-20) | 14.443 | 115819711 | 38.254 PPM |
| Spiked Amount 50.000 | | Recovery = | 76.51% |
| Target Compounds | | | |
| 2) H Gasoline | 4.000 | 18567860 | NoCal PPM |
| 3) H Diesel Fuel #1 (05-27... | 10.000 | 25238569 | 4.933 PPM |
| 4) H Diesel Fuel #2 (01-23... | 14.000 | 24266482 | 3.488 PPM |
| 5) H Oil (05-01-20) | 22.000 | 55046545 | 16.207 PPM |
| 6) H Oil Acid Clean (05-01... | 22.000 | 55046545 | 7.134 PPM |
| 7) H Diesel Fuel #2 Combo ... | 14.000 | 20931237 | 2.742 PPM |
| 8) H Oil Combo (05-01-20) | 22.000 | 51837754 | 15.780 PPM |
| 9) H Oil Acid Clean Combo ... | 22.000 | 51837754 | 6.686 PPM |
| 10) H Oil MO Combo (05-01-20) | 22.000 | 48941468 | 15.427 PPM |
| 11) H Oil Acid Clean MO Com... | 22.000 | 48941468 | 6.287 PPM |
| 12) H HAWAII 8015M DF2 (05-... | 14.000 | 23759979 | 4.314 PPM |
| 13) H HAWAII 8015M Oil (05-... | 22.000 | 48360364 | 16.909 PPM |
| 14) H Mineral Oil (05-01-20) | 16.000 | 24331771 | 4.870 PPM |
| 15) H Mineral Oil Combo (05... | 16.000 | 16499674 | 3.986 PPM |
| 16) H Diesel Fuel #2 ACU (0... | 14.000 | 24266482 | 2.716 PPM |
| 17) H Diesel Fuel #2 ACU Co... | 14.000 | 20931237 | 2.056 PPM |

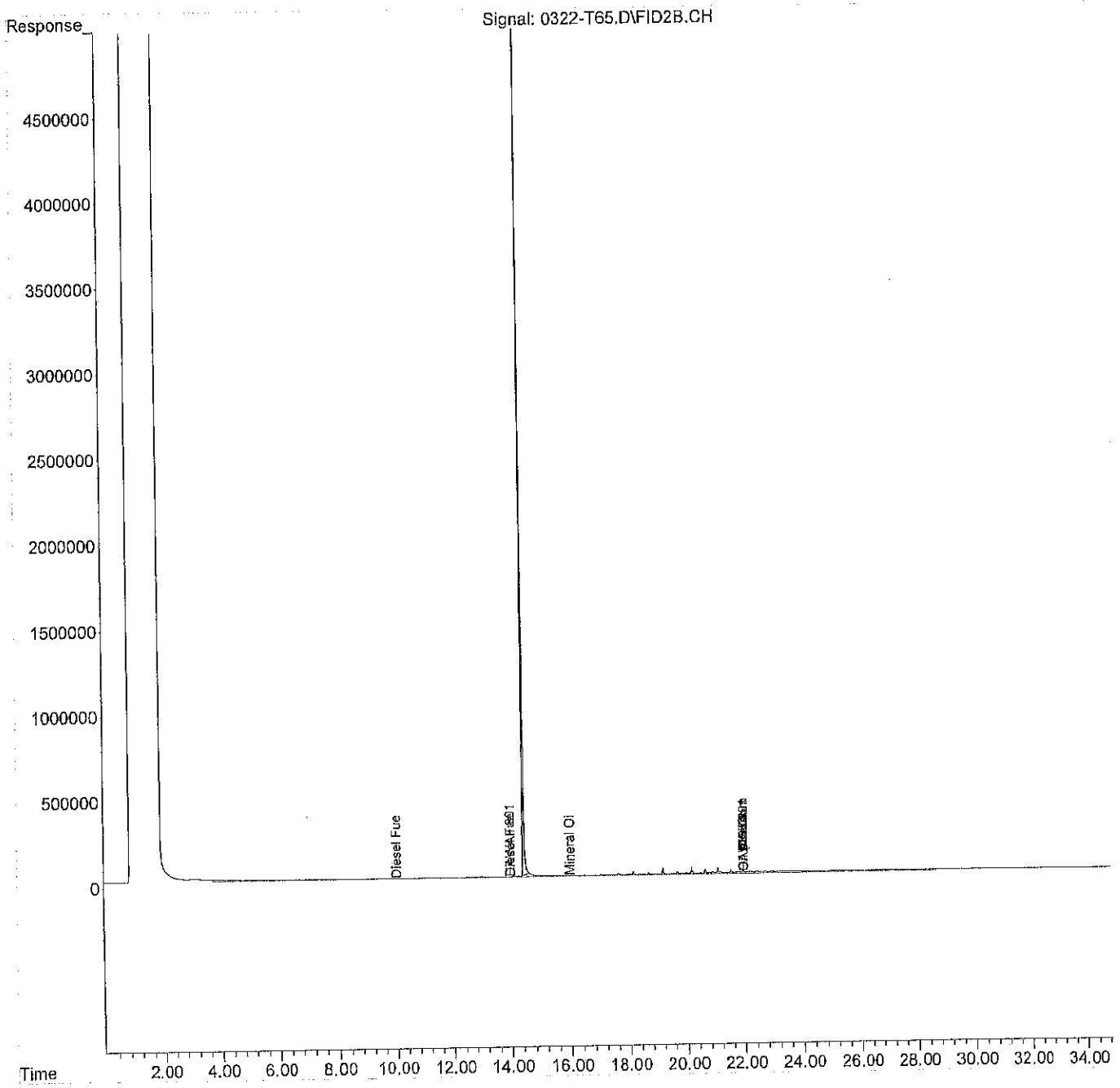
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\T210322.SEC\
Data File : 0322-T65.D
Signal(s) : FID2B.CH
Acq On : 22 Mar 2021 16:34
Operator : JT
Sample : 03-219-06 ACU
Misc :
ALS Vial : 65 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 22 17:10:33 2021
Quant Method : C:\MSDCHEM\1\METHODS\T200501R.M
Quant Title : GCTPH
QLast Update : Fri Feb 05 08:11:56 2021
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\T210322.SEC\
Data File : 0322-T66.D
Signal(s) : FID2B.CH
Acq On : 22 Mar 2021 17:17
Operator : JT
Sample : 03-219-07 ACU
Misc :
ALS Vial : 66 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 22 17:53:39 2021
Quant Method : C:\MSDCHEM\1\METHODS\T200501R.M
Quant Title : GCTPH
QLast Update : Fri Feb 05 08:11:56 2021
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

| | Compound | R.T. | Response | Conc Units |
|---|---|---|---|---|
| | System Monitoring Compounds | | | |
| 1) S | O-Terphenyl (05-04-20) | 14.443 | 118782951 | 39.219 PPM |
| Spiked Amount | 50.000 | | Recovery = | 78.44% |
| | Target Compounds | | | |
| 2) H | Gasoline | 4.000 | 18385935 | NoCal PPM |
| 3) H | Diesel Fuel #1 (05-27... | 10.000 | 25603358 | 5.070 PPM |
| 4) H | Diesel Fuel #2 (01-23... | 14.000 | 26761533 | 4.513 PPM |
| 5) H | Oil (05-01-20) | 22.000 | 66265410 | 22.306 PPM |
| 6) H | Oil Acid Clean (05-01... | 22.000 | 66265410 | 12.111 PPM |
| 7) H | Diesel Fuel #2 Combo ... | 14.000 | 22534242 | 3.417 PPM |
| 8) H | Oil Combo (05-01-20) | 22.000 | 61959482 | 21.362 PPM |
| 9) H | Oil Acid Clean Combo ... | 22.000 | 61959482 | 11.237 PPM |
| 10) H | Oil MO Combo (05-01-20) | 22.000 | 58337070 | 20.749 PPM |
| 11) H | Oil Acid Clean MO Com... | 22.000 | 58337070 | 10.622 PPM |
| 12) H | HAWAII 8015M DF2 (05-... | 14.000 | 26168495 | 5.282 PPM |
| 13) H | HAWAII 8015M Oil (05-... | 22.000 | 57675371 | 22.165 PPM |
| 14) H | Mineral Oil (05-01-20) | 16.000 | 28825839 | 6.527 PPM |
| 15) H | Mineral Oil Combo (05... | 16.000 | 18138042 | 4.614 PPM |
| 16) H | Diesel Fuel #2 ACU (0... | 14.000 | 26761533 | 3.602 PPM |
| 17) H | Diesel Fuel #2 ACU Co... | 14.000 | 22534242 | 2.639 PPM |

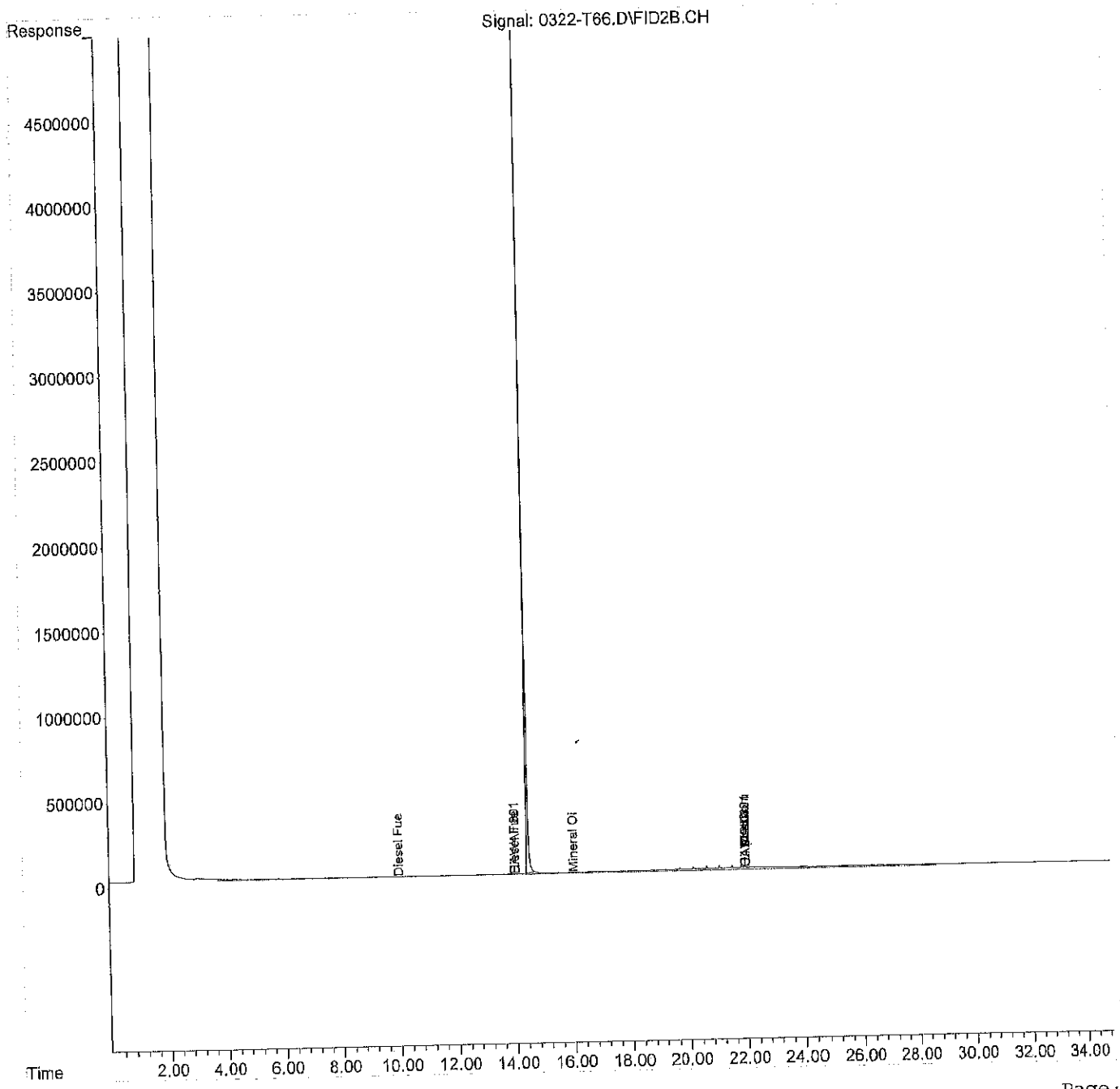
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\T210322.SEC\
Data File : 0322-T66.D
Signal(s) : FID2B.CH
Acq On : 22 Mar 2021 17:17
Operator : JT
Sample : 03-219-07 ACU
Misc :
ALS Vial : 66 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 22 17:53:39 2021
Quant Method : C:\MSDCHEM\1\METHODS\T200501R.M
Quant Title : GCTPH
QLast Update : Fri Feb 05 08:11:56 2021
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\T210322.SEC\
Data File : 0322-T59.D
Signal(s) : FID2B.CH
Acq On : 22 Mar 2021 12:20
Operator : JT
Sample : MB0319S1 ACU
Misc :
ALS Vial : 59 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 22 12:55:37 2021
Quant Method : C:\MSDCHEM\1\METHODS\T200501R.M
Quant Title : GCTPH
QLast Update : Fri Feb 05 08:11:56 2021
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

| | Compound | R.T. | Response | Conc Units |
|---|---|---|---|---|
| System Monitoring Compounds | | | | |
| 1) S | O-Terphenyl (05-04-20) | 14.436 | 132029213 | 43.535 PPM |
| Spiked Amount | 50.000 | | Recovery = | 87.07% |
| Target Compounds | | | | |
| 2) H | Gasoline | 4.000 | 17065367 | NoCal PPM |
| 3) H | Diesel Fuel #1 (05-27... | 10.000 | 20857952 | 3.291 PPM |
| 4) H | Diesel Fuel #2 (01-23... | 14.000 | 19278671 | 1.440 PPM |
| 5) H | Oil (05-01-20) | 22.000 | 47619784 | 12.170 PPM |
| 6) H | Oil Acid Clean (05-01... | 22.000 | 47619784 | 3.840 PPM |
| 7) H | Diesel Fuel #2 Combo ... | 14.000 | 16829017 | 1.016 PPM |
| 8) H | Oil Combo (05-01-20) | 22.000 | 44982033 | 12.000 PPM |
| 9) H | Oil Acid Clean Combo ... | 22.000 | 44982033 | 3.603 PPM |
| 10) H | Oil MO Combo (05-01-20) | 22.000 | 42874546 | 11.990 PPM |
| 11) H | Oil Acid Clean MO Com... | 22.000 | 42874546 | 3.488 PPM |
| 12) H | HAWAII 8015M DF2 (05-... | 14.000 | 18873596 | 2.351 PPM |
| 13) H | HAWAII 8015M Oil (05-... | 22.000 | 42281351 | 13.479 PPM |
| 14) H | Mineral Oil (05-01-20) | 16.000 | 17474460 | 2.341 PPM |
| 15) H | Mineral Oil Combo (05... | 16.000 | 12552824 | 2.473 PPM |
| 16) H | Diesel Fuel #2 ACU (0... | 14.000 | 19278671 | 0.945 PPM |
| 17) H | Diesel Fuel #2 ACU Co... | 14.000 | 16829017 | 0.562 PPM |

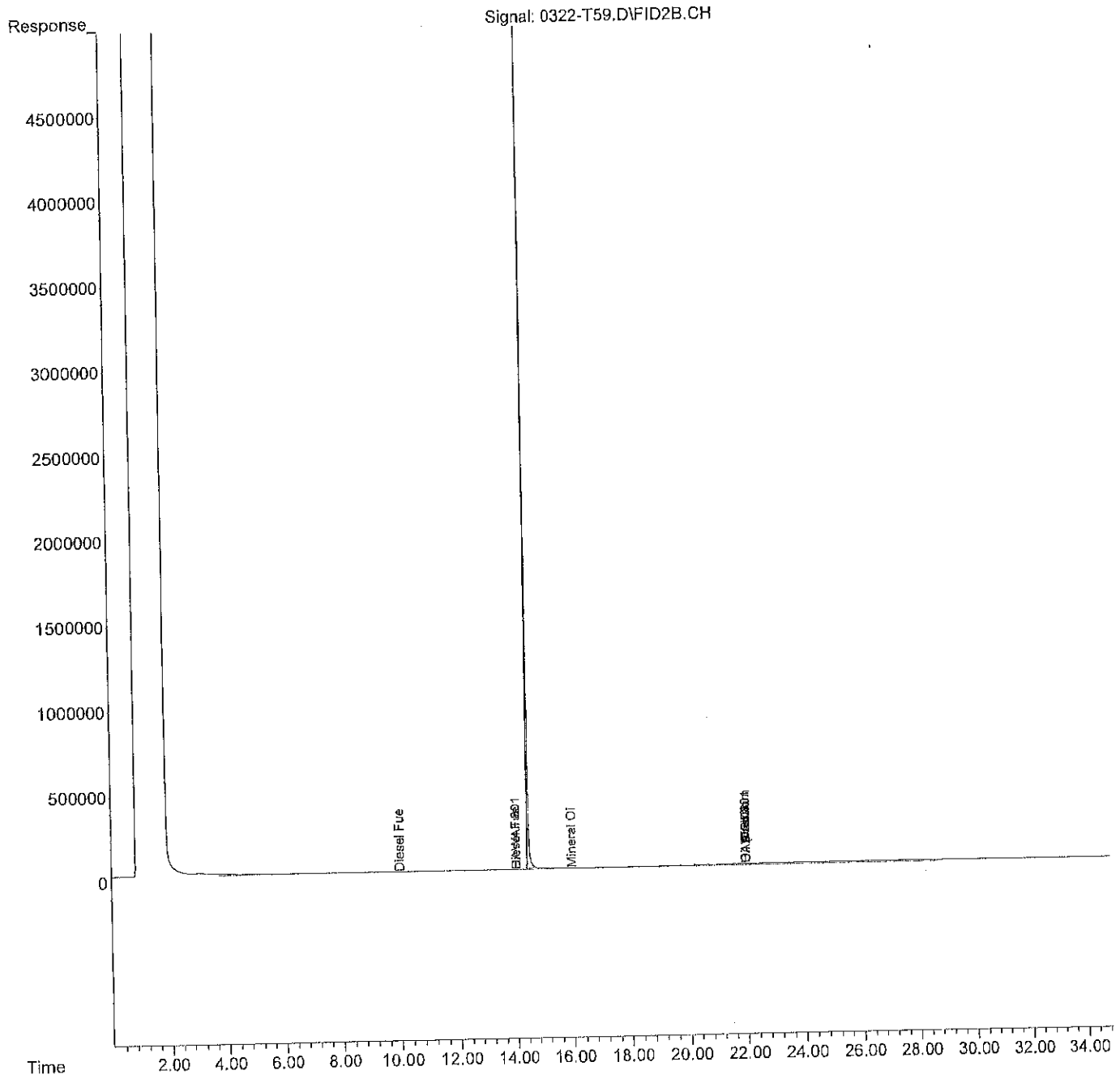
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\T210322.SEC\
Data File : 0322-T59.D
Signal(s) : FID2B.CH
Acq On : 22 Mar 2021 12:20
Operator : JT
Sample : MB0319S1 ACU
Misc :
ALS Vial : 59 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 22 12:55:37 2021
Quant Method : C:\MSDCHEM\1\METHODS\T200501R.M
Quant Title : GCTPH
QLast Update : Fri Feb 05 08:11:56 2021
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\T210322.SEC\
Data File : 0322-T68.D
Signal(s) : FID2B.CH
Acq On : 22 Mar 2021 18:42
Operator : JT
Sample : SB0319S1 EDP ACU
Misc :
ALS Vial : 68 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 22 19:18:28 2021
Quant Method : C:\MSDCHEM\1\METHODS\T200501R.M
Quant Title : GCTPH
QLast Update : Fri Feb 05 08:11:56 2021
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

| | Compound | R.T. | Response | Conc | Units |
|---|---|---|---|---|---|
| | System Monitoring Compounds | | | | |
| 1) S | O-Terphenyl (05-04-20) | 14.443 | 141995524 | 46.782 | PPM |
| Spiked Amount | 50.000 | | Recovery = | 93.56% | |
| | Target Compounds | | | | |
| 2) H | Gasoline | 4.000 | 39005112 | NoCal | PPM |
| 3) H | Diesel Fuel #1 (05-27... | 10.000 | 261733378 | 93.568 | PPM |
| 4) H | Diesel Fuel #2 (01-23... | 14.000 | 267412272 | 103.338 | PPM |
| 5) H | Oil (05-01-20) | 22.000 | 65954906 | 22.138 | PPM |
| 6) H | Oil Acid Clean (05-01... | 22.000 | 65954906 | 11.974 | PPM |
| 7) H | Diesel Fuel #2 Combo ... | 14.000 | 259990186 | 103.330 | PPM |
| 8) H | Oil Combo (05-01-20) | 22.000 | 49489740 | 14.486 | PPM |
| 9) H | Oil Acid Clean Combo ... | 22.000 | 49489740 | 5.630 | PPM |
| 10) H | Oil MO Combo (05-01-20) | 22.000 | 42785272 | 11.939 | PPM |
| 11) H | Oil Acid Clean MO Com... | 22.000 | 42785272 | 3.447 | PPM |
| 12) H | HAWAII 8015M DF2 (05-... | 14.000 | 266079981 | 101.668 | PPM |
| 13) H | HAWAII 8015M Oil (05-... | 22.000 | 42081796 | 13.366 | PPM |
| 14) H | Mineral Oil (05-01-20) | 16.000 | 184385772 | 63.893 | PPM |
| 15) H | Mineral Oil Combo (05... | 16.000 | 177443861 | 65.680 | PPM |
| 16) H | Diesel Fuel #2 ACU (0... | 14.000 | 267412272 | 89.055 | PPM |
| 17) H | Diesel Fuel #2 ACU Co... | 14.000 | 259990186 | 89.112 | PPM |

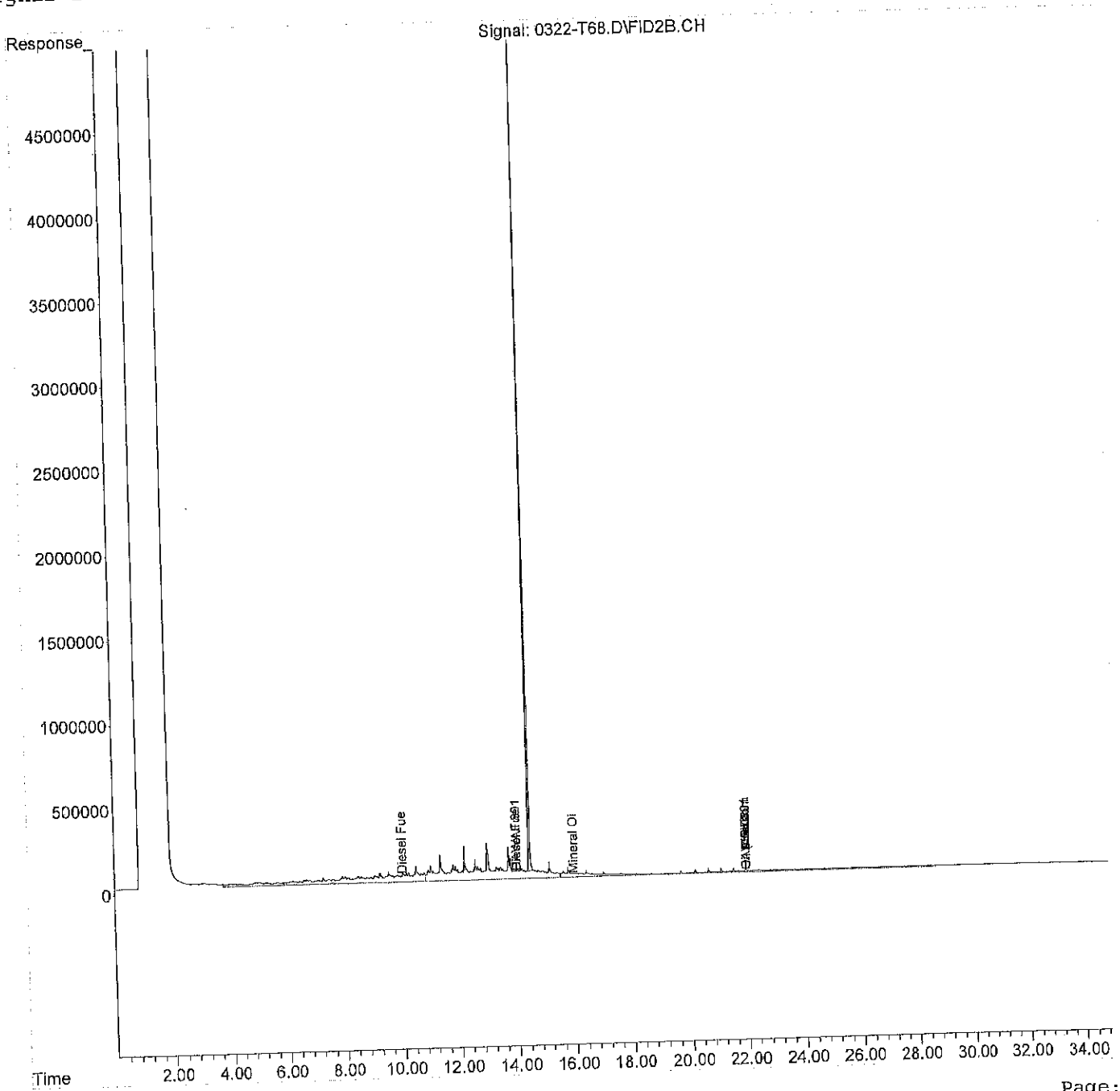
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\T210322.SEC\
Data File : 0322-T68.D
Signal(s) : FID2B.CH
Acq On : 22 Mar 2021 18:42
Operator : JT
Sample : SB0319S1 DUP ACU
Misc :
ALS Vial : 68 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 22 19:18:28 2021
Quant Method : C:\MSDCHEM\1\METHODS\T200501R.M
Quant Title : GCTPH
QLast Update : Fri Feb 05 08:11:56 2021
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\T210322.SEC\
Data File : 0322-T67.D
Signal(s) : FID2B.CH
Acq On : 22 Mar 2021 18:00
Operator : JT
Sample : SB0319S1 ACU DUP
Misc :
ALS Vial : 67 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 22 18:36:11 2021
Quant Method : C:\MSDCHEM\1\METHODS\T200501R.M
Quant Title : GCTPH
QLast Update : Fri Feb 05 08:11:56 2021
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

| | Compound | R.T. | Response | Conc Units |
|---|---|---|---|---|
| | System Monitoring Compounds | | | |
| 1) S | O-Terphenyl (05-04-20) | 14.439 | 109008632 | 36.034 PPM |
| Spiked Amount | 50.000 | | Recovery = | 72.07% |
| | Target Compounds | | | |
| 2) H | Gasoline | 4.000 | 31101790 | NoCal PPM |
| 3) H | Diesel Fuel #1 (05-27... | 10.000 | 210867384 | 74.504 PPM |
| 4) H | Diesel Fuel #2 (01-23... | 14.000 | 219166302 | 83.525 PPM |
| 5) H | Oil (05-01-20) | 22.000 | 67745871 | 23.111 PPM |
| 6) H | Oil Acid Clean (05-01... | 22.000 | 67745871 | 12.768 PPM |
| 7) H | Diesel Fuel #2 Combo ... | 14.000 | 212007797 | 83.140 PPM |
| 8) H | Oil Combo (05-01-20) | 22.000 | 52693203 | 16.252 PPM |
| 9) H | Oil Acid Clean Combo ... | 22.000 | 52693203 | 7.070 PPM |
| 10) H | Oil MO Combo (05-01-20) | 22.000 | 46251999 | 13.903 PPM |
| 11) H | Oil Acid Clean MO Com... | 22.000 | 46251999 | 5.046 PPM |
| 12) H | HAWAII 8015M DF2 (05-... | 14.000 | 218065808 | 82.378 PPM |
| 13) H | HAWAII 8015M Oil (05-... | 22.000 | 45548267 | 15.322 PPM |
| 14) H | Mineral Oil (05-01-20) | 16.000 | 158170295 | 54.225 PPM |
| 15) H | Mineral Oil Combo (05... | 16.000 | 150577359 | 55.381 PPM |
| 16) H | Diesel Fuel #2 ACU (0... | 14.000 | 219166302 | 71.924 PPM |
| 17) H | Diesel Fuel #2 ACU Co... | 14.000 | 212007797 | 71.638 PPM |

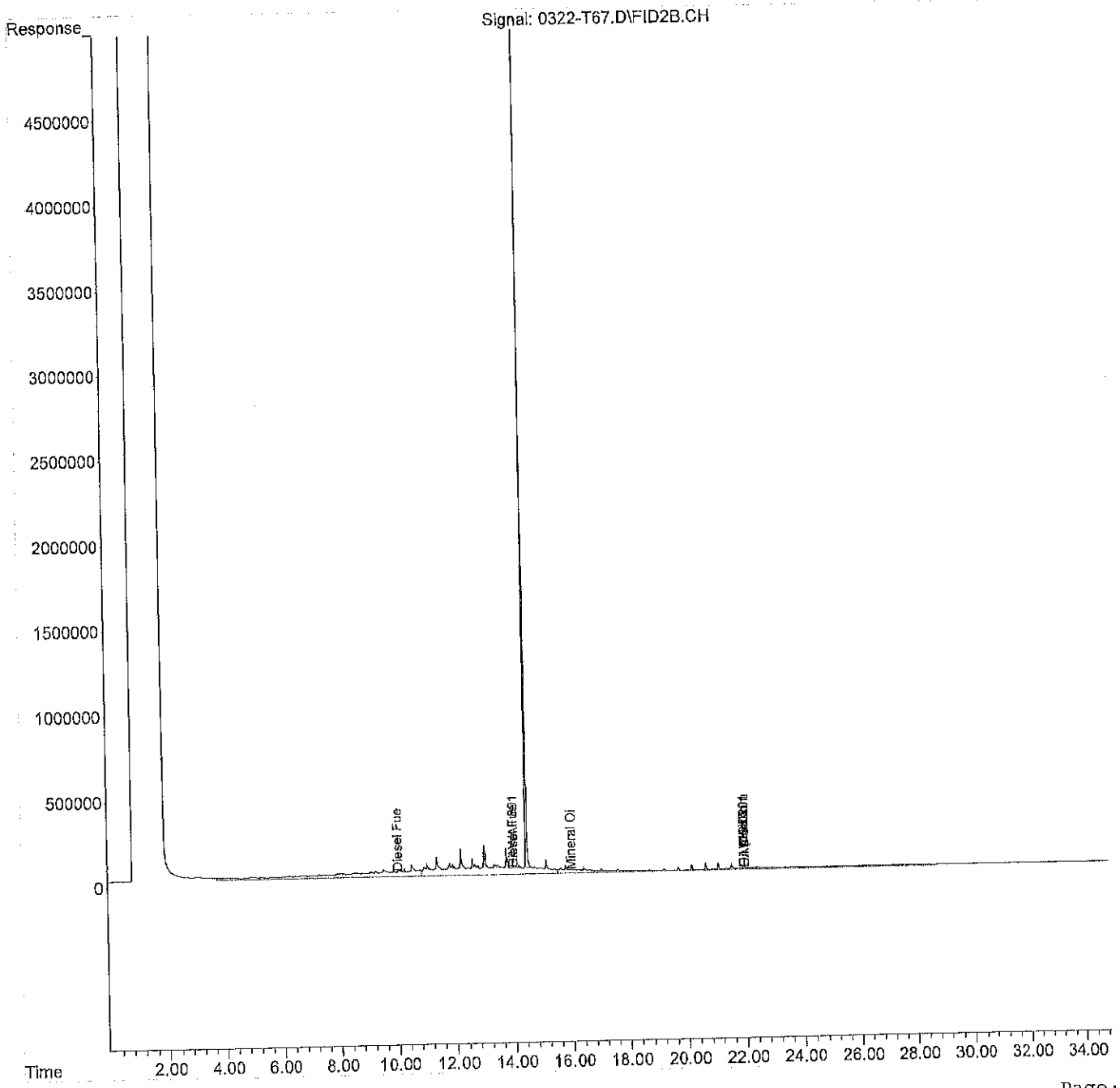
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\T210322.SEC\
Data File : 0322-T67.D
Signal(s) : FID2B.CH
Acq On : 22 Mar 2021 18:00
Operator : JT
Sample : SB0319S1 ACU
Misc :
ALS Vial : 67 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 22 18:36:11 2021
Quant Method : C:\MSDCHEM\1\METHODS\T200501R.M
Quant Title : GCTPH
QLast Update : Fri Feb 05 08:11:56 2021
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\T210322.SEC\
Data File : 0322-T58.D
Signal(s) : FID2B.CH
Acq On : 22 Mar 2021 11:28
Operator : JT
Sample : CCV0322R-T2
Misc :
ALS Vial : 58 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 22 12:04:00 2021
Quant Method : C:\MSDCHEM\1\METHODS\T200501R.M
Quant Title : GCTPH
QLast Update : Fri Feb 05 08:11:56 2021
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

| | Compound | R.T. | Response | Conc | Units |
|---|---|---|---|---|---|
| System Monitoring Compounds | | | | | |
| 1) S | O-Terphenyl (05-04-20) | 0.000 | 0 | N.D. | PPM |
| Spiked Amount | 50.000 | | Recovery = | 0.00% | |
| Target Compounds | | | | | |
| 2) H | Gasoline | 4.000 | 47268895 | NoCal | PPM |
| 3) H | Diesel Fuel #1 (05-27... | 10.000 | 279763667 | 100.325 | PPM |
| 4) H | Diesel Fuel #2 (01-23... | 14.000 | 278241328 | 107.785 | PPM |
| 5) H | Oil (05-01-20) | 22.000 | 67764241 | 23.121 | PPM |
| 6) H | Oil Acid Clean (05-01... | 22.000 | 67764241 | 12.776 | PPM |
| 7) H | Diesel Fuel #2 Combo ... | 14.000 | 271834292 | 108.313 | PPM |
| 8) H | Oil Combo (05-01-20) | 22.000 | 52968911 | 16.404 | PPM |
| 9) H | Oil Acid Clean Combo ... | 22.000 | 52968911 | 7.194 | PPM |
| 10) H | Oil MO Combo (05-01-20) | 22.000 | 47184752 | 14.431 | PPM |
| 11) H | Oil Acid Clean MO Com... | 22.000 | 47184752 | 5.477 | PPM |
| 12) H | HAWAII 8015M DF2 (05-... | 14.000 | 276721665 | 105.944 | PPM |
| 13) H | HAWAII 8015M Oil (05-... | 22.000 | 46440323 | 15.826 | PPM |
| 14) H | Mineral Oil (05-01-20) | 16.000 | 181340921 | 62.770 | PPM |
| 15) H | Mineral Oil Combo (05... | 16.000 | 175227633 | 64.830 | PPM |
| 16) H | Diesel Fuel #2 ACU (0... | 14.000 | 278241328 | 92.901 | PPM |
| 17) H | Diesel Fuel #2 ACU Co... | 14.000 | 271834292 | 93.425 | PPM |

(f)=RT Delta > 1/2 Window

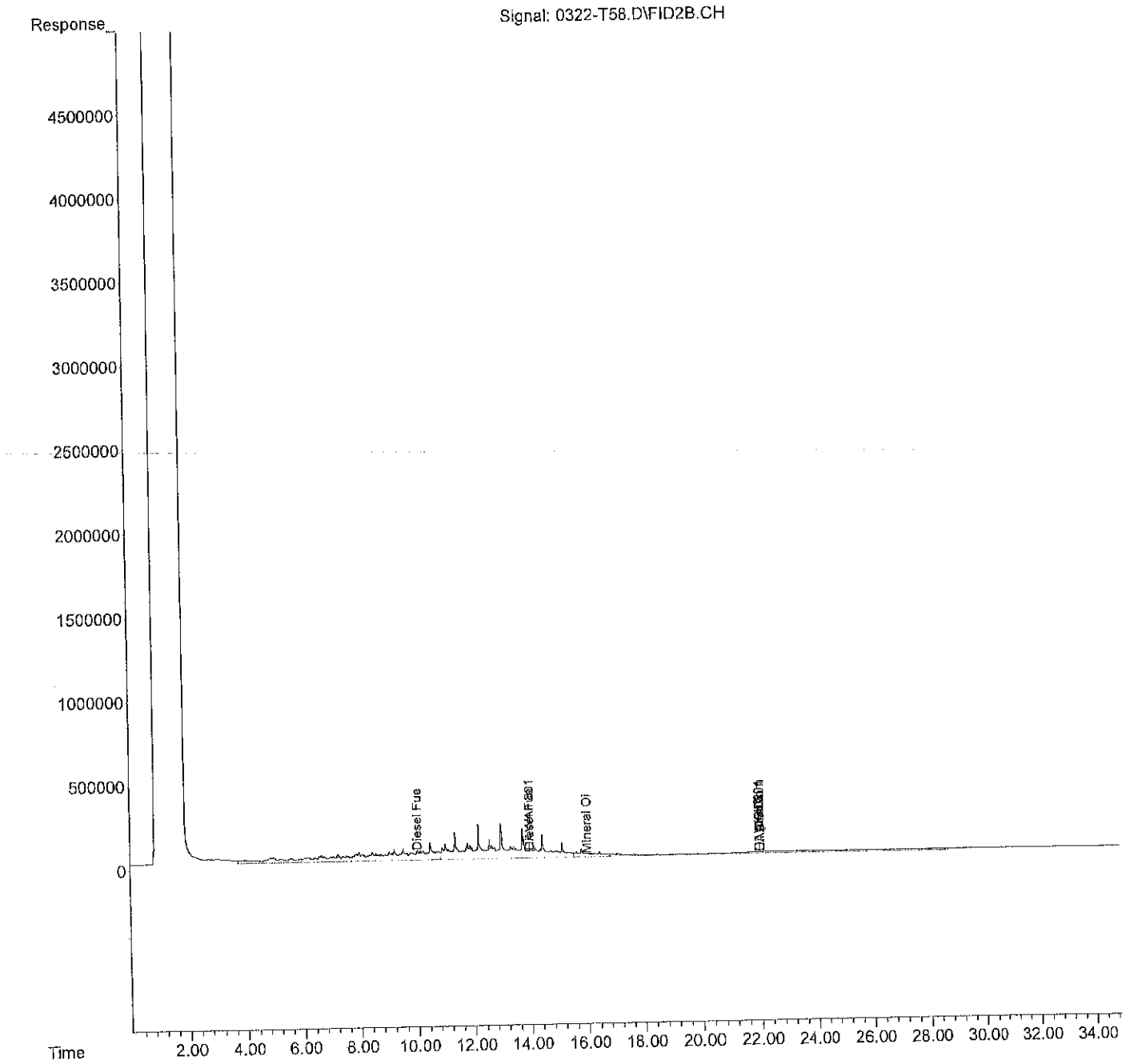
(m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\T210322.SEC\
Data File : 0322-T58.D
Signal(s) : FID2B.CH
Acq On : 22 Mar 2021 11:28
Operator : JT
Sample : CCV0322R-T2
Misc :
ALS Vial : 58 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 22 12:04:00 2021
Quant Method : C:\MSDCHEM\1\METHODS\T200501R.M
Quant Title : GCTPH
QLast Update : Fri Feb 05 08:11:56 2021
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\T210322.SEC\
Data File : 0322-T69.D
Signal(s) : FID2B.CH
Acq On : 22 Mar 2021 19:25
Operator : JT
Sample : CCV0322R-T3
Misc :
ALS Vial : 69 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 22 20:00:53 2021
Quant Method : C:\MSDCHEM\1\METHODS\T200501R.M
Quant Title : GCTPH
QLast Update : Fri Feb 05 08:11:56 2021
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :

| | Compound | R.T. | Response | Conc | Units |
|---|---|---|---|---|---|
| | System Monitoring Compounds | | | | |
| 1) S | O-Terphenyl (05-04-20) | 0.000 | 0 | N.D. | PPM |
| Spiked Amount | 50.000 | | Recovery = | 0.00% | |
| | Target Compounds | | | | |
| 2) H | Gasoline | 4.000 | 47496951 | NoCal | PPM |
| 3) H | Diesel Fuel #1 (05-27... | 10.000 | 274534587 | 98.365 | PPM |
| 4) H | Diesel Fuel #2 (01-23... | 14.000 | 271281450 | 104.927 | PPM |
| 5) H | Oil (05-01-20) | 22.000 | 53927280 | 15.599 | PPM |
| 6) H | Oil Acid Clean (05-01... | 22.000 | 53927280 | 6.638 | PPM |
| 7) H | Diesel Fuel #2 Combo ... | 14.000 | 265680154 | 105.724 | PPM |
| 8) H | Oil Combo (05-01-20) | 22.000 | 40033180 | 9.271 | PPM |
| 9) H | Oil Acid Clean Combo ... | 22.000 | 40033180 | 1.378 | PPM |
| 10) H | Oil MO Combo (05-01-20) | 22.000 | 34956846 | 7.505 | PPM |
| 11) H | Oil Acid Clean MO Com... | 22.000 | 34956846 | N.D. | PPM |
| 12) H | HAWAII 8015M DF2 (05-... | 14.000 | 269825223 | 103.173 | PPM |
| 13) H | HAWAII 8015M Oil (05-... | 22.000 | 34343541 | 9.000 | PPM |
| 14) H | Mineral Oil (05-01-20) | 16.000 | 174266327 | 60.161 | PPM |
| 15) H | Mineral Oil Combo (05... | 16.000 | 169894397 | 62.786 | PPM |
| 16) H | Diesel Fuel #2 ACU (0... | 14.000 | 271281450 | 90.429 | PPM |
| 17) H | Diesel Fuel #2 ACU Co... | 14.000 | 265680154 | 91.184 | PPM |

