



Naval Facilities Engineering Systems Command Hawaii

Draft Final
Technical Memorandum,
Phase 2 Holding Tank and Leach Tank
Characterization, November 2021 Pipeline
Release
Red Hill Bulk Fuel Storage Facility
JBPHH, O‘ahu, Hawai‘i

DOH Facility ID No. 9-102271
DOH Release ID No. 20211120_2330

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Executive Summary

This Technical Memorandum was prepared for Naval Facilities Engineering Systems Command (NAVFAC) Hawaii by AECOM Technical Services Inc. in accordance with the State of Hawai‘i Department of Health (DOH) Technical Guidance Manual (TGM) and in response to the DOH Notice of Interest letter dated November 24, 2021 for the Red Hill Bulk Fuel Storage Facility (Facility) and as required by Hawai‘i Administrative Rules (HAR) 11-280.1-65.2.

This document is the second of two technical memoranda by NAVFAC Hawaii to document the activities and results of site characterization at the Holding Tank and Leach Tank area of concern. The characterization has occurred in two serial phases. Phase 1 of the characterization field work occurred during January 11–13, 2022 and consisted of sampling 21 soil borings in the vicinity of the Adit 3 Holding Tank and Leach Tank, where an unknown quantity of Jet Fuel Propellant Number 5 (JP-5) was released to the environment during the November 20, 2021 Adit 3 tunnel release. Phase 1 activities and results were documented in a Draft Technical Memorandum in February 2022 (DON 2022b) (see Appendix A).

Following consultation with DOH and United States Environmental Protection Agency Region 9, the Navy conducted Phase 2 field work March 9–17, 2022 to vertically delineate the petroleum in subsurface soil and to characterize petroleum in the shallow perched water body located at approximately 30 feet below ground surface in the study area. During the Phase 2 investigation, subsurface soil samples and organic vapor headspace readings were collected at eight soil borings from data gap locations, and groundwater grab samples were collected from three temporary wells, within the perched groundwater zone. The chemical constituents evaluated were total petroleum hydrocarbons (TPH) as gasoline range organics (TPH-g), diesel range organics (TPH-d), and oil range organics (TPH-o); benzene, toluene, ethylbenzene, and total xylenes (BTEX); naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene (N, 1MN, and 2MN). This Technical Memorandum presents a summary of the Phase 1 and Phase 2 investigations, including activities, methods, and field observations to characterize the soil around the Holding Tank and Leach Tank area of concern. The quantitative laboratory data in this report have been validated and flagged, as necessary for decision-making purposes.

Investigation Results

In the absence of site-specific risk-based screening levels, soil and groundwater data are compared to DOH Environmental Action Levels (EALs) (DOH 2021a). EALs from Table A-2, Soil Action Levels (Potentially impacted groundwater is a current or potential drinking water source; surface water body is located within 150 meters of the release site) (DOH 2021a) were used to compare results to the following risk drivers:

- Gross contamination (e.g., odors)
- Direct exposure impact to human health
- Leaching to groundwater that is a drinking water resource

Subsurface soil EAL exceedances were noted in the following soil borings:

- HT-E00, HT-E10, HT-N10, HT-S10, HT-W10, and HT-N15
- LT-E00, LT-N10, LT-N25, LT-S10, LT-W10, LT-W17.5, LT-E15, and LT-N35

Although the groundwater encountered is not a drinking water resource, the underlying basal aquifer is; therefore, EALs from Table D-1a Groundwater Action Levels (DOH 2021a) were used to compare results to the following risk drivers:

- Drinking Water Toxicity (leaching to basal aquifer)
- Aquatic Habitat Impact, and
- Gross Contamination, Taste, Odor, etc.

Groundwater samples from one hydraulically downgradient temporary well located in boring LT-W35, exceeded DOH EALs for TPH-g, TPH-d, N, 1MN, and 2MN. LT-W35 is hydraulically downgradient from the other temporary wells and adjacent to the Federal property boundary, which is the eastern embankment of the channelized South Hālawā Stream in this area of the Facility.

Conclusions

The Navy performed a removal action remedy, which was implemented in two phases. The first phase was completed in May 2022 and included removal of the Holding Tank, Leach Tank, and the petroleum-impacted soil immediately surrounding the tanks. The second phase was conducted in September and October 2022, and included removal of additional impacted soil to further mitigate the threat to human health and the environment. Once the removal action confirmation sampling results have been evaluated, the Navy will develop site-specific risk-based action levels following the Hazard Evaluation and Emergency Response Environmental Hazard Evaluation process and, if necessary, develop and implement an Environmental Hazard Management Plan in accordance with Hazard Evaluation and Emergency Response Guidelines.

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- A Technical Memorandum, Holding Tank and Leach Tank Characterization, February 2022
- B Initial and Phase 2 Holding Tank and Leach Tank Field Boring Logs
- C Initial and Phase 2 Holding Tank and Leach Tank Level II Laboratory Reports
- D Initial and Phase 2 Holding Tank and Leach Tank Level IV Laboratory Reports
- E Data Validation Reports

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Acronyms and Abbreviations

%D	percent difference
%R	percent recovery
µg/L	micrograms per liter
µg/m ³	micrograms per cubic meter
BTEX	benzene, toluene, ethylbenzene, and xylenes
CF&T	contaminant fate and transport
COC	chain of custody
COPC	chemical of potential concern
DoD	United States Department of Defense
DOH	State of Hawai‘i Department of Health
DQI	data quality indicator
EAL	environmental action level
EPA	United States Environmental Protection Agency
FID	flame ionization detector
HAR	Hawai‘i Administrative Rules
HCl	hydrochloric acid
HEER	Hazard Evaluation and Emergency Response
JBPHH	Joint Base Pearl Harbor-Hickam
JP-5	Jet Fuel Propellant Number 5
L	Liter
L-L Ext	liquid/liquid extraction
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LNAPL	light nonaqueous-phase liquid
LOQ	limit of quantitation
mL	milliliter
MIS	multi-incremental sampling
MS	matrix spike
MSD	matrix spike duplicate
NAVFAC	Naval Facilities Engineering Systems Command
NAVSUP FLC	Naval Supply Systems Command Fleet Logistics Center
Navy	United States Department of the Navy
NRH	Navy Region Hawaii
PAH	polynuclear aromatic hydrocarbon
PID	photoionization detector
ppmv	parts per million by volume
QC	quality control
QSM	Quality Systems Manual
SIM	selected ion monitoring

SOP	standard operating procedure
SVOC	semivolatile organic compound
TGM	Technical Guidance Manual
TIC	tentatively identified compound
TOC	total organic carbon
TPH	total petroleum hydrocarbons
TPH-d	total petroleum hydrocarbons – diesel range organics
TPH-g	total petroleum hydrocarbons – gasoline range organics
TPH-o	total petroleum hydrocarbons – residual range organics (i.e., TPH-oil)
U.S.	United States
UIC	Underground Injection Control
USGS	United States Geological Survey
UST	underground storage tank
VOC	volatile organic compound

1.0 Introduction and Purpose

This Technical Memorandum was prepared for Naval Facilities Engineering Systems Command (NAVFAC) Hawaii by AECOM Technical Services Inc. in accordance with the State of Hawai'i Department of Health (DOH) Technical Guidance Manual (TGM) and in response to the DOH Notice of Interest letter dated November 24, 2021 (DOH 2021b) for the Red Hill Bulk Fuel Storage Facility (Facility) and as required by Hawai'i Administrative Rules (HAR) 11-280.1-65.2.

This Technical Memorandum provides the results of the characterization of the Holding Tank and Leach Tank area of concern located east of the Moanalua Freeway in South Hālawā Valley approximately 2 miles east of Pearl Harbor, as shown on Figure 1.

The investigation is designed to fill identified data gaps and collect data of sufficient quality to make decisions in accordance with the Phase 2 Preliminary Site Characterization Plan (DON 2022d). This Technical Memorandum presents the results of the investigation at the Holding Tank and Leach Tank area of concern. Data presented in this report includes:

- Field boring logs and cross-sections developed from subsurface soil cores
- Subsurface soil organic vapor headspace results from hand-held photoionization detector (PID) measurements collected in real time from subsurface soil cores
- Laboratory results of chemical constituents from discrete subsurface soil samples collected from two locations in each boring as follows:
 - From the soil interval with the highest PID reading in each boring
 - From the bottom of each boring
- Laboratory results of chemical constituents in perched groundwater from two sampling rounds from three temporary wells collected on March 16 and April 1, 2022
- Laboratory results of chemical constituents in perched groundwater from OWDFMW06B collected on January 26, 2022

1.1 Statement of Purpose

This Technical Memorandum presents the Phase 2 results of the Holding Tank and Leach Tank preliminary site characterization for evaluation and assessment. The Navy evaluated the data in this memorandum and in collaboration with regulatory agencies, decided to implement soil removal actions to protect human health and the environment from the impact of the fuel release from the Adit 3 Sump drain line mixed with infiltrating groundwater and pump cooling water.

1.2 Previous Reports and Plans

Table 1 provides a summary of previous reports and plans.

2.0 Background

During the release event on November 20, 2021 (November 20 Release), Jet Fuel Propellant Number 5 (JP-5)-impacted water from the Adit 3 Sump was pumped into the Sump discharge line to an external leach area, which includes a Holding Tank and a Leach Tank. The JP-5-impacted water was then released to the subsurface soil environment adjacent to the concreted portion of South Hālawā Stream directly west of the Adit 3 portal (see Figure 2 and Figure 3).

On December 18, 2021, a buried Holding Tank and connected Leach Tank were identified as potentially being impacted by the release. The purpose of these tanks is to discharge subsurface drainage, cooling water, and condensate collected from the sump located at the entrance to Adit 3. Both tanks are cylindrical and are 8 feet tall and 7 feet in diameter. Upon inspection, the Holding Tank was found to have approximately 1,500 gallons of fuel/water mixture. This fuel/water mixture was pumped out of the tank and found to contain approximately 235 gallons of free product and roughly 1,250 gallons of water. The Leach Tank, which is open to the soil below, did not contain any liquid; however, noticeable petroleum odors were observed. At the time, it was unknown whether these petroleum odors were a result of volatilized fuel vapors that traveled from the Holding Tank or fuel that may have entered the Leach Tank. This preliminary characterization was proposed to address this uncertainty and support decision-making regarding any remedial action that might be needed. The locations of the Holding Tank, Leach Tank, and sampling locations are illustrated on Figure 4.

2.1.1 Climate

Climatological conditions in the area of the Holding Tank and Leach Tank consist of warm to moderate temperatures and low to moderate rainfall. The average annual precipitation is approximately 40 inches, which occurs mainly between November and April (Giambelluca, Nullet, and Schroeder 1986). Average temperatures range from the low 60s to high 80s (degrees Fahrenheit) (Juvik and Juvik 1998).

2.1.2 Soils/Geology

Soils in the vicinity of the Holding Tank and Leach Tank are mapped as Helemano-Wahiawā association consisting of well-drained, moderately fine-textured and fine-textured soils (USDA SCS 1972). The surfaces of the basaltic flows have been weathered to form reddish-brown clayey silt, which is the basis for the local name “Red Hill.” These soils typically range from nearly level to moderately sloping and occur in broad areas dissected by very steep gulches. Along the slopes, the basaltic bedrock is covered with approximately 10–30 feet of Ko‘olau residuum. These soils were derived from weathering of the underlying basalt bedrock or were deposited as alluvium/colluvium. The younger alluvium/colluvium deposits were derived from fractured basalts and tuff. Beneath the surficial soils, alternating layers of clay and basalts are encountered at depth. The northwestern slope of Red Hill is generally barren of soil and consists of outcropping basalt lava flows to the valley floor.

The Holding Tank and Leach Tank are located within the Ko‘olau Volcanic series. The Ko‘olau formation at Red Hill consists of basaltic lava flows that erupted from a fissure line approaching 30 miles in length and trending along a northwest rift zone (Wentworth and Macdonald 1953). Pāhoehoe and a‘ā lava flows are present in the Ko‘olau formation. The valleys on either side of Red Hill ridge were formed as a result of fluvial erosion and are filled with sedimentary deposits (alluvium and colluvium), also known as valley fill, underlain by residual material (weathered basalt), also known as saprolite. Saprolite zones in Hawai‘i are typically around 75 feet thick but can be 300 feet thick or greater beneath the valley floors or in areas of high precipitation (Hunt Jr. 1996; Macdonald, Abbott, and Peterson 1983). The results of a recently conducted seismic survey in North and South Hālawā Valleys, Red Hill, and Moanalua Valley (DON 2018) found that valley fill and saprolite extend much deeper in the valleys surrounding Red Hill, particularly in the center of the valleys and below the streambeds.

2.1.3 Surface Water

Surface water features in the general vicinity of the Holding Tank and Leach Tank include South Hālawā Stream (an ephemeral stream approximately 70 feet to the west/northwest). In Hālawā Valley, stream flow may contribute water to perched groundwater within alluvial material (valley fill) but is generally isolated from the underlying basal aquifer. Most precipitation percolates to the basal aquifer and does not maintain base flows in the streams (Izuka 1992). South Hālawā Stream is located approximately 170 feet or more above the basal water table.

2.1.4 Groundwater

In the vicinity of Red Hill, the basal aquifer water table lies between 15 and 20 feet above mean sea level, and regionally groundwater flows toward Pearl Harbor (mauka to makai), although potential exists for variability in localized flow directions depending on geologic formations and other factors. In addition, the extensive drilling associated with the Facility has identified low permeability strata above the basal aquifer in which the infiltration of groundwater slows and perched water bearing zones are observed. Stratigraphy that result in these perched water bearing zones, such as weathered clinker zones, and massive a‘ā lithology have significantly lower hydraulic permeabilities than the highly conductive fractured pāhoehoe. In addition, fine silt and clay sediments and weathered volcanic rock, known as saprolite, produce perched water bodies associated with the incised valley streambeds, such as South Hālawā stream that is observed in the study area.

The Facility, including the Holding Tank and Leach Tank area of concern, is located at the administrative boundary between the Waimalu Aquifer System of the Pearl Harbor Aquifer Sector and the Moanalua Aquifer System of the Honolulu Aquifer Sector. The underlying aquifer is classified as a basal, unconfined, flank-type aquifer and is currently used as a drinking water source.

The Holding Tank and Leach Tank area is located upgradient of the Hawaii State Underground Injection Control (UIC) Line, which separates potable groundwater from non-potable groundwater. The nearest drinking water supply well is Navy Supply Well 2254-01 (also known as Red Hill Shaft), located approximately 770 feet east of the area.

2.2 *Historical Land Use*

Prior to the 1940s, the surface of Red Hill supported sugar cane and pineapple agriculture. Navy archive images show that the Red Hill ground surface was exposed and modified during construction of the tank farm beginning in 1940. A 1952 aerial photograph shows unmaintained land on the ridge of Red Hill and agriculture on the lower reaches of Red Hill north of the Moanalua Golf Course (DON 2019).

2.3 *Current Land Use*

The Facility, including the Holding Tank and Leach Tank area, is located on land zoned by the County as a mix of F-1 Federal and Military and P-1 Restricted Preservation districts. All major structures at the Facility are located underground. Populated areas closest to the Facility are ‘Aiea to the west and Honolulu to the south and east. Honolulu is heavily urbanized and densely populated.

Preservation land is located east and northeast of the Facility boundary. To the southeast are residential single-family homes in Moanalua Valley; a high cliff face with a 100–200 foot elevation difference exists between the Facility and this residential area. Southwest of the tank farm area on the lower southwest flank of Red Hill are the public Red Hill Elementary school and residential apartments, and farther west is U.S. Coast Guard Housing on F-1 Military land. North of the western segment of the Facility boundary in South Hālawā Valley is the State Animal Quarantine Station, private businesses in Hālawā Industrial Park, and the State-operated Hālawā Correctional Facility. To the north of the Correctional Facility at the lower reaches of an inter-valley ridge that forms the north wall of South Hālawā Valley is the open-pit Hālawā Quarry operated by the Hawaiian Cement Company.

2.4 Preliminary Conceptual Site Model

2.4.1 Preliminary Holding Tank and Leach Tank Exposure Model

The preliminary conceptual site model describes potentially contaminated media and potential receptors specific to the Holding Tank and Leach Tank release area. Potentially contaminated media include:

- Unconsolidated subsurface soil, coinciding with depths greater than the bottom of the Holding Tank and Leach Tank (approximately 8 feet below ground surface [bgs]).
- The perched groundwater identified in adjacent well OWDMW06B (Appendix A) at approximately 30 feet bgs beneath the area of concern in the unconsolidated soil and saprolite.
- The confined basal aquifer groundwater identified in adjacent well OWDFMW06A (Appendix A), was encountered at approximately 75 feet below mean sea level (msl) (approximately 192 feet bgs). On September 28, 2021, static water was measured at 18.93 feet above msl (approximately 97 feet bgs), indicating strong confining conditions and an upward vertical hydraulic gradient in the basal aquifer at this location.
- South Hālawā Stream runs from northeast to southwest adjacent to the area of concern and is approximately 70 feet to the west northwest of the Leach Tank at its nearest extent. South Hālawā Stream consists of a concrete channel for more than 300 feet in either direction of the area; the concrete channel contains drain holes to allow infiltrating groundwater to flow into the stream channel during periods of high precipitation. Based on USGS digital elevation model data, the bottom of the South Hālawā Stream channel is at approximately 97 feet above msl adjacent to the Holding Tank and Leach Tank area of concern. This is compared to similar data for the ground surface of the eastern embankment of South Hālawā Stream of approximately 107 feet above msl in this area.

Potential receptors include:

- Potential construction worker who may have direct contact with contaminated subsurface soil at depths more than 8 feet bgs.
- Potential human receptors and ecological receptors that may have direct contact with contaminated soil that has been excavated from the site, depending on where the excavated soil is disposed of or used.

- Potential human receptors and ecological receptors that may come in contact with the perched water: although the perched water is not a source of potable water and is not currently used, it may enter South Hālawā Stream during storm events and contact human receptors and ecological receptors downstream under significantly diluted conditions. This perched water is likely below the stream during non-storm events.
- Potential human and ecological receptors may come in contact with the basal groundwater beneath the area of concern, which is a drinking water source. These include offsite residents using tap water sourced from the Red Hill Shaft Water Supply Well 2254-01. These receptors could be exposed to constituents in tap water via direct ingestion and dermal contact, and via inhalation while showering and bathing. Animals and vegetation may also be exposed to tap water through ingestion or from irrigation. However, there is evidence that the basal groundwater may be protected by a significant confining layer and resulting upward vertical gradient identified during the drilling of monitoring well OWDFMW06A (see borelog in Appendix B for details).

3.0 Summary of Holding Tank and Leach Tank Release History

On November 20, 2021, a release of JP-5 jet fuel occurred in the Adit 3 tunnel of the Facility. Approximately 19,000 gallons of JP-5 was released from an overhead 14-inch polyvinyl chloride (PVC pipe at a location approximately 400 feet east of the U.S. Navy Well 2254-01 Pump Station and approximately 200 feet east of the upper Pearl Harbor tunnel.

In December 2021, the Navy identified the endpoint of water and JP-5 product that had accumulated in the subsurface drainage sump located approximately 125 feet from the Adit 3 entrance in the lower access tunnel. It was determined that the JP-5-water mixture was pumped (automatic float pump was activated during the release) to the Holding Tank and Leach Tank area identified on Figure 3 via a 4-inch cast iron discharge line that runs along the makai side of the tunnel along the tunnel wall to the Adit 3 portal, then was later traced underground to extend from the Adit 3 tunnel entrance under the pavement to the Holding Tank and Leach Tank shown on Figure 2.

Planning documents were developed for the Phase 1 site investigation, and the investigation was conducted during January 11–13, 2022. The Phase 1 investigation consisted of subsurface soil sampling of 21 soil borings using a limited-access Geoprobe direct-push drilling rig collecting continuous samples in a step-out/step-in process from depths ranging from 4 to 24 feet bgs. Continuous coring was conducted with headspace organic vapors measured with a PID in composite grab samples from each 1 foot of core and recorded in field logs as semi-quantitative data. The PID results were used to determine the “hotspot” for collection of a laboratory sample in each boring. In general, two discrete soil samples were collected in each boring: one from the hotspot determined by PID readings and professional judgment, and one just above the total depth of the boring. Subsurface soil samples were analyzed for DOH TGM chemicals of potential concern (COPCs).

4.0 Summary of Data Quality Objectives for the Phase 2 Sampling Event

The data quality objectives for the Phase 2 Holding Tank and Leach Tank subsurface characterization were to fill data gaps that were not addressed in the Phase 1 subsurface soil sampling event in January 2022:

- Vertically delineate contamination in subsurface soil adjacent to the Holding Tank and Leach Tank in areas where the direct-push drill rig encountered refusal prior to achieving the objective of vertical delineation.
- Horizontally delineate contamination in subsurface soil to provide better resolution for the planning of any removal actions that may be required.
- Investigate perched groundwater directly beneath the release area to determine the nature and extent of COPC contamination in the medium.
- The objectives of the semi-quantitative headspace measurement using handheld real-time organic vapor detectors at each 1-foot interval of subsurface soil core located below 5 feet bgs were to:
 - Assess the potential for petroleum migration in the unsaturated zone as light nonaqueous-phase liquid (LNAPL) based on the relative magnitude of these results compared to that expected for LNAPL; and
 - Identify the location of the hotspot in the soil boring, which will be sampled for laboratory analysis to estimate the maximum COPC concentrations in each boring.

The objectives of the quantitative discrete subsurface soil samples collected for laboratory analysis include:

- Collection of one discrete subsurface soil sample at the soil interval with the highest headspace measurement of subsurface soil core located below 5 feet bgs to conservatively evaluate the concentration of site-specific COPCs in each soil boring to compare to site-specific and constituent-specific DOH Table 2-A soil action levels, as presented in the Phase 2 Preliminary Site Characterization Plan (DON 2022a) (see Table 2).
- Collection of one discrete subsurface soil sample at the bottom soil interval in each boring to evaluate the potential for COPCs to have migrated below the bottom of the boring and potentially into the underlying perched groundwater system.

- Analyze samples for COPCs presented in the Phase 2 Preliminary Site Characterization Plan as follows:
 - Total petroleum hydrocarbons (TPH) in the gasoline carbon range, which is C6–C12 (TPH-g) as measured by Method 8260/CALUFT
 - Volatile organic compounds (VOCs) benzene, toluene, ethylbenzene, and xylenes (BTEX) as measured by Method 8260D
 - TPH in the middle distillate carbon range, which is C10–C24 (TPH-d) as measured by Method 8015D
 - Polynuclear aromatic hydrocarbons (PAHs) naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene (N, 1MN, and 2MN) as measured by Method 8270E Selected Ion Monitoring (SIM)

5.0 Phase 2 Field Activities

Phase 2 activities performed to characterize subsurface soil and perched groundwater are described below. Figure 5 identifies the location of cross-sections A-A', B-B', C-C', and D-D' presented on Figure 6 through Figure 9, respectively. These cross-sections provide a graphical depiction of subsurface conditions, including hydrogeologic conditions, and results from PID measurements in relation to selected results from laboratory analyses of COPCs. The cross-sections also show the temporary wells at HT-E00, LT-E00, and LT-W35, along with selected groundwater results from these locations. Figure 10 shows the generalized construction parameters for each 2-inch temporary well. Appendix B provides the field boring logs.

5.1 Phase 2 Project Planning and Mobilization

The Draft Phase 2 Preliminary Site Characterization Plan was submitted on February 13, 2022. Regulator comments were received on February 23, 2022, and the final Phase 2 Preliminary Site Characterization Plan was submitted on March 2, 2022.

5.2 Phase 2 Subsurface Soil Sampling Activities

During the Phase 2 Site Characterization, subsurface soil sampling was conducted during March 9–17, 2022. A GeoProbe hollow-stem auger drill rig was used to collect soil cores from 5 feet bgs to a minimum depth of 19.5 feet bgs and a maximum depth of 43 feet bgs. These depths could not be sampled with the direct push methods used during the Phase 1 sampling conducted in January 2022 due to the presence of boulders and cobbles. Over the drilling period, eight soil boring locations, determined by the results from the Phase 1 site investigation, were adjusted due to field conditions in accordance with the Phase 2 Preliminary Site Characterization Plan.

Table 3 provides the coordinates for all borings that were sampled in Phase 1 and Phase 2 of the investigation, and the locations are shown on Figure 3. In general, each boring was hand-augered to 5 feet bgs to identify potential near-surface utilities per standard operating procedures (SOPs),

then continuously sampled via California split-spoon sampling techniques. Cores from the split spoons were evaluated in the field for lithology. Each was screened for organic vapor using a PID in accordance with the SOP (DON 2022d). Table 4 provides the organic vapor readings for all borings that were sampled in Phase 1 and Phase 2 of the investigation.