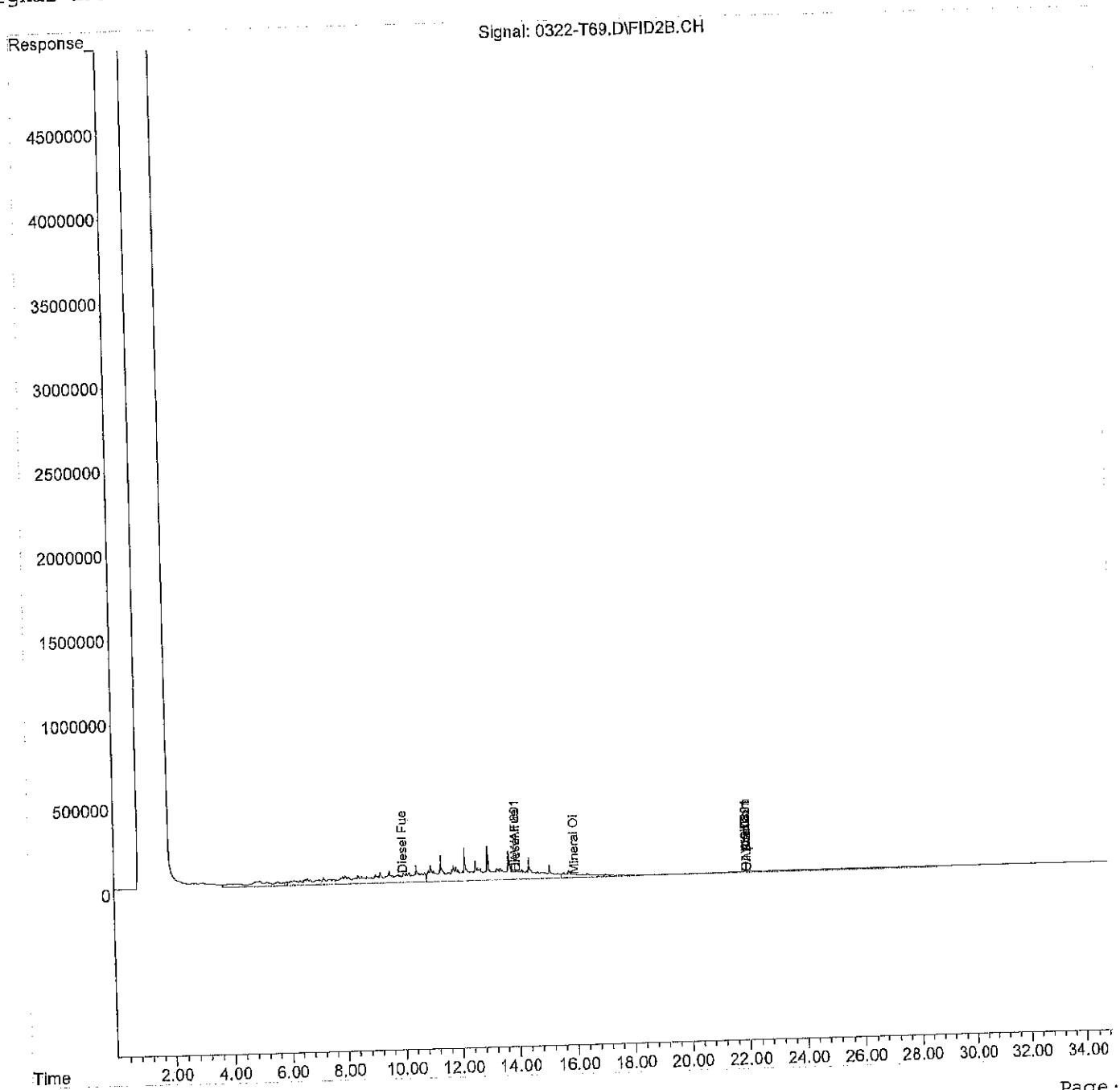
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\T210322.SEC\
Data File : 0322-T69.D
Signal(s) : FID2B.CH
Acq On : 22 Mar 2021 19:25
Operator : JT
Sample : CCV0322R-T3
Misc :
ALS Vial : 69 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 22 20:00:53 2021
Quant Method : C:\MSDCHEM\1\METHODS\T200501R.M
Quant Title : GCTPH
QLast Update : Fri Feb 05 08:11:56 2021
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
Signal Phase :
Signal Info :



# Volatiles Organics
# EPA 8260D Data

Quantitation Report (QT Reviewed)

Data File : X:\VOLATILE\ALBERT\DATA\A210319\A0319021.D Vial: 21
Acq On : 19 Mar 2021 6:25 pm Operator:
Sample : 03-219-01x Inst : Albert
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Mar 22 9:02 2021 Quant Results File: A210315Q.RES

Quant Method : F:\HPCHEM\1\METHODS\A210315Q.M (RTE Integrator)
Title : 8260 Calibration
Last Update : Tue Mar 16 09:05:28 2021
Response via : Initial Calibration
DataAcq Meth : A210315Q

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) Pentafluorobenzene | 3.69 | 168 | 857283 | 50.00 | ppb | 0.02 |
| 28) 1,4-Difluorobenzene | 4.37 | 114 | 1454761 | 50.00 | ppb | 0.02 |
| 38) Chlorobenzene-d5 | 7.09 | 117 | 1265317 | 50.00 | ppb | 0.02 |
| 55) 1,4-Dichlorobenzene-d4 | 9.35 | 152 | 719004 | 50.00 | ppb | 0.01 |
| **System Monitoring Compounds** | | | | | | |
| 23) Dibromofluoromethane | 3.61 | 111 | 454983 | 49.38 | ppb | 0.02 |
| Spiked Amount 50.000 | Range 74 - 131 | | Recovery = | 98.76% | | |
| 36) Toluene-d8 | 5.74 | 98 | 1720603 | 50.70 | ppb | 0.01 |
| Spiked Amount 50.000 | Range 78 - 128 | | Recovery = | 101.40% | | |
| 54) 4-Bromofluorobenzene | 8.22 | 95 | 632794 | 48.90 | ppb | 0.01 |
| Spiked Amount 50.000 | Range 71 - 130 | | Recovery = | 97.80% | | |
| **Target Compounds** | | | | | | Qvalue |
| 9) Acetone | 1.34 | 43 | 21386 | 4.31 | ppb | 93 |
| 11) Carbon Disulfide | 1.47 | 76 | 522850m | 11.87 | ppb | |

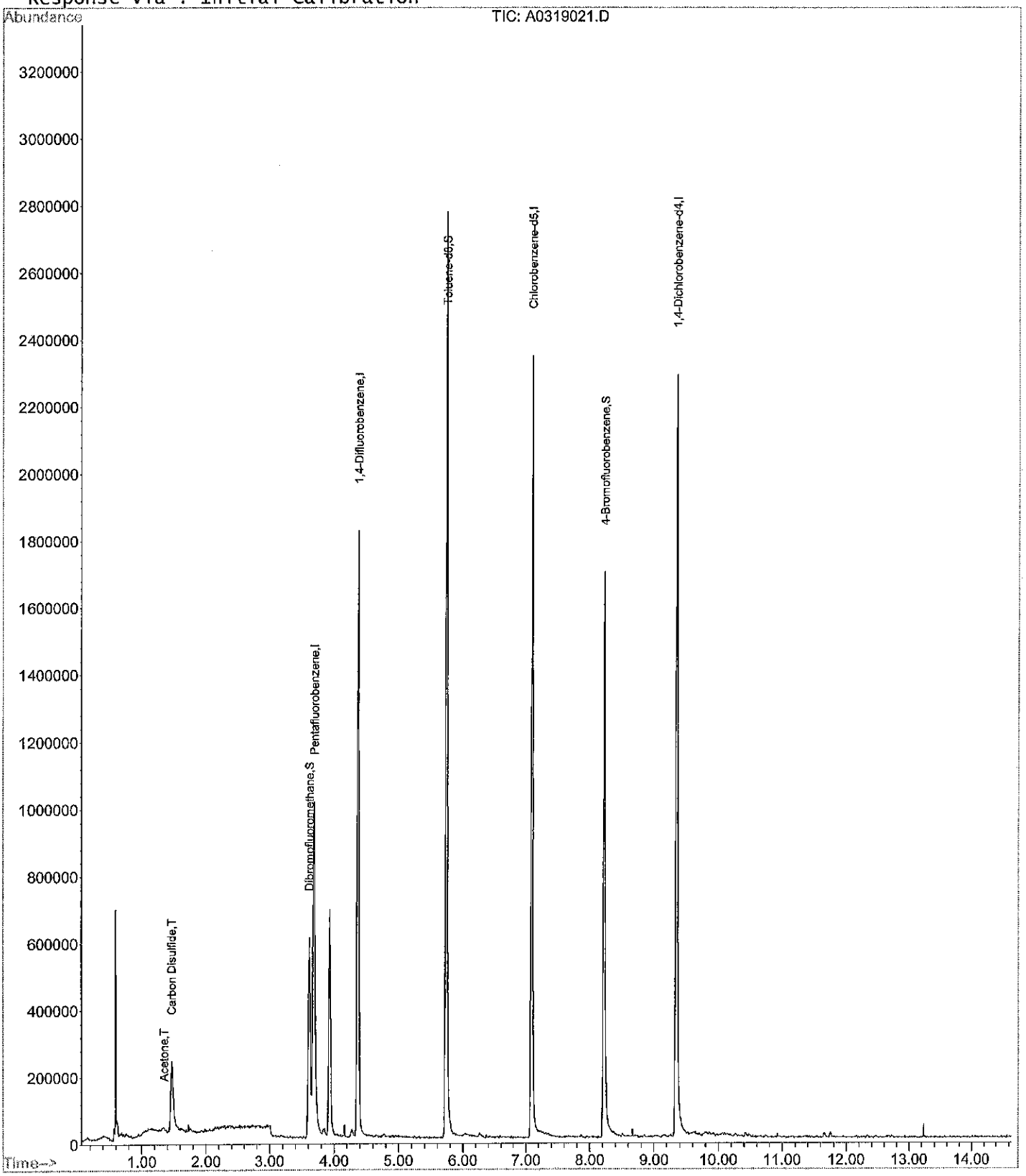
3/25/21

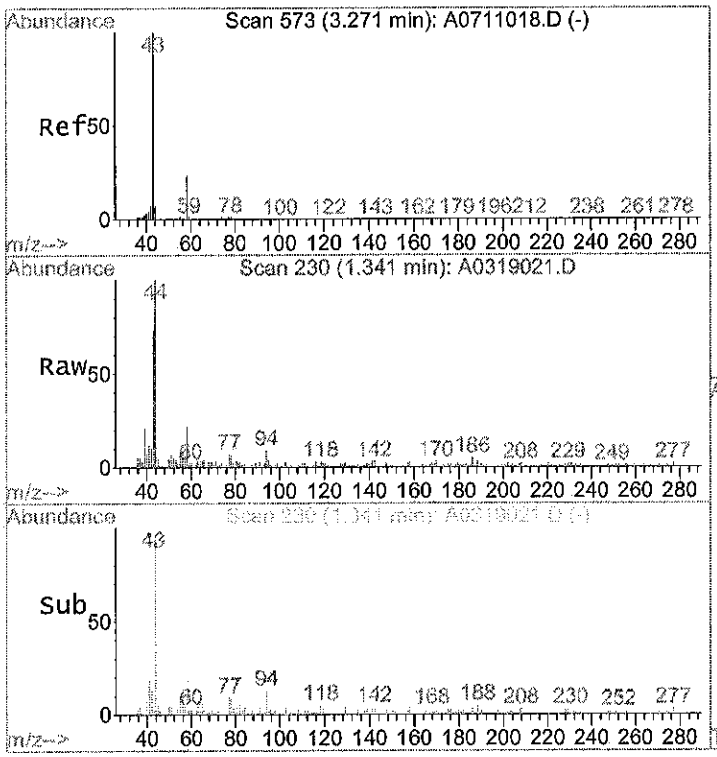
(#) = qualifier out of range (m) = manual integration
A0319021.D A210323Q.M Thu Mar 25 13:39:26 2021

Quantitation Report

Data File : X:\VOLATILE\ALBERT\DATA\A210319\A0319021.D Vial: 21
Acq On : 19 Mar 2021 6:25 pm Operator:
Sample : 03-219-01x Inst : Albert
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Mar 22 9:02 2021 Quant Results File: A210315Q.RES

Method : F:\HPCHEM\1\METHODS\A210323Q.M (RTE Integrator)
Title : 8260 Calibration
Last Update : Wed Mar 24 09:41:12 2021
Response via : Initial Calibration

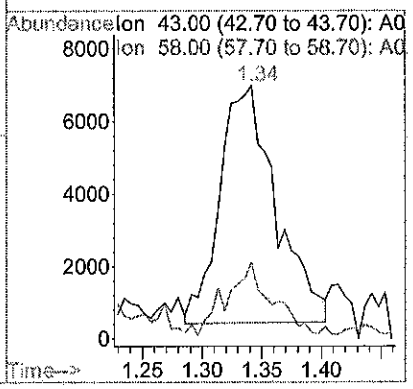


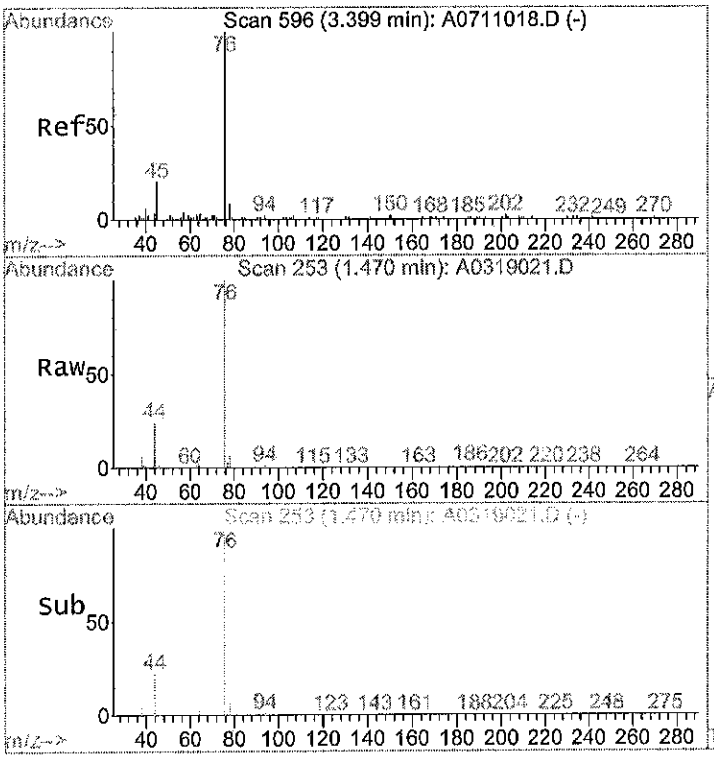



#9
Acetone
Concen: 4.31 ppb
RT: 1.34 min Scan# 230
Delta R.T. 0.01 min
Lab File: A0319021.D
Acq: 19 Mar 2021 6:25 pm

Tgt Ion: 43 Resp: 21386

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 43 | 100 | | |
| 58 | 23.4 | 21.8 | 32.6 |

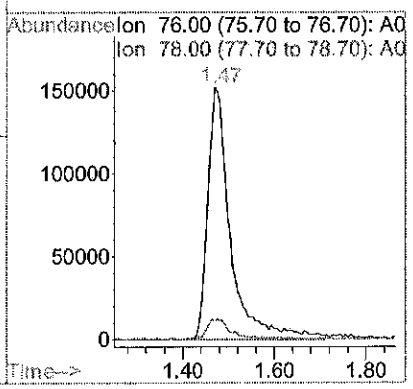



#11
Carbon Disulfide
Concen: 11.87 ppb m
RT: 1.47 min Scan# 253
Delta R.T. 0.02 min
Lab File: A0319021.D
Acq: 19 Mar 2021 6:25 pm

Tgt Ion: 76 Resp: 522850

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 76 | 100 | | |
| 78 | 7.9 | 6.5 | 9.7 |



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\W210323\
Data File : W032306.D
Acq On : 23 Mar 2021 11:02 am
Operator :
Sample : 03-219-03x RR
Misc :
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Mar 24 09:20:10 2021
Quant Method : C:\MSDCHEM\1\METHODS\W210203S.M
Quant Title :
QLast Update : Thu Feb 04 07:56:41 2021
Response via : Initial Calibration

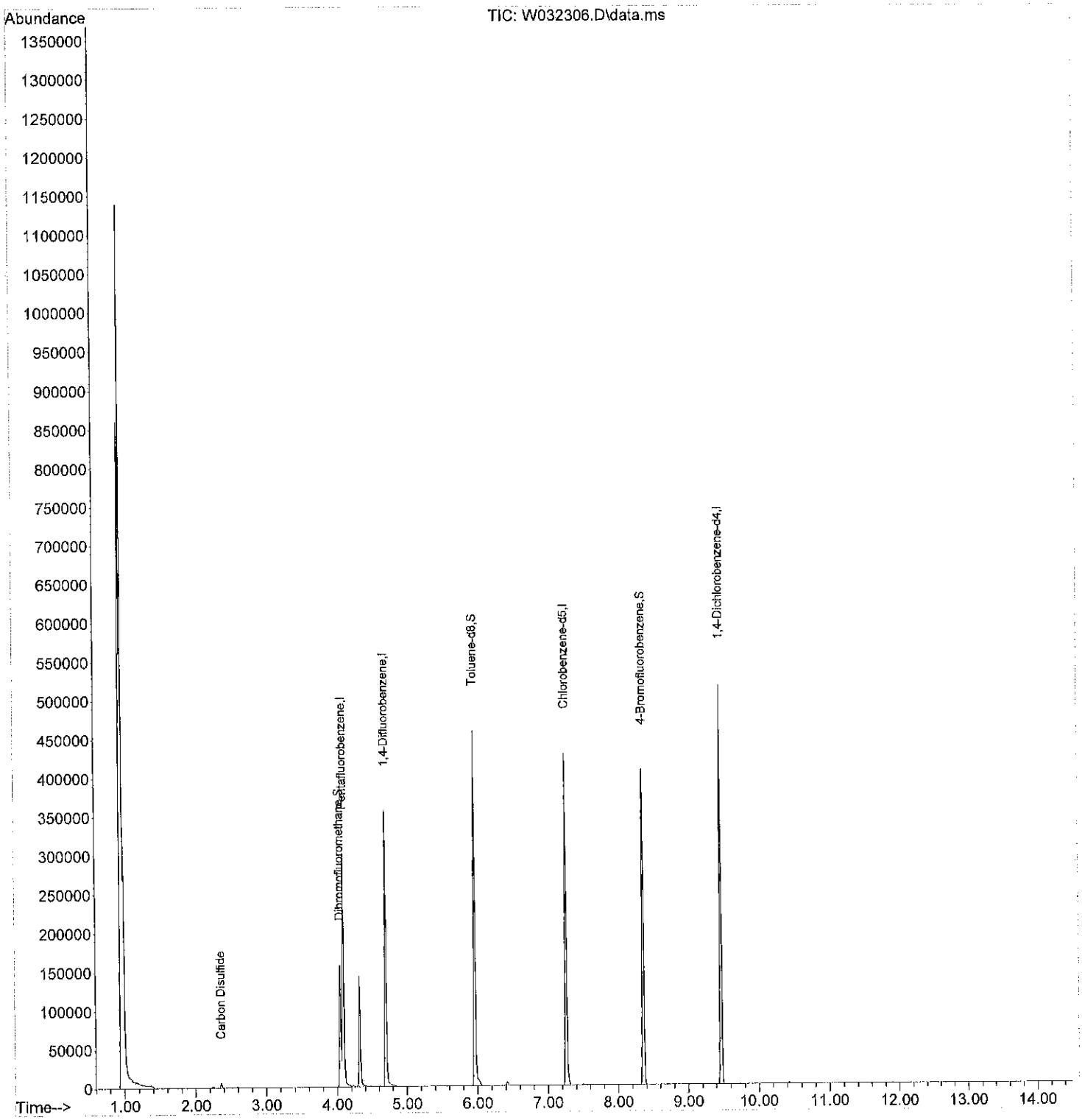
| Compound | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| Internal Standards | | | | | | |
| 1) Pentafluorobenzene | 4.091 | 168 | 153077 | 50.00 | ppb | 0.00 |
| 28) 1,4-Difluorobenzene | 4.697 | 114 | 209241 | 50.00 | ppb | 0.00 |
| 38) Chlorobenzene-d5 | 7.254 | 117 | 195295 | 50.00 | ppb | 0.00 |
| 55) 1,4-Dichlorobenzene-d4 | 9.466 | 152 | 108909 | 50.00 | ppb | 0.00 |
| System Monitoring Compounds | | | | | | |
| 23) Dibromofluoromethane | 4.045 | 111 | 71848 | 49.95 | ppb | 0.00 |
| Spiked Amount 50.000 | Range 76 - 131 | | Recovery = 99.90% | | | |
| 36) Toluene-d8 | 5.962 | 98 | 244926 | 51.14 | ppb | 0.00 |
| Spiked Amount 50.000 | Range 78 - 128 | | Recovery = 102.28% | | | |
| 54) 4-Bromofluorobenzene | 8.360 | 95 | 110849 | 50.71 | ppb | 0.00 |
| Spiked Amount 50.000 | Range 71 - 130 | | Recovery = 101.42% | | | |
| Target Compounds | | | | | | Qvalue |
| 11) Carbon Disulfide | 2.361 | 76 | 6790 | 2.51 | ppb | # 95 |

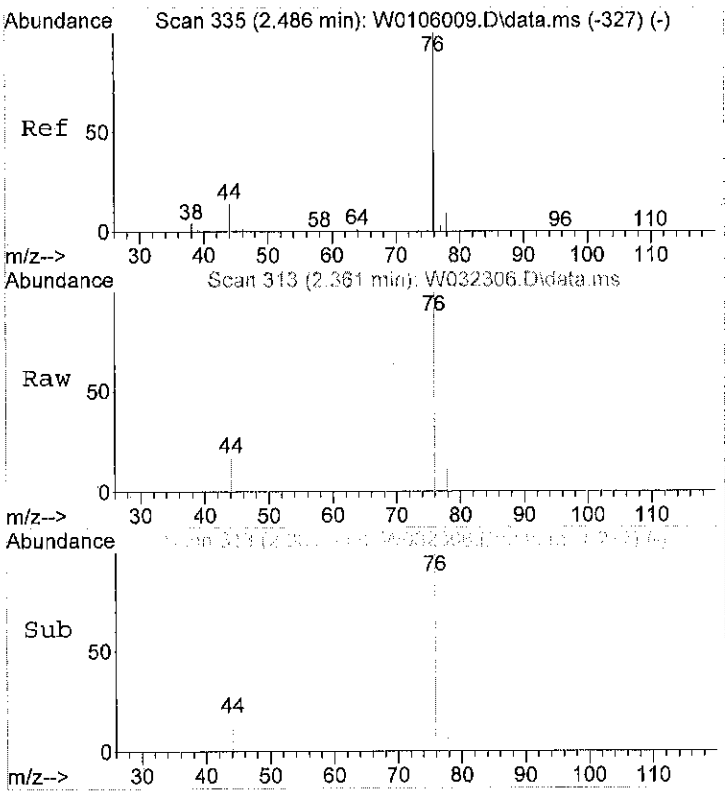
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\W210323\
Data File : W032306.D
Acq On : 23 Mar 2021 11:02 am
Operator :
Sample : 03-219-03x RR
Misc :
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Mar 24 09:20:10 2021
Quant Method : C:\MSDCHEM\1\METHODS\W210203S.M
Quant Title :
QLast Update : Thu Feb 04 07:56:41 2021
Response via : Initial Calibration

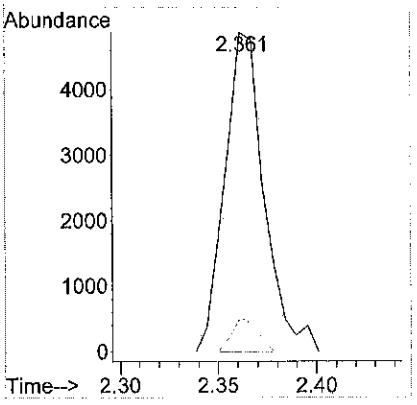





#11
Carbon Disulfide
Concen: 2.51 ppb
RT: 2.361 min Scan# 313
Delta R.T. -0.001 min
Lab File: W032306.D
Acq: 23 Mar 2021 11:02 am

Tgt Ion: 76 Resp: 6790

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 76 | 100 | | |
| 78 | 6.8 | 7.0 | 10.4# |



Quantitation Report (QT Reviewed)

Data File : X:\VOLATILE\ALBERT\DATA\A210319\A0319022.D Vial: 22
Acq On : 19 Mar 2021 6:54 pm Operator:
Sample : 03-219-04x Inst : Albert
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Mar 22 9:03 2021 Quant Results File: A210315Q.RES

Quant Method : F:\HPCHEM\1\METHODS\A210315Q.M (RTE Integrator)
Title : 8260 Calibration
Last Update : Tue Mar 16 09:05:28 2021
Response via : Initial Calibration
DataAcq Meth : A210315Q

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) Pentafluorobenzene | 3.69 | 168 | 827552 | 50.00 | ppb | 0.02 |
| 28) 1,4-Difluorobenzene | 4.37 | 114 | 1444472 | 50.00 | ppb | 0.02 |
| 38) Chlorobenzene-d5 | 7.09 | 117 | 1256593 | 50.00 | ppb | 0.02 |
| 55) 1,4-Dichlorobenzene-d4 | 9.34 | 152 | 709715 | 50.00 | ppb | 0.01 |
| **System Monitoring Compounds** | | | | | | |
| 23) Dibromofluoromethane | 3.61 | 111 | 443334 | 49.84 | ppb | 0.02 |
| Spiked Amount 50.000 | Range 74 - 131 | | Recovery = | 99.68% | | |
| 36) Toluene-d8 | 5.74 | 98 | 1698652 | 50.41 | ppb | 0.01 |
| Spiked Amount 50.000 | Range 78 - 128 | | Recovery = | 100.82% | | |
| 54) 4-Bromofluorobenzene | 8.22 | 95 | 611821 | 47.61 | ppb | 0.01 |
| Spiked Amount 50.000 | Range 71 - 130 | | Recovery = | 95.22% | | |
| **Target Compounds** | | | | | | Qvalue |
| 9) Acetone | 1.33 | 43 | 43473 | 9.08 | ppb | # 84 |
| 11) Carbon Disulfide | 1.47 | 76 | 416610m | 9.80 | ppb | |
| 19) 2-Butanone | 3.17 | 43 | 7960 | 1.62 | ppb | 96 |

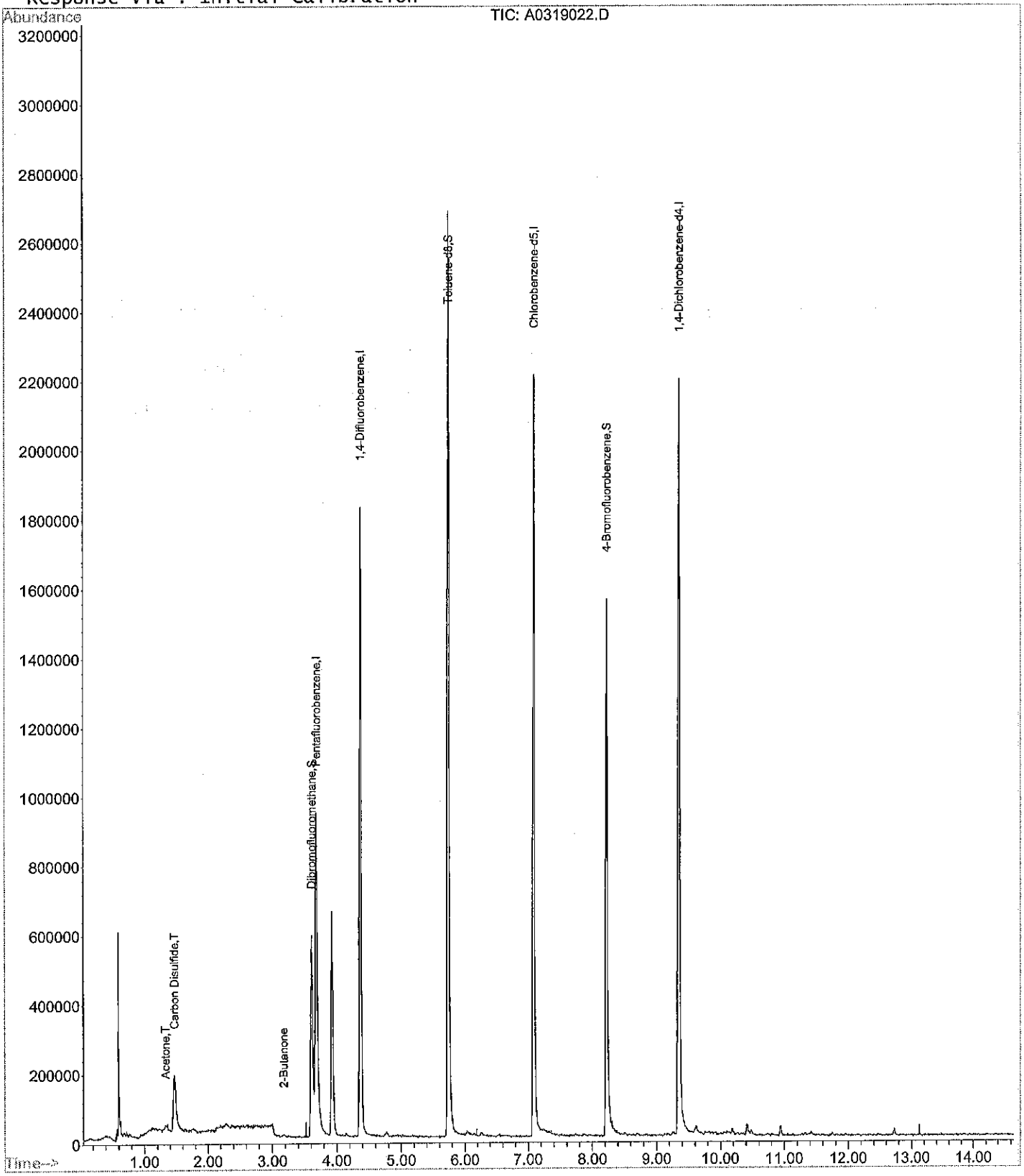
3/25/21 pw

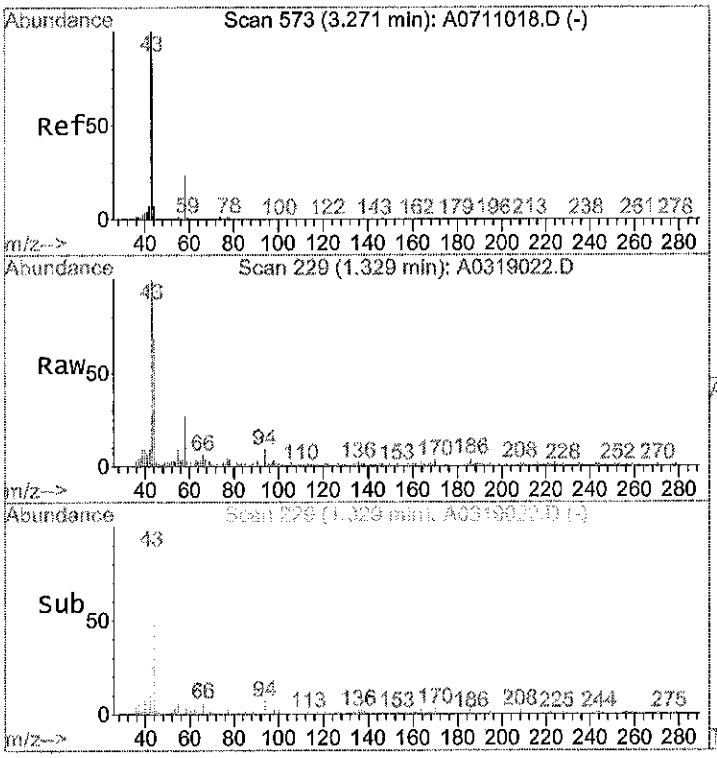
(#) = qualifier out of range (m) = manual integration
A0319022.D A210323Q.M Thu Mar 25 13:39:41 2021

Quantitation Report

Data File : X:\VOLATILE\ALBERT\DATA\A210319\A0319022.D Vial: 22
Acq On : 19 Mar 2021 6:54 pm Operator:
Sample : 03-219-04x Inst : Albert
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Mar 22 9:03 2021 Quant Results File: A210315Q.RES

Method : F:\HPCHEM\1\METHODS\A210323Q.M (RTE Integrator)
Title : 8260 Calibration
Last Update : Wed Mar 24 09:41:12 2021
Response via : Initial Calibration

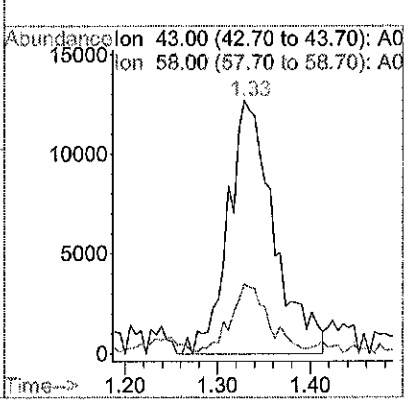


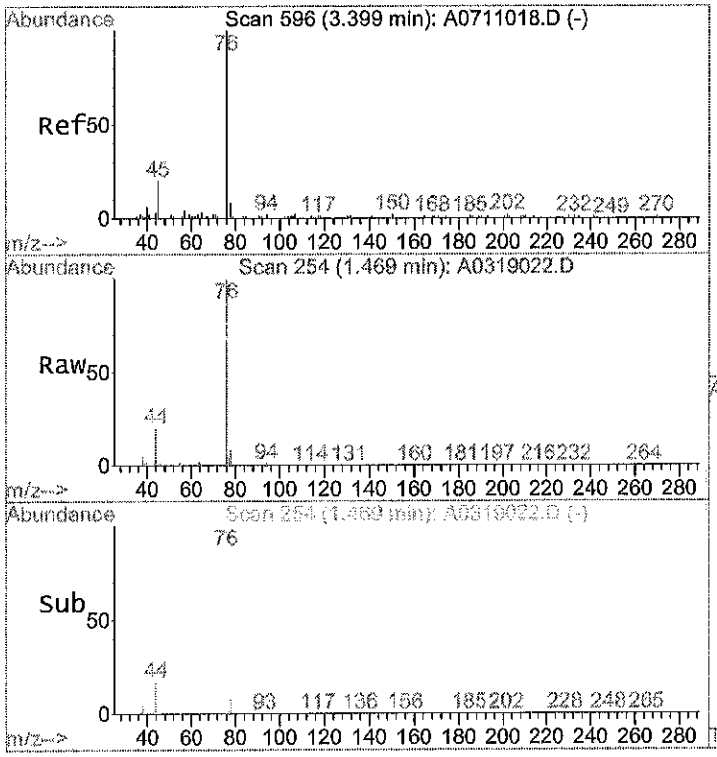



#9
Acetone
Concen: 9.08 ppb
RT: 1.33 min Scan# 229
Delta R.T. 0.00 min
Lab File: A0319022.D
Acq: 19 Mar 2021 6:54 pm

Tgt Ion: 43 Resp: 43473

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 43 | 100 | | |
| 58 | 19.1 | 21.8 | 32.6# |

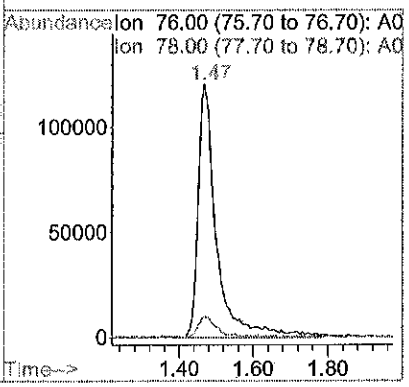


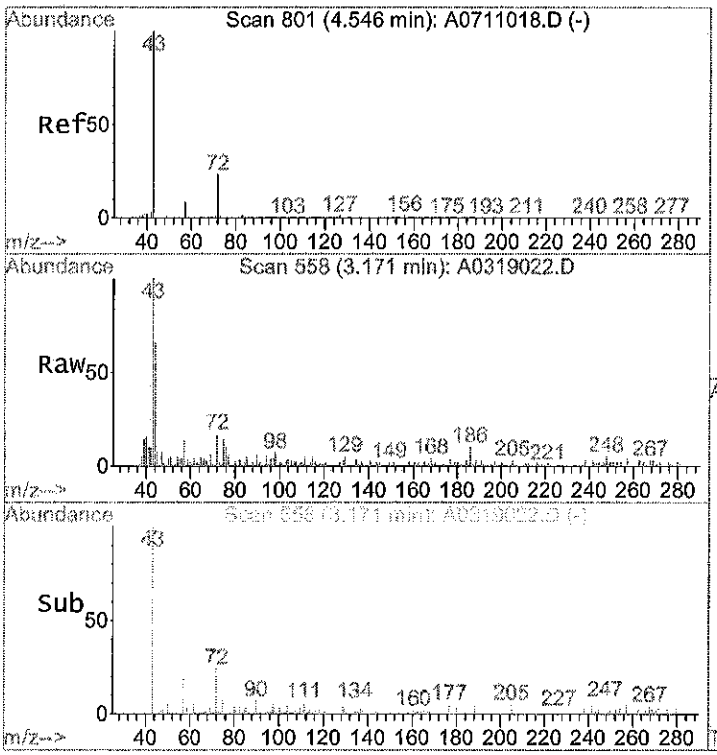




#11
Carbon Disulfide
Concen: 9.80 ppb m
RT: 1.47 min Scan# 254
Delta R.T. 0.02 min
Lab File: A0319022.D
Acq: 19 Mar 2021 6:54 pm

Tgt Ion: 76 Resp: 416610

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 76 | 100 | | |
| 78 | 7.9 | 6.5 | 9.7 |

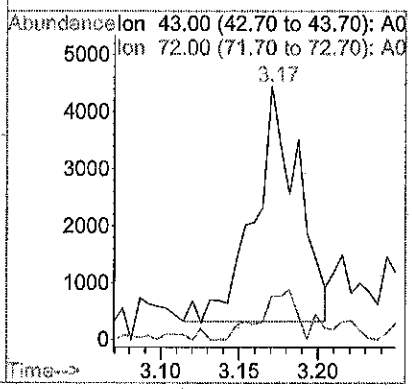





#19
2-Butanone
Concen: 1.62 ppb
RT: 3.17 min Scan# 558
Delta R.T. 0.01 min
Lab File: A0319022.D
Acq: 19 Mar 2021 6:54 pm

Tgt Ion: 43 Resp: 7960

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 43 | 100 | | |
| 72 | 17.0 | 14.9 | 22.3 |



Quantitation Report (QT Reviewed)

Data File : X:\VOLATILE\ALBERT\DATA\A210319\A0319023.D Vial: 23
Acq On : 19 Mar 2021 7:23 pm Operator:
Sample : 03-219-05x Inst : Albert
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Mar 22 9:04 2021 Quant Results File: A210315Q.RES

Quant Method : F:\HPCHEM\1\METHODS\A210315Q.M (RTE Integrator)
Title : 8260 Calibration
Last Update : Tue Mar 16 09:05:28 2021
Response via : Initial Calibration
DataAcq Meth : A210315Q

| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) Pentafluorobenzene | 3.68 | 168 | 797592 | 50.00 | ppb | 0.02 |
| 28) 1,4-Difluorobenzene | 4.37 | 114 | 1415217 | 50.00 | ppb | 0.02 |
| 38) Chlorobenzene-d5 | 7.09 | 117 | 1219275 | 50.00 | ppb | 0.02 |
| 55) 1,4-Dichlorobenzene-d4 | 9.34 | 152 | 682933 | 50.00 | ppb | 0.00 |
| **System Monitoring Compounds** | | | | | | |
| 23) Dibromofluoromethane | 3.61 | 111 | 429164 | 50.06 | ppb | 0.02 |
| Spiked Amount 50.000 | Range 74 - 131 | | Recovery = | 100.12% | | |
| 36) Toluene-d8 | 5.74 | 98 | 1639659 | 49.67 | ppb | 0.00 |
| Spiked Amount 50.000 | Range 78 - 128 | | Recovery = | 99.34% | | |
| 54) 4-Bromofluorobenzene | 8.22 | 95 | 606306 | 48.63 | ppb | 0.00 |
| Spiked Amount 50.000 | Range 71 - 130 | | Recovery = | 97.26% | | |
| **Target Compounds** | | | | | | Qvalue |
| 9) Acetone | 1.33 | 43 | 22625m | 4.90 | ppb | |
| 11) Carbon Disulfide | 1.47 | 76 | 165013m | 4.03 | ppb | |

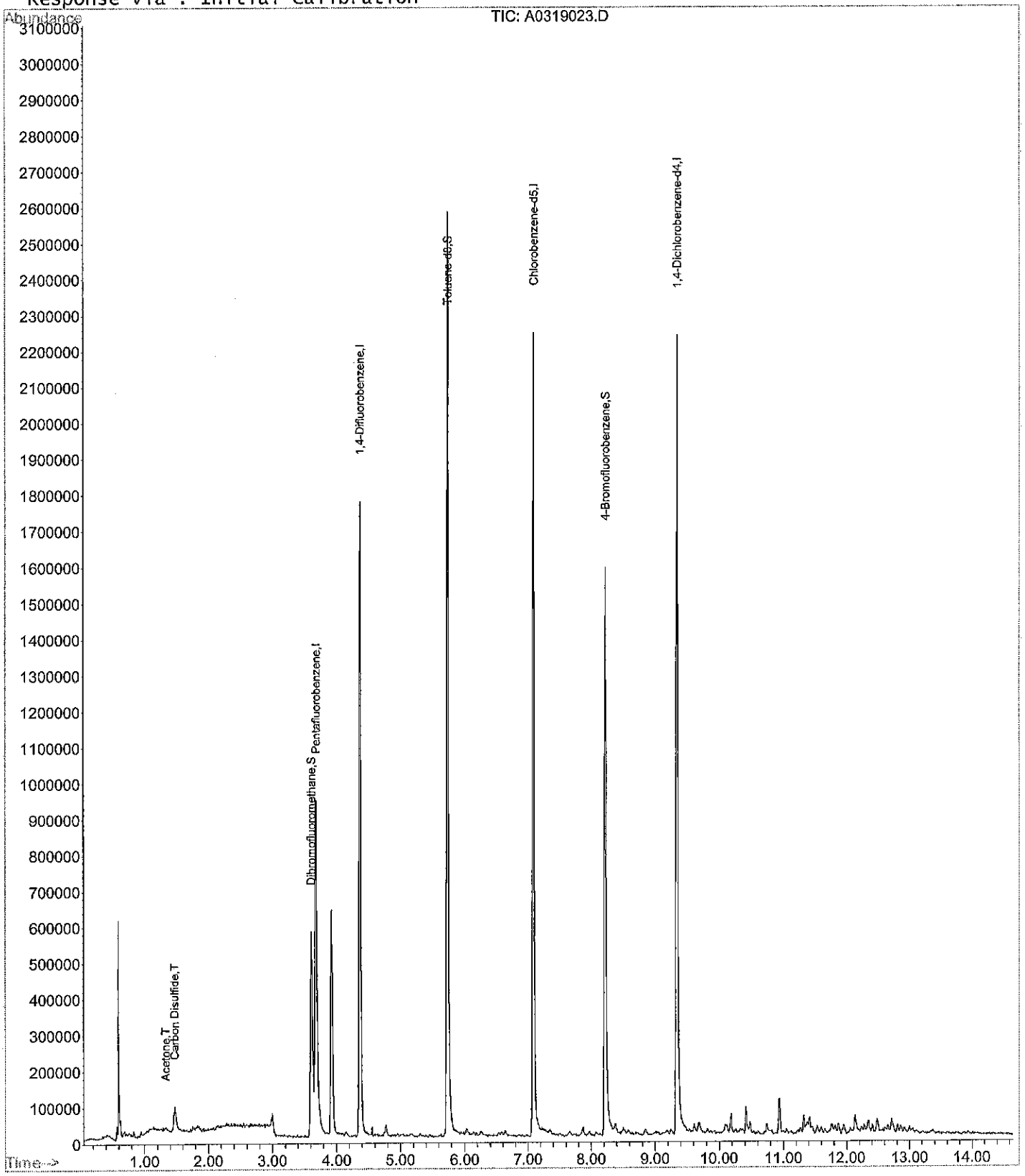
3/25/21 QC

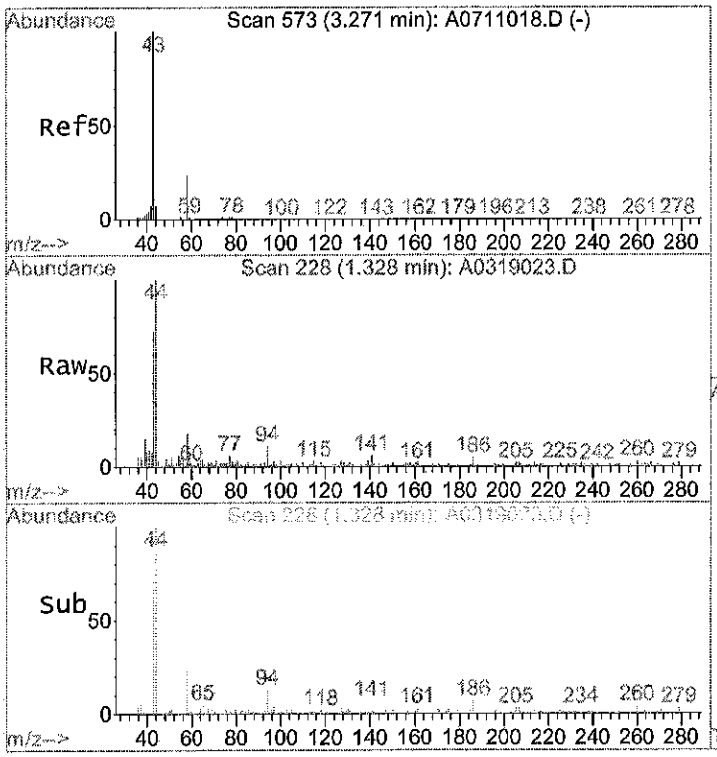
(#) = qualifier out of range (m) = manual integration
A0319023.D A210323Q.M Thu Mar 25 13:40:01 2021

Quantitation Report

Data File : X:\VOLATILE\ALBERT\DATA\A210319\A0319023.D Vial: 23
Acq On : 19 Mar 2021 7:23 pm Operator:
Sample : 03-219-05x Inst : Albert
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Mar 22 9:04 2021 Quant Results File: A210315Q.RES

Method : F:\HPCHEM\1\METHODS\A210323Q.M (RTE Integrator)
Title : 8260 Calibration
Last Update : Wed Mar 24 09:41:12 2021
Response via : Initial Calibration

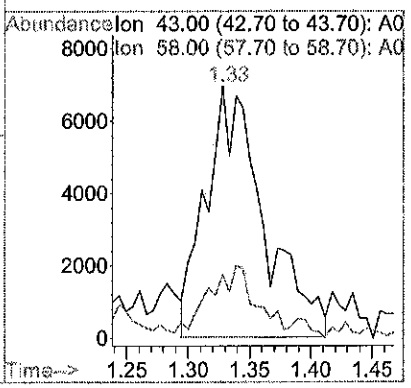


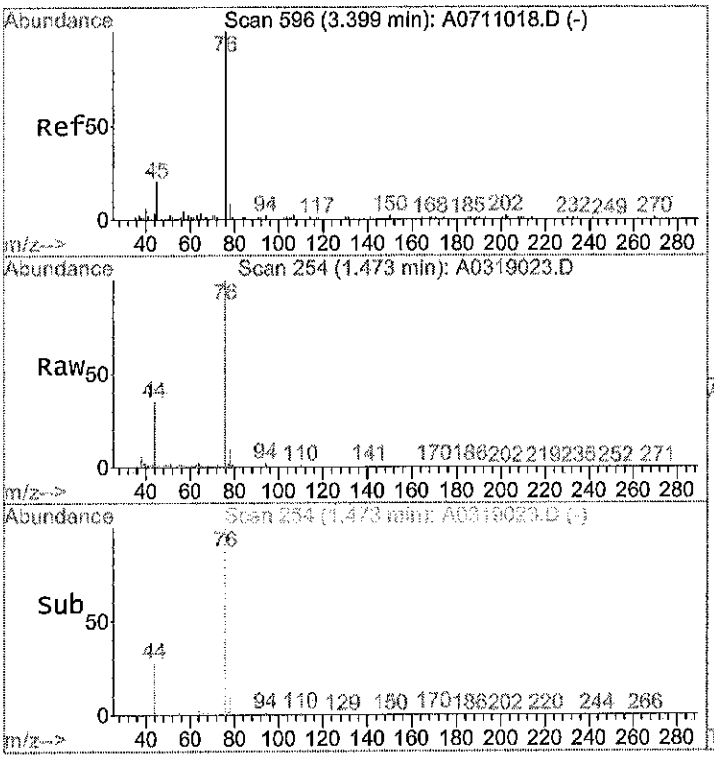



#9
Acetone
Concen: 4.90 ppb m
RT: 1.33 min Scan# 228
Delta R.T. -0.00 min
Lab File: A0319023.D
Acq: 19 Mar 2021 7:23 pm

Tgt Ion: 43 Resp: 22625

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 43 | 100 | | |
| 58 | 24.3 | 21.8 | 32.6 |

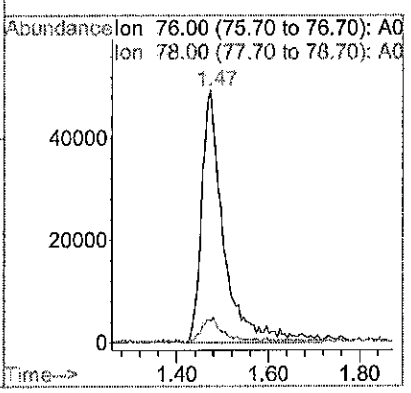



#11
Carbon Disulfide
Concen: 4.03 ppb m
RT: 1.47 min Scan# 254
Delta R.T. 0.03 min
Lab File: A0319023.D
Acq: 19 Mar 2021 7:23 pm

Tgt Ion: 76 Resp: 165013

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 76 | 100 | | |
| 78 | 9.6 | 6.5 | 9.7 |



Quantitation Report (QT Reviewed)

Data File : X:\VOLATILE\ALBERT\DATA\A210319\A0319024.D Vial: 24
Acq On : 19 Mar 2021 7:52 pm Operator:
Sample : 03-219-06x Inst : Albert
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Mar 22 9:05 2021 Quant Results File: A210315Q.RES

Quant Method : F:\HPCHEM\1\METHODS\A210315Q.M (RTE Integrator)
Title : 8260 Calibration
Last Update : Tue Mar 16 09:05:28 2021
Response via : Initial Calibration
DataAcq Meth : A210315Q

| Internal Standards | R.T. | QIon | Response | Conc | Units | | Dev(Min) |
|---|---|---|---|---|---|---|---|
| 1) Pentafluorobenzene | 3.69 | 168 | 792833 | 50.00 | ppb | | 0.02 |
| 28) 1,4-Difluorobenzene | 4.37 | 114 | 1405002 | 50.00 | ppb | | 0.02 |
| 38) Chlorobenzene-d5 | 7.09 | 117 | 1233810 | 50.00 | ppb | | 0.02 |
| 55) 1,4-Dichlorobenzene-d4 | 9.35 | 152 | 654337 | 50.00 | ppb | | 0.01 |
| **System Monitoring Compounds** | | | | | | | |
| 23) Dibromofluoromethane | 3.61 | 111 | 437310 | 51.32 | ppb | | 0.02 |
| Spiked Amount 50.000 | Range 74 - 131 | | Recovery = 102.64% | | | | |
| 36) Toluene-d8 | 5.74 | 98 | 1629762 | 49.73 | ppb | | 0.01 |
| Spiked Amount 50.000 | Range 78 - 128 | | Recovery = 99.46% | | | | |
| 54) 4-Bromofluorobenzene | 8.22 | 95 | 587491 | 46.56 | ppb | | 0.01 |
| Spiked Amount 50.000 | Range 71 - 130 | | Recovery = 93.12% | | | | |
| **Target Compounds** | | | | | | | Qvalue |
| 9) Acetone | 1.34 | 43 | 40276 | 8.78 | ppb | | 97 |
| 11) Carbon Disulfide | 1.47 | 76 | 294307m | 7.22 | ppb | | |
| 19) 2-Butanone | 3.18 | 43 | 8731 | 1.86 | ppb | # | 81 |

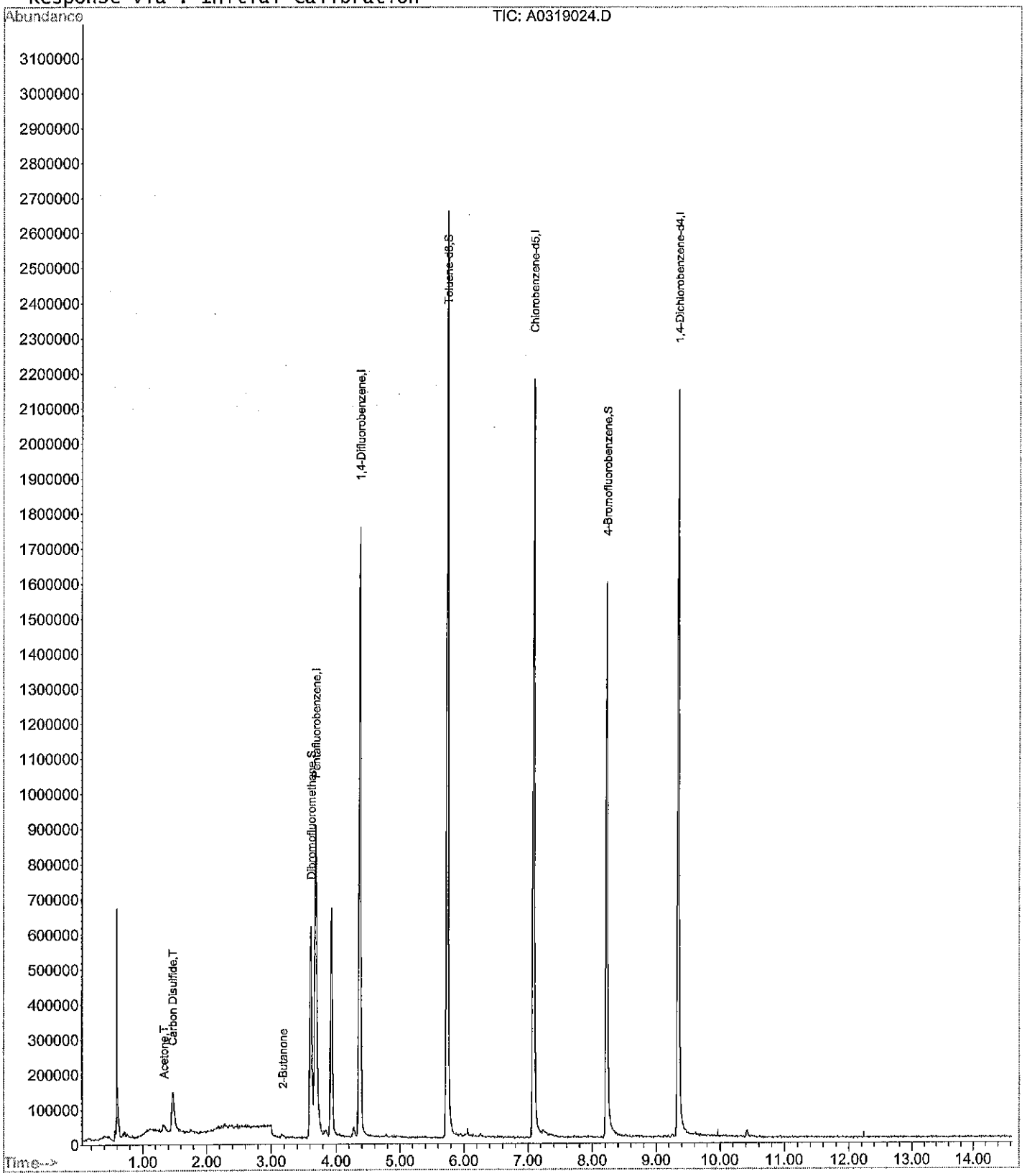
3/25/21

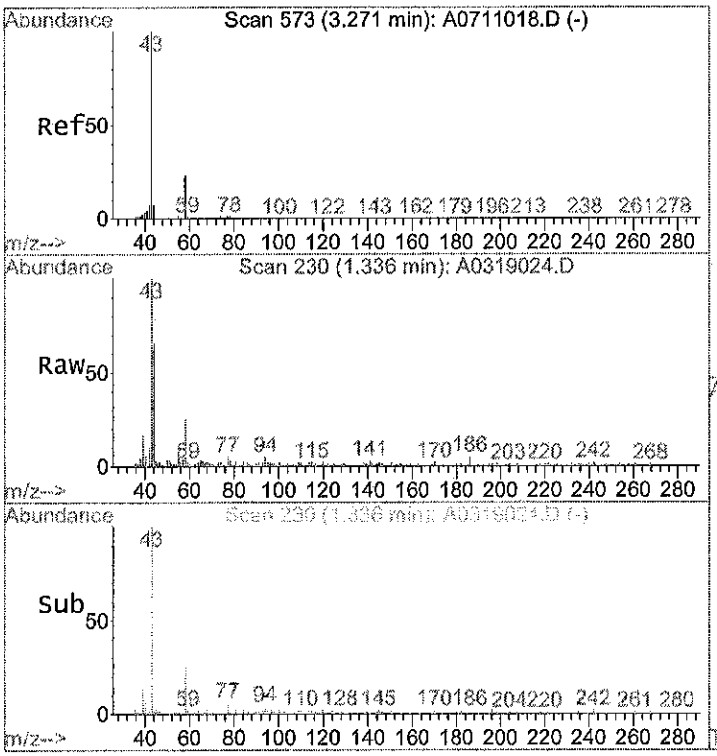
(#) = qualifier out of range (m) = manual integration
A0319024.D A210323Q.M Thu Mar 25 13:40:40 2021

Quantitation Report

Data File : X:\VOLATILE\ALBERT\DATA\A210319\A0319024.D Vial: 24
Acq On : 19 Mar 2021 7:52 pm Operator:
Sample : 03-219-06x Inst : Albert
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Mar 22 9:05 2021 Quant Results File: A210315Q.RES

Method : F:\HPCHEM\1\METHODS\A210323Q.M (RTE Integrator)
Title : 8260 Calibration
Last Update : Wed Mar 24 09:41:12 2021
Response via : Initial Calibration

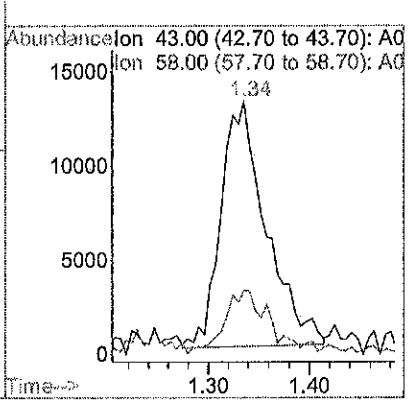


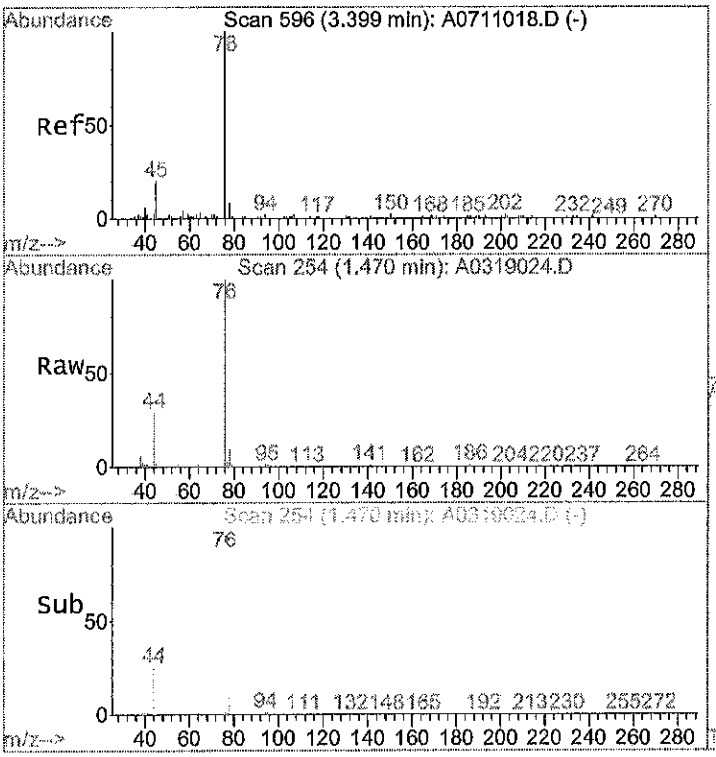



#9
Acetone
Concen: 8.78 ppb
RT: 1.34 min Scan# 230
Delta R.T. 0.01 min
Lab File: A0319024.D
Acq: 19 Mar 2021 7:52 pm

Tgt Ion: 43 Resp: 40276

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 43 | 100 | | |
| 58 | 25.7 | 21.8 | 32.6 |

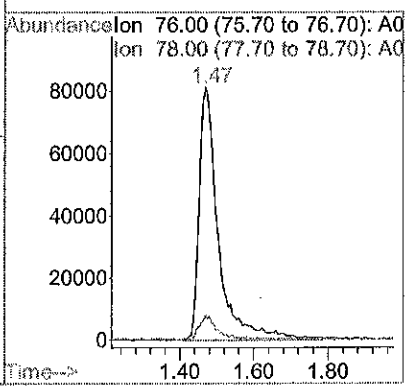


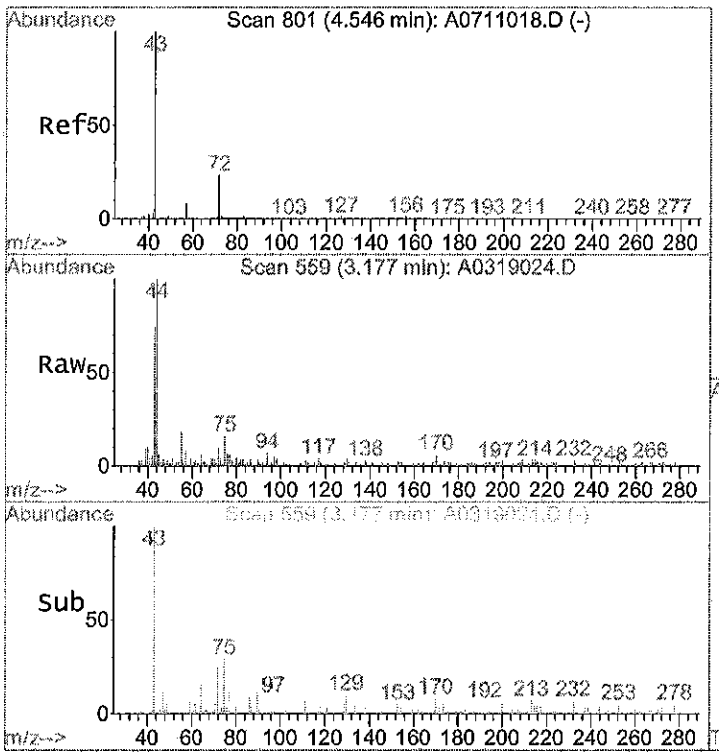




#11
Carbon Disulfide
Concen: 7.22 ppb m
RT: 1.47 min Scan# 254
Delta R.T. 0.02 min
Lab File: A0319024.D
Acq: 19 Mar 2021 7:52 pm

Tgt Ion: 76 Resp: 294307

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 76 | 100 | | |
| 78 | 7.5 | 6.5 | 9.7 |

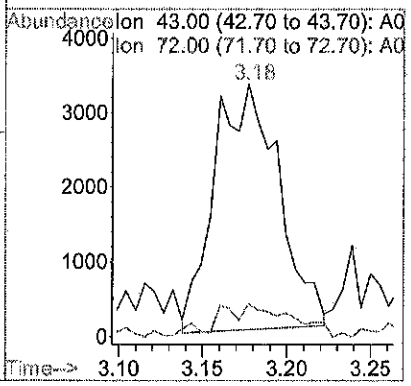





#19
2-Butanone
Concen: 1.86 ppb
RT: 3.18 min Scan# 559
Delta R.T. 0.02 min
Lab File: A0319024.D
Acq: 19 Mar 2021 7:52 pm

Tgt Ion: 43 Resp: 8731

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 43 | 100 | | |
| 72 | 10.0 | 14.9 | 22.3# |



Quantitation Report (QT Reviewed)

Data File : X:\VOLATILE\ALBERT\DATA\A210319\A0319006.D Vial: 6
Acq On : 19 Mar 2021 10:58 am Operator:
Sample : MB0319S1 Inst : Albert
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Mar 22 8:30 2021 Quant Results File: A210315Q.RES

Quant Method : F:\HPCHEM\1\METHODS\A210315Q.M (RTE Integrator)
Title : 8260 Calibration
Last Update : Tue Mar 16 09:05:28 2021
Response via : Initial Calibration
DataAcq Meth : A210315Q

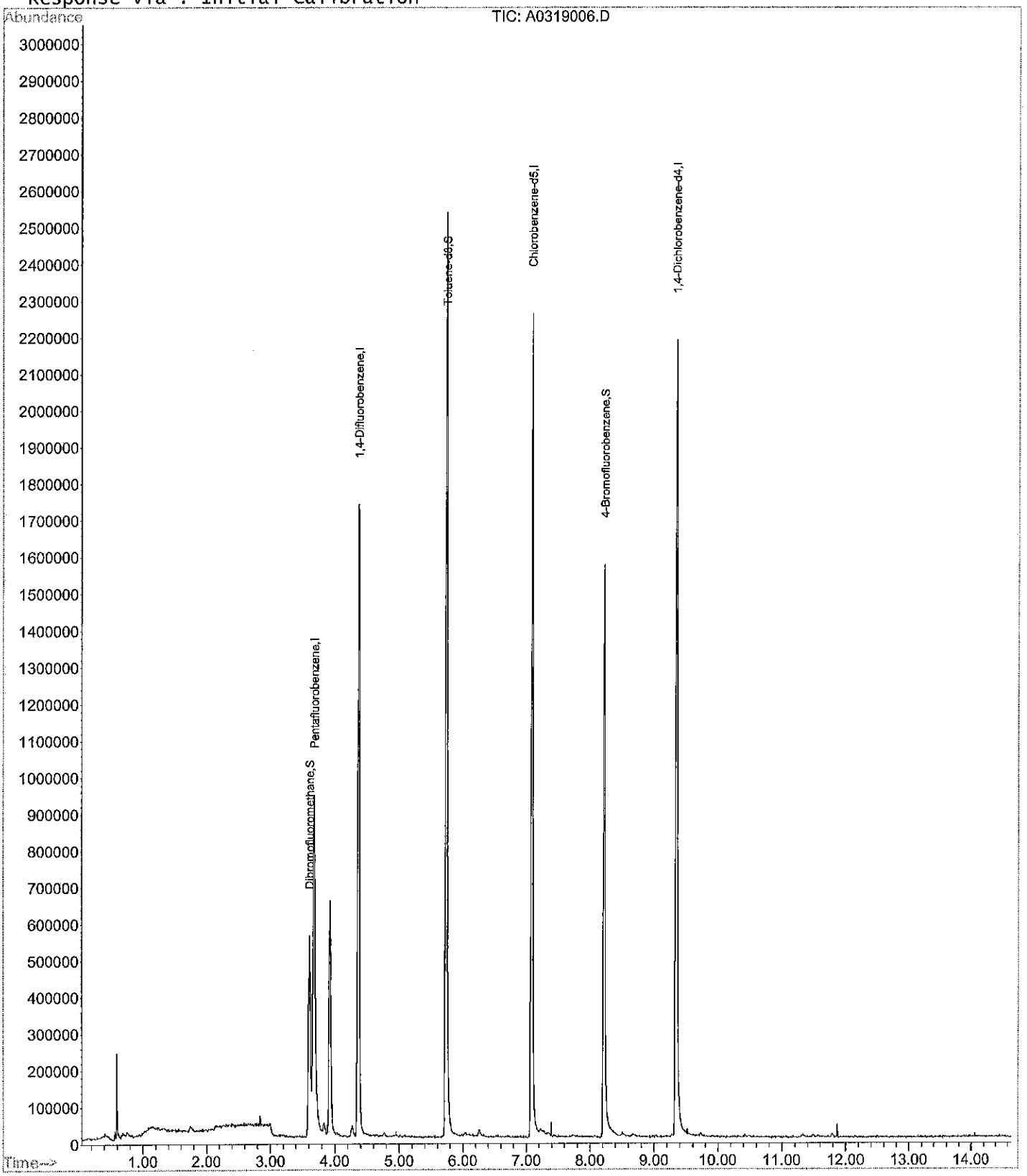
| Internal Standards | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| 1) Pentafluorobenzene | 3.68 | 168 | 808388 | 50.00 | ppb | 0.01 |
| 28) 1,4-Difluorobenzene | 4.37 | 114 | 1416942 | 50.00 | ppb | 0.02 |
| 38) Chlorobenzene-d5 | 7.08 | 117 | 1220124 | 50.00 | ppb | 0.01 |
| 55) 1,4-Dichlorobenzene-d4 | 9.35 | 152 | 703650 | 50.00 | ppb | 0.01 |
| **System Monitoring Compounds** | | | | | | |
| 23) Dibromofluoromethane | 3.61 | 111 | 427482 | 49.20 | ppb | 0.01 |
| Spiked Amount 50.000 | Range 74 - 131 | | Recovery = | 98.40% | | |
| 36) Toluene-d8 | 5.74 | 98 | 1630248 | 49.32 | ppb | 0.01 |
| Spiked Amount 50.000 | Range 78 - 128 | | Recovery = | 98.64% | | |
| 54) 4-Bromofluorobenzene | 8.21 | 95 | 602250 | 48.27 | ppb | 0.00 |
| Spiked Amount 50.000 | Range 71 - 130 | | Recovery = | 96.54% | | |
| **Target Compounds** | | | | | | Qvalue |

(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : X:\VOLATILE\ALBERT\DATA\A210319\A0319006.D Vial: 6
Acq On : 19 Mar 2021 10:58 am Operator:
Sample : MB0319S1 Inst : Albert
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Mar 22 8:30 2021 Quant Results File: A210315Q.RES

Method : F:\HPCHEM\1\METHODS\A210323Q.M (RTE Integrator)
Title : 8260 Calibration
Last Update : Wed Mar 24 09:41:12 2021
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\W210323\
Data File : W032305.D
Acq On : 23 Mar 2021 10:30 am
Operator :
Sample : MB0323S1
Misc :
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Mar 24 09:19:39 2021
Quant Method : C:\MSDCHEM\1\METHODS\W210203S.M
Quant Title :
QLast Update : Thu Feb 04 07:56:41 2021
Response via : Initial Calibration

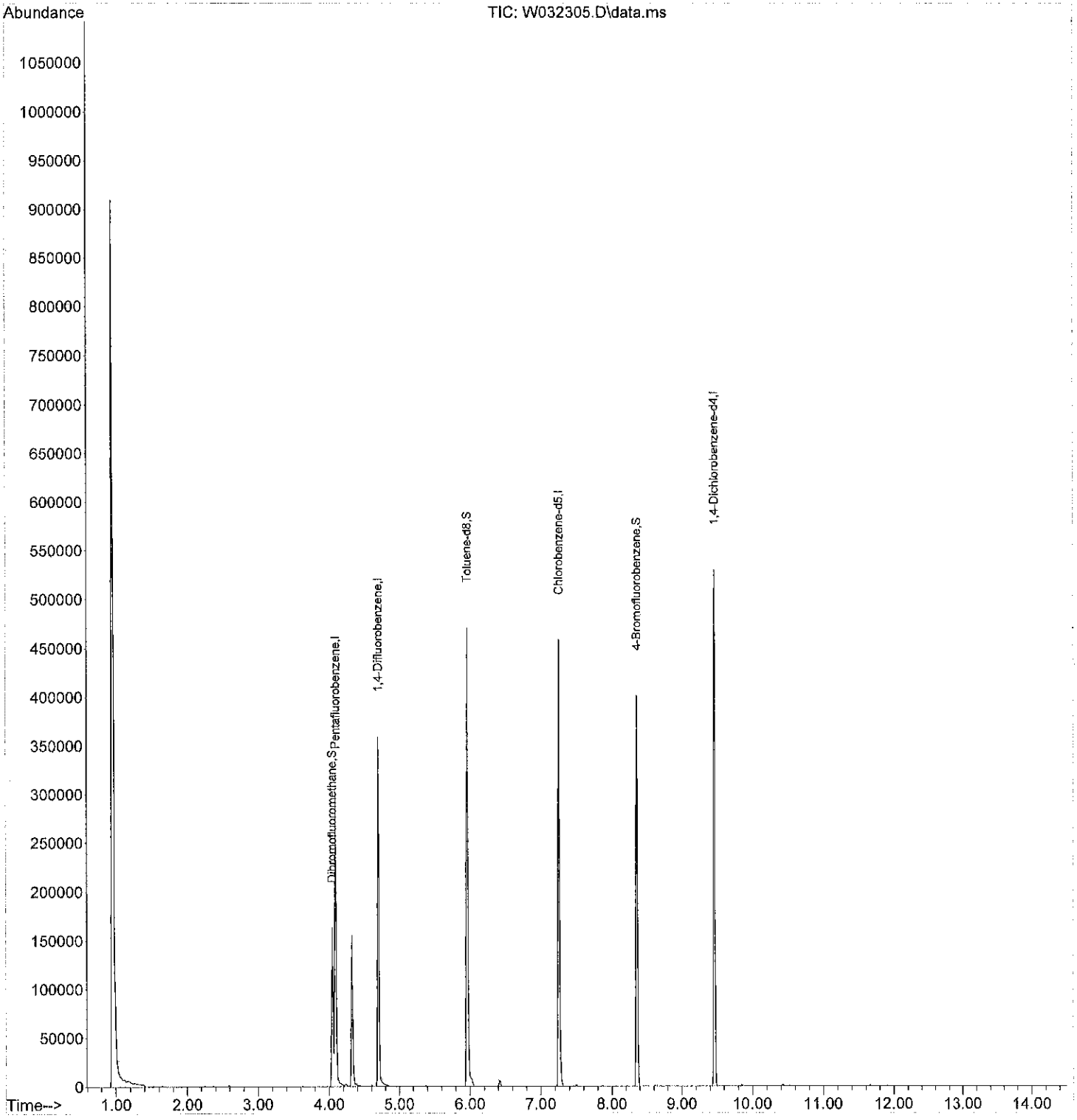
| Compound | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| Internal Standards | | | | | | |
| 1) Pentafluorobenzene | 4.091 | 168 | 152998 | 50.00 | ppb | 0.00 |
| 28) 1,4-Difluorobenzene | 4.697 | 114 | 217051 | 50.00 | ppb | 0.00 |
| 38) Chlorobenzene-d5 | 7.255 | 117 | 200867 | 50.00 | ppb | 0.00 |
| 55) 1,4-Dichlorobenzene-d4 | 9.466 | 152 | 110826 | 50.00 | ppb | 0.00 |
| System Monitoring Compounds | | | | | | |
| 23) Dibromofluoromethane | 4.045 | 111 | 74483 | 51.81 | ppb | 0.00 |
| Spiked Amount 50.000 | Range 76 - 131 | | Recovery = 103.62% | | | |
| 36) Toluene-d8 | 5.962 | 98 | 245226 | 49.36 | ppb | 0.00 |
| Spiked Amount 50.000 | Range 78 - 128 | | Recovery = 98.72% | | | |
| 54) 4-Bromofluorobenzene | 8.354 | 95 | 113261 | 50.37 | ppb | 0.00 |
| Spiked Amount 50.000 | Range 71 - 130 | | Recovery = 100.74% | | | |
| Target Compounds | | | | | | Qvalue |