In general, two discrete soil samples were collected from each boring:

- One subsurface soil sample was collected at the hotspot within the boring, determined by PID readings and professional judgment.
- One subsurface soil sample was collected at the bottom of each boring to evaluate the vertical depth of contamination in that boring.

5.3 Phase 2 Perched Water Sampling Activities

Table 5 presents the perched groundwater results from the January 26, 2022 sampling event at monitoring well OWDFMW06B which was installed.

During the Phase 2 Site Characterization, three temporary wells were installed with temporary well construction information provided on Figure 10. Two wells were located in the following predetermined locations:

- HT-E00 was located directly east of the Holding Tank to assess COPCs in perched groundwater directly under the Holding Tank.
- LT-E00 was located directly east of the Leach Tank to assess COPCs in perched groundwater directly under the Leach Tank.

The third temporary well location was originally located hydraulically downgradient from both tanks, approximately 55 feet west of the Leach Tank, adjacent to the east embankment of South Hālawā Stream, which is channelized at this location. During drilling in this location, multiple attempts were made in a 2 to 3-foot step-out procedure to get to the perched water body, but each met refusal between 18 and 25 feet bgs. The boring that was successful in reaching the perched water body was drilled at a location approximately 45 feet west of the Leach Tank, at LT-W35 and a temporary well was installed at that location.

These temporary wells were sampled on two occasions:

- On March 16, 2022, grab groundwater samples were collected from these temporary wells following a minimum of 25 hours after the last well screen was installed in LT-W35. These wells were sampled as grab samples and were not purged during this sampling event. The preliminary results indicated COPC exceedances at LT-W35, with none reported in LT-E00 or HT-E00. The preliminary results corresponded with field observations of organic vapor headspace measurements from the casing during sampling.

- On April 1, 2022, all three locations were resampled, with three well volumes purged in HT-E00 and LT-W35 and purge parameters were collected after each well volume removed. LT-E00 was purged dry during the first well volume removal, and only one set of purge parameters was collected. Table 6 presents the purge parameters and well volumes removed during the April 1, 2022 sampling event.

5.4 Sampling Packing and Shipping

Subsurface soil and groundwater samples for laboratory analysis were taken to the AECOM warehouse at the end of each sampling day on ice and stored in refrigerated units, to ensure their arrival at the laboratory within the acceptable temperature range. Custody seals were applied, and chain of custody (COC) forms were completed for each cooler. A trip blank was included with each cooler containing samples for VOC analysis. All samples were received at the contract laboratory within specified limits and were analyzed on a four-business-day expedited turnaround time, with Level II (Appendix C) and Level IV (Appendix D) data packages and electronic data.

6.0 Sample Control Procedures

Prior to sampling, the field team inspected all supplies and consumables to ensure that they were acceptable for use. Sampling and sample handling procedures were designed to ensure that samples were consistently collected, labeled, preserved, and transported in a manner that maintained their integrity for their intended purposes.

6.1 Sample Containers and Preservation

These containers, preservatives, and holding times are specified in the respective EPA SW-846 methods. The analytical laboratories selected for the site characterization supplied the required sample containers.

6.2 Chain of Custody

COC documentation was maintained for samples during all phases of sample collection, transport, and laboratory sample preservation procedures and are provided as part of the Level II data reports in Appendix C.

7.0 Field Observations during Sampling

Figure 5 shows the location of the soil borings with respect to site features and the cross-section projection lines A-A', B-B', C-C' and D-D'. Figure 6 through Figure 9 show cross-sections that also present organic vapor headspace measurements and laboratory analytical results for site-specific COPCs.

Important features include the two groundwater monitoring wells that are located approximately 20 feet north-northwest of the Holding Tank. Field observations indicated that the OWDFMW06B shallow well has a static water level associated with the perched groundwater system. On January 26, 2022, the water level was measured at 29.07 feet below top of casing (88.57 feet above msl).

The Holding Tank and Leach Tank are cylindrical cement tanks, approximately 8 feet in diameter and 7 feet deep. A composite sediment sample was collected from the Holding Tank floor, in accordance with the Phase 2 Preliminary Site Characterization Plan. During the same event, similar oily waste sediments at the bottom of the Holding Tank were observed through the surface manhole, though no samples were collected.

Ground surface west of the fence line to South Hālawā Stream consists of a relatively flat plateau extending approximately 15 feet from the fence, then approximately 10 feet of boulders and man-made debris dropping down about 3 feet to another relatively flat plateau adjacent to South Hālawā Stream. The hollow stem auger drill rig encountered refusal at various depths in several of the borings drilled, specifically in the westernmost drill locations along South Hālawā stream.

South Hālawā Stream is a concrete-lined channel that is approximately 10 feet deep on the eastern embankment adjacent to the investigation area. Drainage holes are located in the lower portion of the channel walls, but they were not immediately visible during field activities because they do not protrude from the channel wall. They were obvious during rain events during which water flowed from them in late December 2021 and early January 2022.

Field observations made during sampling activities are described in boring logs provided in Appendix B. In general, the boring logs identified disturbed subsurface soil to depths as deep as 20 feet bgs, as evidenced by man-made debris at depth.

7.1 Organic Vapor Headspace Observations in the Soil Cores

Organic vapor headspace samples were analyzed with a calibrated PID at 1-foot intervals from 6 feet bgs to total depth. Table 4 presents these results with depth. The table and cross-section value boxes include the PID readings at that soil interval.

The Table 4 PID results indicate the following borings were obviously impacted adjacent to the:

Leach Tank:

- LT-W10, LTW-17.5, LT-N10, LT-N25, LT-S10, LT-E00, LT-E15, and LT-S15

Holding Tank:

- HT-E10 and HT-S10

8.0 Data Quality

8.1 Analytical Quality Assurance/Quality Control

Quality assurance/quality control (QA/QC) procedures were employed with the goal of maintaining method compliance and meeting the project measurement quality objectives. The measurement quality objectives are objective performance requirements defined by the analytical methods or applicable guidance documents.

8.1.1 Field QA/QC

During field sampling activities, collection and decontamination procedures were in place to minimize cross-contamination. Pre-cleaned and pre-preserved containers were provided by the laboratory and are traceable by manufacturer and production batch. Field duplicates were collected at a frequency of 5% or greater. Trip blanks provided by the laboratory were included in each cooler containing samples for VOC analyses.

8.1.2 Laboratory QA/QC

QA/QC procedures were performed by the laboratory in accordance with their SOPs and the cited analytical methods. Laboratory QC differs somewhat for each method, but in general includes the following:

- Batch and Sample QC
 - Method blanks
 - Laboratory control samples (LCSs)
 - Matrix spikes/matrix spike duplicates or LCS duplicates
 - Surrogates (organic analyses)
- Instrument QC
 - Initial and continuing calibration blanks
 - Initial and continuing calibration verifications
 - Internal standards (GC/MS analyses)
 - Mass tuning checks (GC/MS analyses)

The procedure, frequency, and measurement quality objectives for each of these QC elements are defined in the individual determinative methods, the Department of Defense (DoD) Quality Systems Manual (QSM) or are statistically derived by the laboratory (for surrogates, spikes and LCSs).

Benzene was not detected in any soil samples; however, in several instances, samples were diluted based on elevated TPH concentrations resulting in detection limits that exceeded the DOH Environmental Action Levels (EAL) for leaching to groundwater and direct exposure. These elevated detection limits are potential exceedances, which are designated as exceedances of the limit of detection (LOD) in Section 9.1.5.

The analytical data were reported by the laboratory in a summary format (“Level II report”), including: a narrative discussing any QA/QC exceedances; definitions of data qualifiers used; the Chain of Custody and sample receiving forms; analytical results by sample; summaries for each of the batch and sample QC elements listed above, as appropriate; and electronic data deliverable (EDD) file(s). In addition, the laboratory provided instrument QC information and raw data, including extraction logs and instrument printouts, in a comprehensive “Level IV report” for each sample delivery group (SDG).

Each Level II report underwent an initial cursory review to verify that the requested analyses were performed, holding times were met, and any data qualifiers applied by the laboratory were defined. Common qualifiers appearing in the Level II reports included:

U = Analyte was not detected at the LOD shown.

J = Analyte was detected at an estimated concentration between the detection limit and the LOD.

Q = One or more QC criteria were exceeded.

M = Analyte was manually integrated (the mass chromatography analyst manually redefined the baseline or the peak boundaries for an analyte when the peak was inappropriately identified or measured by the instrument software).

Level II reports, Level IV reports, and EDDs were uploaded into Synectics’ Environmental Data Management System, where they can be accessed by authorized users for viewing, querying, and validation.

8.1.3 Data Validation

Data validation reports are provided in Appendix E. Each Level IV report underwent data validation by experienced chemists to establish the analytical quality of the data set. All reports were validated at a Stage 2B level, as defined in the DoD QSM, which includes evaluation of the COC; sample receiving documents; batch, sample, and instrument QC summaries; and extraction logs. At least 10% of the samples were further validated at Stage 4, which adds evaluations of the raw data, all manual integrations, standards traceability logs, and includes recalculation of selected sample results.

Based on the validation findings, analytical data may be left unqualified, qualified as estimated (J or UJ), estimated with a low or high bias (J- or J+), below detection (U), or recommended to be

excluded from the data set (X). A data point flagged “X” indicates a serious deficiency in meeting QC criteria and is considered unusable. No data was flagged as unusable in this data set.

During the data validation, a nonconforming practice in the quantitation of TPH-g was identified, which affected all of the Phase 1 and Phase 2 samples. Specifically, the area of the chromatography peaks had not been integrated in accordance with the analytical method. The laboratory was instructed to reprocess the existing TPH-g instrument data to establish an appropriate baseline and integrate the entire area of the unresolved “hump” as well as any discrete peaks falling within the gasoline range, rather than only the area of individual peaks between adjacent valleys. Upon completion of the reprocessing, many of the detected TPH-g concentrations were significantly higher than previously reported. The revised concentrations are more representative of the total petroleum constituents in the range analyzed.

A second quality concern was also identified during the reprocessing and reporting of the TPH-g data. The carbon range reported for the Phase 1 samples was C6 through C12, in accordance with the DOH TGM. However, based on DOH’s January 27, 2022 Technical Memorandum, *Recommended Risk-Based Drinking Water Action Levels for Total Petroleum Hydrocarbons (TPH) Associated with Releases of JP-5 Jet Fuel*, the Phase 2 samples were analyzed for C6 through C10 to avoid overlap between the TPH-g and TPH-d carbon ranges. Since the concentrations of the Phase 1 and Phase 2 samples were not comparable, complicating the evaluation of the data, the laboratory was instructed to reprocess the Phase 1 data a second time to report only C6 through C10. After this second effort, the reported TPH-g concentrations in the Phase 1 samples are considered representative of the petroleum constituents, as well as comparable to the concentrations in the Phase 2 samples. The final TPH-g results are discussed in Section 9.0.

9.0 Phase 1 and Phase 2 Analytical Results

Phase 1 and Phase 2 results are presented in this section to present a comprehensive understanding of the petroleum-impacted soil and groundwater evaluated for this investigation. Appendix A provides the Phase 1 Technical Memorandum, Holding Tank and Leach Tank Characterization, (DON 2022b). Level II laboratory reports for the Phase 1 and Phase 2 sampling are presented in Appendix C.

9.1 Subsurface Soil Sample Results

Table 7 provides a comprehensive summary of the analytical laboratory analyses performed on each subsurface soil sample, including:

- Phase 1 sampling of 21 borings during January 11–13, 2022
- Phase 2 sampling of eight borings during March 10–17, 2022

- Samples were analyzed by Eurofins, Seattle for the COPCs recommended in the DOH TGM for JP-5, the fuel that was released to the environment at this location following the November 20 Release within the Adit 3 tunnel:
 - TPH-g (C6–C10)
 - TPH-d (C10–C24)
 - TPH-oil range organics (TPH-o) (C24–C40)
 - BTEX
 - N, 1MN, and 2MN

Table 8 provides a comprehensive set of laboratory analytical results compared to DOH EALs. Table 9 provides a summary of those results including the number of exceedances of the DOH EALs. Table 10 provides a summary of samples that exceed EALs by COPC and medium (soil and groundwater). The DOH EALs are taken from the Hazard Evaluation and Emergency Response (HEER) Surfer MS Excel database. Soil EALs discussed in Section 9.1 subsections below are from HEER Surfer Table A-2, Soil Action Levels (potentially impacted groundwater is a current or potential drinking water source; surface water body is located within 150 meters of the release site) (DOH 2021a) were used to compare results to the following risk drivers:

- Gross contamination (e.g., odors)
- Direct exposure impact to human health
- Leaching to groundwater that is a potential source of drinking water

Although the perched water sampled beneath the site during this investigation is not a drinking water resource, there is the potential that it may be hydraulically connected to the underlying Pearl Harbor basal aquifer, which is a currently used drinking water source.

The cross-sections presented on Figure 6 through Figure 9 show the results of continuous headspace screening from soil cores collected in the field using a handheld PID, as described in Section 3.0. Based on the results of headspace readings and professional judgment, one discrete subsurface soil sample was collected at the hotspot in each boring, and one discrete subsurface soil sample was collected at the total depth of each boring. These results are also provided on the cross-section figures compared to DOH EALs.

9.1.1 TPH in the Gasoline Carbon Range (C6–C10)

TPH-g was analyzed in 51 subsurface soil samples and detected in 51% of those samples.

- The Leaching to Groundwater EAL was exceeded in three subsurface soil samples.
- The Direct Exposure EAL was exceeded in three subsurface soil samples.

- The Odor EAL was exceeded in 12 subsurface soil samples.
- Samples that exceeded EALs are provided in Table 10.

9.1.2 TPH in the Middle Distillate Carbon Range (C10–C24)

TPH-d was analyzed in 55 subsurface soil samples and detected in 75% of those samples.

- The Leaching to Groundwater EAL was exceeded in eight subsurface soil samples.
- The Direct Exposure EAL was exceeded in 15 subsurface soil samples.
- The Odor EAL was exceeded in 9 subsurface soil samples.
- Samples that exceeded EALs are provided in Table 10.

9.1.3 TPH in the Residual Oil Carbon Range (C24–C40)

TPH-o was analyzed in 55 subsurface soil samples and detected in 33% of those samples.

- The Leaching to Groundwater EAL was not exceeded in these subsurface soil samples.
- The Direct Exposure EAL was not exceeded in these subsurface soil samples.
- The Odor EAL was not exceeded in these subsurface soil samples.
- Samples that exceeded EALs are provided in Table 10.

9.1.4 PAHs (N, 1MN, and 2MN)

Naphthalene was analyzed in 55 subsurface soil samples and detected in 65% of those samples.

- The Leaching to Groundwater EAL was exceeded in three subsurface soil samples.
- The Direct Exposure EAL was not exceeded in these subsurface soil samples.
- The Odor EAL was not exceeded in these subsurface soil samples.
- Samples that exceeded EALs are provided in Table 10.

1-Methylnaphthalene was analyzed in 55 subsurface soil samples and detected in 73% of those samples.

- The Leaching to Groundwater EAL was exceeded in 11 subsurface soil samples.
- The Direct Exposure EAL was not exceeded in these subsurface soil samples.
- The Odor EAL was not exceeded in these subsurface soil samples.
- Samples that exceeded EALs are provided in Table 10.

2-Methylnaphthalene was analyzed in 55 subsurface soil samples and detected in 71% of those samples.

- The Leaching to Groundwater EAL was exceeded in eight subsurface soil samples.
- The Direct Exposure EAL was exceeded in two subsurface soil samples.
- The Odor EAL was exceeded in two subsurface soil samples.
- Samples that exceeded EALs are provided in Table 10.

9.1.5 VOCs (BTEX)

Elevated TPH concentrations in several subsurface soil samples required the samples to be diluted for the VOC analyses, which resulted in elevated detection limits. In some cases, these detection limits were above the DOH EAL of the analytes of concern. In those cases, the result that was compared to the EAL is the elevated LOD and the sample was conservatively shown as exceeding that EAL due to the uncertainty.

Benzene was analyzed in 51 samples and benzene was not detected in these samples; however, the LOD was elevated above the EALs in several cases:

- The Leaching to Groundwater EAL was exceeded by the LOD in three subsurface soil samples.
- The Direct Exposure EAL was exceeded by the LOD in one subsurface soil samples.
- The Odor EAL was not exceeded in these subsurface soil samples.
- Samples that exceeded EALs are provided in Table 10.

Toluene was analyzed in 51 subsurface soil samples and detected in one of those samples (2 %).

- The Leaching to Groundwater EAL was exceeded by the soil concentration in one subsurface soil sample and by the LOD in two subsurface soil samples in which toluene was not detected.
- The Direct Exposure EAL was exceeded by the LOD in one subsurface soil sample.
- The Odor EAL was not exceeded in these subsurface soil samples.
- Samples that exceeded EALs are provided in Table 10.

Ethylbenzene was analyzed in 51 subsurface soil samples and detected in three (6%) of those samples.

- The Leaching to Groundwater EAL was exceeded by the LOD in one subsurface soil sample.
- The Direct Exposure EAL was not exceeded in these subsurface soil samples.
- The Odor EAL was not exceeded in these subsurface soil samples.
- Samples that exceeded EALs are provided in Table 10.

Xylenes were analyzed in 51 subsurface soil samples and detected in 11 (22%) of those samples.

- The Leaching to Groundwater EAL was exceeded by the soil concentration in five subsurface soil samples and by the LOD in one subsurface soil sample in which xylenes were not detected.
- The Direct Exposure EAL was not exceeded in these subsurface soil samples.
- The Odor EAL was not exceeded in these subsurface soil samples.
- Samples that exceeded EALs are provided in Table 10.

9.2 Groundwater Sample Results

Two groundwater sampling events occurred on March 16 and April 1, 2022. Eight groundwater samples, including two duplicate groundwater samples, were collected from three temporary wells installed in borings HT-E00, LT-E00, and LT-W35:

- An initial round of grab samples collected on March 16, 2022
- A second confirmation round of groundwater samples collected on April 1, 2022, in which the temporary screens installed in the borings were purged to ensure groundwater representing the perched water was sampled

Samples were analyzed by Eurofins, Seattle for the COPCs recommended in the DOH TGM for JP-5, the fuel that was released to the environment at this location following the November 20 Release within the Adit 3 tunnel:

- TPH-g (C6–C10)
- TPH-d (C10–C24)
- TPH-o (C24–C40)
- BTEX
- N, 1MN, and 2MN

Table 10 provides a summary of samples that exceed EALs by COPC and medium (soil and groundwater). Table 11 provides a comprehensive set of laboratory analytical results compared to the DOH EALs. Table 12 provides a summary of those results including the number of exceedances for the TGM COPCs compared to DOH EALs. The DOH EALs are taken from the HEER Surfer MS Excel database. Groundwater EALs discussed in Section 9.2 subsections below are from HEER Surfer Table D-1a Groundwater Action Levels (DOH 2021a) were used to compare results to the following risk drivers:

- Drinking Water Toxicity (infiltrating to groundwater that is a drinking water resource, such as the underlying basal aquifer)
- Aquatic Habitat Impact
- Gross Contamination, Taste, Odor, etc.

The cross-sections presented on Figure 6 through Figure 9 show the locations of the temporary screens in borings HT-E00, LT-E00, and LT-W35, and the groundwater results from the March 2022 sampling for COPCs, in reference to other soil borings and soil results and the observed potentiometric surface in the perched aquifer. These cross-sections and tables clearly indicate that the downgradient water samples collected from LT-W35 has significantly higher concentrations of risk-driving COPCs than the samples collected at HT-E00 and LT-E00, which are located directly hydraulically upgradient of and adjacent to the Holding Tank and Leach Tank, respectively.

9.2.1 TPH Gasoline Carbon Range (C6–C10)

TPH-g (C6–C10) was analyzed in four samples collected on March 16, 2022, and four samples collected on April 1, 2022, including one duplicate collected during each event, and was detected in four (50%) of those samples.

- The Human Health Drinking Water Toxicity EAL was not exceeded in these samples.
- The Aquatic Habitat EAL was not exceeded in these samples.
- The Taste and Odor Threshold EAL was not exceeded in these samples.
- Samples that exceeded EALs are provided in Table 10 and results are shown in Table 12.

9.2.2 TPH Middle Distillate Carbon Range (C10–C24)

TPH-d was analyzed in four samples collected on March 16, 2022, and four samples collected on April 1, 2022, including one duplicate collected during each event. TPH-d (C10–C24) was detected in 100% of these samples.

- The Human Health Drinking Water Toxicity EAL was exceeded in five groundwater samples.
- The Aquatic Habitat EAL was exceeded in three groundwater samples.

- The Taste and Odor Threshold EAL was exceeded in three groundwater samples.
- Samples that exceeded EALs are provided in Table 10 and results are shown in Table 12.

9.2.3 TPH Residual Oil Carbon Range (C24–C40)

TPH-o was analyzed in four samples collected on March 16, 2022, and four samples collected on April 1, 2022, including one duplicate collected during each event. TPH-o (C24-C40) was detected in four (100%) of these samples.

- The Human Health Drinking Water Toxicity EAL was not exceeded in these groundwater samples.
- The Aquatic Habitat EAL was not exceeded in these groundwater samples.
- The Taste and Odor Threshold EAL was exceeded in two groundwater samples (LTW35.0-WGFD02-028.0 and LTW35.0-WGN02-028.0).
- Samples that exceeded EALs are provided in Table 10 and results are shown in Table 12.

9.2.4 PAHs (N, 1MN, and 2MN)

PAHs compounds were analyzed in four samples collected on March 16, 2022, and four samples collected on April 1, 2022, including one duplicate collected during each event.

Naphthalene was detected in six samples of the eight groundwater samples analyzed (75%).

- The Human Health Drinking Water Toxicity EAL was exceeded in one groundwater sample (LTW35.0-WGN01-028.0).
- The Aquatic Habitat EAL was not exceeded in these groundwater samples.
- The Taste and Odor Threshold EAL was exceeded in one groundwater sample (LTW35.0-WGN01-028.0).
- Samples that exceeded EALs are provided in Table 10 and results are shown in Table 12.

1-Methylnaphthalene was detected in seven of the eight groundwater samples analyzed (88%).

- The Human Health Drinking Water Toxicity EAL was exceeded in one groundwater sample (LTW35.0-WGN01-028.0).
- The Aquatic Habitat EAL was exceeded in one groundwater sample (LTW35.0-WGN01-028.0).
- The Taste and Odor Threshold EAL was exceeded in one groundwater sample (LTW35.0-WGN01-028.0).
- Samples that exceeded EALs are provided in Table 10 and results are shown in Table 12.

2-Methylnaphthalene was detected in seven of the eight groundwater samples analyzed (88%).

- The Human Health Drinking Water Toxicity EAL was exceeded in one groundwater sample (LTW35.0-WGN01-028.0).
- The Aquatic Habitat EAL was not exceeded in these groundwater samples.
- The Taste and Odor Threshold EAL was exceeded in three groundwater sample (LTW35.0-WGN01-028.0, LTW35.0-WGFD02-028.0, and TW35.0-WGN02-028.0).
- Samples that exceeded EALs are provided in Table 10 and results are shown in Table 12.

9.2.5 VOCs (BTEX)

BTEX compounds were analyzed in four samples collected on March 16, 2022 and four samples collected on April 1, 2022, including one duplicate collected during each event.

Benzene was detected in three of the eight groundwater samples analyzed (38%).

- The Human Health Drinking Water Toxicity EAL was not exceeded in these groundwater samples.
- The Aquatic Habitat EAL was not exceeded in these groundwater samples.
- The Taste and Odor Threshold was not exceeded in these groundwater samples.
- Samples that exceeded EALs are provided in Table 10 and results are shown in Table 12.

Toluene was not detected in the eight groundwater samples analyzed (0%).

- The Human Health Drinking Water Toxicity EAL was not exceeded in these groundwater samples.
- The Aquatic Habitat EAL was not exceeded in these groundwater samples.
- The Taste and Odor Threshold was not exceeded in these groundwater samples.
- Samples that exceeded EALs are provided in Table 10 and results are shown in Table 12.

Ethylbenzene was detected in three of the eight groundwater samples analyzed (38%).

- The Human Health Drinking Water Toxicity EAL was not exceeded in these groundwater samples.
- The Aquatic Habitat EAL was not exceeded in these groundwater samples.
- The Taste and Odor Threshold was not exceeded in these groundwater samples.
- Samples that exceeded EALs are provided in Table 10 and results are shown in Table 12.

Xylenes were detected in two of the eight groundwater samples analyzed (25%).

- The Human Health Drinking Water Toxicity EAL was not exceeded in these groundwater samples.
- The Aquatic Habitat EAL was not exceeded in these groundwater samples.
- The Taste and Odor Threshold was not exceeded in these groundwater samples.
- Samples that exceeded EALs are provided in Table 10 and results are shown in Table 12.

10.0 Summary of Results and Extent and Magnitude of Contamination

A total of 29 soil borings, one permanent well, and three temporary perched groundwater monitoring well locations at the Holding Tank and Leach Tank area of concern were sampled between January 11, 2022 and April 1, 2022. The following subsections summarize the results from these sampling events and provide an evaluation of the extent and magnitude of contamination in soil and groundwater at the area of concern from the November 20 Release.

10.1 Subsurface Soil

Characterization results presented in this report are based on focused hotspot concentrations in subsurface soil samples collected from 29 soil borings. A comprehensive list of soil samples with Leaching to Groundwater EAL exceedances is provided below and the associated soil borings are shown on Figure 11 along with the estimated footprint of subsurface soil exceeding DOH EALs for Leaching to Groundwater:

- a. LT-E00, LT-E15, LT-W10, LT-W17.5, LT-S10, LT-N10, LT-N25, HT-N10, HT-S10, and HT-W10.
- b. Based on this data set, most of the petroleum-contaminated soil appears to be located approximately within:
 - A rectangular area of 1,150 square feet, with sides of 50 feet by 23 feet.
 - Assuming an average depth of 20 feet, this represents a volume of 852 bank cubic yards of soil.

10.2 Groundwater

The Pearl Harbor basal aquifer, which is a current source of drinking water and lies under the Holding Tank and Leach Tank area of concern (subsurface soil and perched water body), was not sampled as part of this investigation.

On January 26, 2022, a nearby perched groundwater well (OWDFMW06B) was sampled to evaluate the potential impact of the November 20 Release on perched groundwater beneath the site. COPC concentrations were all below DOH EALs described in Section 9.2. On March 16 and April 1, 2022, perched groundwater samples were collected from three borings with temporary screens and casing installed for the following purposes and results:

- HT-E00, located directly east of the Holding Tank in a location upgradient from the Holding Tank was installed to evaluate the underlying perched water from the November 20 Release.
 - COPC analyses indicated JP-5 has impacted the perched aquifer at this location with a maximum TPH-d concentration of 490 µg/L, which exceeds the Drinking Water Toxicity EAL of 401 µg/L.
- LT-E00, located directly east of the Leach Tank in a location upgradient from the Leach Tank was installed to evaluate the underlying perched water from the November 20 Release.
 - COPC analyses indicated JP-5 has impacted the perched aquifer at this location with a maximum TPH-d concentration of 500 µg/L, which exceeds the Drinking Water Toxicity EAL of 401 µg/L.
- LT-W35, located hydraulically downgradient from the Holding Tank-Leach Tank area adjacent to the Federal property boundary and South Hālawā Stream, was installed to evaluate the extent of the plume in the downgradient direction.
 - Maximum COPC concentrations were observed at this groundwater location for TPH-d, TPH-g, and PAHs (N, 1MN, and 2MN):
 - Maximum TPH-d concentration of 3,900 µg/L, compared to the Drinking Water Toxicity EAL of 401 µg/L
 - Maximum TPH-g concentration of 180 µg/L, compared to Drinking Water Toxicity EAL of 297 µg/L collected on March 16, 2022.
 - Maximum PAHs concentrations were:
 - Naphthalene at 24 µg/L, compared to Drinking Water Toxicity EAL of 17 µg/L
 - 1-Methylnaphthalene at 75 µg/L, compared to Drinking Water Toxicity EAL of 27 µg/L
 - 2-Methylnaphthalene at 34 µg/L, compared to Drinking Water Toxicity EAL of 24 µg/L

11.0 Conclusions

The Navy implemented a removal action remedy that was performed in two phases. The first phase was completed in May 2022 and included removal of the Holding Tank, Leach Tank, and the petroleum-impacted soil immediately surrounding the tanks. The second phase was conducted in

September and October 2022, and included removal of additional impacted soil to further mitigate the threat to human health and the environment. Once the removal action confirmation sampling results have been evaluated, the Navy will develop site-specific risk-based action levels following the HEER Environmental Hazard Evaluation process and, if necessary, develop and implement an Environmental Hazard Management Plan in accordance with HEER Guidelines.

12.0 References

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Figures

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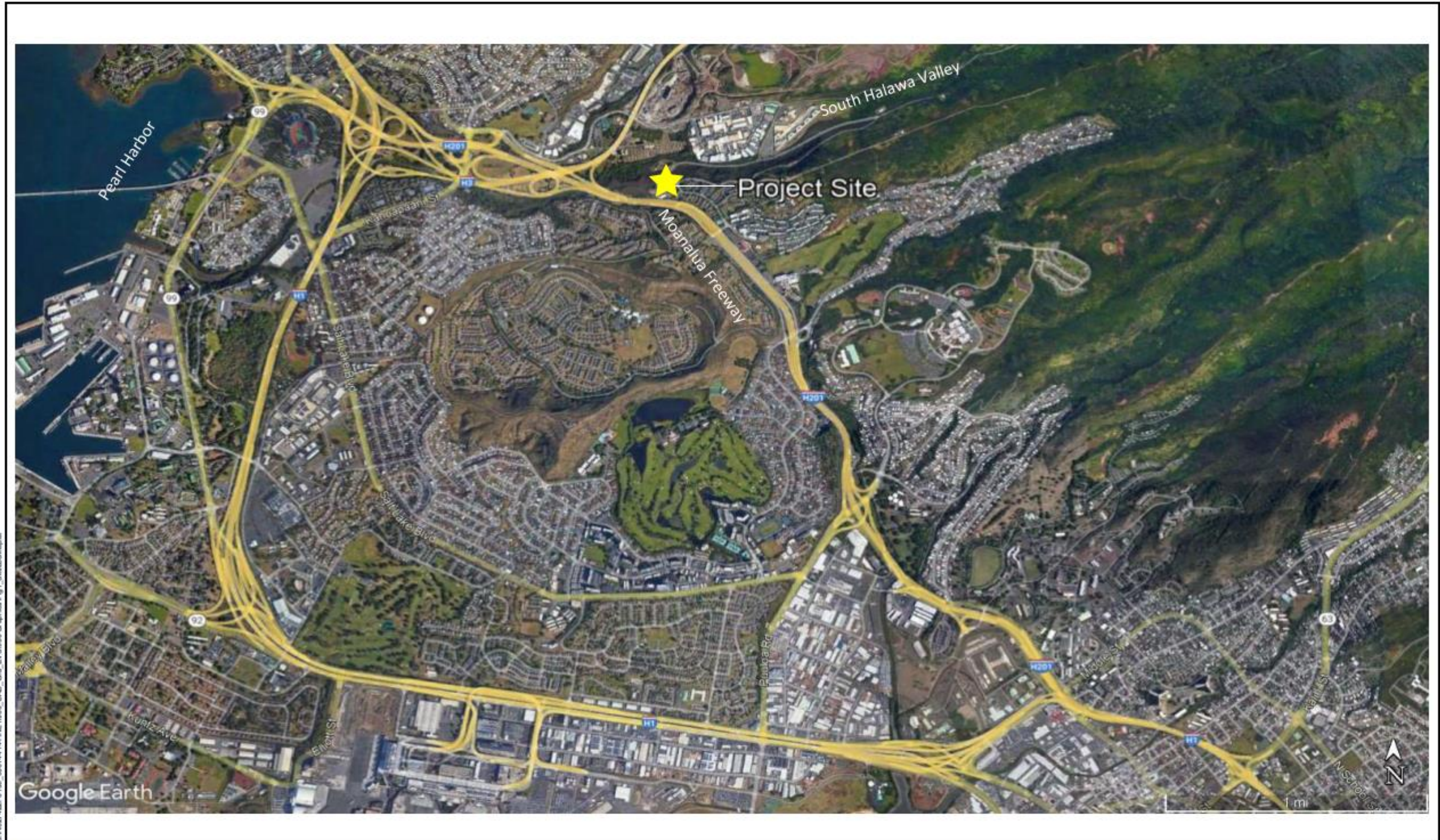


Figure 1: Site Location Map

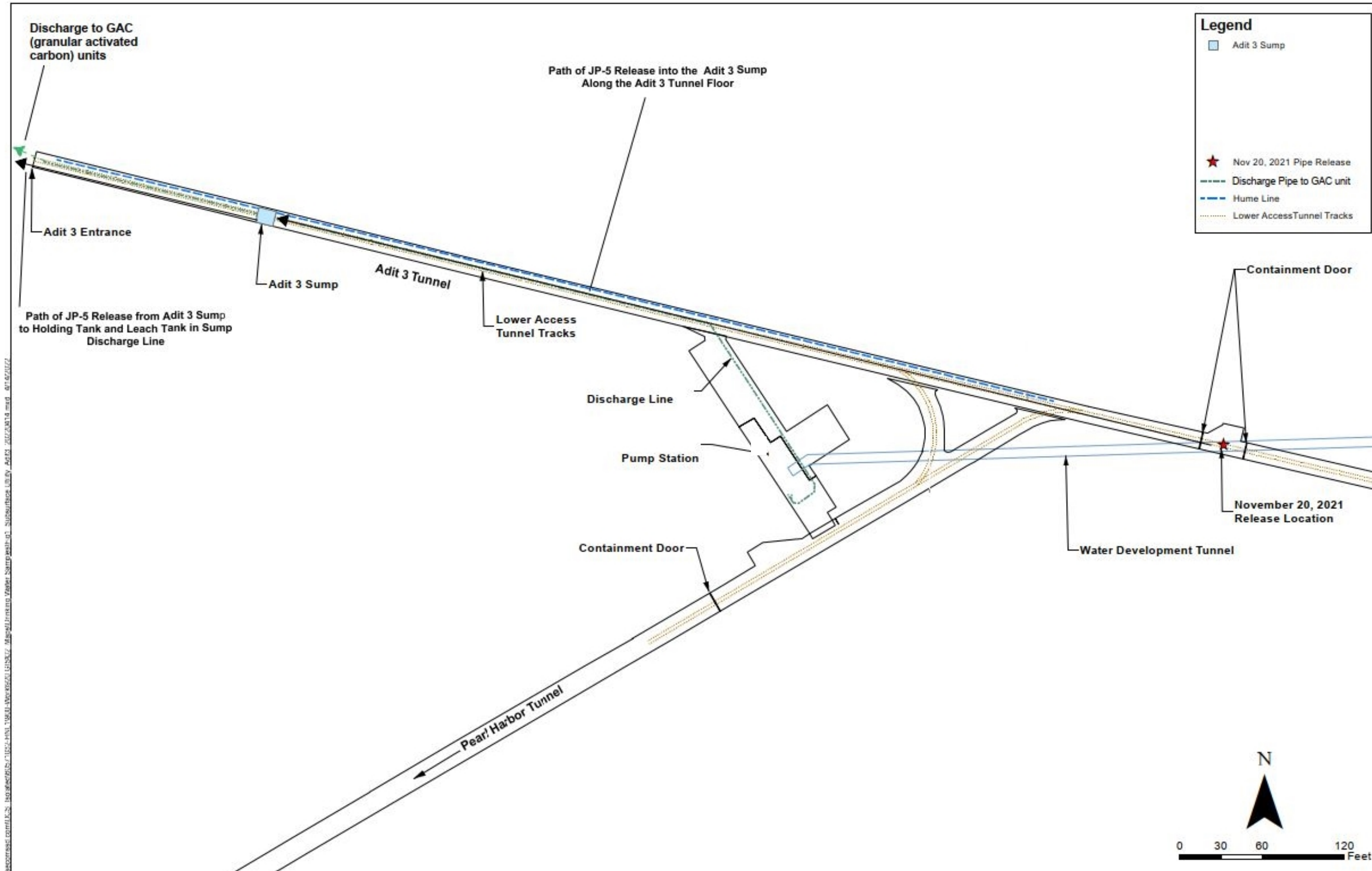


Figure 2: Adit 3 JP-5 Migration Pathway to Holding Tank and Leach Tank Area



Figure 3: Site Feature Map

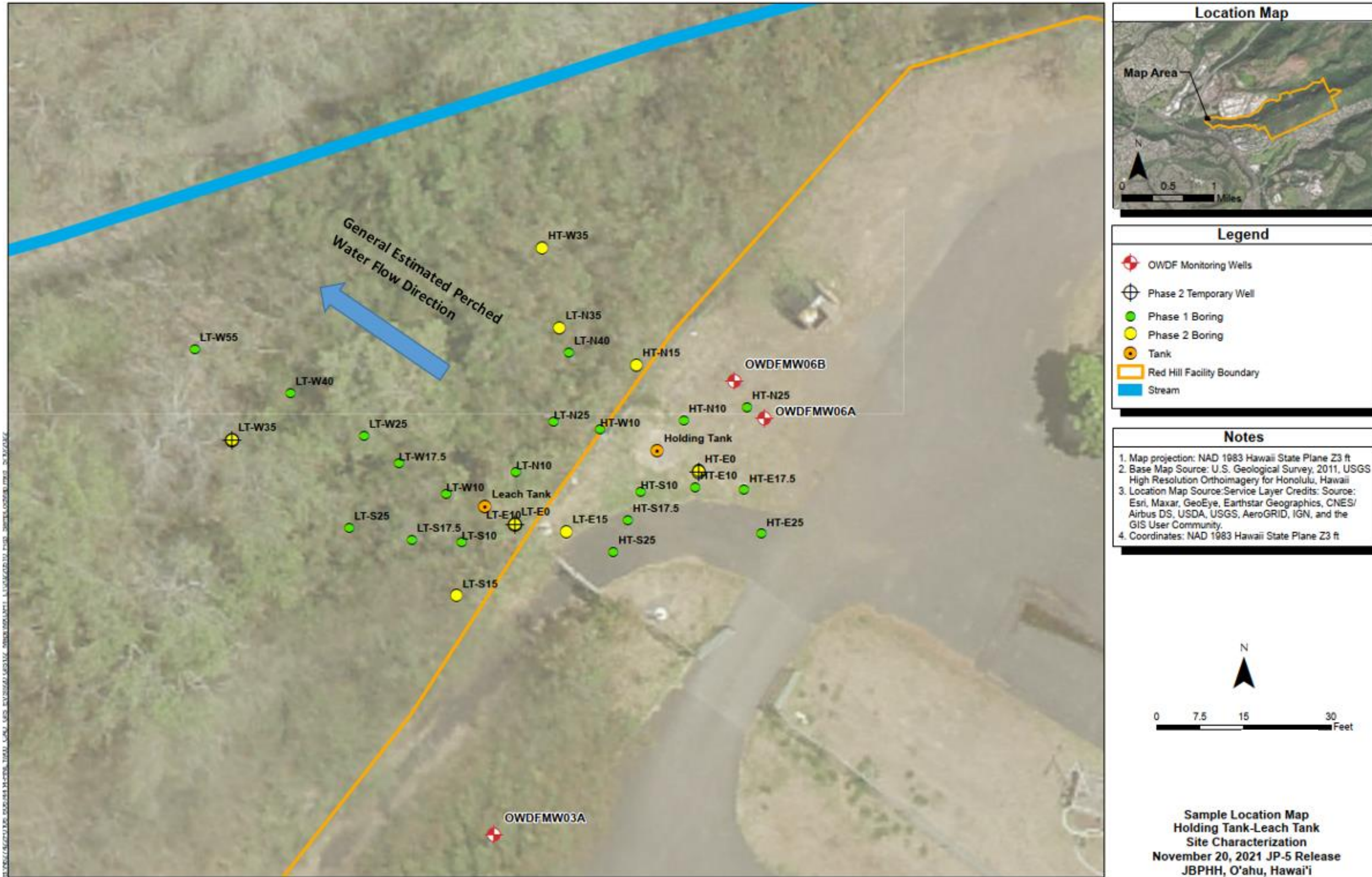


Figure 4: Sample Location Map



Figure 5: Cross-Section Location Map

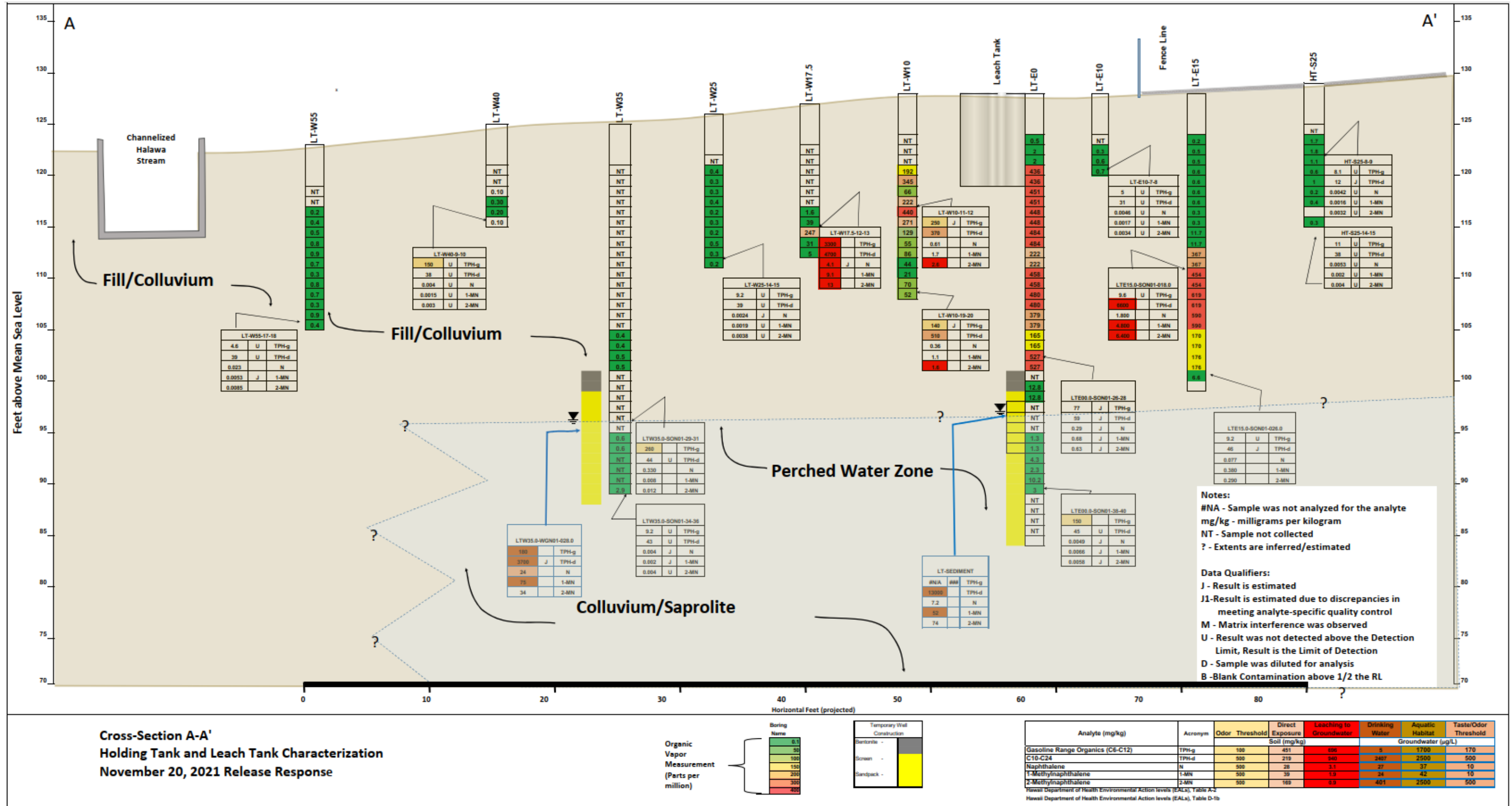


Figure 6: Cross-Section A-A'

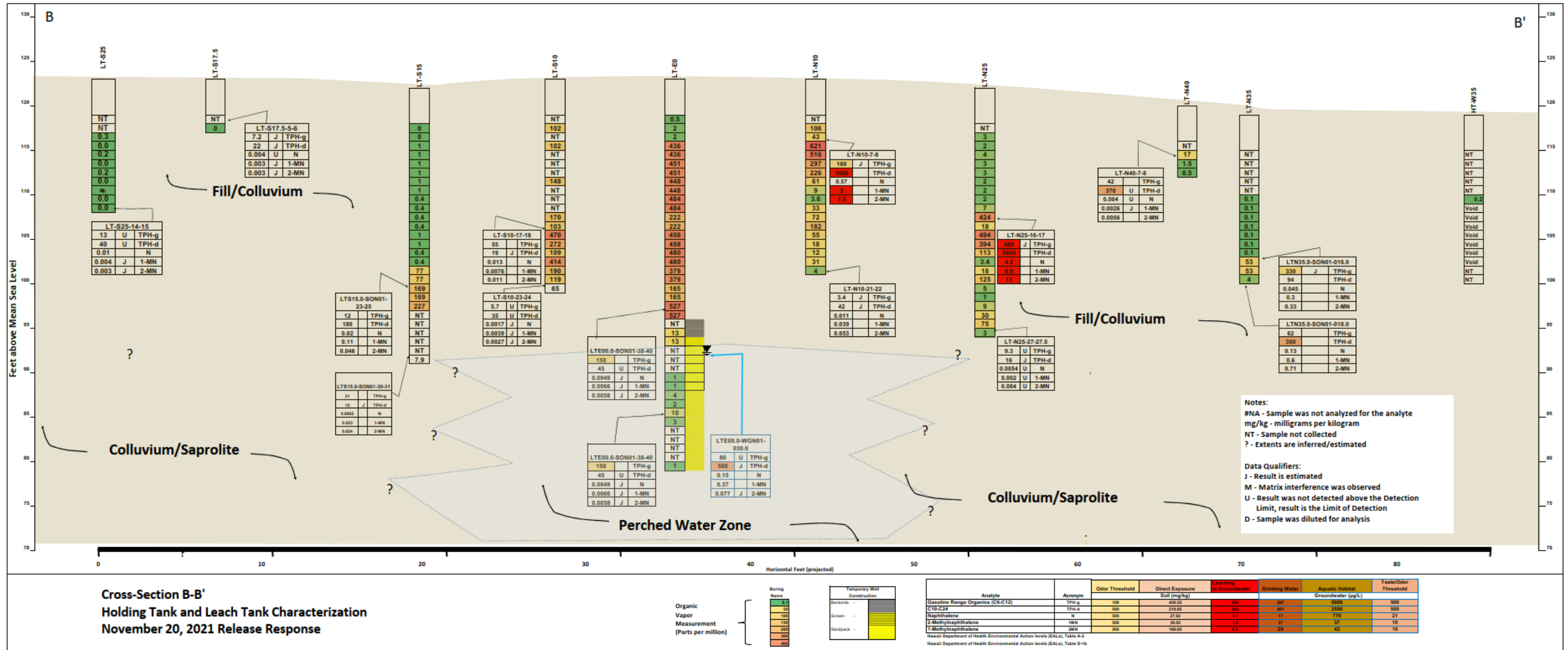


Figure 7: Cross-Section B-B'