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\W210323\
Data File : W032305.D
Acq On : 23 Mar 2021 10:30 am
Operator :
Sample : MB0323S1
Misc :
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Mar 24 09:19:39 2021
Quant Method : C:\MSDCHEM\1\METHODS\W210203S.M
Quant Title :
QLast Update : Thu Feb 04 07:56:41 2021
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : X:\VOLATILE\ALBERT\DATA\A210319\A0319003.D Vial: 3
Acq On : 19 Mar 2021 9:21 am Operator:
Sample : SB0319S1 (CCV0319S1) Inst : Albert
Misc : V4-077-16,V4-077-05 Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Mar 19 10:06 2021 Quant Results File: A210315Q.RES

Quant Method : F:\HPCHEM\1\METHODS\A210315Q.M (RTE Integrator)
Title : 8260 Calibration
Last Update : Tue Mar 16 09:05:28 2021
Response via : Initial Calibration
DataAcq Meth : A210315Q

| Internal Standards | R.T. | QIon | Response | Conc | Units | | Dev(Min) |
|---|---|---|---|---|---|---|---|
| 1) Pentafluorobenzene | 3.68 | 168 | 878106 | 50.00 | ppb | | 0.01 |
| 28) 1,4-Difluorobenzene | 4.37 | 114 | 1512951 | 50.00 | ppb | | 0.02 |
| 38) Chlorobenzene-d5 | 7.08 | 117 | 1348583 | 50.00 | ppb | | 0.01 |
| 55) 1,4-Dichlorobenzene-d4 | 9.34 | 152 | 789146 | 50.00 | ppb | | 0.00 |
| **System Monitoring Compounds** | | | | | | | |
| 23) Dibromofluoromethane | 3.61 | 111 | 475561 | 50.39 | ppb | | 0.01 |
| Spiked Amount 50.000 | Range 74 - 131 | | Recovery = | 100.78% | | | |
| 36) Toluene-d8 | 5.74 | 98 | 1760640 | 49.89 | ppb | | 0.00 |
| Spiked Amount 50.000 | Range 78 - 128 | | Recovery = | 99.78% | | | |
| 54) 4-Bromofluorobenzene | 8.22 | 95 | 730652 | 52.98 | ppb | | 0.00 |
| Spiked Amount 50.000 | Range 71 - 130 | | Recovery = | 105.96% | | | |
| **Target Compounds** | | | | | | | Qvalue |
| 2) Dichlorodifluoromethane | 0.64 | 85 | 143493 | 29.04 | ppb | | 98 |
| 3) Chloromethane | 0.70 | 50 | 158872 | 38.10 | ppb | | 100 |
| 4) Vinyl Chloride | 0.69 | 62 | 136644 | 42.04 | ppb | | 97 |
| 5) Bromomethane | 0.78 | 96 | 74007 | 41.02 | ppb | # | 73 |
| 6) Chloroethane | 0.80 | 64 | 61319 | 48.84 | ppb | | 91 |
| 7) Trichlorofluoromethane | 0.90 | 101 | 631763m | 48.81 | ppb | | |
| 8) 1,1-Dichloroethene | 1.26 | 61 | 1144015m | 48.75 | ppb | | |
| 9) Acetone | 1.33 | 43 | 240103 | 47.28 | ppb | | 98 |
| 10) Iodomethane | 1.40 | 142 | 903729m | 54.33 | ppb | | |
| 11) Carbon Disulfide | 1.46 | 76 | 2319464 | 51.40 | ppb | | 100 |
| 12) Methylene Chloride | 1.75 | 49 | 1108000 | 43.21 | ppb | | 96 |
| 13) (trans) 1,2-Dichloroethene | 2.06 | 61 | 1133886m | 52.82 | ppb | | |
| 14) Methyl t-Butyl Ether | 2.08 | 73 | 1847953 | 51.02 | ppb | | 100 |
| 15) 1,1-Dichloroethane | 2.52 | 63 | 1563056m | 47.17 | ppb | | |
| 16) Vinyl Acetate | 2.60 | 43 | 1943746 | 52.08 | ppb | | 100 |
| 17) 2,2-Dichloropropane | 3.12 | 77 | 754006 | 54.71 | ppb | | 100 |
| 18) (cis) 1,2-Dichloroethene | 3.12 | 61 | 1009275m | 58.10 | ppb | | |
| 19) 2-Butanone | 3.17 | 43 | 281229 | 54.01 | ppb | | 96 |
| 20) Bromochloromethane | 3.36 | 130 | 298331 | 50.02 | ppb | | 87 |
| 21) Chloroform | 3.46 | 83 | 926837m | 56.15 | ppb | | |
| 22) 1,1,1-Trichloroethane | 3.61 | 97 | 695691 | 55.16 | ppb | | 99 |
| 24) Carbon Tetrachloride | 3.78 | 117 | 628052 | 55.10 | ppb | | 100 |
| 25) 1,1-Dichloropropene | 3.78 | 75 | 814080 | 56.58 | ppb | | 100 |
| 26) Benzene | 3.98 | 78 | 2229258 | 56.99 | ppb | | 100 |
| 27) 1,2-Dichloroethane | 3.99 | 62 | 681281 | 55.09 | ppb | | 98 |
| 29) Trichloroethene | 4.60 | 130 | 571880 | 54.76 | ppb | | 100 |
| 30) 1,2-Dichloropropane | 4.80 | 63 | 652790 | 53.40 | ppb | | 98 |
| 31) Dibromomethane | 4.91 | 174 | 320125 | 55.20 | ppb | | 96 |
| 32) Bromodichloromethane | 5.07 | 83 | 648983 | 54.40 | ppb | | 100 |
| 33) 2-Chloroethyl Vinyl Ether | 5.37 | 63 | 277357 | 52.62 | ppb | | 99 |
| 34) (cis) 1,3-Dichloropropene | 5.49 | 75 | 966873 | 57.10 | ppb | | 99 |
| 35) Methyl Isobutyl Ketone | 5.65 | 43 | 659218 | 53.61 | ppb | | 99 |
| 37) Toluene | 5.80 | 91 | 2539902 | 57.33 | ppb | | 99 |
| 39) (trans) 1,3-Dichloropropen | 6.02 | 75 | 766315 | 57.63 | ppb | | 98 |
| 40) 1,1,2-Trichloroethane | 6.18 | 97 | 439800 | 54.71 | ppb | | 99 |
| 41) Tetrachloroethene | 6.31 | 166 | 634074 | 56.00 | ppb | | 99 |
| 42) 1,3-Dichloropropane | 6.33 | 76 | 815358 | 55.46 | ppb | | 100 |
| 43) 2-Hexanone | 6.44 | 43 | 438635 | 53.88 | ppb | | 97 |
| 44) Dibromochloromethane | 6.54 | 129 | 469774 | 55.23 | ppb | | 99 |
| 45) 1,2-Dibromoethane | 6.64 | 107 | 437869 | 55.83 | ppb | | 98 |
| 46) Chlorobenzene | 7.11 | 112 | 1644918 | 55.85 | ppb | | 99 |
| 47) 1,1,1,2-Tetrachloroethane | 7.19 | 133 | 509730 | 55.89 | ppb | | 98 |

(#) = qualifier out of range (m) = manual integration

3/25/21 JR

Quantitation Report (QT Reviewed)

Data File : X:\VOLATILE\ALBERT\DATA\A210319\A0319003.D Vial: 3
Acq On : 19 Mar 2021 9:21 am Operator:
Sample : SB0319S1 (CCV0319S1) Inst : Albert
Misc : V4-077-16,V4-077-05 Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Mar 19 10:06 2021 Quant Results File: A210315Q.RES

Quant Method : F:\HPCHEM\1\METHODS\A210315Q.M (RTE Integrator)
Title : 8260 Calibration
Last Update : Tue Mar 16 09:05:28 2021
Response via : Initial Calibration
DataAcq Meth : A210315Q

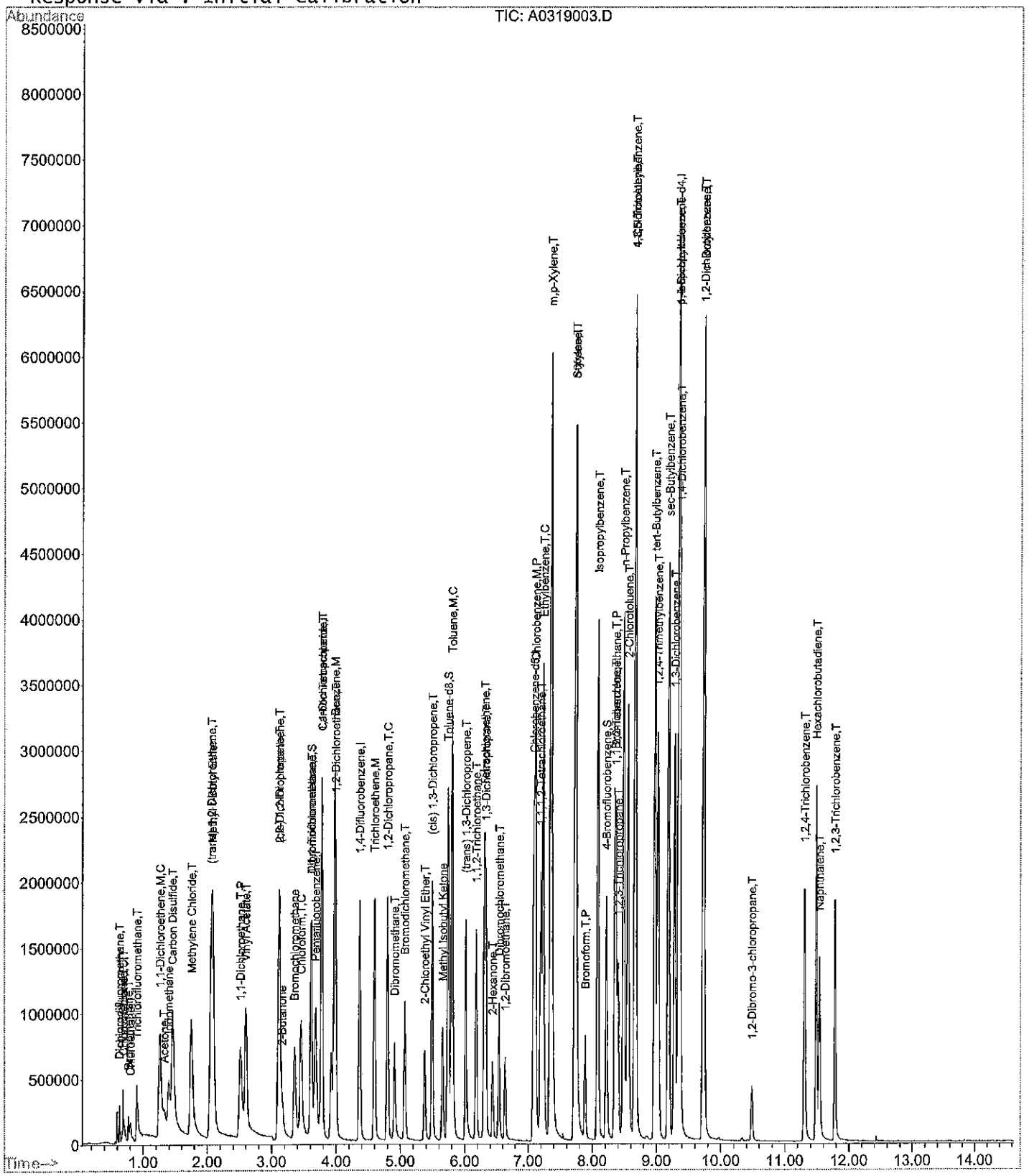
| | Compound | R.T. | QIon | Response | Conc | Unit | Qvalue |
|---|---|---|---|---|---|---|---|
| 48) | Ethylbenzene | 7.23 | 91 | 2816706 | 56.67 | ppb | 99 |
| 49) | m,p-Xylene | 7.35 | 91 | 4718620 | 112.01 | ppb | 99 |
| 50) | o-Xylene | 7.72 | 91 | 2595601 | 53.26 | ppb | 99 |
| 51) | Styrene | 7.73 | 104 | 2130091 | 60.73 | ppb | 100 |
| 52) | Bromoform | 7.89 | 173 | 349211 | 55.95 | ppb | 99 |
| 53) | Isopropylbenzene | 8.08 | 105 | 2978316 | 61.05 | ppb | 100 |
| 56) | Bromobenzene | 8.35 | 156 | 675892 | 57.86 | ppb | 96 |
| 57) | 1,1,2,2-Tetrachloroethane | 8.37 | 83 | 732649 | 61.57 | ppb | 99 |
| 58) | 1,2,3-Trichloropropane | 8.40 | 75 | 458335 | 59.02 | ppb | 99 |
| 59) | n-Propylbenzene | 8.48 | 91 | 3907049 | 59.66 | ppb | 99 |
| 60) | 2-Chlorotoluene | 8.55 | 126 | 697742 | 57.17 | ppb | 99 |
| 61) | 4-Chlorotoluene | 8.66 | 126 | 744707 | 60.52 | ppb | 99 |
| 62) | 1,3,5-Trimethylbenzene | 8.66 | 105 | 2503817 | 62.94 | ppb | 100 |
| 63) | tert-Butylbenzene | 8.97 | 119 | 2057453 | 58.56 | ppb | 98 |
| 64) | 1,2,4-Trimethylbenzene | 9.02 | 105 | 2348974 | 49.27 | ppb | 99 |
| 65) | sec-Butylbenzene | 9.18 | 105 | 3577046 | 60.82 | ppb | 99 |
| 66) | 1,3-Dichlorobenzene | 9.28 | 146 | 1420515 | 58.19 | ppb | 99 |
| 67) | p-Isopropyltoluene | 9.33 | 119 | 2628084 | 58.57 | ppb | 99 |
| 68) | 1,4-Dichlorobenzene | 9.37 | 146 | 1466404 | 56.42 | ppb | 99 |
| 69) | 1,2-Dichlorobenzene | 9.72 | 146 | 1325721 | 60.13 | ppb | 100 |
| 70) | n-Butylbenzene | 9.74 | 91 | 2749556 | 64.09 | ppb | 100 |
| 71) | 1,2-Dibromo-3-chloropropan | 10.48 | 157 | 116026 | 55.97 | ppb | 93 |
| 72) | 1,2,4-Trichlorobenzene | 11.31 | 180 | 637851 | 47.43 | ppb | 97 |
| 73) | Hexachlorobutadiene | 11.50 | 225 | 460440 | 56.69 | ppb | 99 |
| 74) | Naphthalene | 11.54 | 128 | 1158883 | 44.82 | ppb | 99 |
| 75) | 1,2,3-Trichlorobenzene | 11.79 | 180 | 570382 | 46.03 | ppb | 97 |

(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : X:\VOLATILE\ALBERT\DATA\A210319\A0319003.D Vial: 3
Acq On : 19 Mar 2021 9:21 am Operator:
Sample : SB0319S1 (CCV0319S1) Inst : Albert
Misc : V4-077-16,V4-077-05 Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Mar 19 10:06 2021 Quant Results File: A210315Q.RES

Method : F:\HPCHEM\1\METHODS\A210323Q.M (RTE Integrator)
Title : 8260 Calibration
Last Update : Wed Mar 24 09:41:12 2021
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : X:\VOLATILE\ALBERT\DATA\A210319\A0319004.D Vial: 4
Acq On : 19 Mar 2021 9:50 am Operator:
Sample : SBD0319S1 Inst : Albert
Misc : V4-077-16,V4-077-05 Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Mar 22 8:28 2021 Quant Results File: A210315Q.RES

Quant Method : F:\HPCHEM\1\METHODS\A210315Q.M (RTE Integrator)
Title : 8260 Calibration
Last Update : Tue Mar 16 09:05:28 2021
Response via : Initial Calibration
DataAcq Meth : A210315Q

| Internal Standards | R.T. | QIon | Response | Conc | Units | | Dev(Min) |
|---|---|---|---|---|---|---|---|
| 1) Pentafluorobenzene | 3.68 | 168 | 890397 | 50.00 | ppb | | 0.01 |
| 28) 1,4-Difluorobenzene | 4.36 | 114 | 1518929 | 50.00 | ppb | | 0.01 |
| 38) Chlorobenzene-d5 | 7.09 | 117 | 1354323 | 50.00 | ppb | | 0.01 |
| 55) 1,4-Dichlorobenzene-d4 | 9.34 | 152 | 798079 | 50.00 | ppb | | 0.00 |
| **System Monitoring Compounds** | | | | | | | |
| 23) Dibromofluoromethane | 3.61 | 111 | 495606 | 51.79 | ppb | | 0.01 |
| Spiked Amount 50.000 | Range 74 - 131 | | Recovery = 103.58% | | | | |
| 36) Toluene-d8 | 5.74 | 98 | 1795268 | 50.67 | ppb | | 0.00 |
| Spiked Amount 50.000 | Range 78 - 128 | | Recovery = 101.34% | | | | |
| 54) 4-Bromofluorobenzene | 8.22 | 95 | 735322 | 53.09 | ppb | | 0.00 |
| Spiked Amount 50.000 | Range 71 - 130 | | Recovery = 106.18% | | | | |
| **Target Compounds** | | | | | | | Qvalue |
| 2) Dichlorodifluoromethane | 0.63 | 85 | 142518 | 28.44 | ppb | | 99 |
| 3) Chloromethane | 0.70 | 50 | 148071 | 35.02 | ppb | | 100 |
| 4) Vinyl Chloride | 0.69 | 62 | 131522 | 39.90 | ppb | | 98 |
| 5) Bromomethane | 0.78 | 96 | 75582m | 41.32 | ppb | | |
| 6) Chloroethane | 0.80 | 64 | 60395 | 47.44 | ppb | # | 88 |
| 7) Trichlorofluoromethane | 0.90 | 101 | 620115m | 47.24 | ppb | | |
| 8) 1,1-Dichloroethene | 1.26 | 61 | 1106252m | 46.49 | ppb | | |
| 9) Acetone | 1.34 | 43 | 236060 | 45.84 | ppb | | 100 |
| 10) Iodomethane | 1.40 | 142 | 912883m | 54.12 | ppb | | |
| 11) Carbon Disulfide | 1.46 | 76 | 2363943m | 51.66 | ppb | | |
| 12) Methylene Chloride | 1.75 | 49 | 1112482m | 42.79 | ppb | | |
| 13) (trans) 1,2-Dichloroethene | 2.06 | 61 | 1120476m | 51.47 | ppb | | |
| 14) Methyl t-Butyl Ether | 2.08 | 73 | 1785574 | 48.62 | ppb | | 100 |
| 15) 1,1-Dichloroethane | 2.51 | 63 | 1519112m | 45.21 | ppb | | |
| 16) Vinyl Acetate | 2.60 | 43 | 1709817 | 45.18 | ppb | | 99 |
| 17) 2,2-Dichloropropane | 3.12 | 77 | 737616 | 52.78 | ppb | | 99 |
| 18) (cis) 1,2-Dichloroethene | 3.12 | 61 | 992636m | 56.35 | ppb | | |
| 19) 2-Butanone | 3.17 | 43 | 285592 | 54.09 | ppb | | 99 |
| 20) Bromochloromethane | 3.36 | 130 | 325460 | 53.81 | ppb | | 96 |
| 21) Chloroform | 3.45 | 83 | 933307m | 55.76 | ppb | | |
| 22) 1,1,1-Trichloroethane | 3.61 | 97 | 697907 | 54.57 | ppb | | 100 |
| 24) Carbon Tetrachloride | 3.78 | 117 | 608332 | 52.64 | ppb | | 98 |
| 25) 1,1-Dichloropropene | 3.78 | 75 | 797036 | 54.63 | ppb | | 100 |
| 26) Benzene | 3.97 | 78 | 2187582 | 55.15 | ppb | | 100 |
| 27) 1,2-Dichloroethane | 4.00 | 62 | 680476 | 54.26 | ppb | | 99 |
| 29) Trichloroethene | 4.60 | 130 | 562389 | 53.64 | ppb | | 99 |
| 30) 1,2-Dichloropropane | 4.80 | 63 | 641043 | 52.24 | ppb | | 99 |
| 31) Dibromomethane | 4.91 | 174 | 311115 | 53.43 | ppb | | 98 |
| 32) Bromodichloromethane | 5.07 | 83 | 634878 | 53.01 | ppb | | 100 |
| 33) 2-Chloroethyl Vinyl Ether | 5.37 | 63 | 272503 | 51.49 | ppb | | 98 |
| 34) (cis) 1,3-Dichloropropene | 5.49 | 75 | 934040 | 54.94 | ppb | | 99 |
| 35) Methyl Isobutyl Ketone | 5.66 | 43 | 651267 | 52.76 | ppb | | 98 |
| 37) Toluene | 5.80 | 91 | 2473737 | 55.62 | ppb | | 100 |
| 39) (trans) 1,3-Dichloropropen | 6.02 | 75 | 753347 | 56.42 | ppb | | 99 |
| 40) 1,1,2-Trichloroethane | 6.18 | 97 | 434518 | 53.83 | ppb | | 98 |
| 41) Tetrachloroethene | 6.31 | 166 | 616658 | 54.23 | ppb | | 99 |
| 42) 1,3-Dichloropropane | 6.33 | 76 | 806272 | 54.61 | ppb | | 100 |
| 43) 2-Hexanone | 6.44 | 43 | 425831 | 52.08 | ppb | | 98 |
| 44) Dibromochloromethane | 6.54 | 129 | 463619 | 54.28 | ppb | | 98 |
| 45) 1,2-Dibromoethane | 6.64 | 107 | 425254 | 53.99 | ppb | | 100 |
| 46) Chlorobenzene | 7.11 | 112 | 1612450 | 54.52 | ppb | | 99 |
| 47) 1,1,1,2-Tetrachloroethane | 7.19 | 133 | 494685 | 54.01 | ppb | | 97 |

(#) = qualifier out of range (m) = manual integration

3/25/21 JR

Quantitation Report (QT Reviewed)

Data File : X:\VOLATILE\ALBERT\DATA\A210319\A0319004.D Vial: 4
Acq On : 19 Mar 2021 9:50 am Operator:
Sample : SBD0319S1 Inst : Albert
Misc : V4-077-16,V4-077-05 Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Mar 22 8:28 2021 Quant Results File: A210315Q.RES

Quant Method : F:\HPCHEM\1\METHODS\A210315Q.M (RTE Integrator)
Title : 8260 Calibration
Last Update : Tue Mar 16 09:05:28 2021
Response via : Initial Calibration
DataAcq Meth : A210315Q

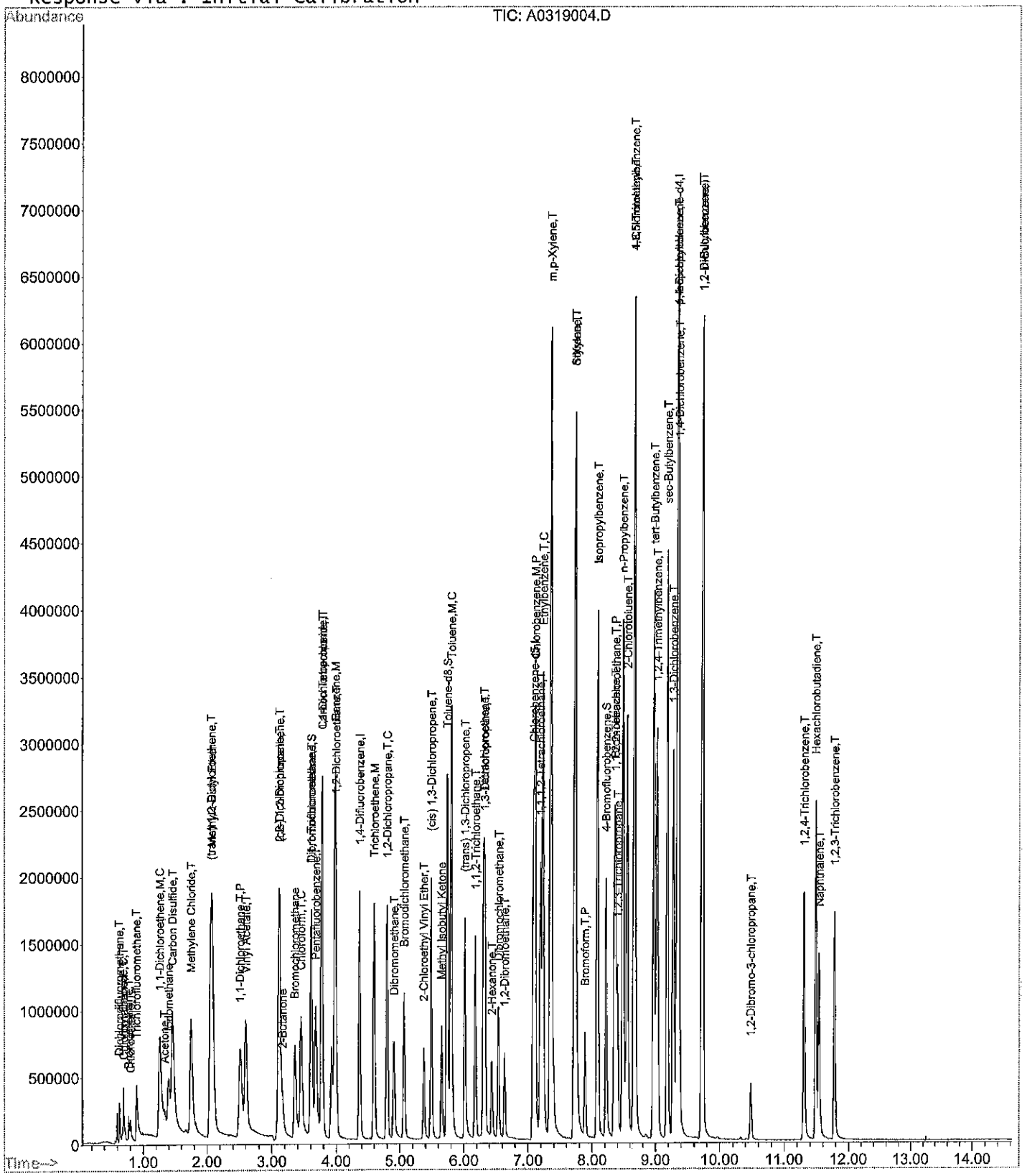
| Compound | R.T. | QIon | Response | Conc Unit | Qvalue |
|---|---|---|---|---|---|
| 48) Ethylbenzene | 7.23 | 91 | 2780085 | 55.69 ppb | 99 |
| 49) m,p-Xylene | 7.35 | 91 | 4580505 | 108.27 ppb | 99 |
| 50) o-Xylene | 7.72 | 91 | 2510179 | 51.31 ppb | 99 |
| 51) Styrene | 7.73 | 104 | 2085447 | 59.20 ppb | 100 |
| 52) Bromoform | 7.89 | 173 | 335535 | 53.54 ppb | 99 |
| 53) Isopropylbenzene | 8.08 | 105 | 2906714 | 59.33 ppb | 100 |
| 56) Bromobenzene | 8.35 | 156 | 641113 | 54.27 ppb | 98 |
| 57) 1,1,2,2-Tetrachloroethane | 8.37 | 83 | 719065 | 59.76 ppb | 99 |
| 58) 1,2,3-Trichloropropane | 8.40 | 75 | 458793 | 58.42 ppb | 97 |
| 59) n-Propylbenzene | 8.48 | 91 | 3803086 | 57.42 ppb | 100 |
| 60) 2-Chlorotoluene | 8.55 | 126 | 672782 | 54.51 ppb | 99 |
| 61) 4-Chlorotoluene | 8.66 | 126 | 726700 | 58.40 ppb | 99 |
| 62) 1,3,5-Trimethylbenzene | 8.66 | 105 | 2446220 | 60.80 ppb | 99 |
| 63) tert-Butylbenzene | 8.97 | 119 | 1980488 | 55.74 ppb | 98 |
| 64) 1,2,4-Trimethylbenzene | 9.02 | 105 | 2295827 | 47.79 ppb | 99 |
| 65) sec-Butylbenzene | 9.18 | 105 | 3460160 | 58.17 ppb | 100 |
| 66) 1,3-Dichlorobenzene | 9.28 | 146 | 1364938 | 55.29 ppb | 99 |
| 67) p-Isopropyltoluene | 9.34 | 119 | 2565752 | 56.54 ppb | 100 |
| 68) 1,4-Dichlorobenzene | 9.36 | 146 | 1425152 | 54.22 ppb | 99 |
| 69) 1,2-Dichlorobenzene | 9.72 | 146 | 1276711 | 57.26 ppb | 99 |
| 70) n-Butylbenzene | 9.73 | 91 | 2698853 | 62.20 ppb | 100 |
| 71) 1,2-Dibromo-3-chloropropan | 10.48 | 157 | 114749 | 54.73 ppb | 97 |
| 72) 1,2,4-Trichlorobenzene | 11.31 | 180 | 613303 | 45.41 ppb | 97 |
| 73) Hexachlorobutadiene | 11.49 | 225 | 449913 | 54.77 ppb | 99 |
| 74) Naphthalene | 11.54 | 128 | 1105791 | 42.76 ppb | 98 |
| 75) 1,2,3-Trichlorobenzene | 11.78 | 180 | 549730 | 44.19 ppb | 99 |

(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : X:\VOLATILE\ALBERT\DATA\A210319\A0319004.D Vial: 4
Acq On : 19 Mar 2021 9:50 am Operator:
Sample : SBD0319S1 Inst : Albert
Misc : V4-077-16,V4-077-05 Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Mar 22 8:28 2021 Quant Results File: A210315Q.RES

Method : F:\HPCHEM\1\METHODS\A210323Q.M (RTE Integrator)
Title : 8260 Calibration
Last Update : Wed Mar 24 09:41:12 2021
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\W210323\
Data File : W032302.D
Acq On : 23 Mar 2021 9:04 am
Operator :
Sample : SB0323S1 (CCV0323S1)
Misc : V4-077-07,V4-077-08
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 23 09:30:56 2021
Quant Method : C:\MSDCHEM\1\METHODS\W210203S.M
Quant Title :
QLast Update : Thu Feb 04 07:56:41 2021
Response via : Initial Calibration

| Compound | R.T. | QIon | Response | Conc | Units | | Dev(Min) |
|---|---|---|---|---|---|---|---|
| Internal Standards | | | | | | | |
| 1) Pentafluorobenzene | 4.091 | 168 | 158802 | 50.00 | ppb | | 0.00 |
| 28) 1,4-Difluorobenzene | 4.697 | 114 | 229758 | 50.00 | ppb | | 0.00 |
| 38) Chlorobenzene-d5 | 7.254 | 117 | 202863 | 50.00 | ppb | | 0.00 |
| 55) 1,4-Dichlorobenzene-d4 | 9.466 | 152 | 109811 | 50.00 | ppb | | 0.00 |
| System Monitoring Compounds | | | | | | | |
| 23) Dibromofluoromethane | 4.045 | 111 | 74123 | 49.68 | ppb | | 0.00 |
| Spiked Amount 50.000 | Range 76 - 131 | | Recovery = 99.36% | | | | |
| 36) Toluene-d8 | 5.962 | 98 | 251224 | 47.77 | ppb | | 0.00 |
| Spiked Amount 50.000 | Range 78 - 128 | | Recovery = 95.54% | | | | |
| 54) 4-Bromofluorobenzene | 8.360 | 95 | 114601 | 50.47 | ppb | | 0.00 |
| Spiked Amount 50.000 | Range 71 - 130 | | Recovery = 100.94% | | | | |
| Target Compounds | | | | | | | Qvalue |
| 2) Dichlorodifluoromethane | 1.091 | 85 | 60973 | 62.62 | ppb | | 100 |
| 3) Chloromethane | 1.216 | 50 | 51019 | 36.26 | ppb | # | 100 |
| 4) Vinyl Chloride | 1.290 | 62 | 52627 | 41.29 | ppb | | 97 |
| 5) Bromomethane | 1.511 | 96 | 22455m | 42.80 | ppb | | |
| 6) Chloroethane | 1.585 | 64 | 28572 | 42.18 | ppb | | 98 |
| 7) Trichlorofluoromethane | 1.777 | 101 | 99548 | 50.98 | ppb | | 99 |
| 8) 1,1-Dichloroethene | 2.191 | 61 | 67189 | 41.29 | ppb | | 100 |
| 9) Acetone | 2.242 | 43 | 16612 | 52.68 | ppb | | 98 |
| 10) Iodomethane | 2.310 | 142 | 45496m | 40.51 | ppb | | |
| 11) Carbon Disulfide | 2.361 | 76 | 104460m | 37.26 | ppb | | |
| 12) Methylene Chloride | 2.588 | 49 | 59032m | 34.02 | ppb | | |
| 13) (trans) 1,2-Dichloroet... | 2.815 | 61 | 66760m | 40.42 | ppb | | |
| 14) Methyl t-Butyl Ether | 2.821 | 73 | 136563 | 52.01 | ppb | | 97 |
| 15) 1,1-Dichloroethane | 3.161 | 63 | 84093 | 41.05 | ppb | | 98 |
| 16) Vinyl Acetate | 3.218 | 43 | 90314 | 42.82 | ppb | | 97 |
| 17) 2,2-Dichloropropane | 3.643 | 77 | 79319 | 51.25 | ppb | | 99 |
| 18) (cis) 1,2-Dichloroethene | 3.643 | 61 | 79000 | 40.10 | ppb | | 99 |
| 19) 2-Butanone | 3.666 | 43 | 21693 | 45.59 | ppb | | 98 |
| 20) Bromochloromethane | 3.841 | 130 | 29786 | 49.51 | ppb | # | 84 |
| 21) Chloroform | 3.909 | 83 | 90908 | 46.39 | ppb | | 98 |
| 22) 1,1,1-Trichloroethane | 4.062 | 97 | 91375 | 47.82 | ppb | # | 100 |
| 24) Carbon Tetrachloride | 4.198 | 117 | 83972 | 47.44 | ppb | | 92 |
| 25) 1,1-Dichloropropene | 4.198 | 75 | 64569 | 44.05 | ppb | | 98 |
| 26) Benzene | 4.369 | 78 | 162160 | 43.32 | ppb | | 98 |
| 27) 1,2-Dichloroethane | 4.386 | 62 | 84296 | 48.94 | ppb | | 99 |
| 29) Trichloroethene | 4.913 | 130 | 49808 | 50.16 | ppb | | 98 |
| 30) 1,2-Dichloropropane | 5.106 | 63 | 45775 | 40.91 | ppb | | 97 |
| 31) Dibromomethane | 5.202 | 174 | 34164 | 53.38 | ppb | | 96 |
| 32) Bromodichloromethane | 5.338 | 83 | 71009 | 48.98 | ppb | | 96 |
| 33) 2-Chloroethyl Vinyl Ether | 5.610 | 63 | 11393 | 53.70 | ppb | # | 90 |
| 34) (cis) 1,3-Dichloropropene | 5.729 | 75 | 79235 | 50.35 | ppb | | 100 |
| 35) Methyl Isobutyl Ketone | 5.871 | 43 | 49281 | 50.25 | ppb | # | 95 |
| 37) Toluene | 6.018 | 91 | 185826 | 43.49 | ppb | | 98 |
| 39) (trans) 1,3-Dichloropr... | 6.223 | 75 | 73391 | 53.20 | ppb | | 99 |
| 40) 1,1,2-Trichloroethane | 6.381 | 97 | 38083 | 46.65 | ppb | | 97 |
| 41) Tetrachloroethene | 6.506 | 166 | 53562 | 50.55 | ppb | | 98 |
| 42) 1,3-Dichloropropane | 6.529 | 76 | 70040 | 49.57 | ppb | | 99 |

3/25/21

Data Path : C:\msdchem\1\data\W210323\
Data File : W032302.D
Acq On : 23 Mar 2021 9:04 am
Operator :
Sample : SB0323S1 (CCV0323S1)
Misc : V4-077-07,V4-077-08
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 23 09:30:56 2021
Quant Method : C:\MSDCHEM\1\METHODS\W210203S.M
Quant Title :
QLast Update : Thu Feb 04 07:56:41 2021
Response via : Initial Calibration

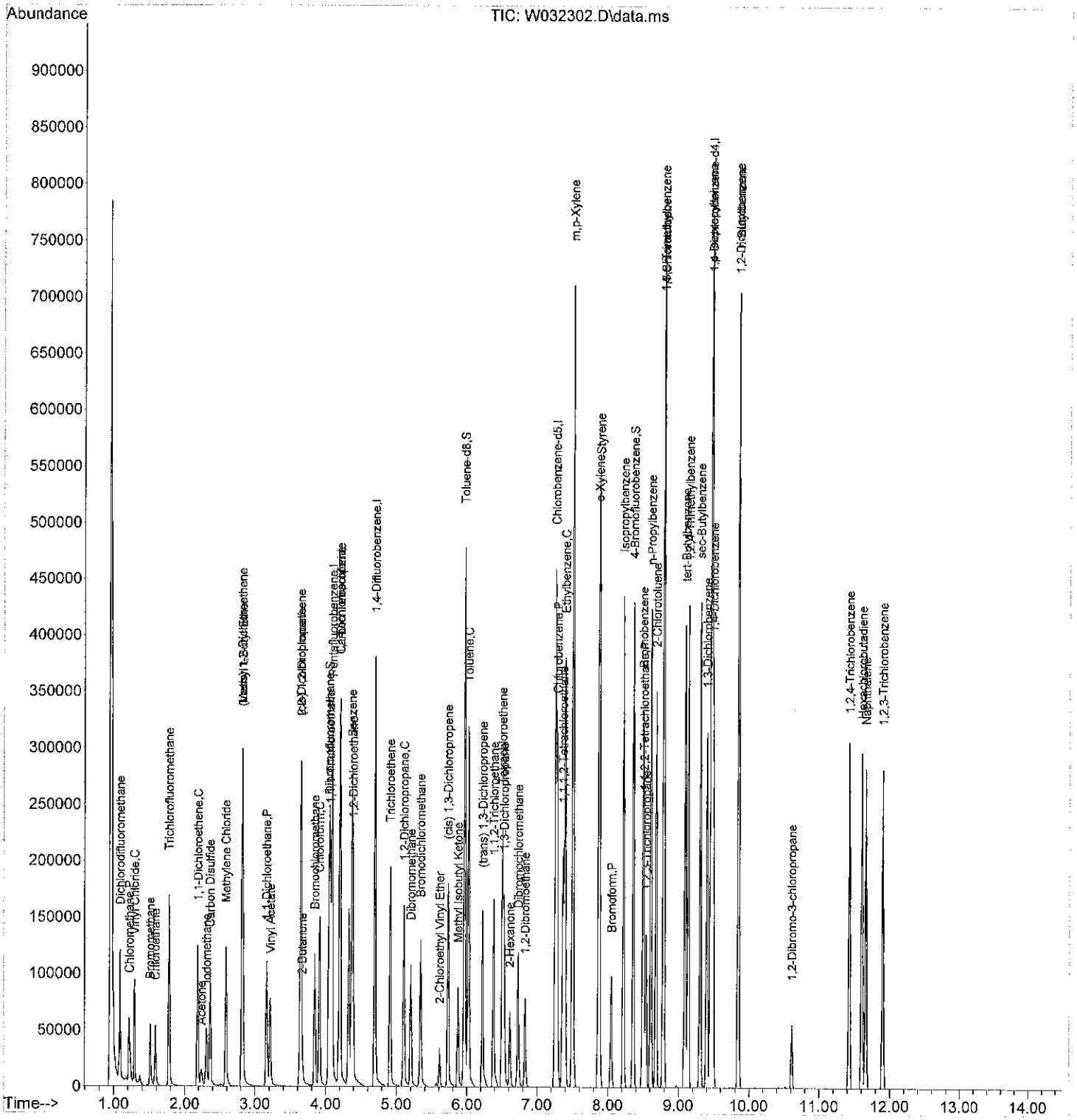
| Compound | R.T. | QIon | Response | Conc | Units | | Dev(Min) |
|---|---|---|---|---|---|---|---|
| 43) 2-Hexanone | 6.614 | 43 | 35909 | 44.81 | ppb | # | 94 |
| 44) Dibromochloromethane | 6.733 | 129 | 54826 | 51.71 | ppb | | 99 |
| 45) 1,2-Dibromoethane | 6.829 | 107 | 43246 | 52.85 | ppb | | 96 |
| 46) Chlorobenzene | 7.283 | 112 | 126620 | 47.61 | ppb | | 99 |
| 47) 1,1,1,2-Tetrachloroethane | 7.362 | 133 | 49340 | 52.04 | ppb | | 97 |
| 48) Ethylbenzene | 7.391 | 91 | 224302 | 45.96 | ppb | | 98 |
| 49) m,p-Xylene | 7.498 | 91 | 359404 | 91.48 | ppb | | 99 |
| 50) o-Xylene | 7.867 | 91 | 186091 | 46.88 | ppb | | 99 |
| 51) Styrene | 7.878 | 104 | 141231 | 47.82 | ppb | | 100 |
| 52) Bromoform | 8.048 | 173 | 40197 | 60.85 | ppb | | 99 |
| 53) Isopropylbenzene | 8.218 | 105 | 234810 | 49.37 | ppb | | 100 |
| 56) Bromobenzene | 8.496 | 156 | 57434 | 49.48 | ppb | | 100 |
| 57) 1,1,2,2-Tetrachloroethane | 8.507 | 83 | 52675 | 52.03 | ppb | | 99 |
| 58) 1,2,3-Trichloropropane | 8.541 | 75 | 45633 | 56.39 | ppb | | 95 |
| 59) n-Propylbenzene | 8.609 | 91 | 275418 | 50.13 | ppb | | 99 |
| 60) 2-Chlorotoluene | 8.683 | 126 | 52961 | 50.72 | ppb | | 99 |
| 61) 4-Chlorotoluene | 8.791 | 126 | 55221 | 51.74 | ppb | | 99 |
| 62) 1,3,5-Trimethylbenzene | 8.785 | 105 | 197235 | 49.92 | ppb | | 99 |
| 63) tert-Butylbenzene | 9.097 | 119 | 175669 | 51.28 | ppb | | 98 |
| 64) 1,2,4-Trimethylbenzene | 9.142 | 105 | 199682 | 50.26 | ppb | | 98 |
| 65) sec-Butylbenzene | 9.307 | 105 | 243515 | 50.15 | ppb | | 99 |
| 66) 1,3-Dichlorobenzene | 9.403 | 146 | 106558 | 50.57 | ppb | | 100 |
| 67) p-Isopropyltoluene | 9.454 | 119 | 215695 | 50.40 | ppb | | 98 |
| 68) 1,4-Dichlorobenzene | 9.488 | 146 | 112923 | 52.17 | ppb | | 99 |
| 69) 1,2-Dichlorobenzene | 9.845 | 146 | 102216 | 51.96 | ppb | | 100 |
| 70) n-Butylbenzene | 9.851 | 91 | 198515 | 49.11 | ppb | | 97 |
| 71) 1,2-Dibromo-3-chloropr... | 10.611 | 157 | 13736 | 64.94 | ppb | | 99 |
| 72) 1,2,4-Trichlorobenzene | 11.427 | 180 | 83683 | 57.23 | ppb | | 100 |
| 73) Hexachlorobutadiene | 11.609 | 225 | 54009 | 54.31 | ppb | | 100 |
| 74) Naphthalene | 11.660 | 128 | 183642 | 59.79 | ppb | | 99 |
| 75) 1,2,3-Trichlorobenzene | 11.904 | 180 | 75631 | 56.07 | ppb | | 99 |

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\W210323\
Data File : W032302.D
Acq On : 23 Mar 2021 9:04 am
Operator :
Sample : SB0323S1 (CCV0323S1)
Misc : V4-077-07,V4-077-08
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 23 09:30:56 2021
Quant Method : C:\MSDCHEM\1\METHODS\W210203S.M
Quant Title :
QLast Update : Thu Feb 04 07:56:41 2021
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data Path : C:\msdchem\1\data\W210323\
Data File : W032303.D
Acq On : 23 Mar 2021 9:33 am
Operator :
Sample : SBD0323S1
Misc : V4-077-07,V4-077-08
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Mar 23 09:47:58 2021
Quant Method : C:\MSDCHEM\1\METHODS\W210203S.M
Quant Title :
QLast Update : Thu Feb 04 07:56:41 2021
Response via : Initial Calibration

| Compound | R.T. | QIon | Response | Conc | Units | | Dev(Min) |
|---|---|---|---|---|---|---|---|
| Internal Standards | | | | | | | |
| 1) Pentafluorobenzene | 4.091 | 168 | 158967 | 50.00 | ppb | | 0.00 |
| 28) 1,4-Difluorobenzene | 4.697 | 114 | 228116 | 50.00 | ppb | | 0.00 |
| 38) Chlorobenzene-d5 | 7.255 | 117 | 202771 | 50.00 | ppb | | 0.00 |
| 55) 1,4-Dichlorobenzene-d4 | 9.466 | 152 | 110347 | 50.00 | ppb | | 0.00 |
| System Monitoring Compounds | | | | | | | |
| 23) Dibromofluoromethane | 4.045 | 111 | 72006 | 48.21 | ppb | | 0.00 |
| Spiked Amount 50.000 | Range 76 - 131 | | Recovery = 96.42% | | | | |
| 36) Toluene-d8 | 5.962 | 98 | 250716 | 48.02 | ppb | | 0.00 |
| Spiked Amount 50.000 | Range 78 - 128 | | Recovery = 96.04% | | | | |
| 54) 4-Bromofluorobenzene | 8.354 | 95 | 115646 | 50.95 | ppb | | 0.00 |
| Spiked Amount 50.000 | Range 71 - 130 | | Recovery = 101.90% | | | | |
| Target Compounds | | | | | | | Qvalue |
| 2) Dichlorodifluoromethane | 1.092 | 85 | 61414 | 63.00 | ppb | | 100 |
| 3) Chloromethane | 1.216 | 50 | 52480 | 37.26 | ppb | # | 100 |
| 4) Vinyl Chloride | 1.290 | 62 | 52494 | 41.14 | ppb | | 96 |
| 5) Bromomethane | 1.511 | 96 | 25535 | 48.62 | ppb | | 99 |
| 6) Chloroethane | 1.585 | 64 | 29630 | 43.70 | ppb | | 97 |
| 7) Trichlorofluoromethane | 1.778 | 101 | 107013 | 54.75 | ppb | | 98 |
| 8) 1,1-Dichloroethene | 2.191 | 61 | 71077 | 43.63 | ppb | | 98 |
| 9) Acetone | 2.242 | 43 | 15098 | 47.16 | ppb | | 95 |
| 10) Iodomethane | 2.311 | 142 | 45443 | 40.42 | ppb | | 99 |
| 11) Carbon Disulfide | 2.362 | 76 | 106395 | 37.91 | ppb | | 99 |
| 12) Methylene Chloride | 2.588 | 49 | 58835 | 33.87 | ppb | | 100 |
| 13) (trans) 1,2-Dichloroet... | 2.815 | 61 | 67969 | 41.11 | ppb | | 99 |
| 14) Methyl t-Butyl Ether | 2.821 | 73 | 137706 | 52.39 | ppb | | 96 |
| 15) 1,1-Dichloroethane | 3.161 | 63 | 90163 | 43.96 | ppb | | 100 |
| 16) Vinyl Acetate | 3.218 | 43 | 89407 | 42.35 | ppb | | 97 |
| 17) 2,2-Dichloropropane | 3.643 | 77 | 81774 | 52.79 | ppb | | 97 |
| 18) (cis) 1,2-Dichloroethene | 3.643 | 61 | 83334 | 42.25 | ppb | | 99 |
| 19) 2-Butanone | 3.666 | 43 | 20668 | 43.39 | ppb | | 96 |
| 20) Bromochloromethane | 3.841 | 130 | 31424 | 52.18 | ppb | # | 82 |
| 21) Chloroform | 3.915 | 83 | 97404 | 49.66 | ppb | | 100 |
| 22) 1,1,1-Trichloroethane | 4.062 | 97 | 96351 | 50.37 | ppb | # | 100 |
| 24) Carbon Tetrachloride | 4.199 | 117 | 89837 | 50.70 | ppb | | 99 |
| 25) 1,1-Dichloropropene | 4.199 | 75 | 69838 | 47.59 | ppb | | 98 |
| 26) Benzene | 4.369 | 78 | 175511 | 46.84 | ppb | | 97 |
| 27) 1,2-Dichloroethane | 4.386 | 62 | 88623 | 51.40 | ppb | | 95 |
| 29) Trichloroethene | 4.913 | 130 | 50661 | 51.39 | ppb | | 97 |
| 30) 1,2-Dichloropropane | 5.106 | 63 | 46661 | 42.00 | ppb | | 99 |
| 31) Dibromomethane | 5.202 | 174 | 33400 | 52.57 | ppb | | 97 |
| 32) Bromodichloromethane | 5.338 | 83 | 73449 | 51.02 | ppb | | 99 |
| 33) 2-Chloroethyl Vinyl Ether | 5.610 | 63 | 11025 | 52.34 | ppb | | 95 |
| 34) (cis) 1,3-Dichloropropene | 5.729 | 75 | 82700 | 52.93 | ppb | | 99 |
| 35) Methyl Isobutyl Ketone | 5.871 | 43 | 45883 | 47.12 | ppb | # | 95 |
| 37) Toluene | 6.019 | 91 | 197020 | 46.44 | ppb | | 99 |
| 39) (trans) 1,3-Dichloropr... | 6.223 | 75 | 75965 | 55.09 | ppb | | 99 |
| 40) 1,1,2-Trichloroethane | 6.381 | 97 | 39676 | 48.62 | ppb | | 97 |
| 41) Tetrachloroethene | 6.506 | 166 | 56917 | 53.74 | ppb | | 100 |
| 42) 1,3-Dichloropropane | 6.529 | 76 | 70643 | 50.02 | ppb | | 99 |

Quantitation Report (Not Reviewed)

Data Path : C:\msdchem\1\data\W210323\
Data File : W032303.D
Acq On : 23 Mar 2021 9:33 am
Operator :
Sample : SBD0323S1
Misc : V4-077-07,V4-077-08
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Mar 23 09:47:58 2021
Quant Method : C:\MSDCHEM\1\METHODS\W210203S.M
Quant Title :
QLast Update : Thu Feb 04 07:56:41 2021
Response via : Initial Calibration

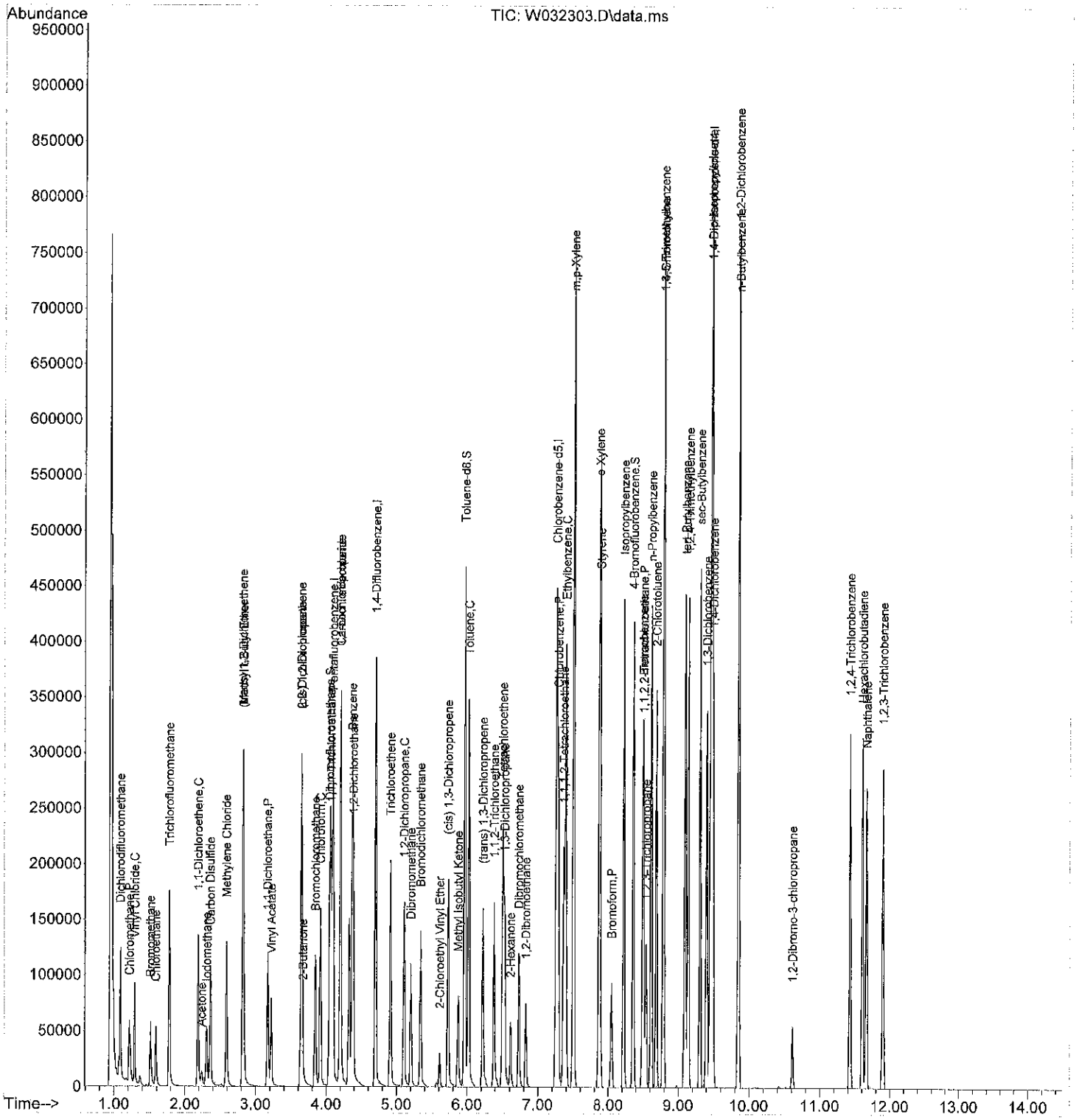
| Compound | R.T. | QIon | Response | Conc | Units | | Dev(Min) |
|---|---|---|---|---|---|---|---|
| 43) 2-Hexanone | 6.614 | 43 | 32212 | 40.21 | ppb | # | 97 |
| 44) Dibromochloromethane | 6.727 | 129 | 55201 | 52.08 | ppb | | 98 |
| 45) 1,2-Dibromoethane | 6.829 | 107 | 41730 | 51.02 | ppb | | 97 |
| 46) Chlorobenzene | 7.283 | 112 | 129140 | 48.58 | ppb | | 96 |
| 47) 1,1,1,2-Tetrachloroethane | 7.362 | 133 | 52365 | 55.26 | ppb | | 97 |
| 48) Ethylbenzene | 7.391 | 91 | 235044 | 48.18 | ppb | | 100 |
| 49) m,p-Xylene | 7.498 | 91 | 379471 | 96.64 | ppb | | 99 |
| 50) o-Xylene | 7.867 | 91 | 197991 | 49.90 | ppb | | 98 |
| 51) Styrene | 7.884 | 104 | 149056 | 50.49 | ppb | | 100 |
| 52) Bromoform | 8.048 | 173 | 38665 | 58.56 | ppb | | 99 |
| 53) Isopropylbenzene | 8.218 | 105 | 243307 | 51.18 | ppb | | 99 |
| 56) Bromobenzene | 8.496 | 156 | 59104 | 50.67 | ppb | | 100 |
| 57) 1,1,2,2-Tetrachloroethane | 8.502 | 83 | 51530 | 50.66 | ppb | | 98 |
| 58) 1,2,3-Trichloropropane | 8.542 | 75 | 43012 | 52.89 | ppb | | 95 |
| 59) n-Propylbenzene | 8.610 | 91 | 280173 | 50.75 | ppb | | 98 |
| 60) 2-Chlorotoluene | 8.683 | 126 | 55502 | 52.89 | ppb | | 98 |
| 61) 4-Chlorotoluene | 8.791 | 126 | 58187 | 54.26 | ppb | | 98 |
| 62) 1,3,5-Trimethylbenzene | 8.785 | 105 | 204610 | 51.53 | ppb | | 100 |
| 63) tert-Butylbenzene | 9.097 | 119 | 181460 | 52.72 | ppb | | 99 |
| 64) 1,2,4-Trimethylbenzene | 9.143 | 105 | 210712 | 52.78 | ppb | | 99 |
| 65) sec-Butylbenzene | 9.307 | 105 | 261359 | 53.56 | ppb | | 100 |
| 66) 1,3-Dichlorobenzene | 9.403 | 146 | 115615 | 54.60 | ppb | | 99 |
| 67) p-Isopropyltoluene | 9.454 | 119 | 231916 | 53.92 | ppb | | 99 |
| 68) 1,4-Dichlorobenzene | 9.488 | 146 | 118251 | 54.36 | ppb | | 97 |
| 69) 1,2-Dichlorobenzene | 9.846 | 146 | 110121 | 55.71 | ppb | | 99 |
| 70) n-Butylbenzene | 9.851 | 91 | 209601 | 51.61 | ppb | | 97 |
| 71) 1,2-Dibromo-3-chloropr... | 10.611 | 157 | 12453 | 58.59 | ppb | | 99 |
| 72) 1,2,4-Trichlorobenzene | 11.427 | 180 | 86569 | 58.91 | ppb | | 98 |
| 73) Hexachlorobutadiene | 11.609 | 225 | 55387 | 55.43 | ppb | | 99 |
| 74) Naphthalene | 11.666 | 128 | 186545 | 60.44 | ppb | | 98 |
| 75) 1,2,3-Trichlorobenzene | 11.904 | 180 | 78370 | 57.82 | ppb | | 99 |

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (Not Reviewed)

Data Path : C:\msdchem\1\data\W210323\
Data File : W032303.D
Acq On : 23 Mar 2021 9:33 am
Operator :
Sample : SBD0323S1
Misc : V4-077-07,V4-077-08
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Mar 23 09:47:58 2021
Quant Method : C:\MSDCHEM\1\METHODS\W210203S.M
Quant Title :
QLast Update : Thu Feb 04 07:56:41 2021
Response via : Initial Calibration



# Evaluate Continuing Calibration Report

Data File : X:\VOLATILE\ALBERT\DATA\A210319\A0319003.D  Vial: 3
Acq On : 19 Mar 2021 9:21 am  Operator:
Sample : SB0319S1 (CCV0319S1)  Inst : Albert
Misc : V4-077-16,V4-077-05  Multiplr: 1.00
MS Integration Params: rteint.p

Method : F:\HPCHEM\1\METHODS\A210315Q.M (RTE Integrator)
Title : 8260 Calibration
Last Update : Tue Mar 16 09:05:28 2021
Response via : Multiple Level Calibration

Min. RRF : 0.100 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 20% Max. Rel. Area : 200%

| | | Compound | Amount | Calc. | %Dev | Area% | Dev(min) |
|---|---|---|---|---|---|---|---|
| 1 | I | Pentafluorobenzene | 50.000 | 50.000 | 0.0 | 115 | 0.01 |
| 2 | T | Dichlorodifluoromethane | 50.000 | 29.039 | 41.9# | 71 | 0.00 |
| 3 | P,T | Chloromethane | 50.000 | 38.101 | 23.8# | 95 | 0.00 |
| 4 | C,T | Vinyl Chloride | 50.000 | 42.038 | 15.9 | 105 | 0.00 |
| 5 | T | Bromomethane | 50.000 | 41.024 | 18.0 | 93 | 0.00 |
| 6 | T | Chloroethane | 50.000 | 48.837 | 2.3 | 110 | 0.00 |
| 7 | T | Trichlorofluoromethane | 50.000 | 48.805 | 2.4 | 109 | 0.00 |
| 8 | M,C | 1,1-Dichloroethene | 50.000 | 48.747 | 2.5 | 115 | 0.02 |
| 9 | T | Acetone | 50.000 | 47.280 | 5.4 | 114 | 0.00 |
| 10 | | Iodomethane | 50.000 | 54.332 | -8.7 | 114 | 0.01 |
| 11 | T | Carbon Disulfide | 50.000 | 51.399 | -2.8 | 119 | 0.01 |
| 12 | T | Methylene Chloride | 50.000 | 43.210 | 13.6 | 111 | 0.01 |
| 13 | T | (trans) 1,2-Dichloroethene | 50.000 | 52.817 | -5.6 | 120 | 0.01 |
| 14 | | Methyl t-Butyl Ether | 50.000 | 51.023 | -2.0 | 114 | 0.00 |
| 15 | T,P | 1,1-Dichloroethane | 50.000 | 47.168 | 5.7 | 113 | 0.01 |
| 16 | T | Vinyl Acetate | 50.000 | 52.076 | -4.2 | 109 | 0.01 |
| 17 | T | 2,2-Dichloropropane | 50.000 | 54.713 | -9.4 | 129 | 0.01 |
| 18 | T | (cis) 1,2-Dichloroethene | 50.000 | 58.097 | -16.2 | 132 | 0.01 |
| 19 | | 2-Butanone | 50.000 | 54.013 | -8.0 | 121 | 0.00 |
| 20 | | Bromochloromethane | 50.000 | 50.019 | -0.0 | 110 | 0.00 |
| 21 | T,C | Chloroform | 50.000 | 56.150 | -12.3 | 125 | 0.02 |
| 22 | T | 1,1,1-Trichloroethane | 50.000 | 55.159 | -10.3 | 124 | 0.01 |
| 23 | S | Dibromofluoromethane | 50.000 | 50.387 | -0.8 | 116 | 0.01 |
| 24 | T | Carbon Tetrachloride | 50.000 | 55.102 | -10.2 | 125 | 0.01 |
| 25 | T | 1,1-Dichloropropene | 50.000 | 56.581 | -13.2 | 127 | 0.01 |
| 26 | M | Benzene | 50.000 | 56.987 | -14.0 | 128 | 0.01 |
| 27 | T | 1,2-Dichloroethane | 50.000 | 55.086 | -10.2 | 125 | 0.00 |
| 28 | I | 1,4-Difluorobenzene | 50.000 | 50.000 | 0.0 | 118 | 0.02 |
| 29 | M | Trichloroethene | 50.000 | 54.761 | -9.5 | 126 | 0.01 |
| 30 | T,C | 1,2-Dichloropropane | 50.000 | 53.404 | -6.8 | 125 | 0.00 |
| 31 | T | Dibromomethane | 50.000 | 55.198 | -10.4 | 123 | 0.01 |
| 32 | T | Bromodichloromethane | 50.000 | 54.399 | -8.8 | 127 | 0.01 |
| 33 | T | 2-Chloroethyl Vinyl Ether | 50.000 | 52.616 | -5.2 | 126 | 0.00 |
| 34 | T | (cis) 1,3-Dichloropropene | 50.000 | 57.100 | -14.2 | 130 | 0.00 |
| 35 | | Methyl Isobutyl Ketone | 50.000 | 53.612 | -7.2 | 127 | 0.00 |
| 36 | S | Toluene-d8 | 50.000 | 49.888 | 0.2 | 118 | 0.00 |
| 37 | M,C | Toluene | 50.000 | 57.329 | -14.7 | 130 | 0.00 |
| 38 | I | Chlorobenzene-d5 | 50.000 | 50.000 | 0.0 | 117 | 0.01 |
| 39 | T | (trans) 1,3-Dichloropropene | 50.000 | 57.635 | -15.3 | 132 | 0.01 |
| 40 | T | 1,1,2-Trichloroethane | 50.000 | 54.712 | -9.4 | 128 | 0.00 |
| 41 | T | Tetrachloroethene | 50.000 | 56.001 | -12.0 | 127 | 0.01 |
| 42 | T | 1,3-Dichloropropane | 50.000 | 55.464 | -10.9 | 127 | 0.01 |
| 43 | T | 2-Hexanone | 50.000 | 53.879 | -7.8 | 128 | 0.00 |
| 44 | T | Dibromochloromethane | 50.000 | 55.235 | -10.5 | 128 | 0.01 |
| 45 | T | 1,2-Dibromoethane | 50.000 | 55.831 | -11.7 | 127 | 0.01 |
| 46 | M,P | Chlorobenzene | 50.000 | 55.855 | -11.7 | 130 | 0.01 |
| 47 | T | 1,1,1,2-Tetrachloroethane | 50.000 | 55.889 | -11.8 | 128 | 0.00 |
| 48 | T,C | Ethylbenzene | 50.000 | 56.669 | -13.3 | 128 | 0.01 |
| 49 | T | m,p-Xylene | 100.000 | 112.010 | -12.0 | 122 | 0.01 |
| 50 | T | o-Xylene | 50.000 | 53.263 | -6.5 | 130 | 0.01 |
| 51 | T | Styrene | 50.000 | 60.725 | -21.5# | 129 | 0.01 |
| 52 | T,P | Bromoform | 50.000 | 55.955 | -11.9 | 124 | 0.00 |
| 53 | T | Isopropylbenzene | 50.000 | 61.052 | -22.1# | 130 | 0.00 |

(#) = Out of Range

Evaluate Continuing Calibration Report

Data File : X:\VOLATILE\ALBERT\DATA\A210319\A0319003.D Vial: 3
Acq On : 19 Mar 2021 9:21 am Operator:
Sample : SB0319S1 (CCV0319S1) Inst : Albert
Misc : V4-077-16,V4-077-05 Multiplr: 1.00
MS Integration Params: rteint.p

Method : F:\HPCHEM\1\METHODS\A210315Q.M (RTE Integrator)
Title : 8260 Calibration
Last Update : Tue Mar 16 09:05:28 2021
Response via : Multiple Level Calibration

Min. RRF : 0.100 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 20% Max. Rel. Area : 200%

| | | Compound | Amount | Calc. | %Dev | Area% | Dev(min) |
|---|---|---|---|---|---|---|---|
| 54 | S | 4-Bromofluorobenzene | 50.000 | 52.979 | -6.0 | 124 | 0.00 |
| 55 | I | 1,4-Dichlorobenzene-d4 | 50.000 | 50.000 | 0.0 | 108 | 0.00 |
| 56 | T | Bromobenzene | 50.000 | 57.864 | -15.7 | 131 | 0.00 |
| 57 | T,P | 1,1,2,2-Tetrachloroethane | 50.000 | 61.574 | -23.1# | 125 | 0.00 |
| 58 | T | 1,2,3-Trichloropropane | 50.000 | 59.024 | -18.0 | 125 | 0.01 |
| 59 | T | n-Propylbenzene | 50.000 | 59.658 | -19.3 | 130 | 0.01 |
| 60 | T | 2-Chlorotoluene | 50.000 | 57.168 | -14.3 | 133 | 0.01 |
| 61 | T | 4-Chlorotoluene | 50.000 | 60.523 | -21.0# | 128 | 0.01 |
| 62 | T | 1,3,5-Trimethylbenzene | 50.000 | 62.939 | -25.9# | 126 | 0.00 |
| 63 | T | tert-Butylbenzene | 50.000 | 58.560 | -17.1 | 132 | 0.01 |
| 64 | T | 1,2,4-Trimethylbenzene | 50.000 | 49.270 | 1.5 | 128 | 0.01 |
| 65 | T | sec-Butylbenzene | 50.000 | 60.815 | -21.6# | 128 | 0.00 |
| 66 | T | 1,3-Dichlorobenzene | 50.000 | 58.190 | -16.4 | 127 | 0.01 |
| 67 | T | p-Isopropyltoluene | 50.000 | 58.571 | -17.1 | 123 | 0.00 |
| 68 | T | 1,4-Dichlorobenzene | 50.000 | 56.423 | -12.8 | 126 | 0.01 |
| 69 | T | 1,2-Dichlorobenzene | 50.000 | 60.132 | -20.3# | 126 | 0.00 |
| 70 | T | n-Butylbenzene | 50.000 | 64.087 | -28.2# | 123 | 0.01 |
| 71 | T | 1,2-Dibromo-3-chloropropane | 50.000 | 55.966 | -11.9 | 114 | 0.00 |
| 72 | T | 1,2,4-Trichlorobenzene | 50.000 | 47.431 | 5.1 | 128 | 0.01 |
| 73 | T | Hexachlorobutadiene | 50.000 | 56.687 | -13.4 | 130 | 0.01 |
| 74 | T | Naphthalene | 50.000 | 44.820 | 10.4 | 123 | 0.00 |
| 75 | T | 1,2,3-Trichlorobenzene | 50.000 | 46.030 | 7.9 | 126 | 0.01 |

(#) = Out of Range SPCC's out = 0 CCC's out = 0
A0319003.D A210315Q.M Thu Mar 25 13:42:38 2021 

Quantitation Report (QT Reviewed)

Data File : X:\VOLATILE\ALBERT\DATA\A210319\A0319003.D Vial: 3
Acq On : 19 Mar 2021 9:21 am Operator:
Sample : SB0319S1 (CCV0319S1) Inst : Albert
Misc : V4-077-16,V4-077-05 Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Mar 19 10:06 2021 Quant Results File: A210315Q.RES

Quant Method : F:\HPCHEM\1\METHODS\A210315Q.M (RTE Integrator)
Title : 8260 Calibration
Last Update : Tue Mar 16 09:05:28 2021
Response via : Initial Calibration
DataAcq Meth : A210315Q

| Internal Standards | R.T. | QIon | Response | Conc | Units | | Dev(Min) |
|---|---|---|---|---|---|---|---|
| 1) Pentafluorobenzene | 3.68 | 168 | 878106 | 50.00 | ppb | | 0.01 |
| 28) 1,4-Difluorobenzene | 4.37 | 114 | 1512951 | 50.00 | ppb | | 0.02 |
| 38) Chlorobenzene-d5 | 7.08 | 117 | 1348583 | 50.00 | ppb | | 0.01 |
| 55) 1,4-Dichlorobenzene-d4 | 9.34 | 152 | 789146 | 50.00 | ppb | | 0.00 |
| **System Monitoring Compounds** | | | | | | | |
| 23) Dibromofluoromethane | 3.61 | 111 | 475561 | 50.39 | ppb | | 0.01 |
| Spiked Amount 50.000 | Range 74 - 131 | | Recovery = 100.78% | | | | |
| 36) Toluene-d8 | 5.74 | 98 | 1760640 | 49.89 | ppb | | 0.00 |
| Spiked Amount 50.000 | Range 78 - 128 | | Recovery = 99.78% | | | | |
| 54) 4-Bromofluorobenzene | 8.22 | 95 | 730652 | 52.98 | ppb | | 0.00 |
| Spiked Amount 50.000 | Range 71 - 130 | | Recovery = 105.96% | | | | |
| **Target Compounds** | | | | | | | Qvalue |
| 2) Dichlorodifluoromethane | 0.64 | 85 | 143493 | 29.04 | ppb | | 98 |
| 3) Chloromethane | 0.70 | 50 | 158872 | 38.10 | ppb | | 100 |
| 4) Vinyl Chloride | 0.69 | 62 | 136644 | 42.04 | ppb | | 97 |
| 5) Bromomethane | 0.78 | 96 | 74007 | 41.02 | ppb | # | 73 |
| 6) Chloroethane | 0.80 | 64 | 61319 | 48.84 | ppb | | 91 |
| 7) Trichlorofluoromethane | 0.90 | 101 | 631763m | 48.81 | ppb | | |
| 8) 1,1-Dichloroethene | 1.26 | 61 | 1144015m | 48.75 | ppb | | |
| 9) Acetone | 1.33 | 43 | 240103 | 47.28 | ppb | | 98 |
| 10) Iodomethane | 1.40 | 142 | 903729m | 54.33 | ppb | | |
| 11) Carbon Disulfide | 1.46 | 76 | 2319464 | 51.40 | ppb | | 100 |
| 12) Methylene Chloride | 1.75 | 49 | 1108000 | 43.21 | ppb | | 96 |
| 13) (trans) 1,2-Dichloroethene | 2.06 | 61 | 1133886m | 52.82 | ppb | | |
| 14) Methyl t-Butyl Ether | 2.08 | 73 | 1847953 | 51.02 | ppb | | 100 |
| 15) 1,1-Dichloroethane | 2.52 | 63 | 1563056m | 47.17 | ppb | | |
| 16) Vinyl Acetate | 2.60 | 43 | 1943746 | 52.08 | ppb | | 100 |
| 17) 2,2-Dichloropropane | 3.12 | 77 | 754006 | 54.71 | ppb | | 100 |
| 18) (cis) 1,2-Dichloroethene | 3.12 | 61 | 1009275m | 58.10 | ppb | | |
| 19) 2-Butanone | 3.17 | 43 | 281229 | 54.01 | ppb | | 96 |
| 20) Bromochloromethane | 3.36 | 130 | 298331 | 50.02 | ppb | | 87 |
| 21) Chloroform | 3.46 | 83 | 926837m | 56.15 | ppb | | |
| 22) 1,1,1-Trichloroethane | 3.61 | 97 | 695691 | 55.16 | ppb | | 99 |
| 24) Carbon Tetrachloride | 3.78 | 117 | 628052 | 55.10 | ppb | | 100 |
| 25) 1,1-Dichloropropene | 3.78 | 75 | 814080 | 56.58 | ppb | | 100 |
| 26) Benzene | 3.98 | 78 | 2229258 | 56.99 | ppb | | 100 |
| 27) 1,2-Dichloroethane | 3.99 | 62 | 681281 | 55.09 | ppb | | 98 |
| 29) Trichloroethene | 4.60 | 130 | 571880 | 54.76 | ppb | | 100 |
| 30) 1,2-Dichloropropane | 4.80 | 63 | 652790 | 53.40 | ppb | | 98 |
| 31) Dibromomethane | 4.91 | 174 | 320125 | 55.20 | ppb | | 96 |
| 32) Bromodichloromethane | 5.07 | 83 | 648983 | 54.40 | ppb | | 100 |
| 33) 2-Chloroethyl Vinyl Ether | 5.37 | 63 | 277357 | 52.62 | ppb | | 99 |
| 34) (cis) 1,3-Dichloropropene | 5.49 | 75 | 966873 | 57.10 | ppb | | 99 |
| 35) Methyl Isobutyl Ketone | 5.65 | 43 | 659218 | 53.61 | ppb | | 99 |
| 37) Toluene | 5.80 | 91 | 2539902 | 57.33 | ppb | | 99 |
| 39) (trans) 1,3-Dichloropropen | 6.02 | 75 | 766315 | 57.63 | ppb | | 98 |
| 40) 1,1,2-Trichloroethane | 6.18 | 97 | 439800 | 54.71 | ppb | | 99 |
| 41) Tetrachloroethene | 6.31 | 166 | 634074 | 56.00 | ppb | | 99 |
| 42) 1,3-Dichloropropane | 6.33 | 76 | 815358 | 55.46 | ppb | | 100 |
| 43) 2-Hexanone | 6.44 | 43 | 438635 | 53.88 | ppb | | 97 |
| 44) Dibromochloromethane | 6.54 | 129 | 469774 | 55.23 | ppb | | 99 |
| 45) 1,2-Dibromoethane | 6.64 | 107 | 437869 | 55.83 | ppb | | 98 |
| 46) Chlorobenzene | 7.11 | 112 | 1644918 | 55.85 | ppb | | 99 |
| 47) 1,1,1,2-Tetrachloroethane | 7.19 | 133 | 509730 | 55.89 | ppb | | 98 |

(#) = qualifier out of range (m) = manual integration

3/25/21

Quantitation Report (QT Reviewed)

Data File : X:\VOLATILE\ALBERT\DATA\A210319\A0319003.D Vial: 3
Acq On : 19 Mar 2021 9:21 am Operator:
Sample : SB0319S1 (CCV0319S1) Inst : Albert
Misc : V4-077-16,V4-077-05 Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Mar 19 10:06 2021 Quant Results File: A210315Q.RES

Quant Method : F:\HPCHEM\1\METHODS\A210315Q.M (RTE Integrator)
Title : 8260 Calibration
Last Update : Tue Mar 16 09:05:28 2021
Response via : Initial Calibration
DataAcq Meth : A210315Q