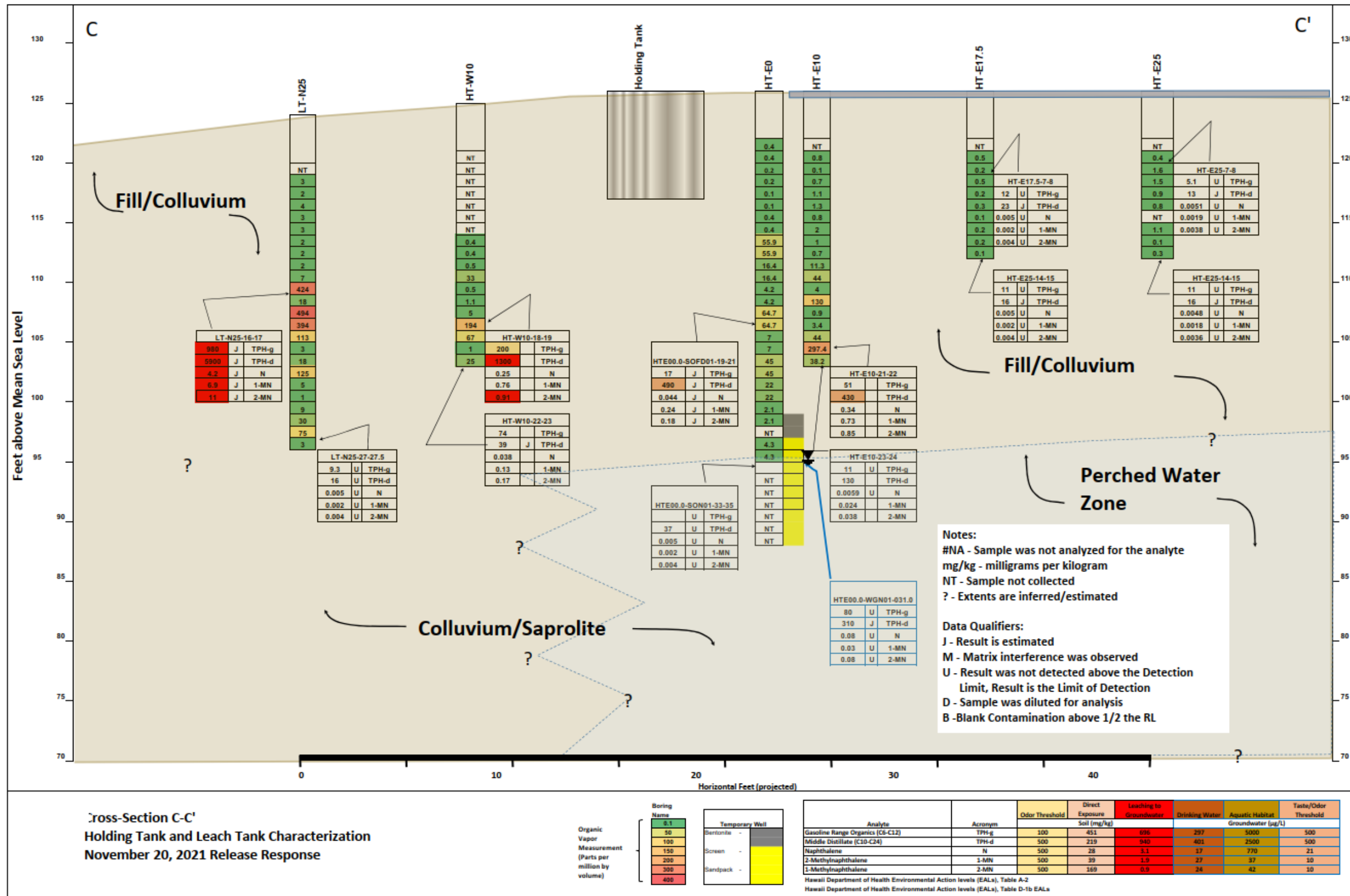


Figure 8: Cross-Section C-C'

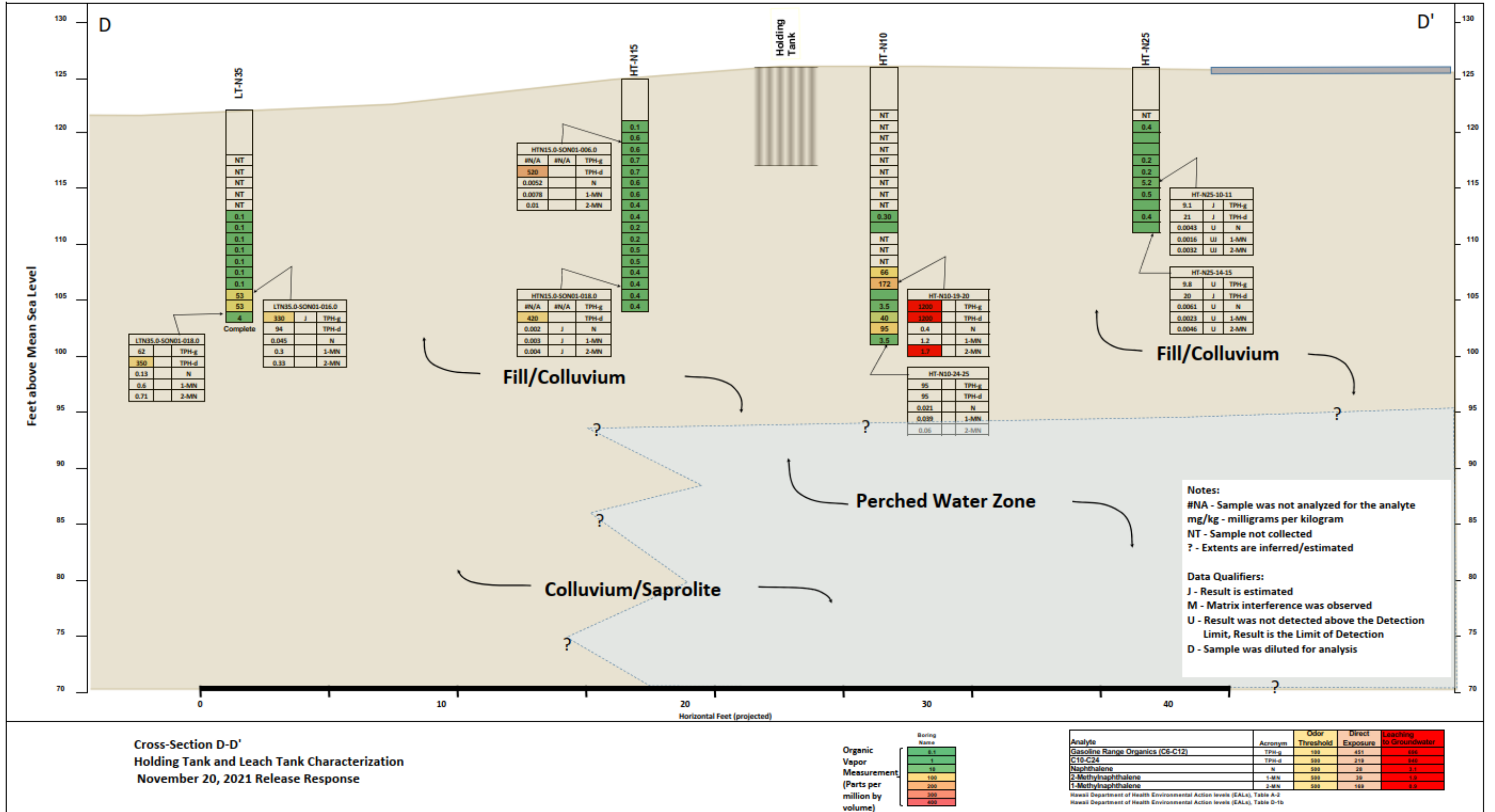


Figure 9: Cross-Section D-D'

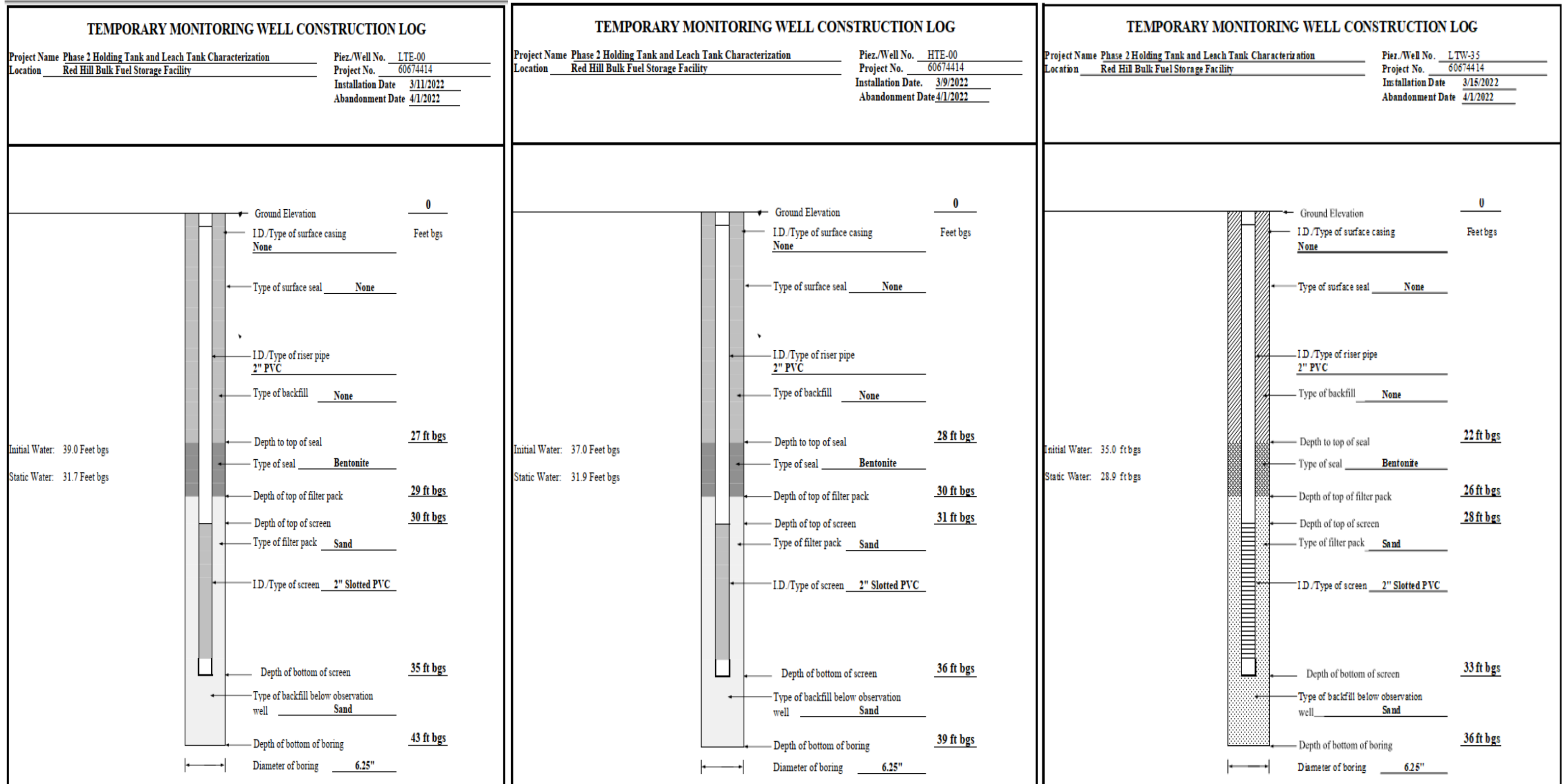


Figure 10: Temporary Well Construction Diagrams – Phase 2



Figure 11: Approximate Contaminated Soil Footprint Location Map

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Tables

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Table 1: Summary of Previous Red Hill Environmental Investigations

Investigation Report	Summary
<i>Initial and Quarterly Release Response Reports, Pipeline Breach in Tunnel and Fire Suppression Drain Line (DON 2021a; 2021b; 2021d; 2022c; 2022d; 2022e)</i>	Documented the results of release response efforts for the May 6, 2021 Tunnel Pipeline Breach and the November 20, 2021 Fire Suppression Drain Line releases.
<i>Preliminary Site Characterization Plan, January 2022</i>	Documented scope of work proposed to characterize the nature and extent of petroleum hydrocarbons impacting Red Hill Shaft.
<i>Draft Technical Memorandum Holding Tank and Leach Tank Characterization, November 2021 Pipeline Release, Red Hill Bulk Fuel Storage Facility, February 2022</i>	Documented the results of the Phase 1 site characterization at the Holding Tank and Leach Tank area of concern from subsurface soil sampling which occurred between January 11 and 13, 2022.
<i>Final Work Plan. Concrete Tank Removal, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, Oahu, Hawaii DON 2022</i>	Documented the scope of work and procedures required for removing and properly disposing of the Holding Tank and Leach Tank and associated appurtenances, as well as associated petroleum contaminated soil that resulted from the November 20, 2021 JP-5 release.

Notes:

DON Department of the Navy
JP-5 Jet Propellant No. 5 fuel

Table 2: DOH Soil and Groundwater Environmental Action Levels

Analytical Method	Analyte	Environmental Action Levels (EALs)	
		Soil (mg/kg) ^a	Groundwater (µg/L) ^b
SW-8260	TPH-g	100/450/700	500/300
	Benzene	500/1.2/0.3	170/5
	Toluene	500/820/0.78	40/1,000
	Ethylbenzene	480/62/0.9	30/700
	Xylenes	260/130/1.4	20/10,000
SW-8270	Naphthalene	500/28/3.1	21/17
	1-Methylnaphthalene	500/170/0.89	10/27
	2-Methylnaphthalene	500/39/1.9	10/24
SW-8015	TPH-d	500/220/940	500/401
	TPH-o	500/9,386/1000	500/2,4078

Notes:

Source: Hawai'i Department of Health Environmental Action Level Surfer (Fall 2017) (DOH 2021a).

^a Soil EALs = (Gross Contamination) / (Direct Exposure) / (Leaching to Groundwater) in milligrams per kilogram (mg/kg).

^b Groundwater EALs = (Odor Taste Threshold) / (Drinking Water Toxicity) in micrograms per liter (µg/L).

Table 3: Phase 1 and Phase 2 Investigation Boring Locations (Coordinates)

Location Identifier	Hawaii, State Plane, Zone 3, Feet			Distance From (ft)	
	X Coordinate	Y Coordinate	Ground Elevation (above Mean Sea Level) ¹	Leach Tank	Holding Tank
Leach Tank	1671760	74248	114	0.0	31.1
Holding Tank	1671790	74258	117	31.1	0.0
LT-E00.0	1671765	74245	114	5.9	27.5
LT-E10	1671766	74245	114	6.4	27.3
LT-W10	1671754	74251	117	7.1	37.0
LT-S10	1671756	74242	118	7.2	37.0
LT-N10	1671766	74254	117	8.0	24.5
LT-S17.5	1671748	74243	117	13.8	44.8
LTE15.0	1671774	74244	114	14.6	20.9
LT-S15.0	1671755	74233	114	16.1	42.6
LT-W17.5	1671745	74256	116	16.6	44.4
LT-N25	1671772	74263	117	18.8	18.5
HT-S25	1671782	74241	118	23.3	18.9
LT-S25	1671737	74245	117	23.6	54.5
HT-W10	1671780	74262	117	23.8	10.5
LT-W25	1671739	74261	116	24.2	50.4
HT-S17.5	1671785	74246	118	24.6	12.9
HT-S10	1671787	74251	118	26.8	7.5
LT-N40	1671775	74275	117	30.2	22.7
LTN35.0	1671773	74279	117	33.3	27.0
HTN15.0	1671786	74273	117	35.6	15.1
HT-E10	1671796	74252	118	36.2	9.1
HT-E00.0	1671797	74255	117	37.2	8.0
HT-N10	1671794	74263	117	37.2	7.0
LT-W40	1671727	74268	113	38.8	63.8
HT-E17.5	1671805	74251	118	44.6	16.4
LT-W35.0	1671717	74260	116	45.0	73.0
HTW35.0	1671770	74293	117	45.5	40.0
HT-E25	1671808	74244	118	47.7	22.9
HT-N25	1671805	74266	118	48.2	17.2
LT-W55	1671710	74276	108	56.8	81.3

¹ Estimated from LIDAR

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Table 4: Phase 1 and Phase 2 Soil Boring Continuous Organic Vapor Headspace Measurements

Location ID	Total Depth (ft bgs)	Date	Maximum Vapor Conc (ppmV)	Total VOC Head Space Sample Interval (ft bgs)																		
				5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0	21.0	22.0	23.0
LT-W10	20	1/11/2022	440	NT	NT	NT	192	345	66	222	440	271	129	55	86	44	21	70	52	Refusal		
LT-W17.5	15	1/12/2022	247	NT	NT	NT	NT	NT	NT	1.6	39	247	31	5	Complete							
LT-W25	15	1/11/2022	0.5	NT	0.4	0.3	0.3	0.4	0.2	0.3	0.2	0.5	0.3	0.2	Complete							
LT-W40	9.5	1/11/2022	0.3	NT	NT	0.1	0.3	0.2	0.1	Refusal												
LT-W55	18	1/11/2022	0.9	NT	NT	0.2	0.4	0.5	0.8	0.9	0.7	0.3	0.8	0.7	0.3	0.9	0.4					
LT-E10	8	1/12/2022	0.7	NT	0.3	0.6	0.7	Refusal														
LT-N10	22	1/12/2022	621	NT	106	43	621	516	297	226	61	9	3.6	33	72	182	55	18	12	31	4	Complete
LT-N25	27.5	1/12/2022	494	NT	3	2	4	3	3	2	2	2	7	424	18	494	394	113	3.4	18	125	5
LT-N40	8	1/12/2022	17	NT	17	1.5	0.5	Refusal														
LT-N55	4	1/12/2022	0	NT	Refusal																	
LT-S10	24	1/12/2022	470	NT	102	NT	102	NT	NT	NT	148	NT	NT	NT	170	103	470	272	109	414	190	119
LT-S25	15	1/12/2022	0.3	NT	NT	0.3	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.0	Refusal							
HT-W10	23	1/12/2022	194	NT	NT	NT	NT	NT	NT	NT	0.4	0.4	0.5	33	0.5	1.1	5	194	67	1	25	Refusal
HT-E10	22	1/13/2022	297	NT	0.8	0.1	0.7	1.1	1.3	0.8	2.0	1.0	0.7	11	44	4	130	1	3	44	297	38
HT-E17.5	15	1/13/2022	0.5	NT	0.5	0.2	0.5	0.2	0.3	0.1	0.2	0.2	0.1	0.2	Complete							
HT-E25	15	1/13/2022	24	NT	0.4	1.6	1.5	0.9	0.8	NT	1.1	0.1	0.3	0.0	Complete							
HT-N10	24	1/12/2022	172	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.3	0.0	NT	NT	NT	66	172	0	4	40
HT-N17.5	15	1/13/2022	0.5	NT	0.5	0.2	0.5	0.2	0.1	0.2	0.1	0.2	0.1	0.2	Refusal							
HT-N25	15	1/13/2022	5.2	NT	0.4	0.0	0.0	0.0	0.2	5.2	0.5	0.0	0.4	0.0	Complete							
HT-S10	18	1/13/2022	518	NT	0.0	0.0	0.0	0.0	88.0	1.2	2.3	0.3	0.4	0.3	518	308	34	Refusal				
HT-S17.5	9	1/13/2022	1.3	NT	0.3	0.3	1.3	0.3	Refusal													
HT-S25	15	1/13/2022	1.8	NT	2	2	1	1	1	0.20	0.40	0.00	0.30	Complete								
HT-E00	37.00	3/9/2022	64.7	0.40	0.40	0.20	0.2	0.1	0.1	0.4	0.4	56	56	16	16	4	4	65	65	7	7	45
LT-E00	43	3/11/2022	527	0.5	2.0	2	436	436	451	451	448	448	484	484	222	222	458	458	480	480	379	379
LT-W35	36	3/14/2022	0.5	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.4	0.4	1
LT-S15	31	3/15/2022	227	0.2	0.2	1	0.7	0.9	0.9	1.0	1.0	0.4	0.4	0.4	0.4	0.6	0.6	0.4	0.4	77	77	169
HT-W35	19.5	3/17/2022	0.2	NT	NT	NT	NT	NT	0.2	Void	Void	Void	Void	Void	Void	Void	NT	NT	Complete			
LT-N35	19.5	3/17/2022	53	NT	NT	NT	NT	NT	0.1	0.1	0.1	0.1	0.1	0.1	53	53	4	Complete				
LT-E15	28	3/16/2022	619	0.2	0.5	0.5	0.6	0.6	0.6	0.6	0.3	0.3	12	12	367	367	454	454	619	619	590	590
HT-N15	22	3/16/2022	0.7	0.1	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.4	0.4	0.2	0.2	0.5	0.5	0.4	0.4	0.4	0.4	Complete

Table 4 cont'd:

Location ID	Total Depth (ft bgs)	Date	Maximum Vapor Conc (ppmV)	Total VOC Head Space Sample Interval (ft bgs)																					
				24.0	25.0	26.0	27.0	27.5	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
LT-W10	20	1/11/2022	440																						
LT-W17.5	15	1/12/2022	247																						
LT-W25	15	1/11/2022	0.5																						
LT-W40	9.5	1/11/2022	0.3																						
LT-W55	18	1/11/2022	0.9																						
LT-E10	8	1/12/2022	0.7																						
LT-N10	22	1/12/2022	621																						
LT-N25	27.5	1/12/2022	494	1	9	30	75	3	Complete																
LT-N40	8	1/12/2022	17																						
LT-N55	4	1/12/2022	0																						
LT-S10	24	1/12/2022	470	65	Refusal																				
LT-S25	15	1/12/2022	0.3																						
HT-W10	23	1/12/2022	194																						
HT-E10	22	1/13/2022	297	70	Refusal																				
HT-E17.5	15	1/13/2022	0.5																						
HT-E25	15	1/13/2022	24																						
HT-N10	24	1/12/2022	172	95	4	Refusal																			
HT-N17.5	15	1/13/2022	0.5																						
HT-N25	15	1/13/2022	5.2																						
HT-S10	18	1/13/2022	518																						
HT-S17.5	9	1/13/2022	1.3																						
HT-S25	15	1/13/2022	1.8																						
HT-E00	37.00	3/9/2022	64.7	45	22	22	2	2	NT	4	4	NT	NT	NT	NT	NT	NT	NT	Compete						
LT-E00	43	3/11/2022	527	165	165	527	527	NT	13	13	NT	NT	NT	1.3	1.3	4.3	2.3	10.2	3	NT	NT	NT	NT	1.3	Compete
LT-W35	36	3/14/2022	0.5	1	NT	NT	NT	NT	NT	NT	1	1	NT	NT	NT	2.9	2.9	Compete							
LT-S15	31	3/15/2022	227	169	227	NT	NT	NT	NT	NT	8	Complete													
HT-W35	19.5	3/17/2022	0.2																						
LT-N35	19.5	3/17/2022	53																						
LT-E15	28	3/16/2022	619	170	170	176	176	7	Complete																
HT-N15	22	3/16/2022	0.7																						

Notes:
Complete - Boring completed to DQO requirements
Conc. - Concentration
ft bgs - feet below ground surface
ppmV - parts per million by volume
NT - Sample not taken due to field conditions
Refusal - Boring could not be advanced due to stratigraphic obstruction

Color Scale	
620	Organic Vapor
100	Measurements
10	Parts Per Million by
1	Volume (ppmv)
0.1	

Table 5: Phase 1 Groundwater Analytical Results for OWDFMW06B Sample Collected on January 26, 2022

Sample ID	Constituent	Result (µg/L)	Method Detection Limit (µg/L)	Limit of Quantitation (µg/L)
ERH2495	TPH-o (C24-C40)	ND	180	360
ERH2495	TPH-d (C9-C25)	250	92	110
ERH2495	TPH-g (C6-C12)	260	31	100
ERH2495	Benzene	ND	0.24	1
ERH2495	Ethylbenzene	ND	0.5	1
ERH2495	m-Xylene & p-Xylene	ND	0.53	2
ERH2495	o-Xylene	ND	0.39	1
ERH2495	Toluene	ND	0.39	1
ERH2495	1-Methylnaphthalene	1.7	0.019	0.1
ERH2495	2-Methylnaphthalene	0.27	0.04	0.2
ERH2495	Naphthalene	0.64	0.032	0.1

Notes:

µg/L micrograms per liter

ID sample identification

ND Constituent was not detected above the Method Detection Limit.

Table 6: Phase 2 Temporary Well Sample Purge Parameters

Location	Date	Parameter	Unit	Volume 1	Volume 2	Volume 3
HTE00	4/1/2022	Purged	Gal	3.5	7	10.5
HTE00	4/1/2022	TDS	mg/L	647.48	644.86	649.31
HTE00	4/1/2022	pH	Unitless	6.77	6.55	6.64
HTE00	4/1/2022	Cond	mS/cm	1	0.99	1
HTE00	4/1/2022	DO	mg/L	4.66	3.47	4.9
HTE00	4/1/2022	Turb	NTU	223.79	463.34	293.88
HTE00	4/1/2022	Temp	C	27.95	27.3	26.7
HTE00	4/1/2022	ORP	mV	276.2	245.9	241.4
HTE00	4/1/2022	Sal	PSU	0.5	0.5	0.5
LTW35	4/1/2022	Purged	Gal	1.7	3.4	6.1
LTW35	4/1/2022	TDS	mg/L	538.19	545.2	544.67
LTW35	4/1/2022	PH	Unitless	6.58	6.48	6.61
LTW35	4/1/2022	Cond	mS/cm	0.83	0.84	0.84
LTW35	4/1/2022	DO	mg/L	1.66	3.28	4.13
LTW35	4/1/2022	Turb	NTU	151.15	682.04	410.54
LTW35	4/1/2022	Temp	C	25.94	25.3	24.76
LTW35	4/1/2022	ORP	mV	345.3	192.8	164.1
LTW35	4/1/2022	Sal	PSU	0.41	0.42	0.42
LTE00	4/1/2022	Purged	Gal	2.5	Well Ran Dry	
LTE00	4/1/2022	TDS	mg/L	591.7		
LTE00	4/1/2022	PH	Unitless	7.19		
LTE00	4/1/2022	Cond	mS/cm	0.91		
LTE00	4/1/2022	DO	mg/L	3.95		
LTE00	4/1/2022	Turb	NTU	1014.2		
LTE00	4/1/2022	Temp	C	24.56		
LTE00	4/1/2022	ORP	mV	206.2		
LTE00	4/1/2022	Sal	PSU	0.45		

Parameters

Purged - Volume water purged
TDS - Total dissolved solids
pH - Measurement of acidity/alkalinity
Cond - Conductivity
DO - Dissolved Oxygen
Turb - Turbidity
Temp - Temperature
ORP - Oxygen reduction potential
Sal - Salinity

Units

Gal - gallons
mg/L - milligrams per liter
Unitless - no units
mS/cm -milliSeimens per centimeter
NTU -Nephelometric turbidity units
C - Centigrade
mV - millivolts
PSU -Practical salinity units

Table 7: Phase 1 and Phase 2 Subsurface Soil Sampling Analytical Summary

Field Sample Identifier	Date	Time	TPH-g	BTEX	TPH-d/o	N, 1MN, 2MN	SDG	Sample Number	Laboratory Identifier
LT-W10-11-12	1/11/2022	15:20	1	1	1	1	580-109299	05	580-109299-05
LT-W10-19-20	1/11/2022	16:02	1	1	1	1	580-109299	06	580-109299-06
LT-W25-14-15	1/11/2022	13:35	1	1	1	1	580-109299	22	580-109299-22
LT-W55-17-18	1/11/2022	14:55	1	1	1	1	580-109299	16	580-109299-16
HT-N10-19-20	1/12/2022	16:08	1	1	1	1	580-109299	07	580-109299-07
HT-W10-18-19	1/12/2022	17:29	1	1	1	1	580-109299	13	580-109299-13
HT-W10-22-23	1/12/2022	17:23	1	1	1	1	580-109299	14	580-109299-14
LT-E10-7-8	1/12/2022	13:25	1	1	1	1	580-109299	03	580-109299-03
LT-N10-21-22	1/12/2022	10:58	1	1	1	1	580-109299	02	580-109299-02
LT-N10-24-25	1/12/2022	16:08	1	1	1	1	580-109299	12	580-109299-12
LT-N10-7-8	1/12/2022	10:50	1	1	1	1	580-109299	11	580-109299-11
LT-N10-7-8 DUP	1/12/2022	10:50	1	1	0	0	580-109299	23	580-109299-23
LT-N25-16-17	1/12/2022	13:36	1	1	1	1	580-109299	09	580-109299-09
LT-N25-27-27.5	1/12/2022	13:36	1	1	1	1	580-109299	20	580-109299-20
LT-N40-7-8	1/12/2022	15:42	1	1	1	1	580-109299	08	580-109299-08
LT-S10-17-18	1/12/2022	10:05	1	1	1	1	580-109299	10	580-109299-10
LT-S10-23-24	1/12/2022	10:10	1	1	1	1	580-109299	18	580-109299-18
LT-S17.5-5-6	1/12/2022	13:43	1	1	1	1	580-109299	15	580-109299-15
LT-S25-14-15	1/12/2022	14:30	1	1	1	1	580-109299	21	580-109299-21
LT-S25-7-8	1/12/2022	14:22	1	1	1	1	580-109299	04	580-109299-04
LT-W17.5-12-13	1/12/2022	15:05	1	1	1	1	580-109299	01	580-109299-01
LT-W19.5-14-15	1/12/2022	16:08	1	1	1	1	580-109299	17	580-109299-17
LT-W40-9-10	1/12/2022	16:51	1	1	1	1	580-109299	19	580-109299-19
HT-E10-21-22	1/13/2022	12:00	1	1	1	1	580-109327	13	580-109327-13
HT-E10-23-24	1/13/2022	11:22	1	1	1	1	580-109327	05	580-109327-05
HT-E17.5-14-15	1/13/2022	13:15	1	1	1	1	580-109327	03	580-109327-03
HT-E17.5-7-8	1/13/2022	13:00	1	1	1	1	580-109327	10	580-109327-10
HT-E25-14-15	1/13/2022	12:45	1	1	1	1	580-109327	08	580-109327-08
HT-E25-7-8	1/13/2022	12:35	1	1	1	1	580-109327	02	580-109327-02
HT-N25-10-11	1/13/2022	14:15	1	1	1	1	580-109327	14	580-109327-14
HT-N25-10-11 DUP	1/13/2022	14:25	1	1	1	1	580-109327	07	580-109327-07
HT-N25-14-15	1/13/2022	14:01	1	1	1	1	580-109327	11	580-109327-11
HT-N25-14-15 DUP	1/13/2022	14:20	1	1	1	1	580-109327	12	580-109327-12
HT-S10-15-16	1/13/2022	11:40	1	1	1	1	580-109327	09	580-109327-09
HT-S10-17-18	1/13/2022	11:35	1	1	1	1	580-109327	06	580-109327-06
HT-S17.5-8-9	1/13/2022	12:20	1	1	1	1	580-109327	04	580-109327-04
HT-S25-14-15	1/13/2022	11:55	1	1	1	1	580-109327	15	580-109327-15
HT-S25-8-9	1/13/2022	11:50	1	1	1	1	580-109327	16	580-109327-16
HTE00.0-SOFD01-19-21	3/9/2022	11:15	1	1	1	1	580-111503	06	580-111503-06
HTE00.0-SON01-19-21	3/9/2022	11:15	1	1	1	1	580-111503	04	580-111503-04
HTE00.0-SON01-33-35	3/10/2022	9:35	1	1	1	1	580-111503	05	580-111503-05
LTE00.0-SOFD01-26-28	3/11/2022	10:15	1	1	1	1	580-111503	03	580-111503-03
LTE00.0-SON01-26-28	3/11/2022	10:15	1	1	1	1	580-111503	01	580-111503-01
LTE00.0-SON01-38-40	3/11/2022	2:10	1	1	1	1	580-111503	02	580-111503-02
LTS15.0-SON01-23-25	3/15/2022	4:10	1	1	1	1	580-111503	09	580-111503-09
LTS15.0-SON01-30-31	3/15/2022	4:35	1	1	1	1	580-111503	10	580-111503-10
LTW35.0-SON01-29-31	3/15/2022	9:35	1	1	1	1	580-111503	07	580-111503-07
LTW35.0-SON01-34-36	3/15/2022	10:25	1	1	1	1	580-111503	08	580-111503-08
HTN15.0-SON01-006.0	3/16/2022	14:25	0	0	1	1	580-111720	05	580-111720-05
HTN15.0-SON01-018.0	3/16/2022	15:30	0	0	1	1	580-111720	06	580-111720-06
LTE15.0-SON01-018.0	3/16/2022	10:40	1	1	1	1	580-111720	01	580-111720-01
LTE15.0-SON01-026.0	3/16/2022	13:30	1	1	1	1	580-111720	02	580-111720-02
HTW35.0-SON01-014.0	3/17/2022	12:00	0	0	1	1	580-111720	07	580-111720-07
HTW35.0-SON01-016.0	3/17/2022	12:20	0	0	1	1	580-111720	08	580-111720-08
LTN35.0-SON01-016.0	3/17/2022	9:55	1	1	1	1	580-111720	03	580-111720-03
LTN35.0-SON01-018.0	3/17/2022	10:05	1	1	1	1	580-111720	04	580-111720-04

Notes:

- BTEX - Benzene, toluene, ethylbenzene, and xylenes, by EPA Method 8260
- N, 1MN, 2MN - Naphthalene, 1-methylnaphthalene, 2-methylnaphthalene by EPA Method 8270 SIM
- TPH-g - Total petroleum hydrocarbons, gasoline range organics by Method 8260/CALUFT
- TPH-d - Total petroleum hydrocarbons, diesel range organics by Method 8015
- TPH-o - Total petroleum hydrocarbons, gasoline range organics by Method 8015
- SDG - Laboratory Sample Delivery Group identifier
- 1- Parameter analyzed
- 0- Parameter not analyzed

Table 8: Phase 1 and Phase 2 Subsurface Soil Analytical Results Compared to Table A-2 Soil Action Levels

Chemical	CAS No.	Units	Sample ID			HT-E10-21-22			HT-E10-23-24			HT-E17.5-14-15			HT-E17.5-7-8			HT-E25-14-15			HT-E25-7-8											
			Boring ID			HT-E10			HT-E10			HT-E17.5			HT-E17.5			HT-E25			HT-E25											
			Date			1/13/2022			1/13/2022			1/13/2022			1/13/2022			1/13/2022			1/13/2022											
			Sample interval (ft bgs)			21 to 22			23 to 24			14 to 15			7 to 8			14 to 15			7 to 8											
			Leaching to Groundwater EAL	Direct Exposure EAL	Odor Threshold EAL	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance		
Benzene	71-43-2	mg/kg	0.3	1	500	0.053	U				0.054	U				0.050	U				0.061	U				0.055	U				0.026	U
Ethylbenzene	100-41-4	mg/kg	0.9	62.5	479	0.110	U				0.110	U				0.100	U				0.120	U				0.110	U				0.051	U
Toluene	108-88-3	mg/kg	0.8	818	500	0.110	U				0.110	U				0.100	U				0.120	U				0.110	U				0.051	U
Xylenes, Total	1330-20-7	mg/kg	1.4	129	260	0.053	U				0.054	U				0.050	U				0.061	U				0.055	U				0.026	U
Naphthalene	91-20-3	mg/kg	3.1	28	500	0.340					0.006	U				0.006	U				0.005	U				0.005	U				0.005	U
1-Methylnaphthalene	90-12-0	mg/kg	0.9	169	500	0.730					0.024					0.002	U				0.002	U				0.002	U				0.002	U
2-Methylnaphthalene	91-57-6	mg/kg	1.9	39	500	0.850					0.038					0.004	U				0.004	U				0.004	U				0.004	U
C6-C10 Gasoline Range Organics	Gas	mg/kg	695.7	451	100	51					11	U				10	U				12	U				11	U				5	U
C10-C24 Petroleum Hydrocarbons	Diesel	mg/kg	940	219	500	430			B		130					15	J				23	J				16	J				13	J
C24-C40 Petroleum Hydrocarbons	Oil	mg/kg	1000	9386	500	40	U				41	U				43	U				72					44	U				36	U

Table 8 cont'd:

Chemical	CAS No.	Units	Sample ID			HT-N10-19-20			HT-N10-24-25			HT-N25-10-11			HT-N25-10-11 DUPLICATE			HT-N25-14-15			HT-N25-14-15 DUPLICATE									
			Boring ID			HT-N10			HT-N10			HT-N25			HT-N25			HT-N25			HT-N25									
			Date			1/12/2022			1/12/2022			1/13/2022			1/13/2022			1/13/2022			1/13/2022									
			Sample interval (ft bgs)			19 to 20			24 to 25			10 to 11			10 to 11			14 to 15			14 to 15									
			Leaching to Groundwater EAL	Direct Exposure EAL	Odor Threshold EAL	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance					
Benzene	71-43-2	mg/kg	0.3	1	500	0.058	U				0.044	U				0.046	U				0.049	U				0.058	U			
Ethylbenzene	100-41-4	mg/kg	0.9	62.5	479	0.120	U				0.087	U				0.091	U				0.099	U				0.120	U			
Toluene	108-88-3	mg/kg	0.8	818	500	0.120	U				0.087	U				0.091	U				0.099	U				0.120	U			
Xylenes, Total	1330-20-7	mg/kg	1.4	129	260	0.230					0.044	U				0.046	U				0.049	U				0.058	U			
Naphthalene	91-20-3	mg/kg	3.1	28	500	0.400					0.021					0.004	U				0.005	U				0.006	U			
1-Methylnaphthalene	90-12-0	mg/kg	0.9	169	500	1.200		A			0.039					0.002	UJ				0.013	J				0.002	U			
2-Methylnaphthalene	91-57-6	mg/kg	1.9	39	500	1.700					0.060					0.003	UJ				0.019	J				0.005	U			
C6-C10 Gasoline Range Organics	Gas	mg/kg	695.7	451	100	160				C	170					9	U				12	J				10	U			
C10-C24 Petroleum Hydrocarbons	Diesel	mg/kg	940	219	500	1200		A	B	C	95					21	J				18	J				20	J			
C24-C40 Petroleum Hydrocarbons	Oil	mg/kg	1000	9386	500	37	U				43	U				36	U				40	J				46	U			

Table 8 cont'd:

			Sample ID			HT-S10-15-16			HT-S10-17-18			HT-S17.5-8-9			HT-S25-14-15			HT-S25-8-9			HT-W10-18-19														
			Boring ID			HT-S10			HT-S10			HT-S17			HT-S25-1			HT-S25			HT-W10														
			Date			1/13/2022			1/13/2022			1/13/2022			1/13/2022			1/13/2022			1/12/2022														
			Sample interval (ft bgs)			15 to 16			17 to 18			8 to 9			14 to 15			8 to 9			18 to 19														
Chemical	CAS No.	Units	Leaching to Groundwater EAL	Direct Exposure EAL	Odor Threshold EAL	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance										
Benzene	71-43-2	mg/kg	0.3	1	500	0.100	U				0.110	U				0.051	U				0.053	U				0.040	U				0.054	U			
Ethylbenzene	100-41-4	mg/kg	0.9	62.5	479	0.290					0.210	U				0.100	U				0.110	U				0.081	U				0.110	U			
Toluene	108-88-3	mg/kg	0.8	818	500	0.210	U				0.210	U				0.100	U				0.110	U				0.081	U				0.110	U			
Xylenes, Total	1330-20-7	mg/kg	1.4	129	260	8.000		A			2.300		A			0.051	U				0.053	U				0.040	U				0.630				
Naphthalene	91-20-3	mg/kg	3.1	28	500	8.900		A			1.400					0.005	U				0.005	U				0.004	U				0.250				
1-Methylnaphthalene	90-12-0	mg/kg	0.9	169	500	29.000		A			4.400		A			0.002	U				0.002	U				0.002	U				0.760				
2-Methylnaphthalene	91-57-6	mg/kg	1.9	39	500	45.000		A	B		6.500		A			0.004	U				0.004	U				0.003	U				0.910				
C6-C10 Gasoline Range Organics	Gas	mg/kg	695.7	451	100	1000	U	A	B	C	370					10	U				11	U				8	U				200				C
C10-C24 Petroleum Hydrocarbons	Diesel	mg/kg	940	219	500	3200		A	B	C	2600		A	B	C	39	U				38	U				12	J				1300		A	B	C
C24-C40 Petroleum Hydrocarbons	Oil	mg/kg	1000	9386	500	61					38	U				39	U				38	U				30	U				33	U			

Table 8 cont'd:

Chemical	CAS No.	Units	Sample ID			HT-W10-22-23				LT-E10-7-8				LT-N10-21-22				LT-N10-7-8				LT-N10-7-8-Dup				LT-N25-16-17									
			Boring ID			HT-W10				LT-E10				LT-N10				LT-N10				LT-N10													
			Date			1/12/2022				1/12/2022				1/12/2022				1/12/2022				#N/A				1/12/2022									
			Sample interval (ft bgs)			22 to 23				7 to 8				21 to 22				7 to 8				7 to 8				16 to 17									
			Leaching to Groundwater EAL	Direct Exposure EAL	Odor Threshold EAL	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance					
Benzene	71-43-2	mg/kg	0.3	1	500	0.048	U				0.025	U				0.027	U				0.024	U				0.250	U				0.560	U	A		
Ethylbenzene	100-41-4	mg/kg	0.9	62.5	479	0.097	U				0.050	U				0.054	U				0.047	UJ				0.160	J				0.370	J			
Toluene	108-88-3	mg/kg	0.8	818	500	0.097	U				0.050	U				0.054	U				0.047	UJ				0.870	J	A			1.100	U	A		
Xylenes, Total	1330-20-7	mg/kg	1.4	129	260	0.048	U				0.025	U				0.027	U				0.470					2.000		A			7.200		A		
Naphthalene	91-20-3	mg/kg	3.1	28	500	0.038					0.005	U				0.011					0.570					NT	NT				4.200		A		
1-Methylnaphthalene	90-12-0	mg/kg	0.9	169	500	0.130					0.002	U				0.039					2.000		A			NT	NT				6.900		A		
2-Methylnaphthalene	91-57-6	mg/kg	1.9	39	500	0.170					0.003	U				0.053					1.500					NT	NT				11.000		A		
C6-C10 Gasoline Range Organics	Gas	mg/kg	695.7	451	100	74					5	U				3	J				160	J				490	UJ		B	C	980	J	A	B	C
C10-C24 Petroleum Hydrocarbons	Diesel	mg/kg	940	219	500	39	J				31	U				42	J				3500		A	B	C	NT	NT				5900		A	B	C
C24-C40 Petroleum Hydrocarbons	Oil	mg/kg	1000	9386	500	33	U				25	J				42	U				39	U				NT	NT				44	U			

Table 8 cont'd:

			Sample ID			LT-N25-27-27.5			LT-N40-7-8			LT-S10-17-18			LT-S10-23-24			LT-S17.5-5-6			LT-S25-14-15														
			Boring ID			LT-N25			LT-N40			LT-S10			LT-S10			LT-S17			LT-S25														
			Date			1/12/2022			1/12/2022			1/12/2022			1/12/2022			1/12/2022			1/12/2022														
			Sample interval (ft bgs)			27 to 28			7 to 8			17 to 18			23 to 24			5 to 6			14 to 15														
Chemical	CAS No.	Units	Leaching to Groundwater EAL	Direct Exposure EAL	Odor Threshold EAL	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance										
Benzene	71-43-2	mg/kg	0.3	1	500	0.046	U				0.042	U				0.030	U				0.028	U				0.039	U				0.064	U			
Ethylbenzene	100-41-4	mg/kg	0.9	62.5	479	0.093	U				0.085	U				0.061	U				0.057	U				0.078	U				0.130	U			
Toluene	108-88-3	mg/kg	0.8	818	500	0.093	U				0.085	U				0.061	U				0.057	U				0.078	U				0.130	U			
Xylenes, Total	1330-20-7	mg/kg	1.4	129	260	0.046	U				0.042	U				0.140					0.028	U				0.039	U				0.064	U			
Naphthalene	91-20-3	mg/kg	3.1	28	500	0.005	U				0.004	U				0.810					0.017					0.004	U				0.010				
1-Methylnaphthalene	90-12-0	mg/kg	0.9	169	500	0.002	U				0.003	J				1.800		A			0.027					0.003	J				0.004	J			
2-Methylnaphthalene	91-57-6	mg/kg	1.9	39	500	0.004	U				0.006					2.600		A			0.021					0.003	J				0.003	J			
C6-C10 Gasoline Range Organics	Gas	mg/kg	695.7	451	100	9	U				42					55					6	U				7	J				13	U			
C10-C24 Petroleum Hydrocarbons	Diesel	mg/kg	940	219	500	16	J				370	U		B		420			B		13	J				22	J				40	U			
C24-C40 Petroleum Hydrocarbons	Oil	mg/kg	1000	9386	500	40	U				640			C		41	U				39	U				110				40	U				

Table 8 cont'd:

Chemical	CAS No.	Units	Sample ID			LT-SEDIMENT				LT-W10-19-20				LT-W17.5-12-13				LT-W19.5-14-15				LT-W25-14-15				LT-W40-9-10									
			Boring ID			LT-SED				LT-W10				LT-W17				LT-W19				LT-W25				LT-W40-9									
			Date			1/13/2022				1/11/2022				1/12/2022				1/12/2022				1/11/2022				1/11/2022									
			Sample interval (ft bgs)			0 to 1				19 to 20				12 to 13				14 to 15				14 to 15				9 to 10									
			Leaching to Groundwater EAL	Direct Exposure EAL	Odor Threshold EAL	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance					
Benzene	71-43-2	mg/kg	0.3	1	500	NT	NT				0.060	U				6.900	U	A	B		0.050	U				0.028	U				0.026	U			
Ethylbenzene	100-41-4	mg/kg	0.9	62.5	479	NT	NT				0.120	U				14.000	U	A			0.099	U				0.057	U				0.052	U			
Toluene	108-88-3	mg/kg	0.8	818	500	NT	NT				0.120	U				14.000	U	A			0.099	U				0.057	U				0.052	U			
Xylenes, Total	1330-20-7	mg/kg	1.4	129	260	NT	NT				1.400		A			6.900	U	A			0.050	U				0.028	U				0.026	U			
Naphthalene	91-20-3	mg/kg	3.1	28	500	7.200		A			0.360					4.100	J	A			0.004	J				0.002	J				0.004	U			
1-Methylnaphthalene	90-12-0	mg/kg	0.9	169	500	52.000		A			1.100		A			9.100		A			0.006					0.002	U				0.002	U			
2-Methylnaphthalene	91-57-6	mg/kg	1.9	39	500	74.000		A	B		1.600					13.000		A			0.008					0.004	U				0.003	U			
C6-C10 Gasoline Range Organics	Gas	mg/kg	695.7	451	100	NT	NT				140	J			C	3300		A	B	C	10	U				6	U				5	U			
C10-C24 Petroleum Hydrocarbons	Diesel	mg/kg	940	219	500	13000		A	B	C	510			B	C	4700		A	B	C	90					39	U				38	U			
C24-C40 Petroleum Hydrocarbons	Oil	mg/kg	1000	9386	500	250					29	J				46	U				110					39	U				38	U			

Table 8 cont'd:

Chemical	CAS No.	Units	Sample ID			LT-W40-9-10				LT-W55-17-18				HTE00.0-SOFD01-19-21				HTE00.0-SON01-19-21				HTE00.0-SON01-33-35				HTN15.0-SON01-006.0							
			Boring ID			LT-W40-9				LT-W55-1				HTE00.				HTE00.				HTE00.0-				HTN15.0-							
			Date			1/11/2022				1/11/2022				3/9/2022				3/9/2022				3/10/2022				3/16/2022							
			Sample interval (ft bgs)			9 to 10				17 to 18				19 to 20				19 to 20				33 to 34				6 to 7							
			Leaching to Groundwater EAL	Direct Exposure EAL	Odor Threshold EAL	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance			
Benzene	71-43-2	mg/kg	0.3	1	500	0.026	U				0.023	U				0.049	U				0.046	U				0.044	U				NT	NT	
Ethylbenzene	100-41-4	mg/kg	0.9	62.5	479	0.052	U				0.046	U				0.098	U				0.091	U				0.088	U				NT	NT	
Toluene	108-88-3	mg/kg	0.8	818	500	0.052	U				0.046	U				0.098	U				0.091	U				0.088	U				NT	NT	
Xylenes, Total	1330-20-7	mg/kg	1.4	129	260	0.026	U				0.033	J				0.049	U				0.056	J				0.044	U				NT	NT	
Naphthalene	91-20-3	mg/kg	3.1	28	500	0.004	U				0.023					0.044	J				0.019	J				0.005	U				0.005		
1-Methylnaphthalene	90-12-0	mg/kg	0.9	169	500	0.002	U				0.005	J				0.240	J				0.110	J				0.002	U				0.008		
2-Methylnaphthalene	91-57-6	mg/kg	1.9	39	500	0.003	U				0.009					0.180	J				0.100	J				0.004	U				0.010		
C6-C10 Gasoline Range Organics	Gas	mg/kg	695.7	451	100	5	U				5	U				17	J				13					5	U				NT	NT	
C10-C24 Petroleum Hydrocarbons	Diesel	mg/kg	940	219	500	38	U				39	U				490	J		B		280	J		B		37	U			520		B	C
C24-C40 Petroleum Hydrocarbons	Oil	mg/kg	1000	9386	500	38	U				39	U				62	J				35	J				37	U			760			C

Table 8 cont'd:

Chemical	CAS No.	Units	Sample ID			HTN15.0-SON01-018.0			HTW35.0-SON01-014.0			HTW35.0-SON01-016.0			LTE00.0-SOFD01-26-28			LTE00.0-SON01-26-28			LTE00.0-SON01-38-40											
			Boring ID			HTN15.0-			HTW35.0			HTW35.0			LTE00.0			LTE00.0			LTE00.0-											
			Date			3/16/2022			3/17/2022			3/17/2022			3/11/2022			3/11/2022			3/11/2022											
			Sample interval (ft bgs)			18 to 19			14 to 15			16 to 17			26 to 27			26 to 27			26 to 27											
			Leaching to Groundwater EAL	Direct Exposure EAL	Odor Threshold EAL	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance							
Benzene	71-43-2	mg/kg	0.3	1	500	NT	NT				NT	NT				0.044	U				0.040	U				0.047	U					
Ethylbenzene	100-41-4	mg/kg	0.9	62.5	479	NT	NT				NT	NT				0.089	U				0.080	U				0.093	U					
Toluene	108-88-3	mg/kg	0.8	818	500	NT	NT				NT	NT				0.089	U				0.080	U				0.093	U					
Xylenes, Total	1330-20-7	mg/kg	1.4	129	260	NT	NT				NT	NT				0.044	U				0.040	U				0.047	U					
Naphthalene	91-20-3	mg/kg	3.1	28	500	0.002	J				0.013					0.002	J				1.100	J				0.290	J					
1-Methylnaphthalene	90-12-0	mg/kg	0.9	169	500	0.003	J				0.008					0.004	J				2.100	J	A			0.680	J					
2-Methylnaphthalene	91-57-6	mg/kg	1.9	39	500	0.004	J				0.011					0.003	J				2.200	J	A			0.630	J					
C6-C10 Gasoline Range Organics	Gas	mg/kg	695.7	451	100	NT	NT				NT	NT				6	J				77	J				150					C	
C10-C24 Petroleum Hydrocarbons	Diesel	mg/kg	940	219	500	420				B	19	J				35	U				620	J		B	C	59	J		B		45	U
C24-C40 Petroleum Hydrocarbons	Oil	mg/kg	1000	9386	500	480					97					30	J				39	U				39	U				45	U