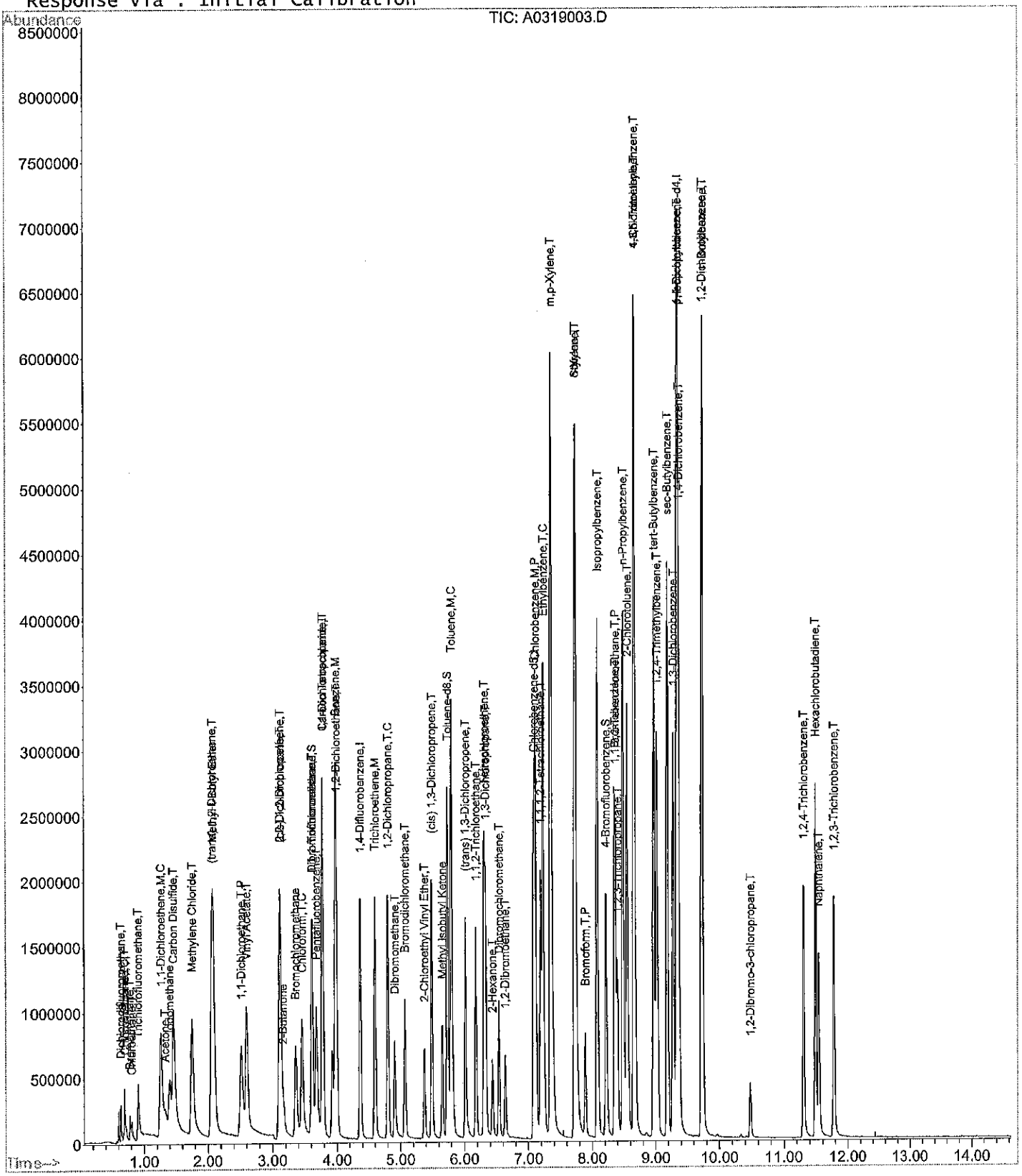
| | Compound | R.T. | QIon | Response | Conc | Unit | Qvalue |
|---|---|---|---|---|---|---|---|
| 48) | Ethylbenzene | 7.23 | 91 | 2816706 | 56.67 | ppb | 99 |
| 49) | m,p-Xylene | 7.35 | 91 | 4718620 | 112.01 | ppb | 99 |
| 50) | o-Xylene | 7.72 | 91 | 2595601 | 53.26 | ppb | 99 |
| 51) | Styrene | 7.73 | 104 | 2130091 | 60.73 | ppb | 100 |
| 52) | Bromoform | 7.89 | 173 | 349211 | 55.95 | ppb | 99 |
| 53) | Isopropylbenzene | 8.08 | 105 | 2978316 | 61.05 | ppb | 100 |
| 56) | Bromobenzene | 8.35 | 156 | 675892 | 57.86 | ppb | 96 |
| 57) | 1,1,2,2-Tetrachloroethane | 8.37 | 83 | 732649 | 61.57 | ppb | 99 |
| 58) | 1,2,3-Trichloropropane | 8.40 | 75 | 458335 | 59.02 | ppb | 99 |
| 59) | n-Propylbenzene | 8.48 | 91 | 3907049 | 59.66 | ppb | 99 |
| 60) | 2-Chlorotoluene | 8.55 | 126 | 697742 | 57.17 | ppb | 99 |
| 61) | 4-Chlorotoluene | 8.66 | 126 | 744707 | 60.52 | ppb | 99 |
| 62) | 1,3,5-Trimethylbenzene | 8.66 | 105 | 2503817 | 62.94 | ppb | 100 |
| 63) | tert-Butylbenzene | 8.97 | 119 | 2057453 | 58.56 | ppb | 98 |
| 64) | 1,2,4-Trimethylbenzene | 9.02 | 105 | 2348974 | 49.27 | ppb | 99 |
| 65) | sec-Butylbenzene | 9.18 | 105 | 3577046 | 60.82 | ppb | 99 |
| 66) | 1,3-Dichlorobenzene | 9.28 | 146 | 1420515 | 58.19 | ppb | 99 |
| 67) | p-Isopropyltoluene | 9.33 | 119 | 2628084 | 58.57 | ppb | 99 |
| 68) | 1,4-Dichlorobenzene | 9.37 | 146 | 1466404 | 56.42 | ppb | 99 |
| 69) | 1,2-Dichlorobenzene | 9.72 | 146 | 1325721 | 60.13 | ppb | 100 |
| 70) | n-Butylbenzene | 9.74 | 91 | 2749556 | 64.09 | ppb | 100 |
| 71) | 1,2-Dibromo-3-chloropropan | 10.48 | 157 | 116026 | 55.97 | ppb | 93 |
| 72) | 1,2,4-Trichlorobenzene | 11.31 | 180 | 637851 | 47.43 | ppb | 97 |
| 73) | Hexachlorobutadiene | 11.50 | 225 | 460440 | 56.69 | ppb | 99 |
| 74) | Naphthalene | 11.54 | 128 | 1158883 | 44.82 | ppb | 99 |
| 75) | 1,2,3-Trichlorobenzene | 11.79 | 180 | 570382 | 46.03 | ppb | 97 |

(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : X:\VOLATILE\ALBERT\DATA\A210319\A0319003.D Vial: 3
Acq On : 19 Mar 2021 9:21 am Operator:
Sample : SB0319S1 (CCV0319S1) Inst : Albert
Misc : V4-077-16,V4-077-05 Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Mar 19 10:06 2021 Quant Results File: A210315Q.RES

Method : F:\HPCHEM\1\METHODS\A210323Q.M (RTE Integrator)
Title : 8260 Calibration
Last Update : Wed Mar 24 09:41:12 2021
Response via : Initial Calibration



# Evaluate Continuing Calibration Report

Data Path : C:\msdchem\1\data\W210323\
Data File : W032302.D
Acq On : 23 Mar 2021 9:04 am
Operator :
Sample : SB0323S1 (CCV0323S1)
Misc : V4-077-07,V4-077-08
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 23 09:30:56 2021
Quant Method : C:\MSDCHEM\1\METHODS\W210203S.M
Quant Title :
QLast Update : Thu Feb 04 07:56:41 2021
Response via : Initial Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

| | | Compound | Amount | Calc. | %Dev | Area% | Dev(min) |
|---|---|---|---|---|---|---|---|
| 1 | I | Pentafluorobenzene | 50.000 | 50.000 | 0.0 | 90 | 0.00 |
| 2 | | Dichlorodifluoromethane | 50.000 | 62.617 | -25.2# | 122 | 0.00 |
| 3 | P | Chloromethane | 50.000 | 36.257 | 27.5# | 70 | 0.00 |
| 4 | C | Vinyl Chloride | 50.000 | 41.290 | 17.4 | 75 | 0.00 |
| 5 | | Bromomethane | 50.000 | 42.804 | 14.4 | 80 | 0.00 |
| 6 | | Chloroethane | 50.000 | 42.182 | 15.6 | 75 | 0.00 |
| 7 | | Trichlorofluoromethane | 50.000 | 50.983 | -2.0 | 93 | 0.00 |
| 8 | C | 1,1-Dichloroethene | 50.000 | 41.289 | 17.4 | 71 | 0.00 |
| 9 | | Acetone | 50.000 | 52.675 | -5.3 | 100 | 0.00 |
| 10 | | Iodomethane | 50.000 | 40.514 | 19.0 | 69 | 0.00 |
| 11 | | Carbon Disulfide | 50.000 | 37.256 | 25.5# | 69 | 0.00 |
| 12 | | Methylene Chloride | 50.000 | 34.015 | 32.0# | 65 | 0.00 |
| 13 | | (trans) 1,2-Dichloroethene | 50.000 | 40.422 | 19.2 | 73 | 0.00 |
| 14 | | Methyl t-Butyl Ether | 50.000 | 52.013 | -4.0 | 91 | 0.00 |
| 15 | P | 1,1-Dichloroethane | 50.000 | 41.047 | 17.9 | 73 | 0.00 |
| 16 | | Vinyl Acetate | 50.000 | 42.824 | 14.4 | 78 | 0.00 |
| 17 | | 2,2-Dichloropropane | 50.000 | 51.254 | -2.5 | 92 | 0.00 |
| 18 | | (cis) 1,2-Dichloroethene | 50.000 | 40.099 | 19.8 | 73 | 0.00 |
| 19 | | 2-Butanone | 50.000 | 45.590 | 8.8 | 86 | 0.00 |
| 20 | | Bromochloromethane | 50.000 | 49.515 | 1.0 | 87 | 0.00 |
| 21 | C | Chloroform | 50.000 | 46.394 | 7.2 | 80 | 0.00 |
| 22 | | 1,1,1-Trichloroethane | 50.000 | 47.820 | 4.4 | 88 | 0.00 |
| 23 | S | Dibromofluoromethane | 50.000 | 49.676 | 0.6 | 86 | 0.00 |
| 24 | | Carbon Tetrachloride | 50.000 | 47.441 | 5.1 | 89 | 0.00 |
| 25 | | 1,1-Dichloropropene | 50.000 | 44.047 | 11.9 | 82 | 0.00 |
| 26 | | Benzene | 50.000 | 43.319 | 13.4 | 78 | 0.00 |
| 27 | | 1,2-Dichloroethane | 50.000 | 48.941 | 2.1 | 84 | 0.00 |
| 28 | I | 1,4-Difluorobenzene | 50.000 | 50.000 | 0.0 | 86 | 0.00 |
| 29 | | Trichloroethene | 50.000 | 50.160 | -0.3 | 86 | 0.00 |
| 30 | C | 1,2-Dichloropropane | 50.000 | 40.906 | 18.2 | 72 | 0.00 |
| 31 | | Dibromomethane | 50.000 | 53.383 | -6.8 | 90 | 0.00 |
| 32 | | Bromodichloromethane | 50.000 | 48.977 | 2.0 | 81 | 0.00 |
| 33 | | 2-Chloroethyl Vinyl Ether | 50.000 | 53.698 | -7.4 | 98 | 0.00 |
| 34 | | (cis) 1,3-Dichloropropene | 50.000 | 50.352 | -0.7 | 84 | 0.00 |
| 35 | | Methyl Isobutyl Ketone | 50.000 | 50.251 | -0.5 | 83 | 0.00 |
| 36 | S | Toluene-d8 | 50.000 | 47.769 | 4.5 | 81 | 0.00 |
| 37 | C | Toluene | 50.000 | 43.485 | 13.0 | 80 | 0.00 |
| 38 | I | Chlorobenzene-d5 | 50.000 | 50.000 | 0.0 | 86 | 0.00 |
| 39 | | (trans) 1,3-Dichloropropene | 50.000 | 53.201 | -6.4 | 89 | 0.00 |
| 40 | | 1,1,2-Trichloroethane | 50.000 | 46.649 | 6.7 | 84 | 0.00 |
| 41 | | Tetrachloroethene | 50.000 | 50.551 | -1.1 | 87 | 0.00 |
| 42 | | 1,3-Dichloropropane | 50.000 | 49.570 | 0.9 | 84 | 0.00 |
| 43 | | 2-Hexanone | 50.000 | 44.807 | 10.4 | 84 | 0.00 |
| 44 | | Dibromochloromethane | 50.000 | 51.706 | -3.4 | 87 | 0.00 |
| 45 | | 1,2-Dibromoethane | 50.000 | 52.847 | -5.7 | 93 | 0.00 |
| 46 | P | Chlorobenzene | 50.000 | 47.608 | 4.8 | 85 | 0.00 |

Data Path : C:\msdchem\1\data\W210323\
Data File : W032302.D
Acq On : 23 Mar 2021 9:04 am
Operator :
Sample : SB0323S1 (CCV0323S1)
Misc : V4-077-07,V4-077-08
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 23 09:30:56 2021
Quant Method : C:\MSDCHEM\1\METHODS\W210203S.M
Quant Title :
QLast Update : Thu Feb 04 07:56:41 2021
Response via : Initial Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 150%

| | | Compound | Amount | Calc. | %Dev | Area% | Dev(min) |
|---|---|---|---|---|---|---|---|
| 47 | | 1,1,1,2-Tetrachloroethane | 50.000 | 52.045 | -4.1 | 89 | 0.00 |
| 48 | C | Ethylbenzene | 50.000 | 45.958 | 8.1 | 83 | 0.00 |
| 49 | | m,p-Xylene | 100.000 | 91.484 | 8.5 | 83 | 0.00 |
| 50 | | o-Xylene | 50.000 | 46.877 | 6.2 | 85 | 0.00 |
| 51 | | Styrene | 50.000 | 47.816 | 4.4 | 82 | 0.00 |
| 52 | P | Bromoform | 50.000 | 60.849 | -21.7# | 101 | 0.00 |
| 53 | | Isopropylbenzene | 50.000 | 49.374 | 1.3 | 87 | 0.00 |
| 54 | S | 4-Bromofluorobenzene | 50.000 | 50.467 | -0.9 | 84 | 0.00 |
| 55 | I | 1,4-Dichlorobenzene-d4 | 50.000 | 50.000 | 0.0 | 84 | 0.00 |
| 56 | | Bromobenzene | 50.000 | 49.475 | 1.0 | 88 | 0.00 |
| 57 | P | 1,1,2,2-Tetrachloroethane | 50.000 | 52.034 | -4.1 | 88 | 0.00 |
| 58 | | 1,2,3-Trichloropropane | 50.000 | 56.385 | -12.8 | 97 | 0.00 |
| 59 | | n-Propylbenzene | 50.000 | 50.133 | -0.3 | 86 | 0.00 |
| 60 | | 2-Chlorotoluene | 50.000 | 50.718 | -1.4 | 88 | 0.00 |
| 61 | | 4-Chlorotoluene | 50.000 | 51.744 | -3.5 | 89 | 0.00 |
| 62 | | 1,3,5-Trimethylbenzene | 50.000 | 49.916 | 0.2 | 87 | 0.00 |
| 63 | | tert-Butylbenzene | 50.000 | 51.285 | -2.6 | 88 | 0.00 |
| 64 | | 1,2,4-Trimethylbenzene | 50.000 | 50.261 | -0.5 | 87 | 0.00 |
| 65 | | sec-Butylbenzene | 50.000 | 50.147 | -0.3 | 85 | 0.00 |
| 66 | | 1,3-Dichlorobenzene | 50.000 | 50.573 | -1.1 | 88 | 0.00 |
| 67 | | p-Isopropyltoluene | 50.000 | 50.397 | -0.8 | 86 | 0.00 |
| 68 | | 1,4-Dichlorobenzene | 50.000 | 52.166 | -4.3 | 91 | 0.00 |
| 69 | | 1,2-Dichlorobenzene | 50.000 | 51.963 | -3.9 | 87 | 0.00 |
| 70 | | n-Butylbenzene | 50.000 | 49.114 | 1.8 | 84 | 0.00 |
| 71 | | 1,2-Dibromo-3-chloropropane | 50.000 | 64.939 | -29.9# | 114 | 0.00 |
| 72 | | 1,2,4-Trichlorobenzene | 50.000 | 57.226 | -14.5 | 100 | 0.00 |
| 73 | | Hexachlorobutadiene | 50.000 | 54.315 | -8.6 | 95 | 0.00 |
| 74 | | Naphthalene | 50.000 | 59.793 | -19.6 | 105 | 0.00 |
| 75 | | 1,2,3-Trichlorobenzene | 50.000 | 56.070 | -12.1 | 97 | 0.00 |

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\W210323\
Data File : W032302.D
Acq On : 23 Mar 2021 9:04 am
Operator :
Sample : SB0323S1 (CCV0323S1)
Misc : V4-077-07,V4-077-08
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 23 09:30:56 2021
Quant Method : C:\MSDCHEM\1\METHODS\W210203S.M
Quant Title :
QLast Update : Thu Feb 04 07:56:41 2021
Response via : Initial Calibration

| Compound | R.T. | QIon | Response | Conc | Units | | Dev(Min) |
|---|---|---|---|---|---|---|---|
| Internal Standards | | | | | | | |
| 1) Pentafluorobenzene | 4.091 | 168 | 158802 | 50.00 | ppb | | 0.00 |
| 28) 1,4-Difluorobenzene | 4.697 | 114 | 229758 | 50.00 | ppb | | 0.00 |
| 38) Chlorobenzene-d5 | 7.254 | 117 | 202863 | 50.00 | ppb | | 0.00 |
| 55) 1,4-Dichlorobenzene-d4 | 9.466 | 152 | 109811 | 50.00 | ppb | | 0.00 |
| System Monitoring Compounds | | | | | | | |
| 23) Dibromofluoromethane | 4.045 | 111 | 74123 | 49.68 | ppb | | 0.00 |
| Spiked Amount 50.000 | Range 76 - 131 | | Recovery = 99.36% | | | | |
| 36) Toluene-d8 | 5.962 | 98 | 251224 | 47.77 | ppb | | 0.00 |
| Spiked Amount 50.000 | Range 78 - 128 | | Recovery = 95.54% | | | | |
| 54) 4-Bromofluorobenzene | 8.360 | 95 | 114601 | 50.47 | ppb | | 0.00 |
| Spiked Amount 50.000 | Range 71 - 130 | | Recovery = 100.94% | | | | |
| Target Compounds | | | | | | | Qvalue |
| 2) Dichlorodifluoromethane | 1.091 | 85 | 60973 | 62.62 | ppb | | 100 |
| 3) Chloromethane | 1.216 | 50 | 51019 | 36.26 | ppb | # | 100 |
| 4) Vinyl Chloride | 1.290 | 62 | 52627 | 41.29 | ppb | | 97 |
| 5) Bromomethane | 1.511 | 96 | 22455m | 42.80 | ppb | | |
| 6) Chloroethane | 1.585 | 64 | 28572 | 42.18 | ppb | | 98 |
| 7) Trichlorofluoromethane | 1.777 | 101 | 99548 | 50.98 | ppb | | 99 |
| 8) 1,1-Dichloroethene | 2.191 | 61 | 67189 | 41.29 | ppb | | 100 |
| 9) Acetone | 2.242 | 43 | 16612 | 52.68 | ppb | | 98 |
| 10) Iodomethane | 2.310 | 142 | 45496m | 40.51 | ppb | | |
| 11) Carbon Disulfide | 2.361 | 76 | 104460m | 37.26 | ppb | | |
| 12) Methylene Chloride | 2.588 | 49 | 59032m | 34.02 | ppb | | |
| 13) (trans) 1,2-Dichloroet... | 2.815 | 61 | 66760m | 40.42 | ppb | | |
| 14) Methyl t-Butyl Ether | 2.821 | 73 | 136563 | 52.01 | ppb | | 97 |
| 15) 1,1-Dichloroethane | 3.161 | 63 | 84093 | 41.05 | ppb | | 98 |
| 16) Vinyl Acetate | 3.218 | 43 | 90314 | 42.82 | ppb | | 97 |
| 17) 2,2-Dichloropropane | 3.643 | 77 | 79319 | 51.25 | ppb | | 99 |
| 18) (cis) 1,2-Dichloroethene | 3.643 | 61 | 79000 | 40.10 | ppb | | 99 |
| 19) 2-Butanone | 3.666 | 43 | 21693 | 45.59 | ppb | | 98 |
| 20) Bromochloromethane | 3.841 | 130 | 29786 | 49.51 | ppb | # | 84 |
| 21) Chloroform | 3.909 | 83 | 90908 | 46.39 | ppb | | 98 |
| 22) 1,1,1-Trichloroethane | 4.062 | 97 | 91375 | 47.82 | ppb | # | 100 |
| 24) Carbon Tetrachloride | 4.198 | 117 | 83972 | 47.44 | ppb | | 92 |
| 25) 1,1-Dichloropropene | 4.198 | 75 | 64569 | 44.05 | ppb | | 98 |
| 26) Benzene | 4.369 | 78 | 162160 | 43.32 | ppb | | 98 |
| 27) 1,2-Dichloroethane | 4.386 | 62 | 84296 | 48.94 | ppb | | 99 |
| 29) Trichloroethene | 4.913 | 130 | 49808 | 50.16 | ppb | | 98 |
| 30) 1,2-Dichloropropane | 5.106 | 63 | 45775 | 40.91 | ppb | | 97 |
| 31) Dibromomethane | 5.202 | 174 | 34164 | 53.38 | ppb | | 96 |
| 32) Bromodichloromethane | 5.338 | 83 | 71009 | 48.98 | ppb | | 96 |
| 33) 2-Chloroethyl Vinyl Ether | 5.610 | 63 | 11393 | 53.70 | ppb | # | 90 |
| 34) (cis) 1,3-Dichloropropene | 5.729 | 75 | 79235 | 50.35 | ppb | | 100 |
| 35) Methyl Isobutyl Ketone | 5.871 | 43 | 49281 | 50.25 | ppb | # | 95 |
| 37) Toluene | 6.018 | 91 | 185826 | 43.49 | ppb | | 98 |
| 39) (trans) 1,3-Dichloropr... | 6.223 | 75 | 73391 | 53.20 | ppb | | 99 |
| 40) 1,1,2-Trichloroethane | 6.381 | 97 | 38083 | 46.65 | ppb | | 97 |
| 41) Tetrachloroethene | 6.506 | 166 | 53562 | 50.55 | ppb | | 98 |
| 42) 1,3-Dichloropropane | 6.529 | 76 | 70040 | 49.57 | ppb | | 99 |

3/25/21

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\W210323\
Data File : W032302.D
Acq On : 23 Mar 2021 9:04 am
Operator :
Sample : SB0323S1 (CCV0323S1)
Misc : V4-077-07,V4-077-08
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 23 09:30:56 2021
Quant Method : C:\MSDCHEM\1\METHODS\W210203S.M
Quant Title :
QLast Update : Thu Feb 04 07:56:41 2021
Response via : Initial Calibration

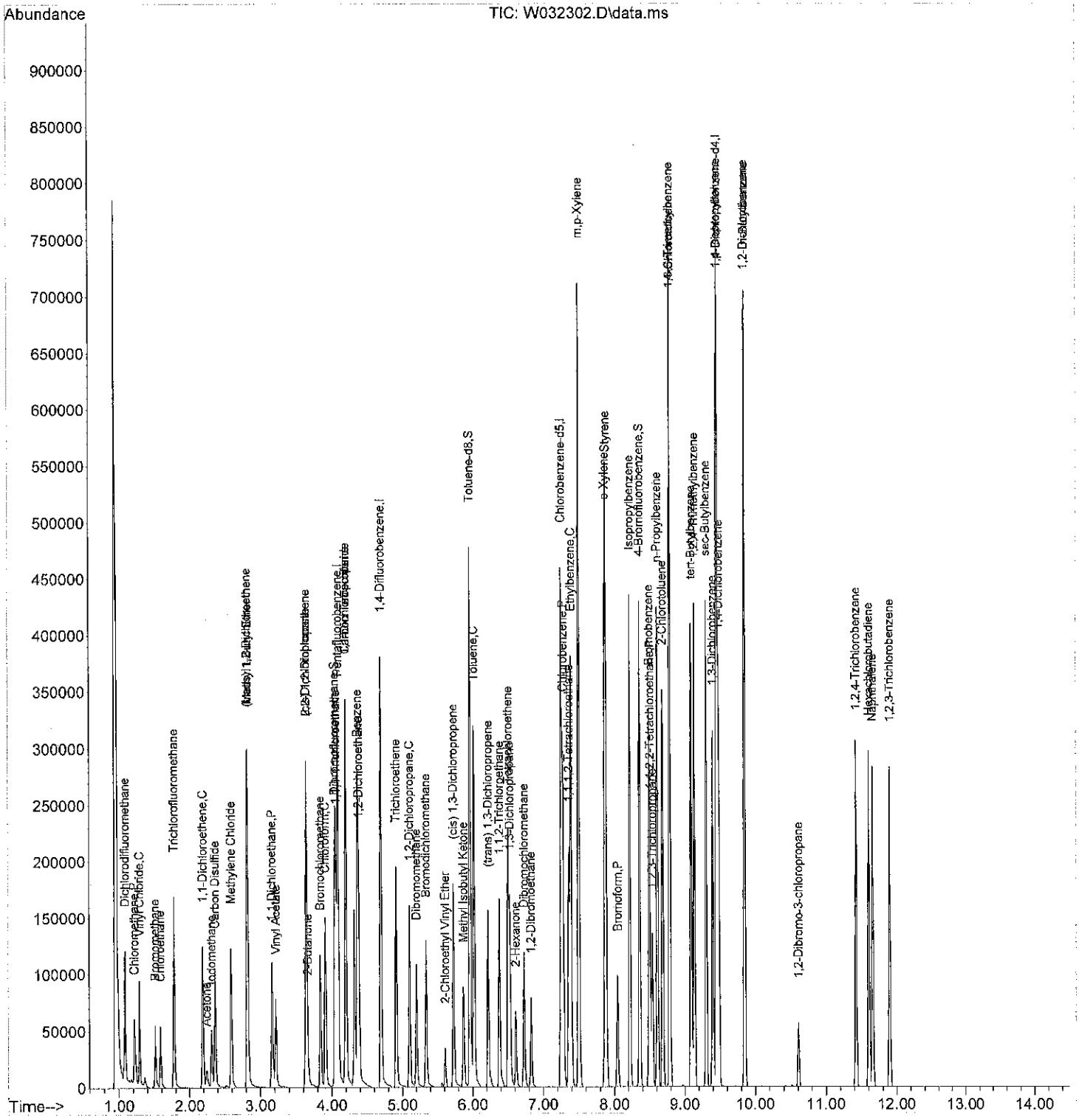
| Compound | R.T. | QIon | Response | Conc | Units | | Dev(Min) |
|---|---|---|---|---|---|---|---|
| 43) 2-Hexanone | 6.614 | 43 | 35909 | 44.81 | ppb | # | 94 |
| 44) Dibromochloromethane | 6.733 | 129 | 54826 | 51.71 | ppb | | 99 |
| 45) 1,2-Dibromoethane | 6.829 | 107 | 43246 | 52.85 | ppb | | 96 |
| 46) Chlorobenzene | 7.283 | 112 | 126620 | 47.61 | ppb | | 99 |
| 47) 1,1,1,2-Tetrachloroethane | 7.362 | 133 | 49340 | 52.04 | ppb | | 97 |
| 48) Ethylbenzene | 7.391 | 91 | 224302 | 45.96 | ppb | | 98 |
| 49) m,p-Xylene | 7.498 | 91 | 359404 | 91.48 | ppb | | 99 |
| 50) o-Xylene | 7.867 | 91 | 186091 | 46.88 | ppb | | 99 |
| 51) Styrene | 7.878 | 104 | 141231 | 47.82 | ppb | | 100 |
| 52) Bromoform | 8.048 | 173 | 40197 | 60.85 | ppb | | 99 |
| 53) Isopropylbenzene | 8.218 | 105 | 234810 | 49.37 | ppb | | 100 |
| 56) Bromobenzene | 8.496 | 156 | 57434 | 49.48 | ppb | | 100 |
| 57) 1,1,2,2-Tetrachloroethane | 8.507 | 83 | 52675 | 52.03 | ppb | | 99 |
| 58) 1,2,3-Trichloropropane | 8.541 | 75 | 45633 | 56.39 | ppb | | 95 |
| 59) n-Propylbenzene | 8.609 | 91 | 275418 | 50.13 | ppb | | 99 |
| 60) 2-Chlorotoluene | 8.683 | 126 | 52961 | 50.72 | ppb | | 99 |
| 61) 4-Chlorotoluene | 8.791 | 126 | 55221 | 51.74 | ppb | | 99 |
| 62) 1,3,5-Trimethylbenzene | 8.785 | 105 | 197235 | 49.92 | ppb | | 99 |
| 63) tert-Butylbenzene | 9.097 | 119 | 175669 | 51.28 | ppb | | 98 |
| 64) 1,2,4-Trimethylbenzene | 9.142 | 105 | 199682 | 50.26 | ppb | | 98 |
| 65) sec-Butylbenzene | 9.307 | 105 | 243515 | 50.15 | ppb | | 99 |
| 66) 1,3-Dichlorobenzene | 9.403 | 146 | 106558 | 50.57 | ppb | | 100 |
| 67) p-Isopropyltoluene | 9.454 | 119 | 215695 | 50.40 | ppb | | 98 |
| 68) 1,4-Dichlorobenzene | 9.488 | 146 | 112923 | 52.17 | ppb | | 99 |
| 69) 1,2-Dichlorobenzene | 9.845 | 146 | 102216 | 51.96 | ppb | | 100 |
| 70) n-Butylbenzene | 9.851 | 91 | 198515 | 49.11 | ppb | | 97 |
| 71) 1,2-Dibromo-3-chloropr... | 10.611 | 157 | 13736 | 64.94 | ppb | | 99 |
| 72) 1,2,4-Trichlorobenzene | 11.427 | 180 | 83683 | 57.23 | ppb | | 100 |
| 73) Hexachlorobutadiene | 11.609 | 225 | 54009 | 54.31 | ppb | | 100 |
| 74) Naphthalene | 11.660 | 128 | 183642 | 59.79 | ppb | | 99 |
| 75) 1,2,3-Trichlorobenzene | 11.904 | 180 | 75631 | 56.07 | ppb | | 99 |

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\W210323\
Data File : W032302.D
Acq On : 23 Mar 2021 9:04 am
Operator :
Sample : SB0323S1 (CCV0323S1)
Misc : V4-077-07,V4-077-08
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 23 09:30:56 2021
Quant Method : C:\MSDCHEM\1\METHODS\W210203S.M
Quant Title :
QLast Update : Thu Feb 04 07:56:41 2021
Response via : Initial Calibration



# PAHs
# EPA 8270E/SIM Data

Quantitation Report (QT Reviewed)

Data Path : X:\semivols\Quaggy\DATA\Q210319\
Data File : Q0319010.D
Acq On : 19 Mar 2021 6:30 pm
Operator :
Sample : 03-219-07
Misc :
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Mar 19 18:45:06 2021
Quant Method : C:\MSDCHEM\1\METHODS\QSIM0317.M
Quant Title : PAH'S BY SIMS
QLast Update : Thu Mar 18 09:45:16 2021
Response via : Initial Calibration

| Compound | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| Internal Standards | | | | | | |
| 1) Naphthalene-d8 | 3.780 | 136 | 153877 | 2000.00 | ppb | 0.00 |
| 6) Acenaphthene-d10 | 5.016 | 164 | 88878 | 2000.00 | ppb | 0.00 |
| 10) Phenanthrene-d10 | 6.026 | 188 | 166828 | 2000.00 | ppb | 0.00 |
| 17) Chrysene-d12 | 8.036 | 240 | 133994 | 2000.00 | ppb | 0.00 |
| 21) Perylene-d12 | 9.429 | 264 | 140142 | 2000.00 | ppb | 0.01 |
| System Monitoring Compounds | | | | | | |
| 2) Nitrobenzene-d5 | 0.000 | 82 | 0 | 0.00 | ppb | |
| Spiked Amount 1000.000 | Range 24 - 92 | | Recovery = 0.00%# | | | |
| 7) 2-Fluorobiphenyl | 4.568 | 172 | 48829 | 900.48 | ppb | 0.00 |
| Spiked Amount 1000.000 | Range 25 - 89 | | Recovery = 90.05%# | | | |
| 11) Pyrene-d10 | 7.006 | 212 | 59264 | 994.19 | ppb | 0.00 |
| Spiked Amount 1000.000 | Range 40 - 110 | | Recovery = 99.42% | | | |
| 18) Terphenyl-d14 | 7.169 | 244 | 42179 | 1002.24 | ppb | 0.00 |
| Spiked Amount 1000.000 | Range 39 - 92 | | Recovery = 100.22%# | | | |
| Target Compounds | | | | | | Qvalue |
| 4) 2-Methylnaphthalene | 4.295 | 142 | 11472 | 225.64 | ppb | 99 |
| 5) 1-Methylnaphthalene | 4.365 | 142 | 5233 | 105.73 | ppb | 96 |
| 12) Fluorene | 5.393 | 166 | 2619 | 45.58 | ppb | 100 |
| 13) Phenanthrene | 6.037 | 178 | 36831 | 413.73 | ppb | 97 |
| 14) Anthracene | 6.072 | 178 | 7908 | 88.92 | ppb | 98 |
| 15) Fluoranthene | 6.861 | 202 | 91971 | 904.90 | ppb | 96 |
| 16) Pyrene | 7.015 | 202 | 86260 | 854.27 | ppb | 97 |
| 19) Benzo[a]anthracene | 8.024 | 228 | 43832 | 477.90 | ppb | 92 |
| 20) Chrysene | 8.053 | 228 | 39095 | 430.16 | ppb | 96 |
| 22) Benzo[b]fluoranthene | 9.063 | 252 | 50089m | 520.02 | ppb | |
| 23) Benzo(j,k)fluoranthene | 9.087 | 252 | 17356m | 190.74 | ppb | |
| 24) Benzo[a]pyrene | 9.365 | 252 | 39786 | 457.93 | ppb | 96 |
| 25) Indeno(1,2,3-c,d)pyrene | 10.411 | 276 | 25052m | 289.52 | ppb | |
| 26) Dibenz[a,h]anthracene | 10.434 | 278 | 4535m | 52.85 | ppb | |
| 27) Benzo[g,h,i]perylene | 10.627 | 276 | 26952 | 298.27 | ppb | 89 |

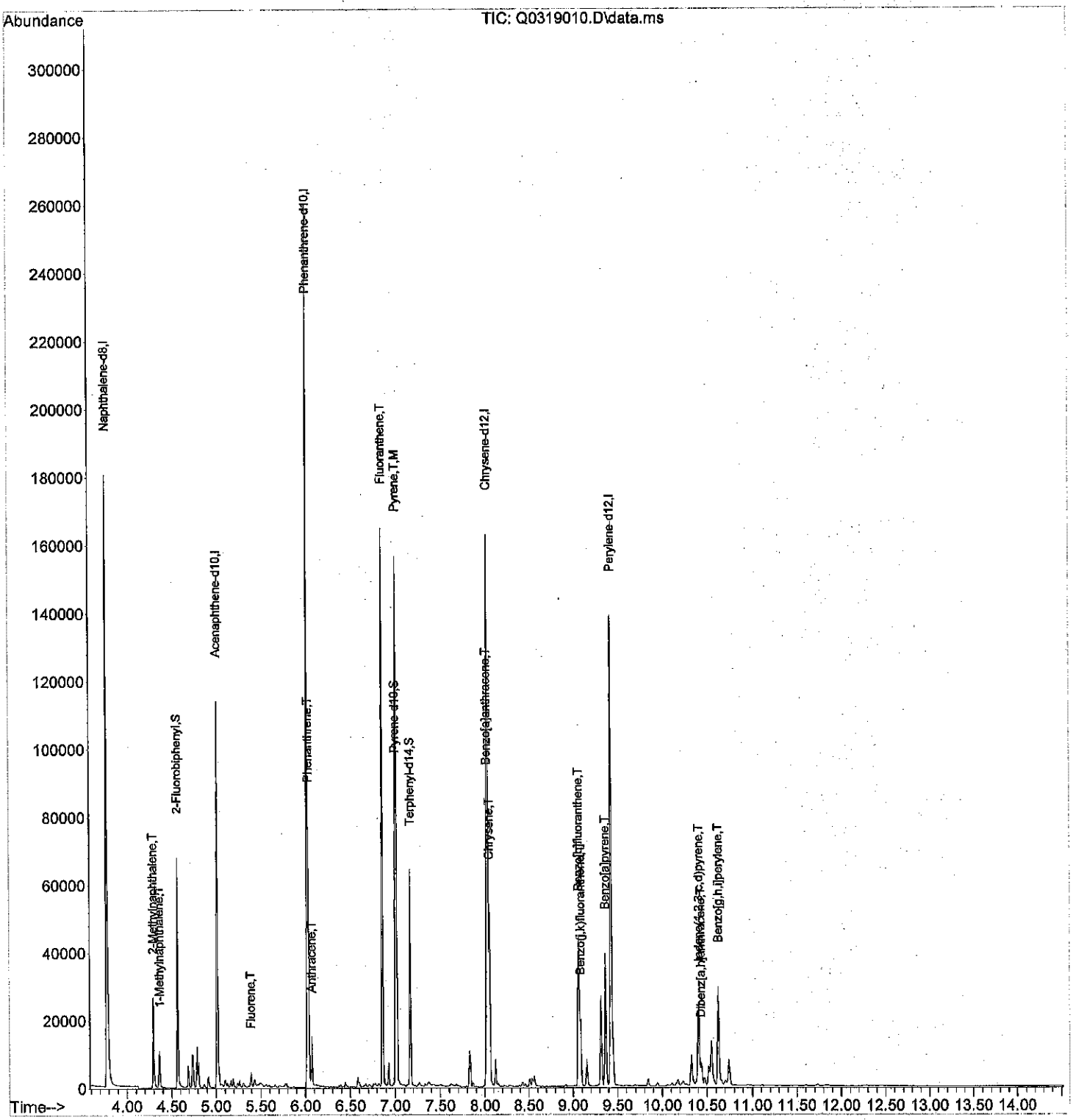
(#) = qualifier out of range (m) = manual integration (+) = signals summed

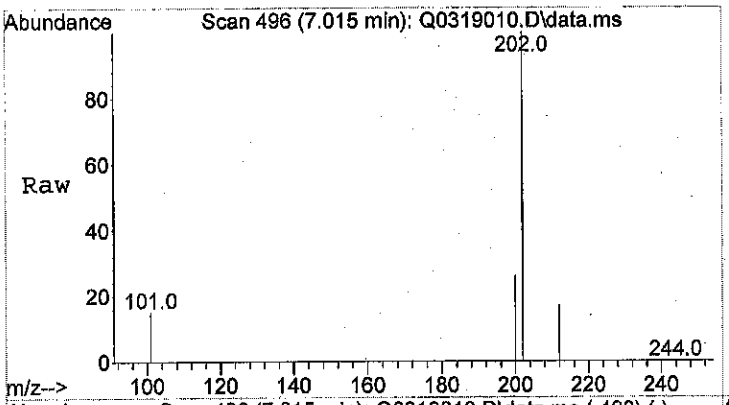
ZT
3-22-21

Quantitation Report (QT Reviewed)

Data Path : X:\semivols\Quaggy\DATA\Q210319\
Data File : Q0319010.D
Acq On : 19 Mar 2021 6:30 pm
Operator :
Sample : 03-219-07
Misc :
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Mar 19 18:45:06 2021
Quant Method : C:\MSDCHEM\1\METHODS\QSIM0317.M
Quant Title : PAH'S BY SIMS
QLast Update : Thu Mar 18 09:45:16 2021
Response via : Initial Calibration

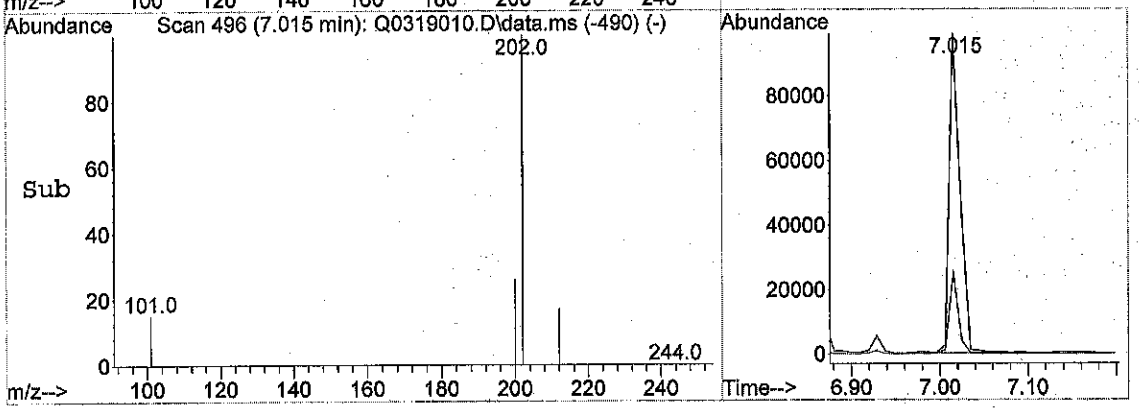


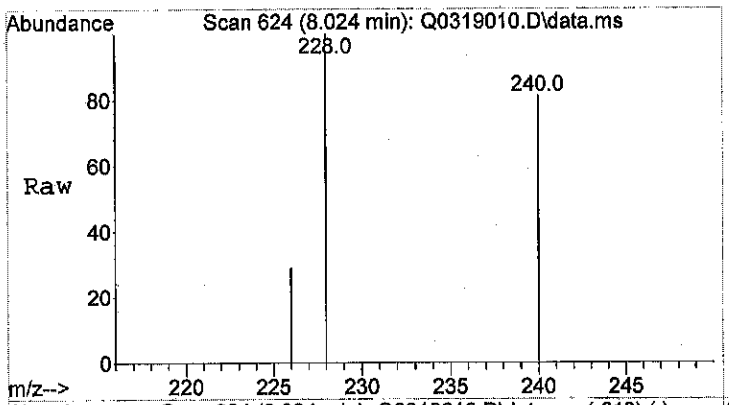



#16
Pyrene
Concen: 854.27 ppb
RT: 7.015 min Scan# 496
Delta R.T. 0.000 min
Lab File: Q0319010.D
Acq: 19 Mar 2021 6:30 pm

Tgt Ion:202 Resp: 86260

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 202 | 100 | | |
| 200 | 21.2 | 2.6 | 42.6 |

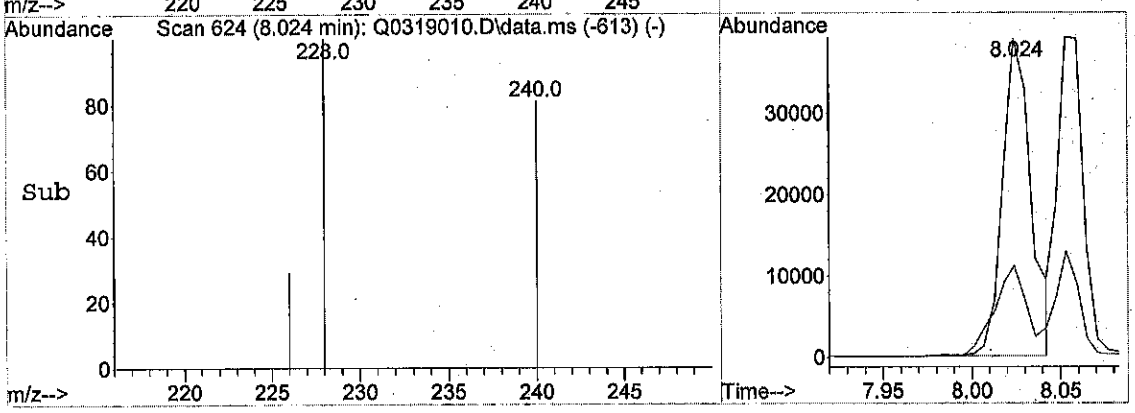


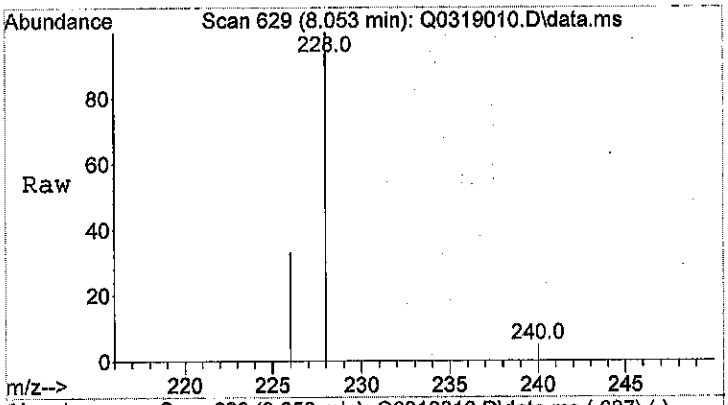




#19
Benzo[a]anthracene
Concen: 477.90 ppb
RT: 8.024 min Scan# 624
Delta R.T. 0.000 min
Lab File: Q0319010.D
Acq: 19 Mar 2021 6:30 pm

Tgt Ion:228 Resp: 43832

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 228 | 100 | | |
| 226 | 31.8 | 7.6 | 47.6 |

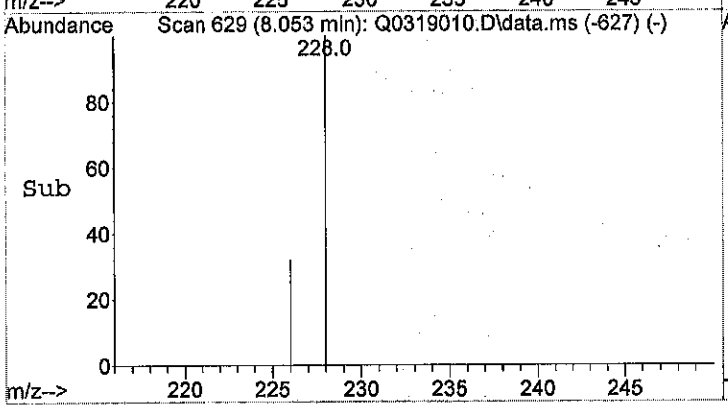


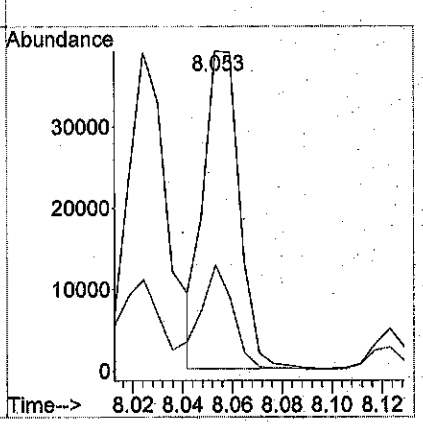


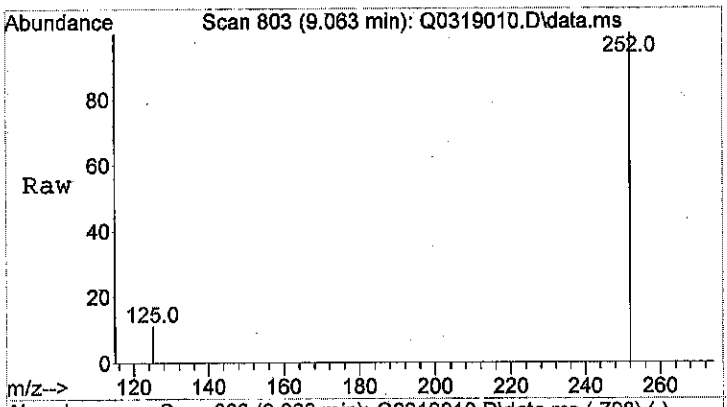

#20
Chrysene
Concen: 430.16 ppb
RT: 8.053 min Scan# 629
Delta R.T. 0.000 min
Lab File: Q0319010.D
Acq: 19 Mar 2021 6:30 pm

Tgt Ion:228 Resp: 39095

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 228 | 100 | | |
| 226 | 32.0 | 9.7 | 49.7 |



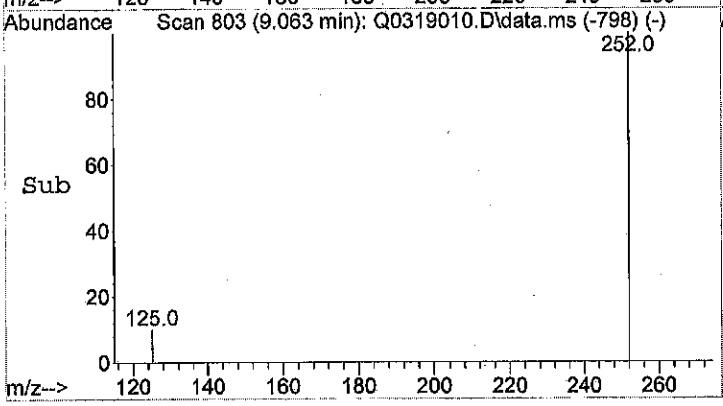



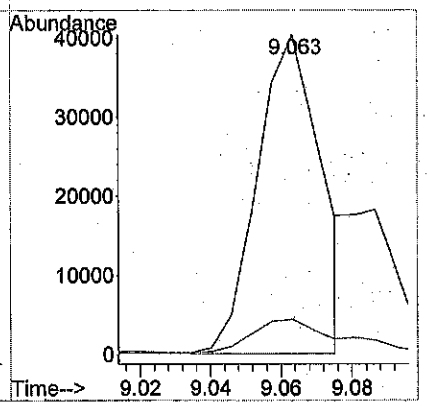



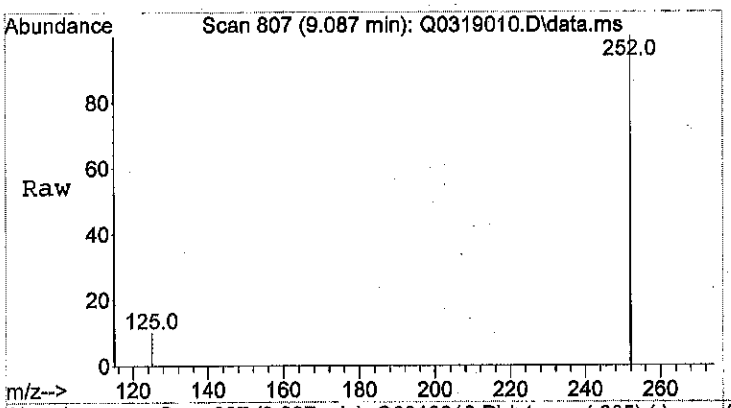

#22
Benzo[b]fluoranthene
Concen: 520.02 ppb m
RT: 9.063 min Scan# 803
Delta R.T. 0.011 min
Lab File: Q0319010.D
Acq: 19 Mar 2021 6:30 pm

Tgt Ion:252 Resp: 50089

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 252 | 100 | | |
| 125 | 14.5 | 0.0 | 29.0 |



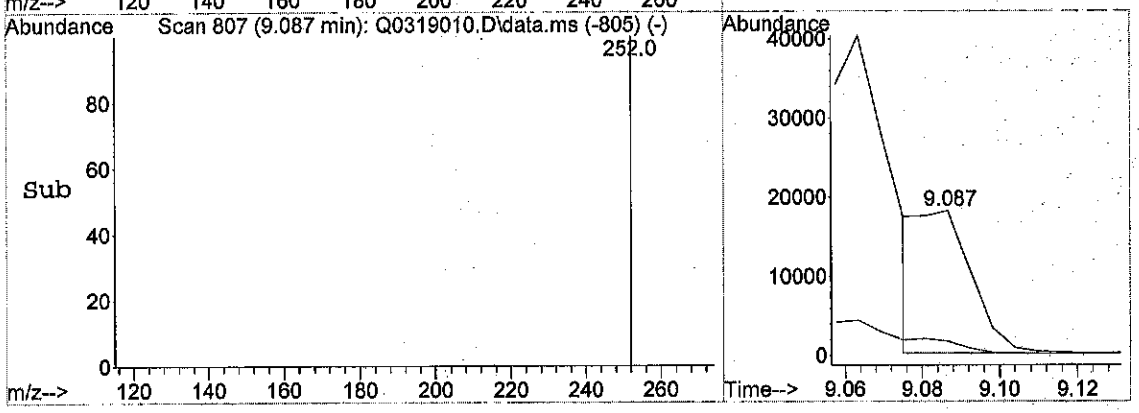






#23
Benzo(j,k)fluoranthene
Concen: 190.74 ppb m
RT: 9.087 min Scan# 807
Delta R.T. 0.006 min
Lab File: Q0319010.D
Acq: 19 Mar 2021 6:30 pm

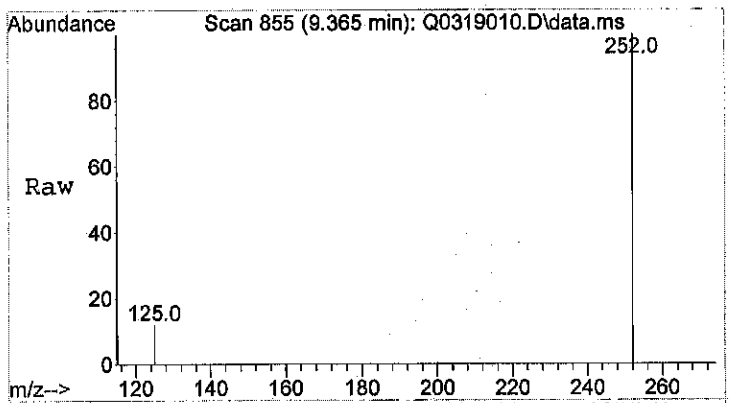
Tgt Ion:252 Resp: 17356

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 252 | 100 | | |
| 125 | 41.8 | 0.0 | 28.2# |





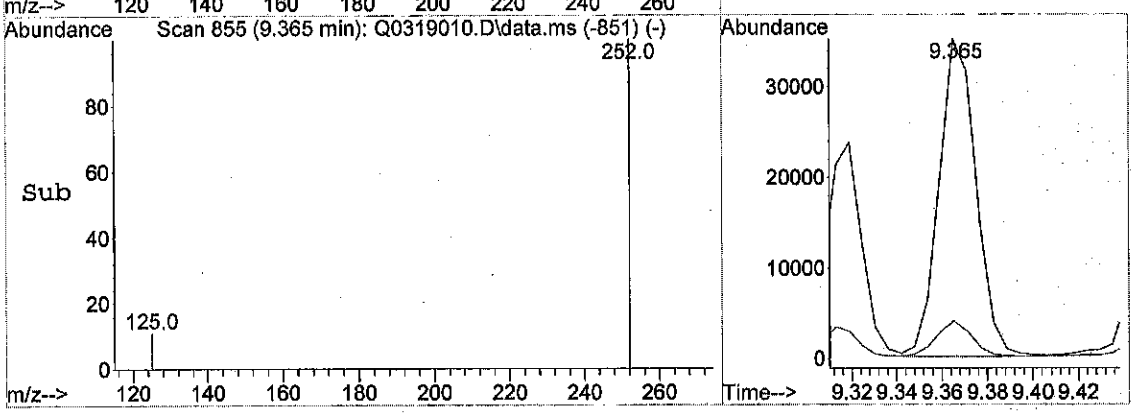


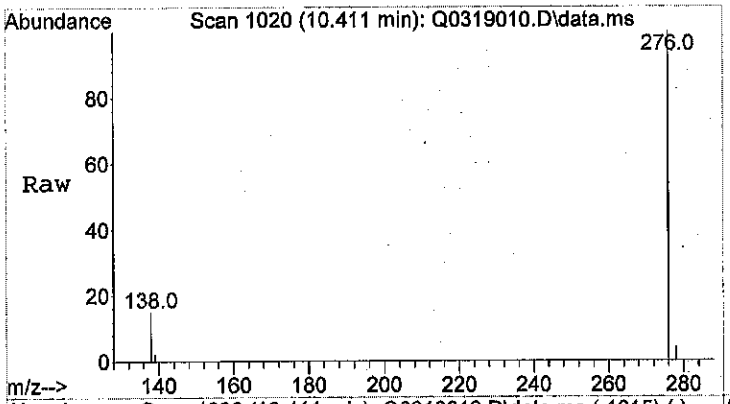



#24
Benzo[a]pyrene
Concen: 457.93 ppb
RT: 9.365 min Scan# 855
Delta R.T. 0.006 min
Lab File: Q0319010.D
Acq: 19 Mar 2021 6:30 pm

Tgt Ion:252 Resp: 39786

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 252 | 100 | | |
| 125 | 10.9 | 0.0 | 29.5 |

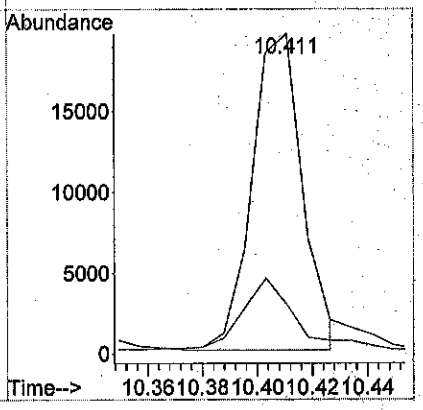


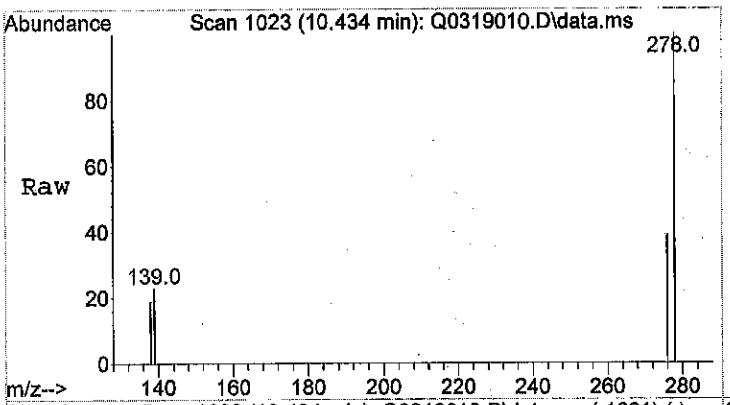



#25
Indeno(1,2,3-c,d)pyrene
Concen: 289.52 ppb m
RT: 10.411 min Scan# 1020
Delta R.T. 0.016 min
Lab File: Q0319010.D
Acq: 19 Mar 2021 6:30 pm

Tgt Ion:276 Resp: 25052

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 276 | 100 | | |
| 138 | 25.9 | 0.0 | 39.6 |

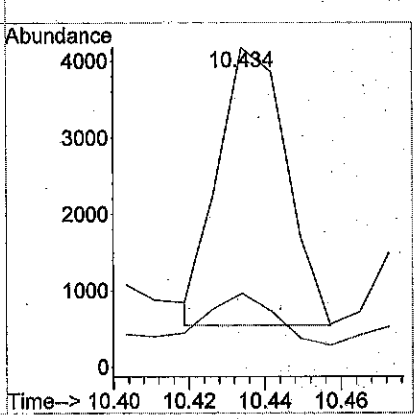



#26
Dibenz[a,h]anthracene
Concen: 52.85 ppb m
RT: 10.434 min Scan# 1023
Delta R.T. 0.008 min
Lab File: Q0319010.D
Acq: 19 Mar 2021 6:30 pm

Tgt Ion:278 Resp: 4535

| Ion | Ratio | Lower | Upper |
|---|---|---|---|
| 278 | 100 | | |
| 139 | 26.7 | 0.0 | 35.1 |



Quantitation Report (Not Reviewed)

Data Path : X:\semivols\Quaggy\DATA\Q210319\
Data File : Q0319002.D
Acq On : 19 Mar 2021 3:28 pm
Operator :
Sample : MB0319S1
Misc :
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 19 15:43:16 2021
Quant Method : C:\MSDCHEM\1\METHODS\QSIM0317.M
Quant Title : PAH'S BY SIMS
QLast Update : Thu Mar 18 09:45:16 2021
Response via : Initial Calibration

| Compound | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| Internal Standards | | | | | | |
| 1) Naphthalene-d8 | 3.780 | 136 | 149668 | 2000.00 | ppb | 0.00 |
| 6) Acenaphthene-d10 | 5.016 | 164 | 86419 | 2000.00 | ppb | 0.00 |
| 10) Phenanthrene-d10 | 6.037 | 188 | 166748 | 2000.00 | ppb | 0.02 |
| 17) Chrysene-d12 | 8.082 | 240 | 134331 | 2000.00 | ppb | 0.05 |
| 21) Perylene-d12 | 9.458 | 264 | 136397 | 2000.00 | ppb | 0.04 |
| System Monitoring Compounds | | | | | | |
| 2) Nitrobenzene-d5 | 0.000 | 82 | 0 | 0.00 | ppb | |
| Spiked Amount 1000.000 | Range 24 - 92 | | Recovery = 0.00%# | | | |
| 7) 2-Fluorobiphenyl | 4.573 | 172 | 47556 | 901.96 | ppb | 0.00 |
| Spiked Amount 1000.000 | Range 25 - 89 | | Recovery = 90.20%# | | | |
| 11) Pyrene-d10 | 7.054 | 212 | 56590 | 949.58 | ppb | 0.05 |
| Spiked Amount 1000.000 | Range 40 - 110 | | Recovery = 94.96% | | | |
| 18) Terphenyl-d14 | 7.227 | 244 | 41822 | 991.23 | ppb | 0.06 |
| Spiked Amount 1000.000 | Range 39 - 92 | | Recovery = 99.12%# | | | |
| Target Compounds | | | | | | Qvalue |
| 19) Benzo[a]anthracene | 8.082 | 228 | 607 | Below Cal | | 73 |

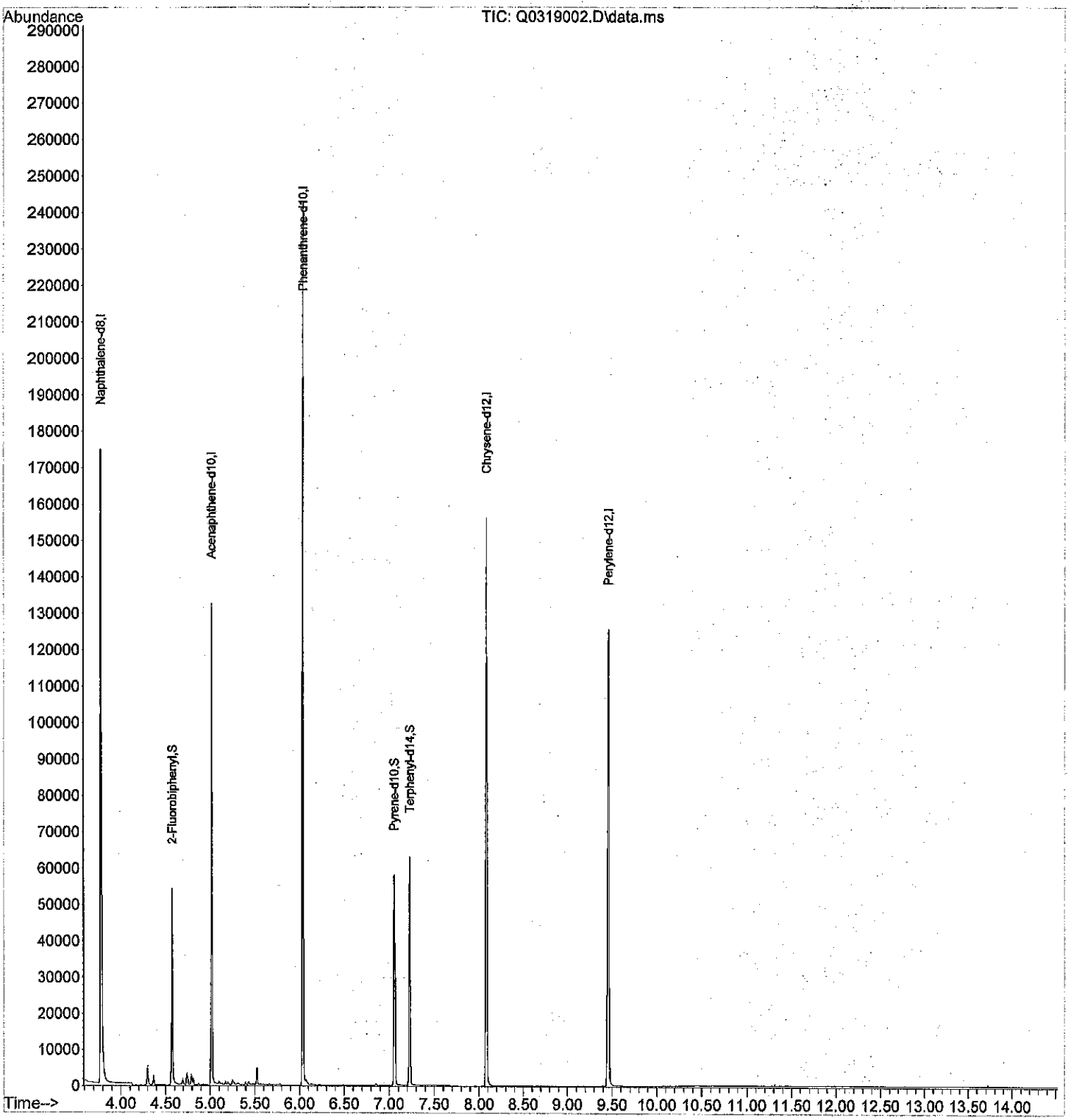
(#) = qualifier out of range (m) = manual integration (+) = signals summed

ZT
3-22-21

Quantitation Report (Not Reviewed)

Data Path : X:\semivols\Quaggy\DATA\Q210319\
Data File : Q0319002.D
Acq On : 19 Mar 2021 3:28 pm
Operator :
Sample : MB0319S1
Misc :
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 19 15:43:16 2021
Quant Method : C:\MSDCHEM\1\METHODS\QSIM0317.M
Quant Title : PAH'S BY SIMS
QLast Update : Thu Mar 18 09:45:16 2021
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\Q210319\
Data File : Q0319007.D
Acq On : 19 Mar 2021 5:22 pm
Operator :
Sample : 03-193-01
Misc :
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Mar 19 17:37:02 2021
Quant Method : C:\MSDCHEM\1\METHODS\QSIM0317.M
Quant Title : PAH'S BY SIMS
QLast Update : Thu Mar 18 09:45:16 2021
Response via : Initial Calibration

| Compound | R.T. | QIon | Response | Conc | Units | | Dev(Min) |
|---|---|---|---|---|---|---|---|
| Internal Standards | | | | | | | |
| 1) Naphthalene-d8 | 3.780 | 136 | 156382 | 2000.00 | ppb | | 0.00 |
| 6) Acenaphthene-d10 | 5.015 | 164 | 90233 | 2000.00 | ppb | | 0.00 |
| 10) Phenanthrene-d10 | 6.026 | 188 | 169155 | 2000.00 | ppb | | 0.00 |
| 17) Chrysene-d12 | 8.042 | 240 | 134257 | 2000.00 | ppb | | 0.01 |
| 21) Perylene-d12 | 9.429 | 264 | 137232 | 2000.00 | ppb | | 0.01 |
| System Monitoring Compounds | | | | | | | |
| 2) Nitrobenzene-d5 | 0.000 | 82 | 0 | 0.00 | ppb | | |
| Spiked Amount 1000.000 | Range 24 - 92 | | Recovery = 0.00%# | | | | |
| 7) 2-Fluorobiphenyl | 4.568 | 172 | 39296 | 713.06 | ppb | | 0.00 |
| Spiked Amount 1000.000 | Range 25 - 89 | | Recovery = 71.31% | | | | |
| 11) Pyrene-d10 | 7.015 | 212 | 56106 | 927.95 | ppb | | 0.00 |
| Spiked Amount 1000.000 | Range 40 - 110 | | Recovery = 92.80% | | | | |
| 18) Terphenyl-d14 | 7.178 | 244 | 38342 | 909.00 | ppb | | 0.00 |
| Spiked Amount 1000.000 | Range 39 - 92 | | Recovery = 90.90% | | | | |
| Target Compounds | | | | | | | Qvalue |
| 3) Naphthalene | 3.795 | 128 | 288 | 3.95 | ppb | # | 67 |
| 4) 2-Methylnaphthalene | 4.295 | 142 | 90 | 1.74 | ppb | | 89 |
| 5) 1-Methylnaphthalene | 4.364 | 142 | 58 | 1.15 | ppb | | 94 |
| 8) Acenaphthylene | 4.908 | 152 | 24 | 0.27 | ppb | | 100 |
| 9) Acenaphthene | 5.015 | 153 | 39 | 0.70 | ppb | | 100 |
| 12) Fluorene | 0.000 | | 0 | N.D. | | | |
| 13) Phenanthrene | 6.037 | 178 | 174 | 1.93 | ppb | # | 56 |
| 14) Anthracene | 6.072 | 178 | 22 | 0.24 | ppb | # | 57 |
| 15) Fluoranthene | 6.861 | 202 | 44 | 0.43 | ppb | # | 74 |
| 16) Pyrene | 7.015 | 202 | 118 | 1.15 | ppb | # | 53 |
| 19) Benzo[a]anthracene | 8.036 | 228 | 538 | Below Cal | | | 72 |
| 20) Chrysene | 8.036 | 228 | 538 | ~~5.91~~ | ppb | | 69 |
| 22) Benzo[b]fluoranthene | 9.069 | 252 | 42 | 0.45 | ppb | # | 1 |
| 23) Benzo(j,k)fluoranthene | 9.069 | 252 | 42 | ~~0.47~~ | ppb | # | 1 |
| 24) Benzo[a]pyrene | 9.365 | 252 | 26 | 0.31 | ppb | # | 74 |
| 25) Indeno(1,2,3-c,d)pyrene | 10.411 | 276 | 36 | 0.42 | ppb | # | 57 |
| 26) Dibenz[a,h]anthracene | 10.442 | 278 | 32 | 0.38 | ppb | # | 64 |
| 27) Benzo[g,h,i]perylene | 10.634 | 276 | 67 | 0.76 | ppb | | 60 |

ZT 3-22-21

0.32

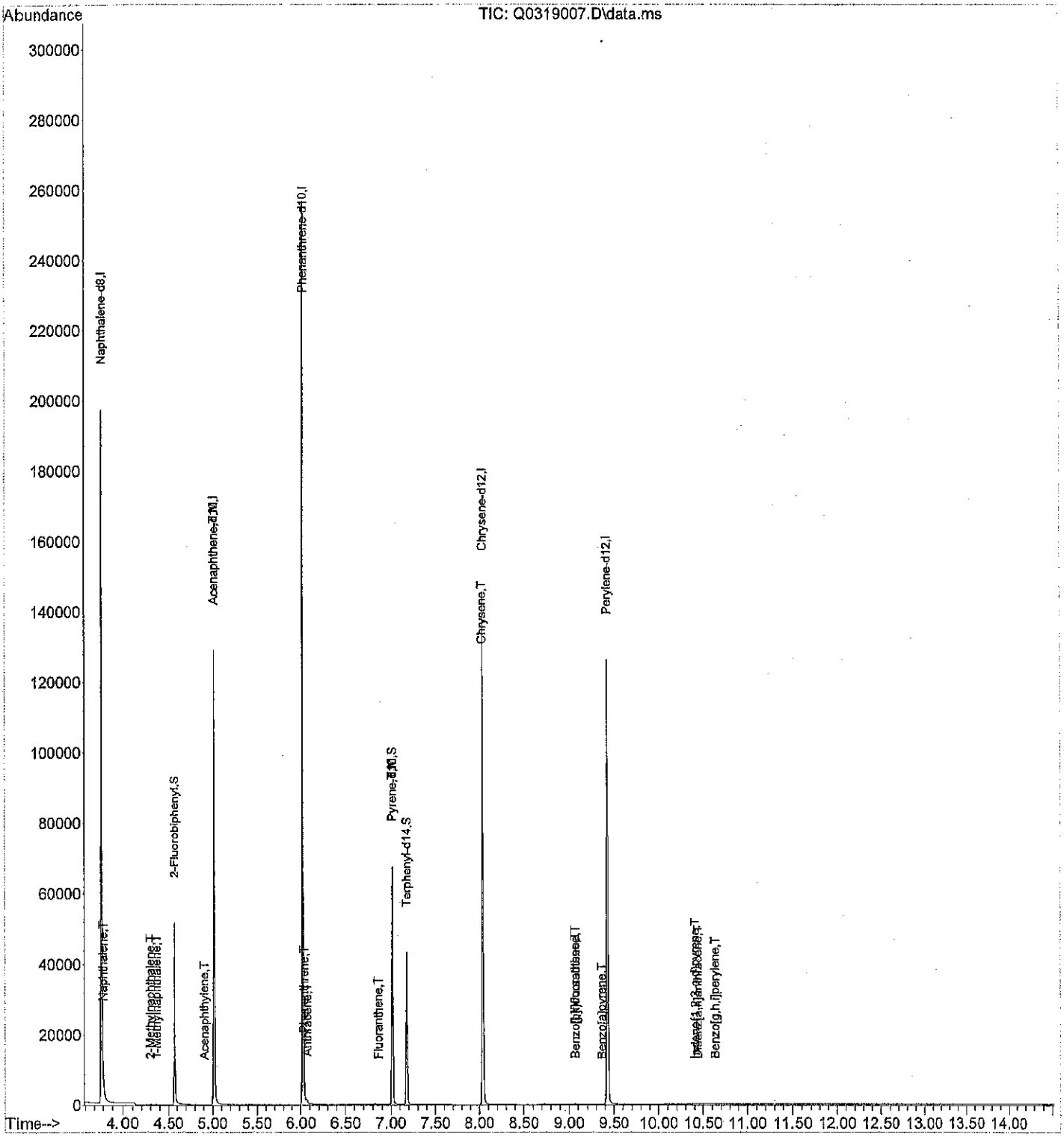
0.32

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\Q210319\
Data File : Q0319007.D
Acq On : 19 Mar 2021 5:22 pm
Operator :
Sample : 03-193-01
Misc :
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Mar 19 17:37:02 2021
Quant Method : C:\MSDCHEM\1\METHODS\QSIM0317.M
Quant Title : PAH'S BY SIMS
QLast Update : Thu Mar 18 09:45:16 2021
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\Q210319\
Data File : Q0319008.D
Acq On : 19 Mar 2021 5:45 pm
Operator :
Sample : 03-193-01 MS
Misc :
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Mar 19 17:59:40 2021
Quant Method : C:\MSDCHEM\1\METHODS\QSIM0317.M
Quant Title : PAH'S BY SIMS
QLast Update : Thu Mar 18 09:45:16 2021
Response via : Initial Calibration

| Compound | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| Internal Standards | | | | | | |
| 1) Naphthalene-d8 | 3.780 | 136 | 150017 | 2000.00 | ppb | 0.00 |
| 6) Acenaphthene-d10 | 5.016 | 164 | 88922 | 2000.00 | ppb | 0.00 |
| 10) Phenanthrene-d10 | 6.026 | 188 | 167959 | 2000.00 | ppb | 0.00 |
| 17) Chrysene-d12 | 8.036 | 240 | 134021 | 2000.00 | ppb | 0.00 |
| 21) Perylene-d12 | 9.429 | 264 | 135046 | 2000.00 | ppb | 0.01 |
| System Monitoring Compounds | | | | | | |
| 2) Nitrobenzene-d5 | 0.000 | 82 | 0 | 0.00 | ppb | |
| Spiked Amount 1000.000 | Range 24 - 92 | | Recovery = 0.00%# | | | |
| 7) 2-Fluorobiphenyl | 4.568 | 172 | 41235 | 759.50 | ppb | 0.00 |
| Spiked Amount 1000.000 | Range 25 - 89 | | Recovery = 75.95% | | | |
| 11) Pyrene-d10 | 7.005 | 212 | 56382 | 939.22 | ppb | 0.00 |
| Spiked Amount 1000.000 | Range 40 - 110 | | Recovery = 93.92% | | | |
| 18) Terphenyl-d14 | 7.169 | 244 | 41256 | 980.05 | ppb | 0.00 |
| Spiked Amount 1000.000 | Range 39 - 92 | | Recovery = 98.00%# | | | |
| Target Compounds | | | | | | Qvalue |
| 3) Naphthalene | 3.795 | 128 | 23990 | 342.57 | ppb | 100 |
| 4) 2-Methylnaphthalene | 4.295 | 142 | 17392 | 350.88 | ppb | 99 |
| 5) 1-Methylnaphthalene | 4.364 | 142 | 17690 | 366.61 | ppb | 96 |
| 8) Acenaphthylene | 4.908 | 152 | 29721 | 343.98 | ppb | 100 |
| 9) Acenaphthene | 5.031 | 153 | 19356 | 351.11 | ppb | 100 |
| 12) Fluorene | 5.393 | 166 | 23027 | 398.02 | ppb | 100 |
| 13) Phenanthrene | 6.037 | 178 | 36182 | 403.70 | ppb | 97 |
| 14) Anthracene | 6.072 | 178 | 36567 | 408.41 | ppb | 98 |
| 15) Fluoranthene | 6.861 | 202 | 45112 | 440.87 | ppb | 97 |
| 16) Pyrene | 7.015 | 202 | 42765 | 420.67 | ppb | 96 |
| 19) Benzo[a]anthracene | 8.024 | 228 | 41044 | 446.94 | ppb | 97 |
| 20) Chrysene | 8.059 | 228 | 40328 | 443.63 | ppb | 99 |
| 22) Benzo[b]fluoranthene | 9.057 | 252 | 41959 | 452.05 | ppb | 98 |
| 23) Benzo(j,k)fluoranthene | 9.086 | 252 | 37958 | 432.90 | ppb | 93 |
| 24) Benzo[a]pyrene | 9.365 | 252 | 36547 | 436.53 | ppb | 96 |
| 25) Indeno(1,2,3-c,d)pyrene | 10.411 | 276 | 43860 | ~~526.00~~ 429.45 | ppb | 95 |
| 26) Dibenz[a,h]anthracene | 10.442 | 278 | 36032 | 435.80 | ppb | 91 |
| 27) Benzo[g,h,i]perylene | 10.627 | 276 | 37739 | 433.41 | ppb | 91 |