Table 8 cont'd:

Chemical	CAS No.	Units	Sample ID			LTE15.0-SON01-018.0				LTE15.0-SON01-026.0				LTN35.0-SON01-016.0				LTN35.0-SON01-018.0				LTS15.0-SON01-23-25				LTS15.0-SON01-30-31										
			Boring ID			LTE15.0-				LTE15.0-				LTN35.0-				LTN35.0				LTS15.0				LTS15.0										
			Date			3/16/2022				3/16/2022				3/17/2022				3/17/2022				3/15/2022				3/15/2022										
			Sample interval (ft bgs)			38 to 39				18 to 19				26 to 27				16 to 17				18 to 19				23 to 24										
			Leaching to Groundwater EAL	Direct Exposure EAL	Odor Threshold EAL	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance						
Benzene	71-43-2	mg/kg	0.3	1	500	0.048	U				0.046	U				0.330	U	A				0.031	U				0.047	U				0.042	U			
Ethylbenzene	100-41-4	mg/kg	0.9	62.5	479	0.096	U				0.092	U				0.660	U				0.062	U				0.094	U				0.085	U				
Toluene	108-88-3	mg/kg	0.8	818	500	0.096	U				0.092	U				0.660	U				0.062	U				0.094	U				0.085	U				
Xylenes, Total	1330-20-7	mg/kg	1.4	129	260	0.048	U				0.046	U				0.330	U				0.031	U				0.047	U				0.042	U				
Naphthalene	91-20-3	mg/kg	3.1	28	500	1.800					0.077					0.045					0.130					0.020					0.009					
1-Methylnaphthalene	90-12-0	mg/kg	0.9	169	500	4.800		A			0.380					0.300					0.600					0.110					0.023					
2-Methylnaphthalene	91-57-6	mg/kg	1.9	39	500	6.400		A			0.290					0.330					0.710					0.046					0.024					
C6-C10 Gasoline Range Organics	Gas	mg/kg	695.7	451	100	10	U				9	U				330	J				62					12					21					
C10-C24 Petroleum Hydrocarbons	Diesel	mg/kg	940	219	500	6600		A	B	C	46	J				94					350					180					12	J				
C24-C40 Petroleum Hydrocarbons	Oil	mg/kg	1000	9386	500	39	J				39	U				210					440					37	U				37	U				

Table 8 cont'd:

			Sample ID			LTW35.0-SON01-29-31			LTW35.0-SON01-34-36						
			Boring ID			LTW35.0			LTW35.0-						
			Date			3/15/2022			3/15/2022						
			Sample interval (ft bgs)			30 to 31			29 to 30						
Chemical	CAS No.	Units	Leaching to Groundwater EAL	Direct Exposure EAL	Odor Threshold EAL	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance	Result	Flag	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance
Benzene	71-43-2	mg/kg	0.3	1	500	0.061	U				0.048	U			
Ethylbenzene	100-41-4	mg/kg	0.9	62.5	479	0.120	U				0.096	U			
Toluene	108-88-3	mg/kg	0.8	818	500	0.120	U				0.096	U			
Xylenes, Total	1330-20-7	mg/kg	1.4	129	260	0.061	U				0.048	U			
Naphthalene	91-20-3	mg/kg	3.1	28	500	0.330					0.004	J			
1-Methylnaphthalene	90-12-0	mg/kg	0.9	169	500	0.008					0.002	J			
2-Methylnaphthalene	91-57-6	mg/kg	1.9	39	500	0.012					0.004	U			
C6-C10 Gasoline Range Organics	Gas	mg/kg	695.7	451	100	260				C	9	U			
C10-C24 Petroleum Hydrocarbons	Diesel	mg/kg	940	219	500	44	U				43	U			
C24-C40 Petroleum Hydrocarbons	Oil	mg/kg	1000	9386	500	44	U				43	U			

Notes:

CAS No. - Chemical Abstract Services Number

ft bgs - feet below ground surface

mg/kg - milligrams per kilogram

#NA - Analysis not conducted

260 - Result exceeds one or more EAL

Quality Assurance Flags

J - The compound was positively identified, the reported value is estimated

U - Undetected at the limit of detection

EAL Exceedance Flags

Table A-2 Soil Action Levels - Potentially impacted groundwater IS a current or potential drinking water resource; surface water body IS located within 150m of release site

A - Result exceeds Leaching to Groundwater EAL

B - Result exceeds Human Health Direct Exposure EAL

C - Result exceeds Odor EAL

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Table 9: Phase 1 and Phase 2 Summary of Subsurface Soil Analytical Results Compared to Table A-2 EALs

Analyte	Analyzed	Detected	% Detected	Maximum Concentration (mg/kg)	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance
Benzene	51			6.9	3	1	
Ethylbenzene	51	3	6%	14	1		
Toluene	51	1	2%	14	3		
Xylenes, Total	51	11	22%	8	6		
Naphthalene	55	36	65%	8.9	4		
1-Methylnaphthalene	55	39	71%	52	11		
2-Methylnaphthalene	55	38	69%	74	8	2	
C6-C10 Gasoline Range Organics	51	25	49%	3300	3	4	13
C10-C24 Petroleum Hydrocarbons	55	41	75%	13000	9	20	12
C24-C40 Petroleum Hydrocarbons	55	18	33%	760			2

Notes:

% percent

mg/kg milligrams per kilogram

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Table 10: Samples Exceeding DOH EALs by Chemical and Medium

Matrix	DOH EAL	COPC	Number of Samples Exceeding	Samples Exceeding EALs by COPC			
Soil	Leaching to Groundwater ^a	Benzene	3	LT-N25-16-17	LT-W17.5-12-13	LTN35.0-SON01-016.0	
		Ethylbenzene	1	LT-W17.5-12-13			
		Toluene	3	LT-N25-16-17	LT-N10-7-8-Dup	LT-W17.5-12-13	
		Xylenes, Total	6	HT-S10-15-16 LT-N10-7-8-Dup	HT-S10-17-18 LT-W17.5-12-13	LT-N25-16-17 LT-W10-19-20	
		Naphthalene	3	HT-S10-15-16	LT-N25-16-17	LT-W17.5-12-13	
		1-Methylnaphthalene	11	HT-N10-19-20 LT-N10-7-8 LT-S10-17-18 LT-W17.5-12-13	HT-S10-15-16 LT-N25-16-17 LT-S10-17-18 LT-W10-19-20	HT-S10-17-18 LTE00.0-SOFD01-26-28 LTE15.0-SON01-018.0	
		2-Methylnaphthalene	8	HT-S10-15-16 LTE00.0-SOFD01-26-28 LTE15.0-SON01-018.0	HT-S10-17-18 LT-S10-17-18 LT-W17.5-12-13	LT-N25-16-17 LT-S10-17-18	
		C6-C10 Gasoline Range Organics	3	HT-S10-15-16	LT-N25-16-17	LT-W17.5-12-13	
		C10-C24 Petroleum Hydrocarbons	8	HT-N10-19-20 LT-N10-7-8 LT-W17.5-12-13	HT-S10-15-16 LT-N25-16-17 HT-W10-18-19	HT-S10-17-18 LTE15.0-SON01-018.0	
		C24-C40 Petroleum Hydrocarbons	0				
	Direct Exposure ^a	Benzene	1	LT-W17.5-12-13			
		Ethylbenzene	0				
		Toluene	0				
		Xylenes, Total	0				
		Naphthalene	0				
		1-Methylnaphthalene	0				
		2-Methylnaphthalene	0				
		C6-C10 Gasoline Range Organics	3	LT-N10-7-8-Dup	LT-W17.5-12-13	LT-N25-16-17	
		C10-C24 Petroleum Hydrocarbons	15	LT-N40-7-8 LT-S10-17-18 LTE15.0-SON01-018.0 HTN15.0-SON01-018.0 HTE00.0-SON01-19-21	LT-W17.5-12-13 LT-N25-16-17 HT-E10-21-22 LTE00.0-SOFD01-26-28 HTN15.0-SON01-006.0	LT-W10-19-20 LT-N10-7-8 HT-N10-19-20 HTE00.0-SOFD01-19-21 HT-S10-17-18	
		C24-C40 Petroleum Hydrocarbons	0				
	Odor Nuisance ^a	Benzene	0				
		Ethylbenzene	0				
		Toluene	0				
		Xylenes, Total	0				
		Naphthalene	0				
		1-Methylnaphthalene	0				
		2-Methylnaphthalene	0				
		C6-C10 Gasoline Range Organics	12	HT-N10-19-20 HT-W10-18-19 LT-N25-16-17 LTE00.0-SON01-38-40	HT-N10-24-25 LT-N10-7-8 LT-W10-19-20 LTN35.0-SON01-016.0	HT-S10-17-18 LT-N10-7-8-Dup LT-W17.5-12-13 LTW35.0-SON01-29-31	
		C10-C24 Petroleum Hydrocarbons	9	HT-N10-19-20 LT-N10-7-8 LT-W17.5-12-13	HT-S10-17-18 LT-N25-16-17 HTN15.0-SON01-006.0	HT-W10-18-19 LT-W10-19-20 LTN35.0-SON01-018.0	
		C24-C40 Petroleum Hydrocarbons	2	LT-N40-7-8	HTN15.0-SON01-006.0		
	Groundwater	Drinking Water Toxicity ^b	Benzene	0			
			Ethylbenzene	0			
			Toluene	0			
Xylenes, Total			0				
Naphthalene			1	LTW35.0-WGN01-028.0			
1-Methylnaphthalene			1	LTW35.0-WGN01-028.0			
2-Methylnaphthalene			1	LTW35.0-WGN01-028.0			
C6-C10 Gasoline Range Organics			0				
C10-C24 Petroleum Hydrocarbons			3	LTE00.0-WGN01-030.0 LTW35.0-WGFD02-028.0	LTW35.0-WGN01-028.0 LTW35.0-WGN02-028.0	HTE00.0-WGN02-031.0	
C24-C40 Petroleum Hydrocarbons			0				
Aquatic Toxicity ^b		Benzene	0				
		Ethylbenzene	0				
		Toluene	0				
		Xylenes, Total	0				
		Naphthalene	0				
		1-Methylnaphthalene	1	LTW35.0-WGN01-028.0			
		2-Methylnaphthalene	0				
		C6-C10 Gasoline Range Organics	0				
		C10-C24 Petroleum Hydrocarbons	3	LTW35.0-WGN01-028.0	LTW35.0-WGFD02-028.0	LTW35.0-WGN02-028.0	
		C24-C40 Petroleum Hydrocarbons	0				
Taste/Odor Threshold ^b		Benzene	0				
		Ethylbenzene	0				
		Toluene	0				
		Xylenes, Total	0				
		Naphthalene	1	LTW35.0-WGN01-028.0			
		1-Methylnaphthalene	3	LTW35.0-WGN01-028.0	LTW35.0-WGFD02-028.0	LTW35.0-WGN02-028.0	
		2-Methylnaphthalene	3	LTW35.0-WGN01-028.0	LTW35.0-WGFD02-028.0	LTW35.0-WGN02-028.0	
C6-C10 Gasoline Range Organics	0						
C10-C24 Petroleum Hydrocarbons	3	LTW35.0-WGN01-028.0	LTW35.0-WGFD02-028.0	LTW35.0-WGN02-028.0			
C24-C40 Petroleum Hydrocarbons	2	LTW35.0-WGFD02-028.0	LTW35.0-WGN02-028.0				

Notes:

COPC Chemical of Potential Concern

DOH EAL Hawaii Department of Health Environmental Action Level (2017)

a TABLE A-2. SOIL ACTION LEVELS,

(Potentially impacted groundwater IS a current or potential drinking water resource; Surface water body IS located within 150m of release site)

b TABLE D-1b. GROUNDWATER ACTION LEVELS

(Groundwater IS a current or potential drinking water resource)(Surface water body IS NOT located within 150m of release site)

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Table 11: Phase 1 and Phase 2 Groundwater Sampling Analytical Summary

FIELD SAMPLE ID	DATE	TIME	MATRIX	TYPE	TPH-g	BTEX	TPH-d/o	NAPHs	LAB	SDG
OWDFMW06B ERH2495	1/26/2022	16:15	WG	N	1	1	1	1	Eurofins Seattle	580-109724
OWDFMW06B ERH2496	1/26/2022	16:15	WG	N					APPL	98654
OWDFMW06B ERH2497	1/26/2022	16:15	WG	N					Alpha	
OWDFMW06B ERH2498	1/26/2022	16:15	WG	N					FQ Labs	220127-2568-033
LTE00.0-WGN01-030.0	3/16/2022	9:00	WG	N	1	1	1	1	Eurofins Seattle	580-111500
HTE00.0-WGN01-031.0	3/16/2022	10:30	WG	N	1	1	1	1	Eurofins Seattle	580-111500
HTE00.0-WGFD01-031.0	3/16/2022	11:00	WG	FD	1	1	1	1	Eurofins Seattle	580-111502
LTW35.0-WGN01-028.0	3/16/2022	12:00	WG	N	1	1	1	1	Eurofins Seattle	580-111502
HTE00.0-WGN02-031.0	4/1/2022	16:45	WG	N	1	1	1	1	Eurofins Seattle	580-112198-2
LTW35.0-WGN02-028.0	4/1/2022	17:50	WG	N	1	1	1	1	Eurofins Seattle	580-112198-2
LTW35.0-WGFD02-028.0	4/1/2022	17:50	WG	N	1	1	1	1	Eurofins Seattle	580-112198-2
LTE00.0-WGN02-030.0	4/1/2022	18:00	WG	N	1	1	1	1	Eurofins Seattle	580-112198-2

Notes:

- WG - Groundwater Matrix
- N - Normal Environmental Sample
- FD - Field Duplicate

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Table 12: Phase 2 Groundwater Analytical Results Compared to Table D-1a Groundwater Action Levels

Chemical	CAS No.	Units	Sample ID			HTE00.0-WGFD01-031.0			HTE00.0-WGN01-031.0			LTE00.0-WGN01-030.0			LTW35.0-WGN01-028.0									
			Boring ID			HTE00.0-			HTE00.0-			LTE00.0-			LTW35.0									
			Date			3/16/2022			3/16/2022			3/16/2022			3/16/2022									
			Sample interval (ft bgs)			34 to 39			31 to 36			31 to 36			28 to 30									
			Drinking Water Toxicity EAL	Aquatic Habitat EAL	Taste/Odor Threshold EAL	Result	Flag	Drinking Water Toxicity	Aquatic Habitat	Taste/Odor Threshold	Result	Flag	Drinking Water Toxicity	Aquatic Habitat	Taste/Odor Threshold	Result	Flag	Drinking Water Toxicity	Aquatic Habitat	Taste/Odor Threshold				
Benzene	71-43-2	µg/L	5	1700	170	0.500	U				0.50	U				0.5	U							
Ethylbenzene	100-41-4	µg/L	700	140	30	0.80	U				0.80	U				0.8	U							
Toluene	108-88-3	µg/L	1000	2100	40	0.80	U				0.80	U				0.8	U							
Xylenes, Total	1330-20-7	µg/L	10000	230	20	0.80	U				0.80	U				0.8	U							
Naphthalene	91-20-3	µg/L	17	770	21	0.08	U				0.08	U				0.2				24.0	A		C	
1-Methylnaphthalene	90-12-0	µg/L	27	37	10	0.05	J				0.03	U				0.4				75.0	A	B	C	
2-Methylnaphthalene	91-57-6	µg/L	24	42	10	0.08	U				0.08	U				0.1	J			34.0	A		C	
C6-C10 Gasoline Range Organics	Gas	µg/L	297	5000	500	80.0	U				80.0	U				80.0	U			180.0				
C10-C24 Petroleum Hydrocarbons	Diesel	µg/L	401	2500	500	280.0	J				310.0	J				500.0	J	A		3700.0	J	A	B	C
C24-C40 Petroleum Hydrocarbons	Oil	µg/L	2407	2500	500	300.0	U				300.0	U				300.0	U			300.0	U			

Table 12 cont'd:

		Sample ID					HTE00.0-WGN02-031.0					LTE00.0-WGN02-030.0					LTW35.0-WGFD02-028.0					LTW35.0-WGN02-028.0				
		Boring ID					HTE00.0					LTE00.0					LTW35.0					LTW35.0				
		Date					4/1/2022					4/1/2022					4/1/2022					4/1/2022				
		Sample interval (ft bgs)					28 to 30					31 to 33					30 to 32					28 to 30				
Chemical	CAS No.	Units	Drinking Water Toxicity EAL	Aquatic Habitat EAL	Taste/Odor Threshold EAL	Result	Flag	Drinking Water Toxicity	Aquatic Habitat	Taste/Odor Threshold	Result	Flag	Drinking Water Toxicity	Aquatic Habitat	Taste/Odor Threshold	Result	Flag	Drinking Water Toxicity	Aquatic Habitat	Taste/Odor Threshold	Result	Flag	Drinking Water Toxicity	Aquatic Habitat	Taste/Odor Threshold	
Benzene	71-43-2	µg/L	5	1700	170	0.4	J				0.5	U				1.0	J				0.9	J				
Ethylbenzene	100-41-4	µg/L	700	140	30	0.6	J				0.8	U				3.1					3.2					
Toluene	108-88-3	µg/L	1000	2100	40	0.8	U				0.8	U				0.8	U				0.8	U				
Xylenes, Total	1330-20-7	µg/L	10000	230	20	0.8	U				0.8	U				0.8	U				0.7	J				
Naphthalene	91-20-3	µg/L	17	770	21	0.2					0.1	J				12.0					14.0					
1-Methylnaphthalene	90-12-0	µg/L	27	37	10	0.5	J				0.1	J				22.0				C	24.0				C	
2-Methylnaphthalene	91-57-6	µg/L	24	42	10	0.1	U				0.2	J				14.0				C	16.0				C	
C6-C10 Gasoline Range Organics	Gas	µg/L	297	5000	500	65.0	J				80.0	U				37.0	J				38.0	J				
C10-C24 Petroleum Hydrocarbons	Diesel	µg/L	401	2500	500	490.0		A			190.0					3900.0		A	B	C	3400.0		A	B	C	
C24-C40 Petroleum Hydrocarbons	Oil	µg/L	2407	2500	500	490.0					400.0					820.0				C	310.0	J			C	

Notes:

CAS No. - Chemical Abstract Services Number

ft bgs - feet below ground surface

µg/L - micrograms per liter

#NA - Analysis not conducted

3700.0 - Result exceeds one or more EAL

Quality Assurance Flags

J - The compound was positively identified, the reported value is estimated

U - Undetected at the limit of detection

EAL Exceedance Flags

Table D1-a Groundwater Action Levels - Groundwater is a current or potential drinking water resource, surface water is located within 150 meters of the release site

A - Result exceeds Leaching to Groundwater EAL

B - Result exceeds Human Health Direct Exposure EAL

C - Result exceeds Odor EAL

Table 13: Summary of Phase 2 Groundwater Analytical Results Compared to Table D-1a EALs

Analyte	Number Analyzed	Number Detected	% Detected	Maximum Concentration (µg/L)	Leaching Exceedance	Direct Exposure Exceedance	Odor Exceedance
Benzene	51			6.9	3	1	1
Ethylbenzene	51	4	8%	14.0	1		
Toluene	51	2	4%	14.0	3		
Xylenes, Total	51	11	22%	8.0	6		
Naphthalene	55	36	65%	8.9	4		
1-Methylnaphthalene	55	40	73%	52	11		
2-Methylnaphthalene	55	39	71%	74	8	2	2
C6-C10 Gasoline Range Organics	51	26	51%	3300	3	4	4
C10-C24 Petroleum Hydrocarbons	55	41	75%	13000	9	19	19
C24-C40 Petroleum Hydrocarbons	55	18	33%	760			

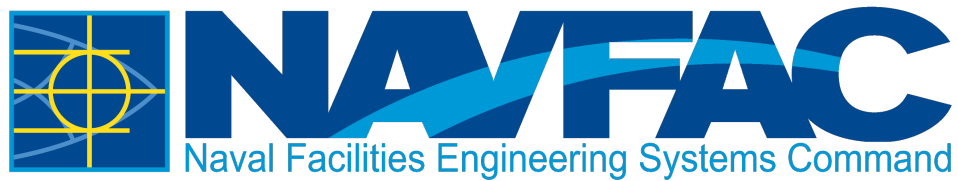
Notes:

% percent
µg/L micrograms per liter

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***Appendix A – Technical Memorandum, Holding Tank and Leach Tank
Characterization, February 2022***

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Naval Facilities Engineering Systems Command Hawaii

Technical Memorandum
Holding Tank and Leach Tank Characterization
November 2021 Pipeline Release
Red Hill Bulk Fuel Storage Facility
JBPHH, O‘ahu, Hawai‘i

DOH Facility ID No. 9-102271
DOH Release ID No 20211120_2330

February 2022

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Technical Memorandum
Holding Tank and Leach Tank Characterization
November 2021 Pipeline Release
Red Hill Bulk Fuel Storage Facility
JBPHH, O‘ahu, Hawai‘i

DOH Facility ID No. 9-102271
DOH Release ID No. 20211120_2330

February 2022

Prepared for NAVFAC Hawaii by

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Executive Summary

Subsurface soil samples and organic vapor headspace readings were collected during this preliminary investigation from selected locations around a Holding Tank and Leach Tank to characterize the nature and extent of a fuel-water mixture originating from the Adit 3 tunnel sump. The potential analytes that were evaluated were total petroleum hydrocarbons (TPH) as gasoline (TPH-g), diesel (TPH-d), and oil (TPH-o); benzene, toluene, ethylbenzene, and total xylenes (BTEX); and naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene. This Technical Memorandum presents a summary of the activities, methods, field observations, pre-validation Level II data package results, and pre-validation Level IV data package results to initially characterize the soil around the Holding Tank and Leach Tank area of concern.

Objectives

This preliminary investigation was conducted to: 1) determine whether petroleum or petroleum-impacted water entered the Holding Tank and Leach Tank from the Adit 3 drain line, 2) determine whether petroleum or petroleum-impacted water passed through the Holding Tank and Leach Tank from the Adit 3 drain line and into the surrounding environment, and 3) if petroleum impacts entered the environment adjacent to these features, determine the nature and extent of the contamination.

Field Activities

The direct-push drilling activities at the Holding Tank and Leach Tank began on January 11, 2022 and were completed on January 13, 2022. All field activities were accomplished in accordance with procedures detailed in the Preliminary Site Characterization Plan (DON 2022). A total of 27 sampling locations were preselected and evaluated to be cleared of utilities, of which 22 borings were advanced but 1 boring (LT-N55) could not be sampled due to refusal.

Investigation Results

Several subsurface soil sample results analyzed at the project laboratory exceeded Hawaii Department of Health (DOH) Environmental Action Levels (EALs) for TPH-g, TPH-d, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene. EALs from Table A-2, Soil Action Levels (Potentially impacted groundwater is a current or potential drinking water source; surface water body is located within 150 meters of the release site) (DOH 2017a) were used to compare results to the following risk drivers:

- Leaching to groundwater that is a drinking water source
- Direct exposure impact to human health
- Gross contamination (e.g., odors)

Recommendations

Following the process laid out in the Preliminary Site Characterization Plan (DON 2022a), the Navy recommends conducting additional characterization to refine the lateral and vertical extent of contamination using a drill rig capable of coring through rock. The Navy also recommends collecting groundwater samples from the perched and basal aquifers using OWDFMW06B and OWDFMW06A, respectively, to determine if contamination has impacted the water bearing zones beneath the Holding Tank and Leach Tank. The Navy will consult with DOH to determine the best approach to complete the investigation.