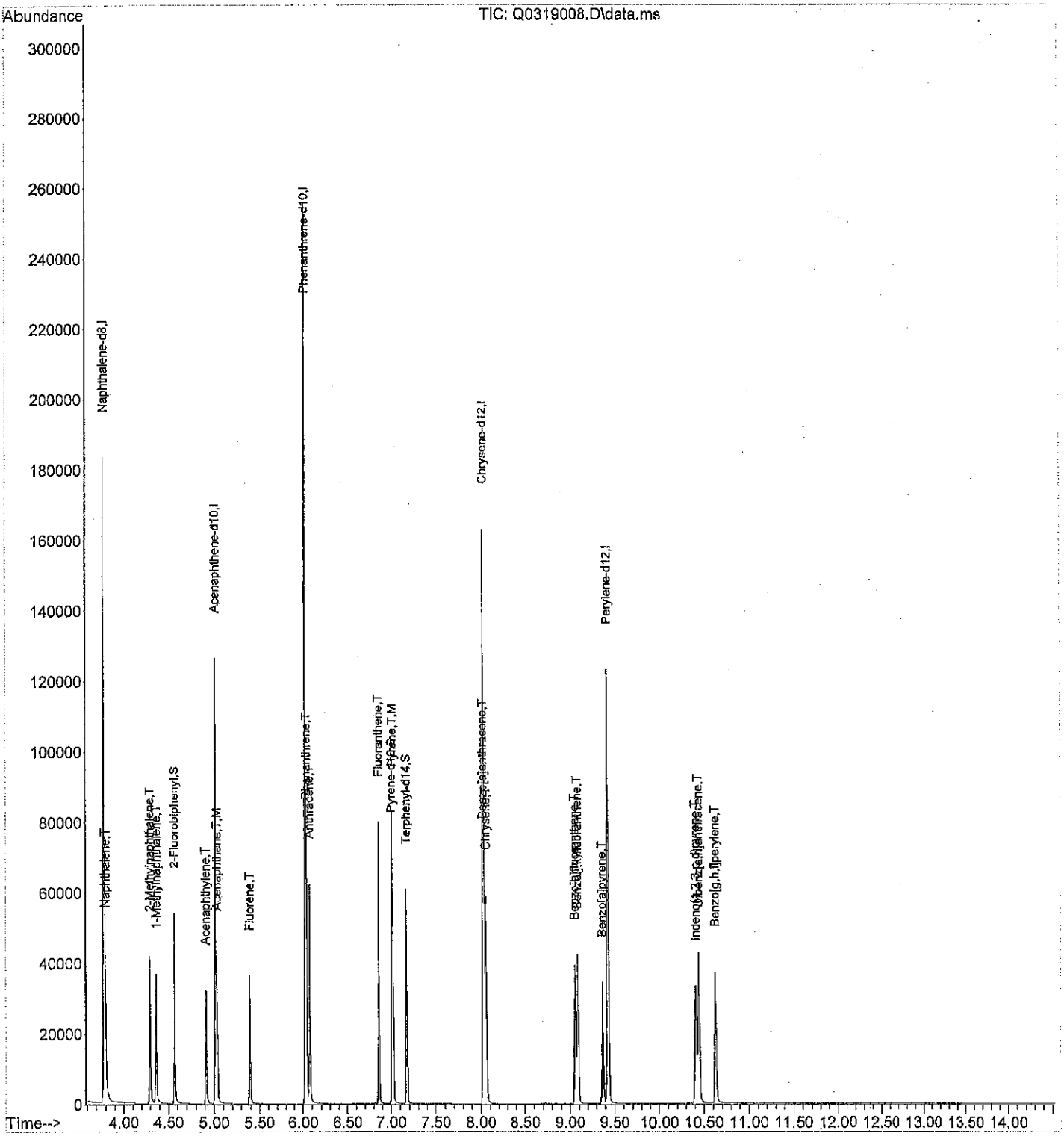
(#) = qualifier out of range (m) = manual integration (+) = signals summed

ZT
3-22-21

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\Q210319\
Data File : Q0319008.D
Acq On : 19 Mar 2021 5:45 pm
Operator :
Sample : 03-193-01 MS
Misc :
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Mar 19 17:59:40 2021
Quant Method : C:\MSDCHEM\1\METHODS\QSIM0317.M
Quant Title : PAH'S BY SIMS
QLast Update : Thu Mar 18 09:45:16 2021
Response via : Initial Calibration



Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\Q210319\
Data File : Q0319009.D
Acq On : 19 Mar 2021 6:07 pm
Operator :
Sample : 03-193-01 MSD
Misc :
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Mar 19 18:22:19 2021
Quant Method : C:\MSDCHEM\1\METHODS\QSIM0317.M
Quant Title : PAH'S BY SIMS
QLast Update : Thu Mar 18 09:45:16 2021
Response via : Initial Calibration

| Compound | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| Internal Standards | | | | | | |
| 1) Naphthalene-d8 | 3.780 | 136 | 152014 | 2000.00 | ppb | 0.00 |
| 6) Acenaphthene-d10 | 5.015 | 164 | 88993 | 2000.00 | ppb | 0.00 |
| 10) Phenanthrene-d10 | 6.026 | 188 | 169028 | 2000.00 | ppb | 0.00 |
| 17) Chrysene-d12 | 8.036 | 240 | 133702 | 2000.00 | ppb | 0.00 |
| 21) Perylene-d12 | 9.429 | 264 | 135606 | 2000.00 | ppb | 0.01 |
| System Monitoring Compounds | | | | | | |
| 2) Nitrobenzene-d5 | 0.000 | 82 | 0 | 0.00 | ppb | |
| Spiked Amount 1000.000 | Range 24 - 92 | | Recovery = 0.00%# | | | |
| 7) 2-Fluorobiphenyl | 4.567 | 172 | 40165 | 739.11 | ppb | 0.00 |
| Spiked Amount 1000.000 | Range 25 - 89 | | Recovery = 73.91% | | | |
| 11) Pyrene-d10 | 7.005 | 212 | 58844 | 974.20 | ppb | 0.00 |
| Spiked Amount 1000.000 | Range 40 - 110 | | Recovery = 97.42% | | | |
| 18) Terphenyl-d14 | 7.169 | 244 | 40262 | 958.65 | ppb | 0.00 |
| Spiked Amount 1000.000 | Range 39 - 92 | | Recovery = 95.86%# | | | |
| Target Compounds | | | | | | Qvalue |
| 3) Naphthalene | 3.795 | 128 | 23398 | 329.73 | ppb | 100 |
| 4) 2-Methylnaphthalene | 4.295 | 142 | 16844 | 335.36 | ppb | 99 |
| 5) 1-Methylnaphthalene | 4.364 | 142 | 17302 | 353.86 | ppb | 97 |
| 8) Acenaphthylene | 4.908 | 152 | 29317 | 339.03 | ppb | 100 |
| 9) Acenaphthene | 5.031 | 153 | 18980 | 344.02 | ppb | 100 |
| 12) Fluorene | 5.393 | 166 | 22338 | 383.67 | ppb | 100 |
| 13) Phenanthrene | 6.037 | 178 | 35343 | 391.85 | ppb | 97 |
| 14) Anthracene | 6.072 | 178 | 36146 | 401.16 | ppb | 97 |
| 15) Fluoranthene | 6.861 | 202 | 44197 | 429.19 | ppb | 97 |
| 16) Pyrene | 7.015 | 202 | 44729 | 437.21 | ppb | 96 |
| 19) Benzo[a]anthracene | 8.024 | 228 | 41042 | 448.00 | ppb | 98 |
| 20) Chrysene | 8.059 | 228 | 40002 | 441.10 | ppb | 98 |
| 22) Benzo[b]fluoranthene | 9.057 | 252 | 38902 | 417.38 | ppb | 95 |
| 23) Benzo(j,k)fluoranthene | 9.086 | 252 | 40935 | 464.93 | ppb | 96 |
| 24) Benzo[a]pyrene | 9.365 | 252 | 36543 | 434.68 | ppb | 96 |
| 25) Indeno(1,2,3-c,d)pyrene | 10.411 | 276 | 44247 | ~~528.45~~ 431.34 | ppb | 96 |
| 26) Dibenz[a,h]anthracene | 10.442 | 278 | 36156 | 435.49 | ppb | 91 |
| 27) Benzo[g,h,i]perylene | 10.627 | 276 | 38120 | 435.98 | ppb | 91 |

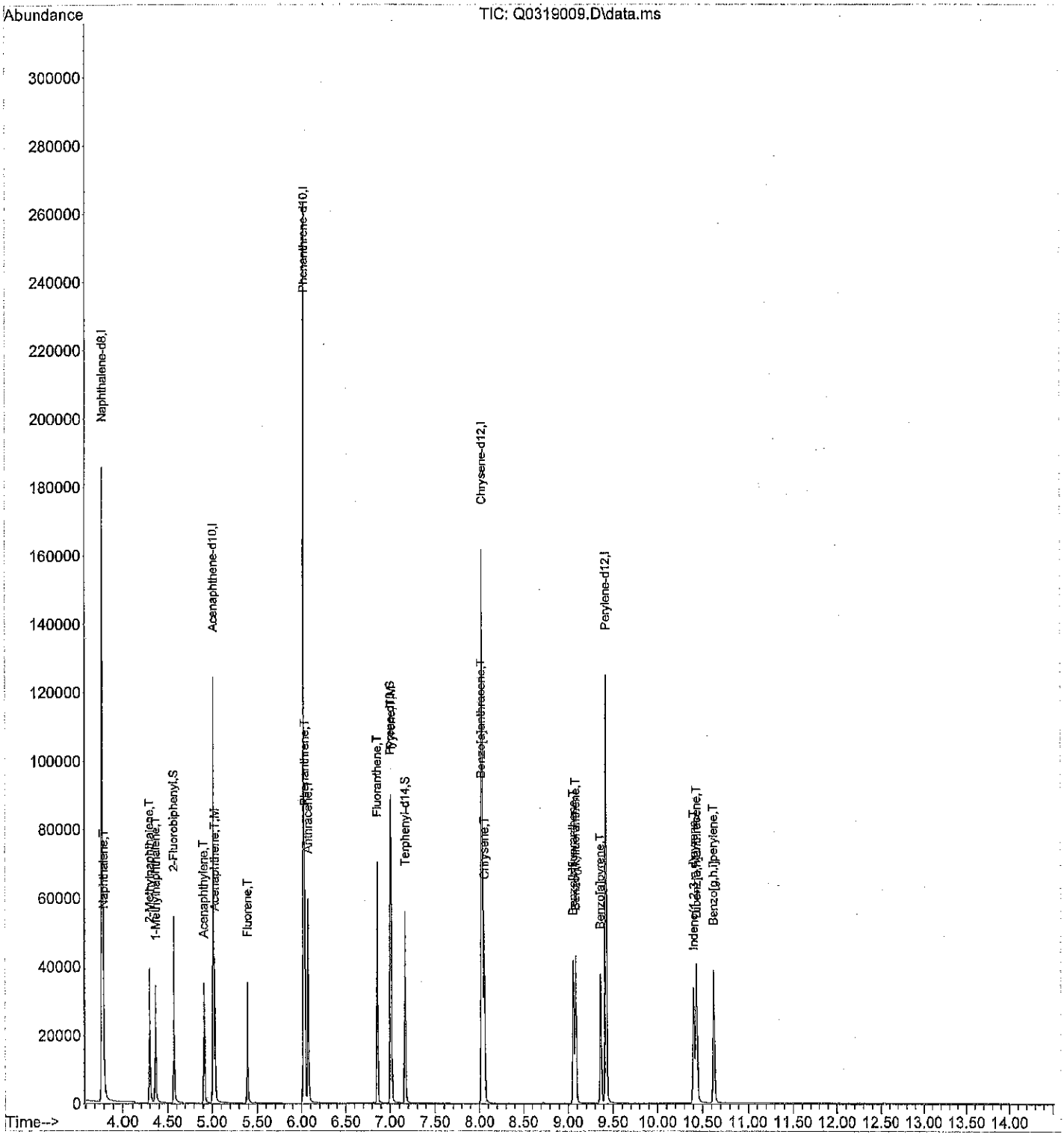
(#) = qualifier out of range (m) = manual integration (+) = signals summed

NT 3-22-21

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\Q210319\
Data File : Q0319009.D
Acq On : 19 Mar 2021 6:07 pm
Operator :
Sample : 03-193-01 MSD
Misc :
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Mar 19 18:22:19 2021
Quant Method : C:\MSDCHEM\1\METHODS\QSIM0317.M
Quant Title : PAH'S BY SIMS
QLast Update : Thu Mar 18 09:45:16 2021
Response via : Initial Calibration



# Evaluate Continuing Calibration Report

Data Path : C:\msdchem\1\data\Q210319\
Data File : Q0319001.D
Acq On : 19 Mar 2021 2:54 pm
Operator :
Sample : PAH CCV0319-1
Misc : SV5-200-27
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Mar 19 15:08:38 2021
Quant Method : C:\MSDCHEM\1\METHODS\QSIM0317.M
Quant Title : PAH'S BY SIMS
QLast Update : Thu Mar 18 09:45:16 2021
Response via : Initial Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

| | | Compound | Amount | Calc. | %Dev | Area% | Dev(min) |
|---|---|---|---|---|---|---|---|
| 1 | I | Naphthalene-d8 | 2000.000 | 2000.000 | 0.0 | 92 | 0.00 |
| 2 | S | Nitrobenzene-d5 | 500.000 | 0.000 | 100.0# | 0 | -3.34# |
| 3 | T | Naphthalene | 500.000 | 510.832 | -2.2 | 99 | 0.00 |
| 4 | T | 2-Methylnaphthalene | 500.000 | 437.148 | 12.6 | 83 | 0.00 |
| 5 | T | 1-Methylnaphthalene | 500.000 | 457.517 | 8.5 | 87 | 0.00 |
| 6 | I | Acenaphthene-d10 | 2000.000 | 2000.000 | 0.0 | 98 | 0.00 |
| 7 | S | 2-Fluorobiphenyl | 500.000 | 453.058 | 9.4 | 90 | 0.00 |
| 8 | T | Acenaphthylene | 500.000 | 420.544 | 15.9 | 86 | 0.00 |
| 9 | T,M | Acenaphthene | 500.000 | 416.630 | 16.7 | 84 | 0.00 |
| 10 | I | Phenanthrene-d10 | 2000.000 | 2000.000 | 0.0 | 93 | 0.01 |
| 11 | S | Pyrene-d10 | 500.000 | 488.291 | 2.3 | 89 | 0.04 |
| 12 | T | Fluorene | 500.000 | 459.722 | 8.1 | 91 | 0.00 |
| 13 | T | Phenanthrene | 500.000 | 441.903 | 11.6 | 88 | 0.01 |
| 14 | T | Anthracene | 500.000 | 467.137 | 6.6 | 90 | 0.01 |
| 15 | T | Fluoranthene | 500.000 | 457.460 | 8.5 | 87 | 0.03 |
| 16 | T,M | Pyrene | 500.000 | 470.360 | 5.9 | 95 | 0.04 |
| 17 | I | Chrysene-d12 | 2000.000 | 2000.000 | 0.0 | 97 | 0.04 |
| 18 | S | Terphenyl-d14 | 500.000 | 490.345 | 1.9 | 96 | 0.04 |
| 19 | T | Benzo[a]anthracene | 500.000 | 465.559 | 6.9 | 92 | 0.04 |
| 20 | T | Chrysene | 500.000 | 445.148 | 11.0 | 89 | 0.04 |
| 21 | I | Perylene-d12 | 2000.000 | 2000.000 | 0.0 | 97 | 0.04 |
| 22 | T | Benzo[b]fluoranthene | 500.000 | 441.072 | 11.8 | 92 | 0.03 |
| 23 | T | Benzo(j,k)fluoranthene | 500.000 | 448.238 | 10.4 | 89 | 0.03 |
| 24 | T | Benzo[a]pyrene | 500.000 | 441.425 | 11.7 | 91 | 0.03 |
| 25 | T | Indeno(1,2,3-c,d)pyrene | 500.000 | 436.745 | 12.7 | 93 | 0.03 |
| 26 | T | Dibenz[a,h]anthracene | 500.000 | 431.370 | 13.7 | 88 | 0.03 |
| 27 | T | Benzo[g,h,i]perylene | 500.000 | 432.389 | 13.5 | 90 | 0.02 |

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Quantitation Report (Not Reviewed)

Data Path : C:\MSDCHEM\1\DATA\Q210319\
Data File : Q0319001.D
Acq On : 19 Mar 2021 2:54 pm
Operator :
Sample : PAH CCV0319-1
Misc : SV5-200-27
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Mar 19 15:08:38 2021
Quant Method : C:\MSDCHEM\1\METHODS\QSIM0317.M
Quant Title : PAH'S BY SIMS
QLast Update : Thu Mar 18 09:45:16 2021
Response via : Initial Calibration

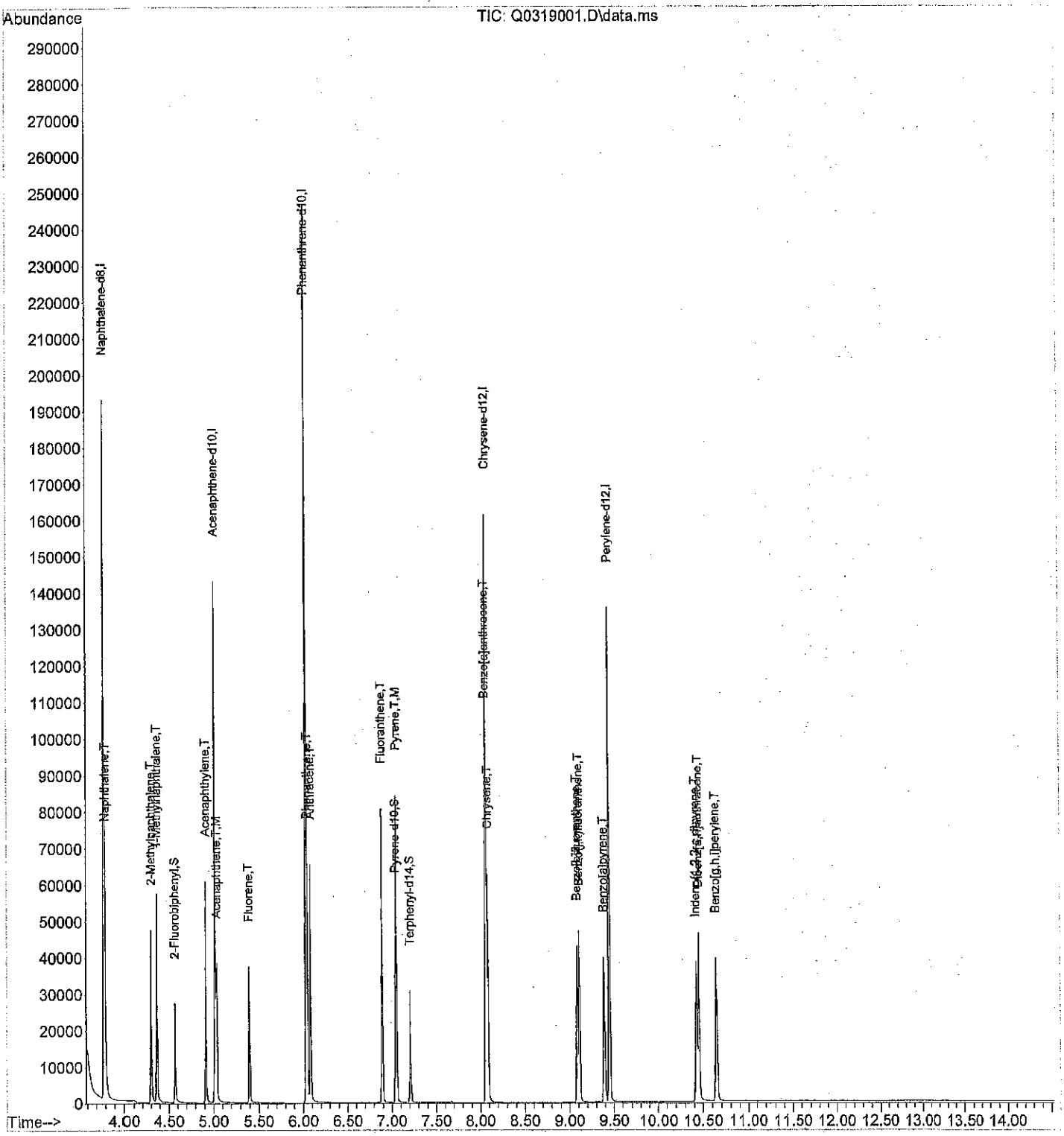
| Compound | R.T. | QIon | Response | Conc | Units | Dev(Min) |
|---|---|---|---|---|---|---|
| Internal Standards | | | | | | |
| 1) Naphthalene-d8 | 3.780 | 136 | 152003 | 2000.00 | ppb | 0.00 |
| 6) Acenaphthene-d10 | 5.016 | 164 | 89883 | 2000.00 | ppb | 0.00 |
| 10) Phenanthrene-d10 | 6.032 | 188 | 167069 | 2000.00 | ppb | 0.01 |
| 17) Chrysene-d12 | 8.071 | 240 | 137324 | 2000.00 | ppb | 0.04 |
| 21) Perylene-d12 | 9.452 | 264 | 143830 | 2000.00 | ppb | 0.04 |
| System Monitoring Compounds | | | | | | |
| 2) Nitrobenzene-d5 | 0.000 | 82 | 0 | 0.00 | ppb | |
| Spiked Amount 1000.000 | Range 24 - 92 | | Recovery = 0.00%# | | | |
| 7) 2-Fluorobiphenyl | 4.568 | 172 | 24942 | 453.06 | ppb | 0.00 |
| Spiked Amount 1000.000 | Range 25 - 89 | | Recovery = 45.31% | | | |
| 11) Pyrene-d10 | 7.044 | 212 | 29290 | 488.29 | ppb | 0.04 |
| Spiked Amount 1000.000 | Range 40 - 110 | | Recovery = 48.83% | | | |
| 18) Terphenyl-d14 | 7.207 | 244 | 21216 | 490.35 | ppb | 0.04 |
| Spiked Amount 1000.000 | Range 39 - 92 | | Recovery = 49.04% | | | |
| Target Compounds | | | | | | Qvalue |
| 3) Naphthalene | 3.795 | 128 | 36247 | 510.83 | ppb | 99 |
| 4) 2-Methylnaphthalene | 4.301 | 142 | 21955 | 437.15 | ppb | 99 |
| 5) 1-Methylnaphthalene | 4.365 | 142 | 22369 | 457.52 | ppb | 98 |
| 8) Acenaphthylene | 4.916 | 152 | 36729 | 420.54 | ppb | 100 |
| 9) Acenaphthene | 5.039 | 153 | 23216 | 416.63 | ppb | 100 |
| 12) Fluorene | 5.393 | 166 | 26456 | 459.72 | ppb | 100 |
| 13) Phenanthrene | 6.049 | 178 | 39396 | 441.90 | ppb | 97 |
| 14) Anthracene | 6.084 | 178 | 41603 | 467.14 | ppb | 97 |
| 15) Fluoranthene | 6.890 | 202 | 46562 | 457.46 | ppb | 98 |
| 16) Pyrene | 7.054 | 202 | 47563 | 470.36 | ppb | 94 |
| 19) Benzo[a]anthracene | 8.059 | 228 | 43779 | 465.56 | ppb | 96 |
| 20) Chrysene | 8.088 | 228 | 41463 | 445.15 | ppb | 100 |
| 22) Benzo[b]fluoranthene | 9.087 | 252 | 43603 | 441.07 | ppb | 97 |
| 23) Benzo(j,k)fluoranthene | 9.110 | 252 | 41859 | 448.24 | ppb | 97 |
| 24) Benzo[a]pyrene | 9.389 | 252 | 39361 | 441.42 | ppb | 96 |
| 25) Indeno(1,2,3-c,d)pyrene | 10.426 | 276 | 47491 | ~~534.77~~ 436.75 | ppb | 99 |
| 26) Dibenz[a,h]anthracene | 10.457 | 278 | 37986 | 431.37 | ppb | 92 |
| 27) Benzo[g,h,i]perylene | 10.642 | 276 | 40099 | 432.39 | ppb | 92 |

IT 3-19-21

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : C:\MSDCHEM\1\DATA\Q210319\
Data File : Q0319001.D
Acq On : 19 Mar 2021 2:54 pm
Operator :
Sample : PAH CCV0319-1
Misc : SV5-200-27
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Mar 19 15:08:38 2021
Quant Method : C:\MSDCHEM\1\METHODS\QSIM0317.M
Quant Title : PAH'S BY SIMS
QLast Update : Thu Mar 18 09:45:16 2021
Response via : Initial Calibration



# APPENDIX C
## Data Validation Report

GeoEngineers

2101 4th Street, Suite 950, Seattle, WA 98121, Telephone: 206.728.2674, Fax: 206.728.2732 www.geoengineers.com

# Data Validation Report

**Project:** Dakota Creek Industries Cleanup Site – Supplemental Soil Investigation

**GEI File No:** 05147-006-14

**Date:** May 3, 2021

This report documents the results of a United States Environmental Protection Agency (USEPA)-defined Stage 2B data validation (USEPA Document 540-R-08-005; USEPA, 2009) of analytical data from the analyses of direct push soil boring samples collected as the Supplemental Soil Investigation, and the associated laboratory and field quality control (QC) samples. The samples were obtained from the Dakota Creek Industries Shipyard Site (Site) located in Anacortes, Washington.

## OBJECTIVE AND QUALITY CONTROL ELEMENTS

GeoEngineers, Inc. (GeoEngineers) completed the data validation consistent with the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (USEPA 2017a) and Inorganic Superfund Data Review (USEPA 2017b) (National Functional Guidelines) to determine if the laboratory analytical results meet the project objectives and are usable for their intended purpose. Data usability was assessed by determining if:

- The samples were analyzed using well-defined and acceptable methods that provide reporting limits below applicable regulatory criteria;
- The precision and accuracy of the data are well-defined and sufficient to provide defensible data; and
- The quality assurance/quality control (QA/QC) procedures utilized by the laboratory meet acceptable industry practices and standards.

In accordance with the Remedial Investigation/Feasibility Work Plan Addendum, Dakota Creek Industries Site (GeoEngineers 2021), the data validation included review of the following QC elements:

- Data Package Completeness
- Chain-of-Custody Documentation
- Holding Times and Sample Preservation
- Surrogate Recoveries
- Method Blanks
- Matrix Spikes/Matrix Spike Duplicates
- Laboratory Control Samples/Laboratory Control Sample Duplicates
- Field and Laboratory Duplicates
- Instrument Tuning
- Internal Standards
- Initial Calibrations (ICALs)

- Continuing Calibrations (CCALs)
- Reporting Limits

## VALIDATED SAMPLE DELIVERY GROUPS

This data validation included review of the sample delivery groups (SDGs) listed below in Table 1.

### TABLE 1: SUMMARY OF VALIDATED SAMPLE DELIVERY GROUPS

| Laboratory SDG | Samples Validated |
|---|---|
| 2103-219 | GEI-47-9.0, GEI-48-8.0, GEI-49-11.0, GEI-50-9.0, GEI-51-12.0, GEI-52-10.0, GEI-52-10.0 |

## CHEMICAL ANALYSIS PERFORMED

Onsite Environmental (Onsite), located in Redmond, Washington, perfomed accredited laboratory analyses on all soil samples. Onsite used one or more of the following methods:

- Polycyclic Aromatic Hydrocarbons (PAHs) by Method SW8270-SIM
- Gasoline-range Hydrocarbons by NWTPH-Gx
- Diesel-range and Heavy Oil-range Hydrocarbons by NWTPH-Dx (Includes sulfuric acid & silica gel)
- Volatile Organic Compounds by Method SW8260

## DATA VALIDATION SUMMARY

The results for each of the QC elements are summarized below.

### Data Package Completeness

Onsite provided all required deliverables for the data validation according to the National Functional Guidelines. The laboratory followed adequate corrective action processes and all identified anomalies were discussed in the relevant laboratory case narrative.

### Chain-of-Custody Documentation

Chain-of-custody (COC) forms were provided with the laboratory analytical reports. The COCs were accurate and complete when submitted to the lab. Documents were properly signed and dated by field and laboratory personel, analyses were properly requested and checked by the laboratory.

### Holding Times and Sample Preservation

The sample holding time is defined as the time that elapses between sample collection and sample analysis. Maximum holding time criteria exist for each analysis to help ensure that the analyte concentrations found at the time of analysis reflect the concentration present at the time of sample collection. Established holding times were met for all analyses. The sample coolers arrived at the laboratory at the appropriate temperatures of between 2 and 6 °C.

### Surrogate Recoveries

A surrogate compound is a compound that is chemically similar to the organic analytes of interest, but unlikely to be found in any environmental sample. Surrogates are used for organic analyses and are added to all samples, standards, and blanks to serve as an accuracy and specificity check of each analysis. The surrogates are added to the samples at a known concentration and percent recoveries are calculated following analysis. All surrogate percent recoveries for field samples were within the laboratory control limits.

### Method Blanks

Method blanks are analyzed to ensure that laboratory procedures and reagents do not introduce measurable concentrations of the analytes of interest. A method blank was analyzed with each batch of samples, at a frequency of 1 per 20 samples. For all sample batches, method blanks were analyzed at the required frequency. None of the analytes of interest were detected above the reporting limits in any of the method blanks.

### Matrix Spikes/Matrix Spike Duplicates

Since the actual analyte concentration in an environmental sample is not known, the accuracy of a particular analysis is usually inferred by performing a matrix spike (MS) analysis on one sample from the associated batch, known as the parent sample. One aliquot of the sample is analyzed in the normal manner and then a second aliquot of the sample is spiked with a known amount of analyte concentration and analyzed. From these analyses, a percent recovery (%R) is calculated. Matrix spike duplicate (MSD) analyses are generally performed for organic analyses as a precision check and analyzed in the same sequence as a matrix spike. Using the result values from the MS and MSD, the relative percent difference (RPD) is calculated. The %R control limits for MS and MSD analyses are specified in the laboratory documents, as are the RPD control limits for MS/MSD sample sets.

For inorganic methods, the matrix spike is followed by a post-digestion spike sample if any element %R values were outside the control limits in the matrix spike. All metals %R control limits for matrix spikes are 75% to 125%.

One MS/MSD analysis should be performed for every analytical batch or every 20 field samples, whichever is more frequent. The frequency requirements were met for all analyses and the %R and RPD values were within the proper control limits.

### Laboratory Control Samples/Laboratory Control Sample Duplicates

A laboratory control sample (LCS) is a blank sample that is spiked with a known amount of analyte and then analyzed. An LCS is similar to an MS, but without the possibility of matrix interference. Given that matrix interference is not an issue, the LCS/LCSD control limits for accuracy and precision are usually more rigorous than for MS/MSD analyses. Additionally, data qualification based on LCS/LCSD analyses would apply to all samples in the associated batch, instead of just the parent sample. The percent recovery control limits for LCS and LCSD analyses are specified in the laboratory documents, as are the RPD control limits for LCS/LCSD sample sets.

One LCS/LCSD analysis should be performed for every analytical batch or every 20 field samples, whichever is more frequent. The frequency requirements were met for all analyses and the percent recovery and RPD values were within the proper control limits.

### Laboratory Duplicates

Internal laboratory duplicate analyses are performed to monitor the precision of the analyses. Two separate aliquots of a sample are analyzed as distinct samples in the laboratory and the RPD between the two results is calculated. Duplicate analyses should be performed once per analytical batch. If one or more of the samples used has a concentration less than five times the reporting limit for that sample, the absolute difference is used instead of the RPD. For organic analyses, the RPD control limits are specified in the laboratory documents. For inorganic analyses, the RPD control limit for soil samples is 35 percent. Laboratory duplicates were analyzed at the proper frequency and the specified acceptance criteria were met.

### Field Duplicates

In order to assess precision, field duplicate samples are collected and analyzed along with the reviewed sample batches. The duplicate samples are analyzed for the same parameters as the associated parent samples. Precision is determined by calculating the Relative Percent Difference (RPD) between each pair of samples. If one or more of the sample analytes has a concentration greater than five times the reporting limit for that sample, then the absolute difference is used instead of the RPD. The RPD control limit for soil samples is 50 percent, while the absolute difference control limit is equal to twice the reporting limit.

### Instrument Tuning

Instrument tuning for analyses by gas chromatography/mass spectrometry (GC/MS) are completed to ensure that mass resolution, identification, and sensitivity of the analyses are acceptable. Instrument tuning should be performed at the beginning of each 12-hour period during which samples or standards are analyzed. The frequency and specified acceptance criteria were met for each applicable analysis.

### Internal Standards (Low Resolution Mass Spectrometry)

Like the surrogate, an internal standard is a compound that is chemically similar to the analytes of interest, but unlikely to be found in any environmental sample. Internal standards are used only for the mass spectrometry instrumentation and are usually added to the sample aliquot after extraction has taken place. The internal standard should be analyzed at the beginning of a 12-hour sample run and the control limits for internal standard recoveries are 50 percent to 200 percent of the calibration standard. All internal standard recoveries were within the control limits, with the following exceptions:

### Initial Calibrations (ICALs)

The initial calibrations were conducted according to the laboratory methods and consisted of the appropriate number of standards. For all organic analyses, the percent relative standard deviation (%RSD) and relative response factors (RRF) values were within the laboratory control limits and also the control limits stated in the National Functional Guidelines for Organic Superfund Data Review (USEPA 2017). For all inorganic analyses, the calibrations were within the laboratory control limits and also the control limits stated in the National Functional Guidelines for Inorganic Superfund Methods Data Review (USEPA 2017).

### Continuing Calibrations (CCALs)

The continuing calibrations were conducted according to the laboratory methods and consisted of the appropriate number of standards. F For the NWTPH-Gx analyses, the %R values were within the control limits of ±20%. For the NWTPH-Dx analyses, the %R values were within the control limits of ±15%. For organic analyses, the percent difference (%D) and relative response factors (RRF) values were within the control limits in the National Functional Guidelines for Organic Superfund Data Review (USEPA 2017). For all inorganic analyses, the %D values were within the laboratory control limits and also the control limits stated in the National Functional Guidelines for Inorganic Superfund Methods Data Review (USEPA 2017).

### Reporting Limits

The reporting limits were met by the laboratory for all target analytes throughout this sampling event.

## OVERALL ASSESSMENT

As was determined by this data validation, the laboratory followed the specified analytical methods. Accuracy was acceptable, as demonstrated by the surrogate, LCS/LCSD, and MS/MSD percent recovery values. Precision was acceptable, as demonstrated by the LCS/LCSD, MS/MSD, and field/laboratory duplicate RPD values.

No data points were qualified for any reason.

## REFERENCES

U.S. Environmental Protection Agency (USEPA). "Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use," EPA-540-R-08-005. January 2009.

U.S. Environmental Protection Agency (USEPA 2017a). "National Functional Guidelines for Organic Superfund Methods Data Review," EPA-540-R-2017-002. January 2017.

U.S. Environmental Protection Agency (USEPA 2017b). "National Functional Guidelines for Inorganic Superfund Methods Data Review," EPA-540-R-2017-001. January 2017.

GeoEngineers, Inc., "Remedial Investigation/Feasibility Work Plan Addendum, Dakota Creek Industries Site, Anacortes, Washington, Ecology Agreed Order No. DE-07TCPHQ-5080," GEI File No. 5147-006-14, March 1, 2021

# Exhibit C

**EXHIBIT C**
**DAKOTA CREEK INDUSTRIES SITE SCOPE OF WORK AND SCHEDULE**

| Deliverables | | Due[1] |
|---|---|---|
| ***A. Administrative*** | | |
| A.1 | File Consent Decree in Court (CD Effective Date) | Within 30 days of execution by Port and Ecology |
| A.2 | Quarterly Progress Reports to Ecology | Following the CD Effective Date through the completion of construction activities, quarterly on the 10th of the month beginning after the effective date of the CD. Thereafter, annually on the CD anniversary date. |
| ***B. Soil Removal and Capping*** | | |
| B.1 | Draft Engineering Design Report (EDR)[2] | Within 120 days of Effective Date (A.1) |
| B.2 | Draft Final EDR | Within 30 days of receipt of Ecology's comments on Draft EDR (B.1) |
| B.3 | Conduct Construction | Complete within one year from 100% Plans and Specifications per WAC 173-340-400(4)(b) |
| B.4 | Draft Construction Completion Report | Submit to Ecology within 90 days of completion of construction |
| B.5 | Final Construction Completion Report | Submit to Ecology within 30 days following Ecology approval of draft Construction Completion Report |
| ***C. Environmental Covenant*** | | |
| C.1 | Draft Environmental Covenant and Draft Engineering and Institutional Controls Monitoring and Maintenance Plan (EICMMP) | Submit to Ecology with Final Construction Completion Report (B.7) |
| C.2 | Final Environmental Covenant and Final EICMMP | Submit to Ecology within 30 days following Ecology approval of draft (C.1) |
| C.3 | Proof of recording of Environmental Covenant | Submit to Ecology within 30 days following Final Environmental Covenant (C.2) |
| ***D. Groundwater MNA*** | | |
| D.1 | Draft Groundwater MNA Compliance Monitoring Plan (CMP) | Submit to Ecology with draft EDR (B.1) |
| D.2 | Final Groundwater MNA CMP | Submit to Ecology within 30 days following Ecology approval of draft (D.1) |
| D.3 | Groundwater MNA CMP implementation | Start within 180 days of completing construction |
| D.4 | Draft Annual Groundwater MNA Report | Submit to Ecology annually within 90 days after receipt of current year's analytical data |
| D.5 | Final Annual Groundwater MNA Report | Submit to Ecology within 30 days following Ecology approval of draft (D.4) |

[1] *Schedule is in calendar days. Deliverable due date may be modified with Ecology concurrence without amendment to the Consent Decree.*

[2] *The EDR includes: a Storm Water Pollution Plan or Construction Quality Assurance Project Plan, an Inadvertent Monitoring Plan, Proposed Best Management Practices, and Substantive Requirements of Procedurally Exempt Permits.*

# Exhibit D

**EXHIBIT D**
**LIST OF REQUIRED PERMITS OR APPROVALS**

## APPLICABLE PERMITS OR APPROVALS & REQUIREMENTS

The cleanup action to be performed at the Site requires the following permit and environmental review process:

### State Environmental Policy Act Integrated Compliance

Compliance with SEPA (RCW 43.21C.036 and WAC 197-11-250 through 259) will be achieved by conducting SEPA review in accordance with applicable regulatory requirements, including and Ecology guidance as presented in Ecology Policy 130A (Ecology 2004). The Port of Anacortes will act as the SEPA lead agency and will coordinate SEPA review.

# Exhibit E

**EXHIBIT E**
**APPLICABLE SUBSTANTIVE REQUIREMENTS OF PROCEDURALLY EXEMPT PERMITS OR APPROVALS**

## APPLICABLE PERMITS OR APPROVALS & REQUIREMENTS

The cleanup action to be performed at the Site is exempt from the procedural requirements of the following permits and approvals but must meet the substantive requirements:

### City of Anacortes Grading Permit

Pursuant to the City of Anacortes Grading Ordinance (AMC Ch. 19.78), a grading permit is required from the City for all grading projects that are not categorically exempt. The City grading ordinance identifies a number of standards and requirements for obtaining a grading permit. The City standards and requirements will be integrated into the construction plans and specifications where applicable for the cleanup action to insure it complies with the substantive requirements of the City grading ordinance.

### City of Anacortes Construction Stormwater Permit

Pursuant to the City of Anacortes Stormwater Management ordinance (AMC Ch. 19.76), the cleanup action must meet the requirements of a City Stormwater Permit. The substantive requirements include preparation of a stormwater site plan, construction stormwater pollution prevention, source control of pollution, preservation of natural drainage systems and outfalls, on-site stormwater management, runoff treatment, flow control, wetlands protection, and operation and maintenance.

### City of Anacortes Shoreline Substantial Development Permit

Pursuant to the City of Anacortes Shoreline Master Program (AMC Ch. 18.16), the cleanup action must meet the requirements of a City Shoreline Substantial Development Permit (SSDP). The cleanup action will occur within the regulated shoreline area. The substantive requirements include meeting the general conditions for a SSDP and applicable general regulations and use activities policies.

### City of Anacortes Discharge Permit

Pursuant to the City of Anacortes Sewer System Code (AMC 13.04.131) it is unlawful to discharge materials into the Anacortes sanitary and stormwater sewer other than an authorized sewer connection or designated dump station without the expressed written authorization of the director of public works. Should the contractor elect to discharge dewatering decant into the City treatment system, the substantive requirements of this authorization will be followed.