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Acronyms and Abbreviations

µg/L	micrograms per liter
amsl	above mean sea level
AOC	Administrative Order on Consent
BTEX	benzene, toluene, ethylbenzene, and xylenes
BWS	Honolulu Board of Water Supply
cc	cubic centimeter
CF&T	contaminant fate and transport
CoC	chain of custody
COPC	chemical of potential concern
CSM	conceptual site model
DOH	State of Hawai‘i Department of Health
DQO	data quality objectives
EAL	Environmental Action Level
EPA	United States Environmental Protection Agency
GWPP	Groundwater Protection Plan
HAR	Hawai‘i Administrative Rules
HCl	hydrochloric acid
HEER	Hazard Evaluation and Emergency Response
JBPHH	Joint Base Pearl Harbor-Hickam
JP-5	jet fuel propellant number
LNAPL	light nonaqueous-phase liquid
mL	milliliter
NAVFAC	Naval Facilities Engineering Systems Command
Navy	United States Department of the Navy
PID	photoionization detector
ppmv	parts per million by volume
SIM	selected ion monitoring
SOP	standard operating procedure
SSRBL	Site-Specific Risk-Based Level
SVMP	soil vapor monitoring point
TGM	Technical Guidance Manual
TPH	total petroleum hydrocarbons
TPH-d	total petroleum hydrocarbons – diesel range organics
TPH-g	total petroleum hydrocarbons – gasoline range organics
TPH-o	total petroleum hydrocarbons – residual range organics (i.e., TPH-oil)
U.S.	United States
UIC	Underground Injection Control
VOC	volatile organic compound

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1.0 Introduction and Purpose

This Technical Memorandum was prepared for Naval Facilities Engineering Systems Command (NAVFAC) Hawaii by AECOM in accordance with the State of Hawai‘i Department of Health (DOH) Technical Guidance Manual (TGM) for the Implementation of the Hawaii State Contingency Plan (DOH 2021) and in response to the DOH release confirmation letter dated November 24, 2021 for the Red Hill Bulk Fuel Storage Facility (Facility) and as required by Hawai‘i Administrative Rules (HAR) 11-280.1-65.2.

This Technical Memorandum provides the results of the Holding Tank and Leach Tank characterization area of concern located east of the Moanalua Freeway in South Hālawā Valley approximately 2 miles east of Pearl Harbor, as shown on Figure 1 (figures are compiled after the References section).

This Technical Memorandum is based on the data quality objectives (DQOs) presented in the Preliminary Site Characterization Plan (DON 2022a) and presents field observations, pre-validation Level II data package results, and pre-validation Level IV data package results available at the time of preparation. Data presented in this report was gathered from the January 11 through January 13, 2022 direct-push subsurface soil investigation at the Holding Tank and Leach Tank area of concern, and includes:

- Preliminary bore logs and cross sections developed from subsurface soil cores
- Subsurface soil organic vapor headspace semi-quantitative results from hand-held photoionization detector (PID) measurements collected in real time from subsurface soil cores
- Subsurface soil laboratory quantitative results of chemical constituents from discrete subsurface soil samples collected at two selected locations in each borehole:
 - At the soil interval with the highest PID reading in each borehole
 - At the bottom of each borehole

1.1 Statement of Purpose

This Technical Memorandum has been prepared to present preliminary results of the Holding Tank and Leach Tank characterization for evaluation and assessment. The Navy will evaluate data presented in this memorandum and in collaboration with regulatory agencies will make decisions on future actions to protect human health and the environment.

1.2 Previous Reports and Plans

The following document related to the Holding Tank and Leach Tank investigation were previously submitted to DOH:

- Preliminary Site Characterization Plan (DON 2022a).

2.0 Background

Based on historical drawings, Jet Fuel Propellant Number 5 (JP-5)-impacted fluid from the Adit 3 sump may have been pumped via pipeline first to an external Holding Tank and then a Leach Tank located near the concrete-lined portion of South Hālawā Stream.

On December 18, 2021, a buried holding tank (Holding Tank) and connected leach tank (Leach Tank) were identified. The purpose of these tanks is to discharge storm water collected from a sump pump located near the entrance of Adit 3 (see Figure 2). Both cylindrical tanks are 8 feet tall and 7 feet in diameter. Upon inspection of the Holding Tank, approximately 1,500 gallons of fuel/water mixture was observed. This fuel/water mixture was pumped out of the tank and measured to contain approximately 253 gallons of free product and roughly 1,250 gallons of water. The Leach Tank was empty and dry; however, noticeable petroleum odors were noted. At the time, it was unknown whether these petroleum odors were a result of volatized fuel vapors that traveled from the Holding Tank or fuel that may have entered the Leach Tank. This preliminary characterization was proposed to address this uncertainty and support decision-making regarding a remedial action, if needed. The locations of the Holding Tank, Leach Tank, and sampling locations are illustrated on Figure 3.

2.1.1 Climate

Climatological conditions in the area of the Holding Tank and Leach Tank consist of warm to moderate temperatures and low to moderate rainfall. The average annual precipitation is approximately 40 inches, which occurs mainly between November and April (Giambelluca, Nullet, and Schroeder 1986). Average temperatures range from the low 60s to high 80s (degrees Fahrenheit) (Juvik and Juvik 1998).

2.1.2 Soils and Geology

The Holding Tank and Leach Tank are located within the Ko‘olau Volcanic series. The Ko‘olau formation at Red Hill consists of the basaltic lava flows that erupted from a fissure line approaching 30 miles in length and trending in a northwest rift zone (Wentworth and Macdonald 1953). Pāhoehoe and a‘ā lava flows are present in the Ko‘olau formation. The valleys on either side of Red Hill ridge were formed as a result of fluvial erosion and are filled with sedimentary deposits (alluvium and colluvium), also known as valley fill, underlain by residual (weathered basalt), also known as saprolite. Saprolite zones in Hawai‘i are typically around 75 feet thick but can be 300 feet thick or greater beneath the valley floors or in areas of high precipitation (Hunt Jr. 1996; Macdonald, Abbott, and Peterson 1983) The results of a recently conducted geophysical seismic survey in North and South Hālawā Valleys, Red Hill, and Moanalua Valley (DON 2018a) found that valley fill and saprolite extend much deeper in the valleys surrounding Red Hill, particularly in the center of the valleys and below the streambeds.

Soils in the vicinity of the Holding Tank and Leach Tank are mapped as Helemano-Wahiawā association consisting of well-drained, moderately fine-textured and fine-textured soils (USDA SCS 1972). The surfaces of the basaltic flows have been weathered to form reddish-brown clayey silt, which is the basis for the local name “Red Hill.” These soils typically range from nearly level to moderately-sloping and occur in broad areas dissected by very steep gulches, which typically formed in material weathered from basalt to a depth of approximately 10 feet below ground surface (bgs). Along the slopes, the basaltic bedrock is covered with approximately 10–30 feet of Ko‘olau residuum. These soils were derived from weathering of the underlying basalt bedrock or were deposited as alluvium/colluvium. The younger alluvium/colluvium deposits were derived from fractured basalts and tuff. Beneath the surficial soils, alternating layers of clay and basalts are encountered at depth. The northwestern slope of Red Hill is generally barren of soil and consists of outcropping basalt lava flows to the valley floor.

2.1.3 Surface Water

Surface water features in the general vicinity of the Holding Tank and Leach Tank include South Hālawā Stream (an ephemeral stream approximately 70 feet to the west northwest). Potential recharge (run-on and operational water use) from the Hālawā Quarry north of the tank farm Facility may also impact groundwater flow in this area. In Hālawā Valley, stream flow may contribute water to perched groundwater within alluvial material (valley fill) but is generally isolated from the underlying basal aquifer. Most precipitation percolates to the basal aquifer and does not maintain base flows in the streams (Izuka 1992). Groundwater that flows beneath the Facility does not intercept surface water inland of the ocean shoreline (DON 2007). Both South Hālawā Stream and Moanalua Stream (to the north and south of Red Hill ridge, respectively) are located approximately 170 feet or more above the basal water table.

2.1.4 Groundwater

In the vicinity of Red Hill, the basal aquifer water table lies between 15 and 20 feet above mean sea level, and regionally groundwater flows toward Pearl Harbor (mauka to makai), although potential exists for variability in localized flow directions depending on geologic formations and other factors.

The Facility, including the Holding Tank and Leach Tank area of concern, is located at the administrative boundary between the Waimalu Aquifer System of the Pearl Harbor Aquifer Sector and the Moanalua Aquifer System of the Honolulu Aquifer Sector. The underlying aquifer is classified as a basal, unconfined, flank-type aquifer and is currently used as a drinking water source.

The Holding Tank and Leach Tank area is located upgradient of the Hawaii State Underground Injection Control (UIC) Line, which separates potable groundwater from non-potable groundwater. The nearest drinking water supply well is Navy Supply Well 2254-01 (also known as Red Hill Shaft), located approximately 770 feet east of the area. The nearest Honolulu Board of

Water Supply (BWS) public drinking water supply well (BWS Hālawa Shaft Well 2354-01) is located hydraulically cross-gradient of the Facility approximately 4,400 feet to the northwest and pumps water from the basal aquifer.

2.2 Historical Land Use

Prior to the 1940s, the surface of Red Hill supported cane and pineapple agriculture. Navy archive images show that the Red Hill ground surface was exposed and modified during construction of the tank farm beginning in 1940. A 1952 aerial photograph shows unmaintained land on the ridge of Red Hill and agriculture on the lower reaches of Red Hill north of the Moanalua Golf Course (DON 2019).

2.3 Current Land Use

The Facility, including the Holding Tank and Leach Tank area, is located on land zoned by the County as a mix of F-1 Federal and Military and P-1 Restricted Preservation districts. All major structures at the Facility are located underground. Populated areas closest to the Facility are ‘Aiea to the west and Honolulu to the south and east. Honolulu is heavily urbanized and densely populated.

Preservation land is located east and northeast of the Facility boundary. To the southeast are residential single-family homes in Moanalua Valley; a high cliff face with a 100–200 foot elevation difference exists between the Facility and this residential area. Southwest of the tank farm area on the lower southwest flank of Red Hill are the public Red Hill Elementary School and residential apartments, and further west is U.S. Coast Guard Housing on F-1 Military land. North of the western segment of the Facility boundary in South Hālawa Valley is the State Animal Quarantine Station, private businesses in Hālawa Industrial Park, and the State-operated Hālawa Correctional Facility. To the north of the Correctional Facility at the lower reaches of an inter-valley ridge that forms the north wall of South Hālawa Valley is the open-pit Hālawa Quarry operated by the Hawaiian Cement Company.

As shown on Figure 1, the H-201 Moanalua Freeway transits approximately 350–700 feet beyond the Facility’s southwest boundary and intersects with the H-1 and H-3 Freeways at the Hālawa Interchange, approximately 1,800 feet west of the Facility. The H-3 Freeway transits northeast from the interchange through North Hālawa Valley and on to O‘ahu’s windward side.

2.4 Conceptual Site Model

The following description includes elements from the Red Hill Conceptual Site Model report (DON 2019).

2.4.1 Holding Tank and Leach Tank Exposure Model

This exposure model includes potentially impacted environmental media and potential receptors specific to the Holding Tank and Leach Tank release area. Potentially impacted media are:

- Unconsolidated subsurface soil at depths greater than the bottom of the Holding Tank and Leach Tank (approximately 8 feet bgs).
- The perched groundwater water identified in adjacent well OWDMW06B at approximately 30 feet bgs beneath the area of concern the unconsolidated soil and saprolite (see Appendix B).
- The confined basal aquifer groundwater identified in adjacent well OWDFMW06A, which was encountered during drilling between approximately 191 and 192 feet bgs, corresponding to between approximately -74 and -75 feet above mean sea level (amsl). OWDFMW06A was subsequently screened between 190 feet bgs and 210 feet bgs (approximately -73 and -93 feet bgs) on or about June 18, 2021. On September 28, 2021, static water was measured at 18.93 feet amsl, indicating strong confining conditions resulting in an upward vertical hydraulic gradient in the basal aquifer at this location (see Appendix B).
- South Hālawā Stream runs from northeast to southwest adjacent to the area of concern and is approximately 70 feet to the west-northwest of the Leach Tank at its nearest extent. South Hālawā Stream consists of a concrete channel for more than 300 feet in either direction of the investigation area but contains drain holes to allow infiltrating groundwater to flow into the channel during periods of high precipitation.

Potential receptors include:

- Human receptors that may contact contaminated subsurface soil would include:
 - Potential construction workers who may have direct contact with contaminated subsurface soil at depths more than 8 feet bgs.
 - Potential human receptors and ecological receptors that may have direct contact with contaminated soil that has been excavated from the site, depending on where the excavated soil is disposed, or used.
 - Potential human recreators and ecological receptors that may come in contact with the perched water. Although the perched water is not a source of potable water and is not currently used, it is unknown whether it may enter South Hālawā Stream during extreme storm events, which could result in contact by human recreators and ecological receptors downstream under significantly diluted conditions. This perched water is likely below the stream during non-storm events.
 - Potential human and ecological receptors who may come in contact with the basal groundwater beneath the area of concern, which is a drinking water source. These include offsite residents using tap water sourced from the Red Hill Shaft Water Supply Well 2254-01. These receptors could be exposed to constituents in tap water via direct ingestion and dermal contact, and via inhalation while showering and bathing. Animals and vegetation may also be exposed to tap water as pets or from irrigation. However, there is evidence that

dry, low-permeability strata are present between the perched and basal aquifers, and the basal groundwater may be further protected by a significant confining layer and resulting upward vertical gradient identified during the drilling of the adjacent OWDFMW06A (see Appendix B).

2.5 Previous Facility Investigations

Previous environmental investigations at the Facility are summarized in Table 1.

Table 1: Summary of Previous Red Hill Environmental Investigations

Investigation Report	Summary
<i>Pre-AOC Investigations</i>	
<i>Remedial Investigation [RI] Phase I and II, Red Hill Oily Waste Disposal Facility</i> (DON 1996; 2000)	A two-phase RI was initiated in the early 1990s at the Red Hill Oily Waste Disposal Facility. No contaminants were detected in the basal aquifer beneath the site, and DOH issued a concurrence letter for a No Further Action determination in 2005 (DOH 2005).
<i>Facility Site Characterization and Investigation</i> (DON 1999, 2002)	A two-phase investigation initiated in 1998 evaluated the presence of petroleum constituents at the Facility. DOH requested the Navy to conduct quarterly groundwater monitoring, conduct a Tier 3 risk assessment, and develop a contingency plan.
<i>Quarterly Groundwater Monitoring Reports</i> (DON 2005 to present)	Sampling and analysis of Red Hill network groundwater monitoring wells was initiated in 2005 and incorporated into the Red Hill Groundwater Protection Plan (GWPP) (DON 2008a; 2014b); results are reported to DOH.
<i>Technical Report</i> (DON 2007)	An environmental investigation and risk assessment initiated in 2004 included installation of soil vapor monitoring points (SVMPs) in angle borings under the active fuel storage tanks, three additional groundwater monitoring wells in the lower access tunnel, a three-dimensional groundwater model, and a Tier 3 human health risk assessment.
<i>Tank 17 Removal Action Report</i> (DON 2008b)	A limited removal action and site characterization investigation was conducted in June 2008; the report's Environmental Hazard Analysis determined that the release posed no further significant environmental hazards.
<i>Type 1 Letter Report</i> (DON 2010)	A 2010 investigation re-evaluated the DON (2007) groundwater model assumptions and results and the Tier 3 risk assessment results.
<i>Monthly Soil Vapor Monitoring Reports</i> (DON 2014a through present)	Soil vapor PID measurements are collected monthly under the Facility's fuel storage tanks with SVMPs in accordance with the Red Hill GWPP (DON 2008a; 2014b); results are reported to DOH.

Investigation Report	Summary
<i>AOC-Related Investigations (EPA Region 9 and DOH 2015)</i>	
<i>Tank 5 Quarterly Release Response Reports (DON 2014a to present)</i>	In response to the 2014 fuel release from Tank 5, Navy reports release response actions undertaken in the last 90 days to the DOH.
<i>Seismic Profiling to Map Hydrostratigraphy in the Red Hill Area (DON 2018a)</i>	Presented results and evaluation of nine seismic profiling transects conducted at Red Hill and in North and South Hālawā Valleys and Moanalua Valley to improve understanding of subsurface conditions that affect groundwater flow and CF&T.
<i>Groundwater Protection and Evaluation Considerations for the Red Hill Bulk Fuel Storage Facility (DON 2018c)</i>	Presented an interim environmental analysis of data and an initial analysis of potential environmental risks; interim results of the groundwater flow model; and an evaluation of hypothetical release scenarios.
<i>Conceptual Site Model (DON 2018b; 2019)</i>	Established a basis for evaluating contaminant transport pathways and potential for exposure of human receptors to potentially impacted drinking water.
<i>Groundwater Flow Model Report (DON 2020a)</i>	Refined the previous groundwater flow model to improve understanding of the direction and rate of groundwater flow within the aquifers around the Facility.
<i>Investigation and Remediation of Releases Report (DON 2020b)</i>	Documented the response to the January 2014 Tank 5 release and evaluated potential remedial alternatives for that release and any potential future release.
<i>Evaluation of Chromatograms for Understanding TPH Detections in Monitoring Wells (DON 2020c)</i>	Provided an evaluation of TPH detections in monitoring wells to determine whether those detections are indicative of potential fuel impacts from the Facility.
<i>Initial and Quarterly Release Response Reports (DON 2021; 2022b; 2022c)</i>	Documented the response to the May 6, 2021 Tunnel Pipeline Breach and November 20, 2021 Fire Suppression Drain Line releases.

Notes:

- AOC Administrative Order on Consent
- CF&T contaminant fate and transport
- GWPP Groundwater Protection Plan
- HEER Hazard Evaluation and Emergency Response
- SSRBL Site-Specific Risk-Based Level
- SVMP soil vapor monitoring point
- TPH total petroleum hydrocarbons

3.0 Summary of Investigation History

On November 20, 2021, a release of JP-5 jet fuel occurred in the Adit 3 tunnel of the Facility. JP-5 was released from an overhead 14-inch polyvinyl chloride (PVC) pipe at a location approximately 400 feet east of the Adit 3 Pump Station and approximately 200 feet east of the upper Pearl Harbor tunnel. The release point was near the underlying U.S. Navy Well 2254-01 water development

tunnel that extends greater than 1,200 feet east-southeast of the well's Pump Station at an elevation of approximately 0–20 feet amsl. Subsequently, Navy divers entered the water development tunnel and swam approximately 300 feet east of the Pump Station; they reported observing emulsified fuel in the water tunnel. Skimmers and floating absorbent booms were deployed to remove light nonaqueous-phase liquid (LNAPL) fuel from the surface of the water development tunnel and to prevent it from floating into the production well chamber.

The fuel released from the overhead pipe ran westward along the tunnel floor, likely in the low point between the centrally located rail lines, past the Pearl Harbor tunnel and the Pump Station, which also directly overlay the water development tunnel. Fuel gathered in a sump located approximately 750 feet west of the release point. Fuel that made its way to the sump likely entered the environment directly at this point, and also likely traveled eastward and westward in the subfloor Hume line:

- Eastward, fuel was observed in the Navy Well 2254-01 water development tunnel, following the observance of fuel odors and impacts to residents that were served by the well later in the week of November 21, 2021.
- Westward, fuel had the potential to migrate within the sump drainage system via a sump pump to approximately 150 feet from the entrance of Adit 3, and another 225 feet under the Adit 3 loading area to reach the sump drain Holding Tank and connected Leach Tank, which are the subject of this investigation.

Upon indication that there was a fuel-like odor in drinking water in some of the homes served by the Red Hill source, the U.S. Navy Well 2254-01 was turned off on November 28, 2021.

Between December 15 and 17, 2021, 47 subsurface soil vapor monitoring points (SVMPs) were installed into petroleum-impacted segments of the Adit 3 and Pearl Harbor tunnels. Results from hand-held organic vapor detectors (PIDs) that sampled these SVMPs between December 17 and 24, 2021 indicated elevated petroleum vapors under the concrete tunnel floors. Organic vapor maxima, or hotspots, were noted over the water development tunnel in the vicinity of the release area, and just below the intersection of the Adit 3 tunnel and the Pearl Harbor tunnel. Organic vapors were also elevated throughout the lower portion of the Adit 3 tunnel, highest surrounding the sump. The SVMP results will be presented in a future report.

4.0 Summary of Data Quality Objectives

The data quality objectives (DQOs) for the Leach Tank area subsurface characterization are:

- Determine whether petroleum or petroleum-impacted water was/is entering the Holding Tank and Leach Tank from the Adit 3 drain line.

- Determine whether petroleum or petroleum-impacted water passed through the Holding Tank and Leach Tank from the Adit 3 drain line into environmental media (subsurface soil, groundwater) in the vicinity of these features.
- If petroleum impacts entered the environment adjacent to these features, evaluate the nature and extent of the contamination.

The objectives of collecting semi-quantitative headspace measurements using handheld real-time organic vapor detectors at each 1-foot interval of subsurface soil core located below 5 feet bgs were to:

- Provide information on the extent of the vertical contamination in each borehole.
- Assess the potential for LNAPL migration in the unsaturated zone based on the relative magnitude of these results compared to that expected for LNAPL.
- Estimate the location of the most contaminated subsurface soil interval in each borehole to guide sampling for more detailed laboratory analyses.

The objectives of the quantitative discrete subsurface soil samples collected for laboratory analysis include:

- Conservatively evaluate the concentrations of site-specific chemicals of potential concern (COPCs) in each soil boring compared to site-specific and constituent-specific DOH Table 2-A Soil Action Levels, as presented in the Preliminary Site Characterization Plan (DON 2022a) (see Table 2). One discrete subsurface soil sample was collected at the soil interval with the highest headspace measurement of subsurface soil core located below 5 feet bgs.
- Evaluate the potential for COPCs to have migrated below the bottom of the borehole and potentially into the underlying groundwater systems. One discrete subsurface soil sample was collected at the bottom soil interval in each boring.

COPCs presented in the Preliminary Site Characterization Plan are:

- TPH-g (C6 to C12) as measured by Method 8260/CALUFT
- BTEX as measured by Method 8260D
- TPH-d (C10 to C24) as measured by Method 8015D
- Naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene as measured by Method 8270E selected ion monitoring (SIM)

Table 2: DOH Soil Environmental Action Levels (Table A-2)

Analytical Method	Analyte	Soil Environmental Action Levels (EALs)		
		Gross Contamination (Odor, Visual) (mg/kg)	Direct Exposure (mg/kg)	Leaching to Groundwater (mg/kg)
SW-8260	TPH-g	100	451	696
	Benzene	500	1.2	0.3
	Toluene	500	818	0.78
	Ethylbenzene	479	62	0.89
	Xylenes	260	129	1.4
SW-8270	Naphthalene	500	28	3.1
	1-Methylnaphthalene	500	169	0.89
	2-Methylnaphthalene	500	39	1.9
SW-8015	TPH-d	500	219	940
	TPH-o	500	9,386	1,000

Notes:

Source: (DOH 2017b) Hawai'i Department of Health Environmental Action Level Surfer (Fall 2017)

Soil EALs = (Gross Contamination) / (Direct Exposure) / (Leaching to Groundwater) in milligrams per kilogram (mg/kg)

5.0 Field Activities

Subsurface soil characterization activities are described below.

5.1 Project Planning and Mobilization

During the weeks prior to the field activity:

- The project Preliminary Site Characterization Plan was submitted on January 6, 2022 for DOH review. DOH provided comments on January 9, 2022. Responses to comments and a final Preliminary Site Characterization Plan were submitted on January 12, 2022 (DON 2022a).
- Dig permits were completed on January 10, 2022, and toning for utilities was completed on January 10, 2022.
- Site access for subcontractors was provided by full-time military escort, as the work required the Facility security fence to be breached and open because the Leach Tank is located west of the fence.

5.2 *Direct-Push Soil Sampling*

Direct-push soil sampling was conducted on January 11 through 13, 2022 with two Geoprobe track rigs working simultaneously. Over that 3-day period, 23 soil borings were drilled in a step-out manner from the Holding Tank and the Leach Tank, and 21 of those borings were sampled for JP-5 constituents in subsurface soil. The approach as described in the Preliminary Site Characterization Plan was to initially sample four borings at approximately 10 feet from each tank in approximately north, south, east, and west locations. If PID readings were elevated above 10 parts per million by volume (ppmv) and professional judgement identified the subsurface soil as potentially contaminated, an additional boring would be sampled approximately 15 feet radially away from the Tank in the general direction of the original sample, accounting for features that would obstruct sample collection, such as large boulders, highly uneven ground, large trees, and other potential obstructions. If no contamination was observed in a borehole, the sampler retreated approximately 7.5 feet toward the previously sampled boring where contamination was observed, and the final boring was advanced and sampled. Subsurface soil sampling continued vertically until no contamination was observed, or the direct-push sampler could no longer penetrate the subsurface (i.e., encountered refusal). Groundwater was not encountered during the subsurface sampling event. Appendix A provides the field bore logs and field notes for each day. Figure 3 shows the locations of each boring.

All boreholes were hand-augered to 5 feet and then sampled via direct-push methods. Cores were logged, and each 1-foot interval was bagged for headspace analysis using a PID. PID readings were recorded in the bore logs and evaluated along with sample observations to determine the most impacted soil core to be sampled and sent to the project environmental laboratory (Eurofins TestAmerica Seattle in Tacoma, Washington).

An additional sample was collected at the bottom of each borehole to evaluate potential contaminant migration. Table 3 presents the intervals sampled at each borehole and the laboratory analyses conducted on each sample (Tables 3, 4, 5, and 6 are compiled after the References section).

Figure 3 shows the boring locations in topographic relation to the Holding Tank and Leach Tank and other site features. Each borehole was abandoned by filling the 2.5-inch-diameter hole with bentonite chips to ground surface.

Soil aliquots that were to be analyzed for the volatile organic compounds (VOCs) BTEX by Method 8260D and TPH-g by 8260/CALUFT were sampled using Terra Core sampling methodology in which a single-use Terra-Core sampling kit collected three sets of approximately 5 cubic centimeters (cc) of soil with a dedicated, disposable sampler from the portion of the sampling interval evaluated as having the highest potential for maximum impact of contamination. Two of the 5-cc plugs were placed with 5 milliliters (mL) of methanol in a 40-mL vial with septum and stir bar for medium-level analysis. The third 5-cc plug was placed with 5 mL of de-ionized,

reagent-free water in a third 40-mL vial for low-level analysis. The labels on the tared vials were filled out and the three vials were bubble wrapped and placed in a new, clean Ziploc bag and placed on ice for storage before shipment.

The remainder of the sample (approximately 4–6 ounces) was placed in a single-use, clean resealable plastic bag, labeled, double-bagged, and immediately placed on ice prior to shipment to the laboratory by overnight courier service.

5.3 Groundwater Sampling at OWDFMW06B

Bore logs from a nearby two-monitoring-well cluster were evaluated: OWDFMW06A, a deep groundwater monitoring well screened in the confined basal aquifer; and OWDFMW06B, a shallow monitoring well screened in the perched aquifer located below the Holding Tank and Leach Tank. OWDFMW06B is located approximately 20 feet north-northeast of the Holding Tank and is screened from approximately 25 to 35 feet bgs. A groundwater sample was collected from OWDFMW06B on January 26, 2022. A summary of the laboratory analyses performed on this sample is included in Table 3. The results of the groundwater sampling at OWDFMW06B are described in Section 8.1.5.

5.4 Sampling Packing and Shipping

Subsurface soil samples for laboratory analysis were taken to a warehouse at the end of each sampling day on ice, then were frozen to ensure they would arrive at the laboratory within the acceptable temperature range. Custody seals were applied, chain-of-custody (CoC) forms were completed for each cooler, and a trip blank was included with each cooler containing VOCs. All samples were received at the contract laboratory within specification limits, and were analyzed on an expedited turnaround time, with Level II and Level IV data packages and electronic data deliverables available beginning Wednesday, January 19, 2022.

6.0 Sample Control Procedures

Prior to sampling, the field team inspected all supplies and consumables to ensure that they were acceptable for use. Sampling and sample handling procedures were designed to ensure that samples were consistently collected, labeled, preserved, and transported in a manner that maintained their integrity for their intended purposes.

6.1 Sample Containers and Preservation

Soil laboratory samples were collected in accordance with the standard operating procedure (SOP) included in the Preliminary Site Characterization Plan (DON 2022a).

These containers, preservatives, and holding times are specified in the respective EPA SW-846 methods. The analytical laboratories selected for the site characterization supplied the required sample containers.

6.2 Chain of Custody

CoC documentation was maintained for samples during all phases of sample collection, transport, and laboratory sample preservation procedures.

Laboratory samples for soil vapor, groundwater, and drinking water were preserved as described in Section 6.1.

7.0 Field Observations during Sampling

Figure 3 shows the locations of the direct-push soil borings with respect to site features and cross section projection lines A-A', B-B', and C-C'. Figure 4, Figure 5, and Figure 6 show cross sections that present organic vapor headspace measurements and laboratory analytical results for site-specific-COPCs, color-coded to identify exceedances of DOH Soil EALs. The coordinates for these locations were mapped in the field using a 300-foot measuring tape and a calibrated magnetic direction sensor. Locations were not professionally surveyed, but were verified by comparison to items observed in Google Earth imagery.

Important features include the two groundwater monitoring wells that are located approximately 20 feet north-northwest of the Holding Tank. Field observations by others have indicated that the shallower of these two wells (OWDFMW06B) has a static water level associated with the perched groundwater system ranging from approximately 30 to 36 feet bgs. In addition, recent observations of the headspace air within the well casing after the November 20, 2021 release included a petroleum-like odor that was not present before November 20, 2021.

A composite sediment sample was scraped off the Leach Tank floor, as specified in the Preliminary Site Characterization Plan. Observations inside the Holding Tank from the access port in the middle of the top indicated similar oily waste sediments in its bottom. These will be sampled for waste characterization prior to disposal.

Ground surface west of the fence line to South Hālawā Stream consists of a relatively flat plateau extending approximately 15 feet from the fence, then approximately 10 feet of boulders and manmade debris dropping down about 3 feet to another relatively flat plateau adjacent to South Hālawā Stream. The direct-push rig encountered refusal at various depths in the 22 boreholes drilled, ranging from 6 feet bgs at LT-N25 to 26 feet bgs at HT-N10, as shown in Table 4.

South Hālawā Stream in the Holding Tank and Leach Tank area is a concrete-lined channel approximately 10 feet deep on the eastern embankment adjacent to the investigation area. Drainage holes are located in the lower portions of the channel walls.

Field observations made during sampling activities are described in field notes and bore logs provided in Appendix A. In general, the bore logs identified disturbed subsurface soil to depths as deep as 20 feet, in some cases, as evidenced by man-made debris at depth.

7.1 Organic Vapor Headspace Observations in the Soil Cores

As described in the project DQOs (Section 4.0), organic vapor headspace samples were analyzed with a calibrated PID at 1-foot intervals from 6 feet bgs to total depth. Table 4 presents these results with depth. Cross sections A-A', B-B', and C-C' are shown on Figure 4, Figure 5, and Figure 6, respectively. The table and cross section value boxes include the measured PID readings at that soil interval and are coded with the following color scheme:

- Green – (less than 1 ppmv) indicates likely not petroleum-contaminated soil (PCS).
- Green-gold to gold-orange – (1 to 70 ppmv) indicates potential for some PCS although may not exceed EALs.
- Gold-orange to orange-red – (greater than 70 to 220 ppmv) indicates soil is likely PCS and may exceed EALs.
- Orange-red to red – (greater than 220 ppmv to maximum value of 518 ppmv) indicates soil is likely PCS and more likely to exceed EALs.

In some borings, elevated PID readings were not observed in the final depth, including when borings met refusal at shallow depths, and elevated PID readings were observed in adjacent borings at greater depths.

Impacted borings adjacent to the Leach Tank are:

- LT-W10, LT-W17.5
- LT-N10, LT-N25
- LT-S10

Impacted borings adjacent to the Holding Tank are:

- HT-W10
- HT-E10
- HT-N10
- HT-S10

8.0 Laboratory Analytical Results

Table 5 provides the laboratory analytical results from 35 primary subsurface soil samples and three duplicate samples collected from 21 borings, as well as one sediment sample. Table 6 presents the laboratory analytical results for the groundwater sample collected from OWDFMW06B. Figure 4, Figure 5, and Figure 6 are cross sections with analytical results spatially referenced to the location of the samples.

Table 5 provides the final unvalidated laboratory report results compared to DOH EALs for soil overlying a drinking water aquifer and within 150 meters of a surface water body, based on EALs for:

- Leaching to groundwater that is a drinking water source
- Direct exposure impact to human health
- Gross contamination (e.g., odors)

Complete Level II data reports are provided in Appendix C.

8.1.1 TPH-g (Carbon Range C6 to C12) Soil Sample Results

TPH-g analysis included the carbon range of C6 to C12, which overlaps significantly with the TPH-d carbon range of C10 to C24. Of the 35 subsurface soil samples analyzed for TPH-g, the following exceedances were noted:

- The leaching to groundwater EAL of 696 mg/kg in 6 samples
- The direct exposure EAL of 451 mg/kg in 8 samples
- The gross contamination (odor) EAL of 100 mg/kg in 13 samples

8.1.2 Volatile Organic Compound BTEX Soil Sample Results

None of the 35 subsurface soil samples exceeded any DOH EALs for BTEX. In two samples, benzene was not detected but the limit of detection exceeded the DOH EAL for leaching to groundwater due to the requirement for sample dilution prior to analysis.

8.1.3 TPH-d (Carbon Range C10 to C24) and TPH-o (Carbon Range C24 to C40) Soil Sample Results

TPH-d analysis included the carbon range of C10 to C24, which overlaps significantly with the TPH-g carbon range of C6 to C12. Of the 35 subsurface soil samples analyzed for TPH-d, the following exceedances were noted:

- The leaching to groundwater EAL of 940 mg/kg in 7 samples
- The direct exposure EAL of 219 mg/kg in 13 samples
- The gross contamination (odor) EAL of 500 mg/kg in 9 samples

In addition, the sediment sample from the Leach Tank (“LT-Sediment”) exceeded all action levels for TPH-d and had the maximum TPH-d concentration measured on site of 13,000 mg/kg.

None of the soil samples collected exceeded the DOH EALs for TPH-o during this investigation.

8.1.4 Naphthalene, 1-Methylnaphthalene, and 2-Methylnaphthalene Soil Sample Results

The naphthalenes have the lowest Soil Action Levels for leaching to groundwater that is a drinking water source, ranging from 0.9 mg/kg for 1-methylnaphthalene to 3.1 mg/kg for naphthalene:

- Naphthalene exceeded the leaching to groundwater EAL of 3.1 mg/kg in 3 subsurface soil samples.
- 1-Methylnaphthalene exceeded the leaching to groundwater EAL of 0.89 mg/kg in 10 subsurface soil samples.
- 2-Methylnaphthalene exceeded the leaching to groundwater EAL of 1.9 mg/kg in 6 subsurface soil samples.

In addition, the Leach Tank sediment sample (LT-Sediment) exceeded all three naphthalene-related Soil Action Levels, with the highest concentrations of naphthalene being 7.2 mg/kg, 1-methylnaphthalene 52 mg/kg, and 2-methylnaphthalene 74 mg/kg.

8.1.5 Groundwater Analytical Results

A groundwater sample was collected for laboratory analysis from OWDFMW06B on January 26, 2022. In addition, the following information was collected:

- A static water level of 29.13 feet below top of casing
- A headspace organic vapor measurement within the well casing of 159 ppmv
- An oil/water interface measurement indicating no oil was present on the water surface
- Photographs of the bailer indicated no oil or sheen

The elevated headspace PID readings and petroleum odors now present within well OWDFWM06B were not identified prior to the November 2021 release. The laboratory results showed detections of fuel-related constituents (including TPH-g, TPH-d, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene), which indicates that petroleum-related impacts may be present in the perched aquifer, but there were no exceedances of applicable EALs. The analytical results of the groundwater sample collected from OWDFWM06B are summarized in Table 6.

9.0 Summary of Results and Extent and Magnitude of Contamination

The following evidence indicates that fuel was likely released from the Holding Tank and Leach Tank into the subsurface soil beneath the tanks:

- Fuel-related analytes were detected at the highest concentrations on site in the sediments collected from the Leach Tank floor.
- PID headspace measurements and subsurface soil sample results from soil borings located nearest to both tanks show the highest concentrations of TPH-g, TPH-d, and naphthalenes, with the exception of LT-N25 at the 16–17 foot depth interval, which has the highest concentration of TPH-d (5,900 mg/kg).

Although there were significant TPH-g exceedances, the chromatograms reveal that most of the measured constituents were in the upper part of the TPH-g carbon range (i.e., the higher molecular weight), which may more properly be considered to be in the TPH-d range so this does not indicate a gasoline release. The chromatograms were reviewed by the project forensic chemist, who identified the chromatographic signature as very similar to JP-5.

No groundwater was encountered during drilling and sample collection; however, well OWDFMW06B is located within 30 feet of the Holding Tank and is screened in the perched groundwater system located approximately 30–36 feet bgs at that location. Elevated headspace PID readings and petroleum odors now present within the well were not identified prior to the November 2021 release, and laboratory analyses of one groundwater sample indicated that petroleum-related impacts may be present in the perched aquifer at concentrations below applicable regulatory screening levels.

The basal well OWDFMW06A, located just east of OWDFMW06B and within 20 feet northeast of the Holding Tank, was not sampled during this investigation but this well is screened between -73 and -93 feet amsl, below a thick confining unit. Circulation was lost at this depth during drilling, indicating that drilling had entered the high transmissive environment expected in the basal aquifer. Groundwater subsequently rose to the expected basal head of approximately 18 feet amsl, indicating strong confining conditions that would be protective of downward migration of contaminants resulting from LNAPL.

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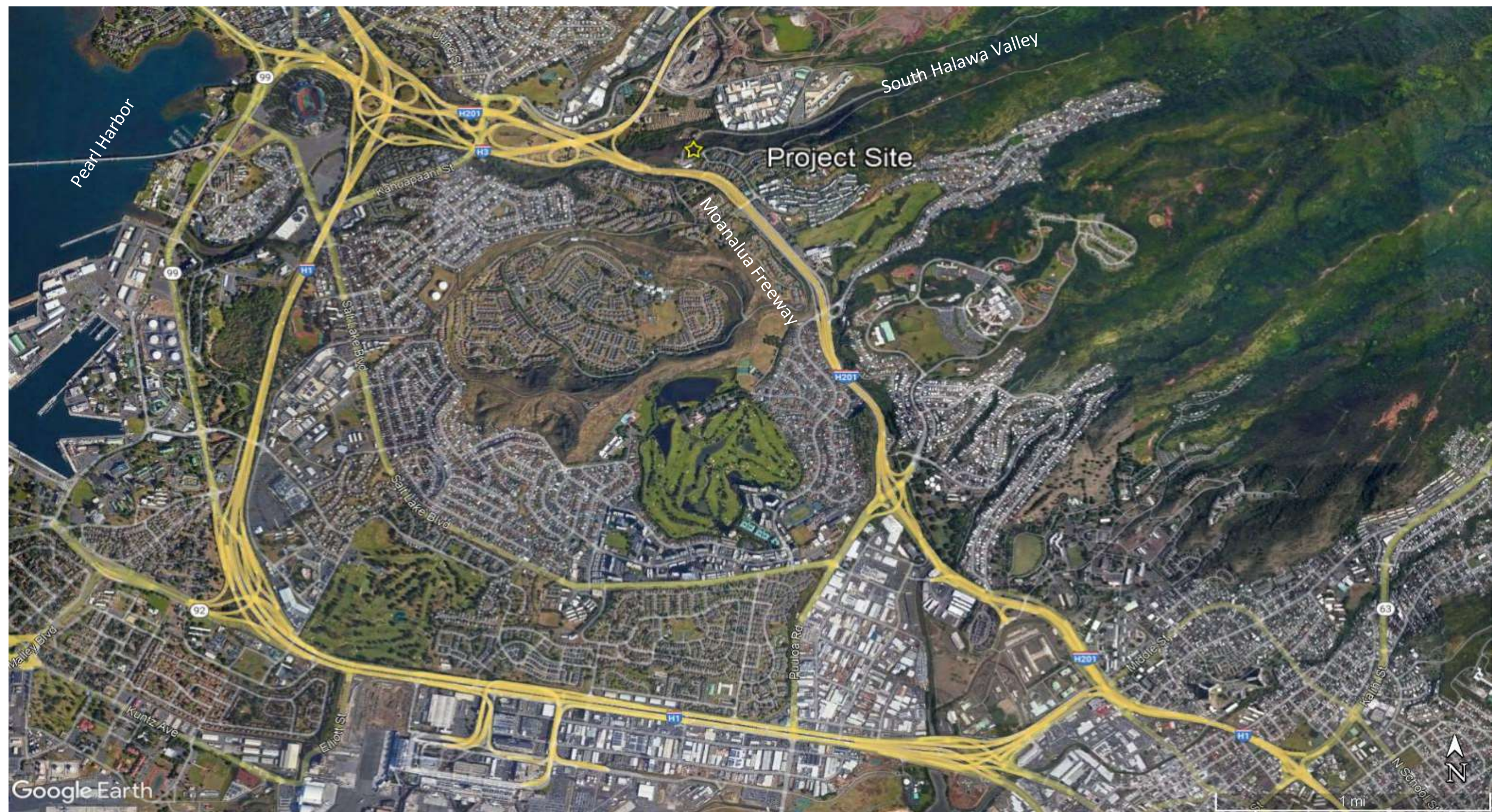
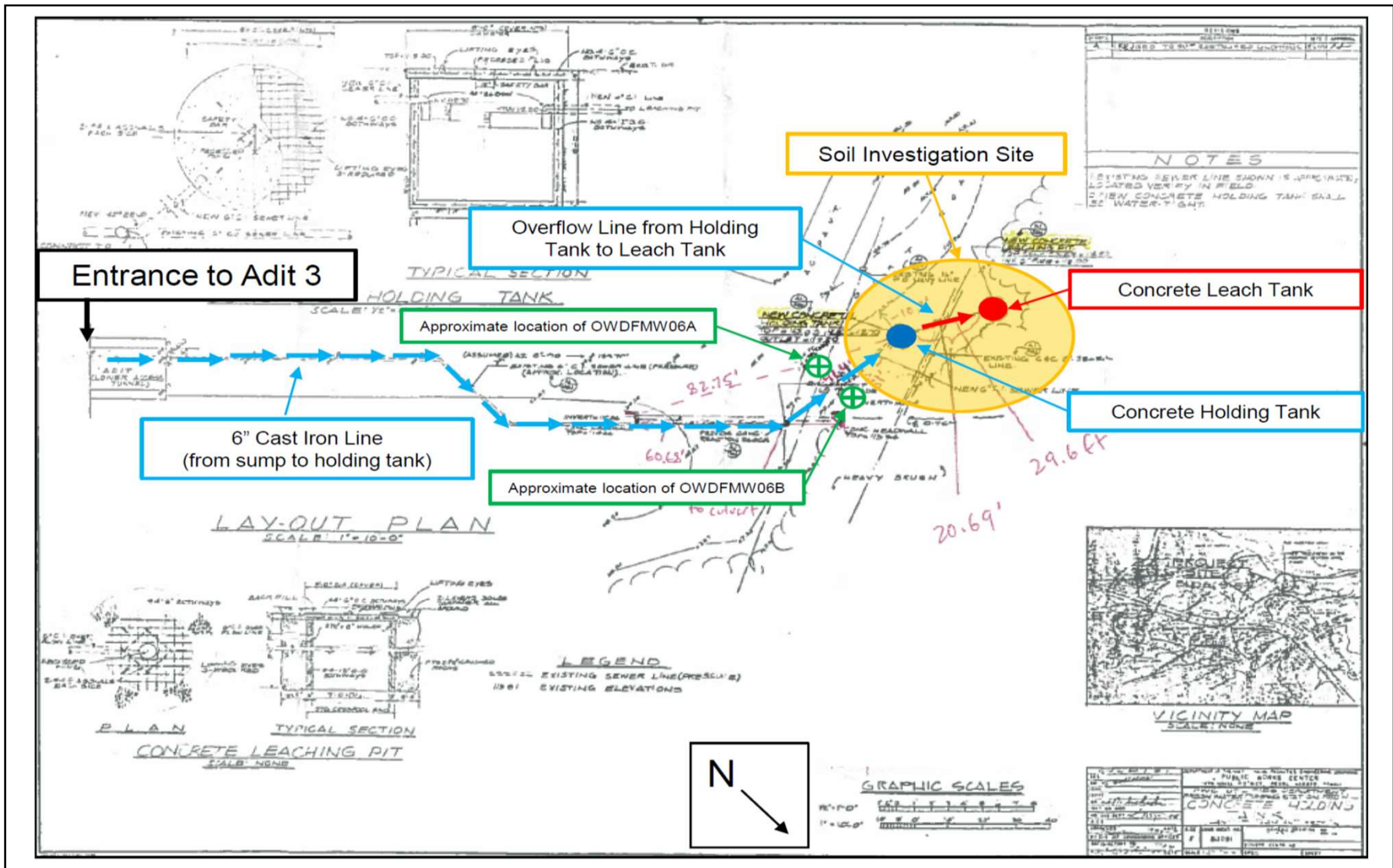
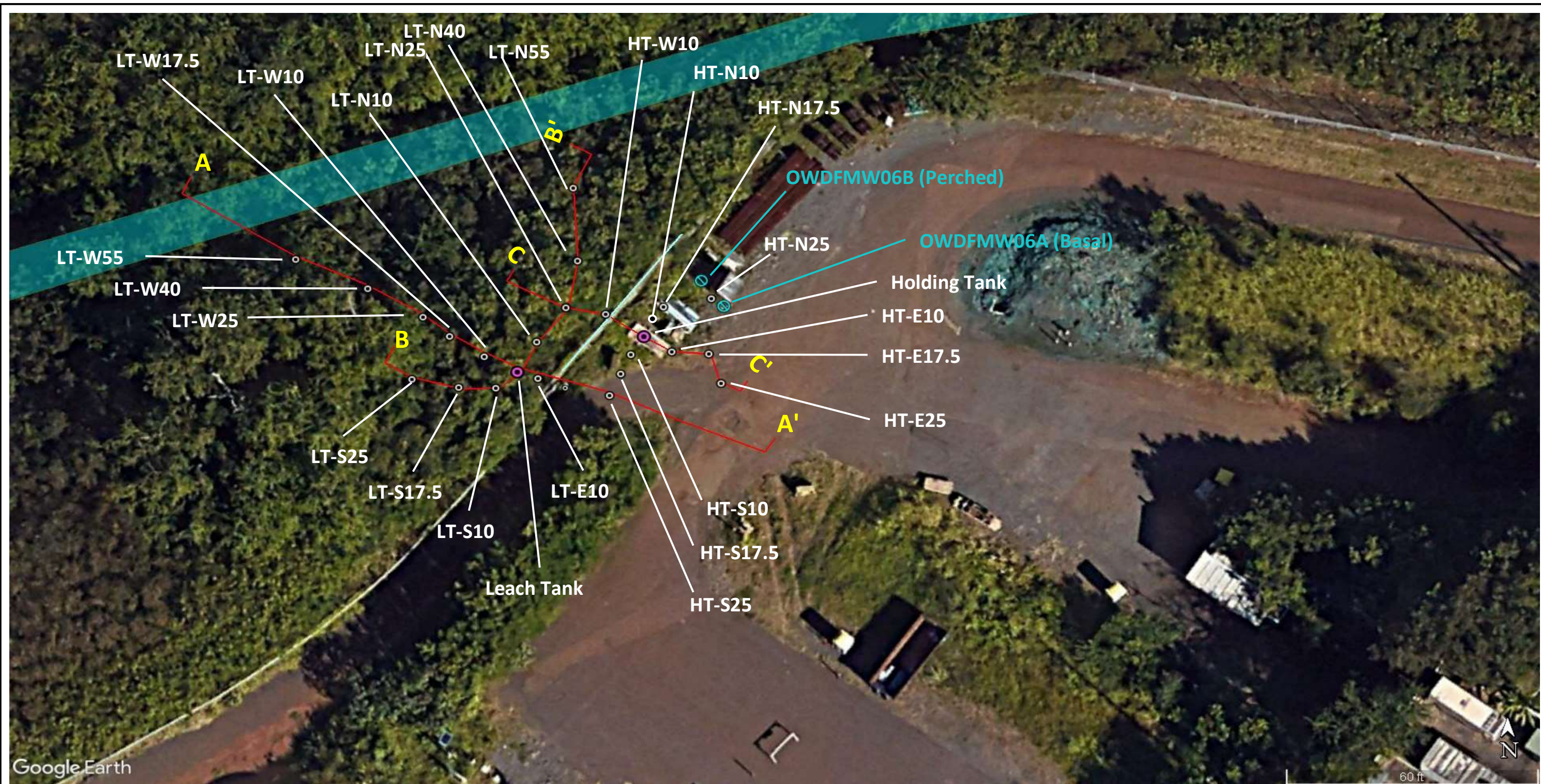


Figure 1. Site Location Map
Holding Tank and Leach Tank Characterization
November 20, 2021 Release Response



**Figure 2. Schematic Drawing of Holding Tank and Leach Tank
Holding Tank and Leach Tank Characterization
November 20, 2021 Release Response**



**Figure 3. Site Sample Locations and Features Map
Holding Tank and Leach Tank Characterization
November 20, 2021 Release Response**

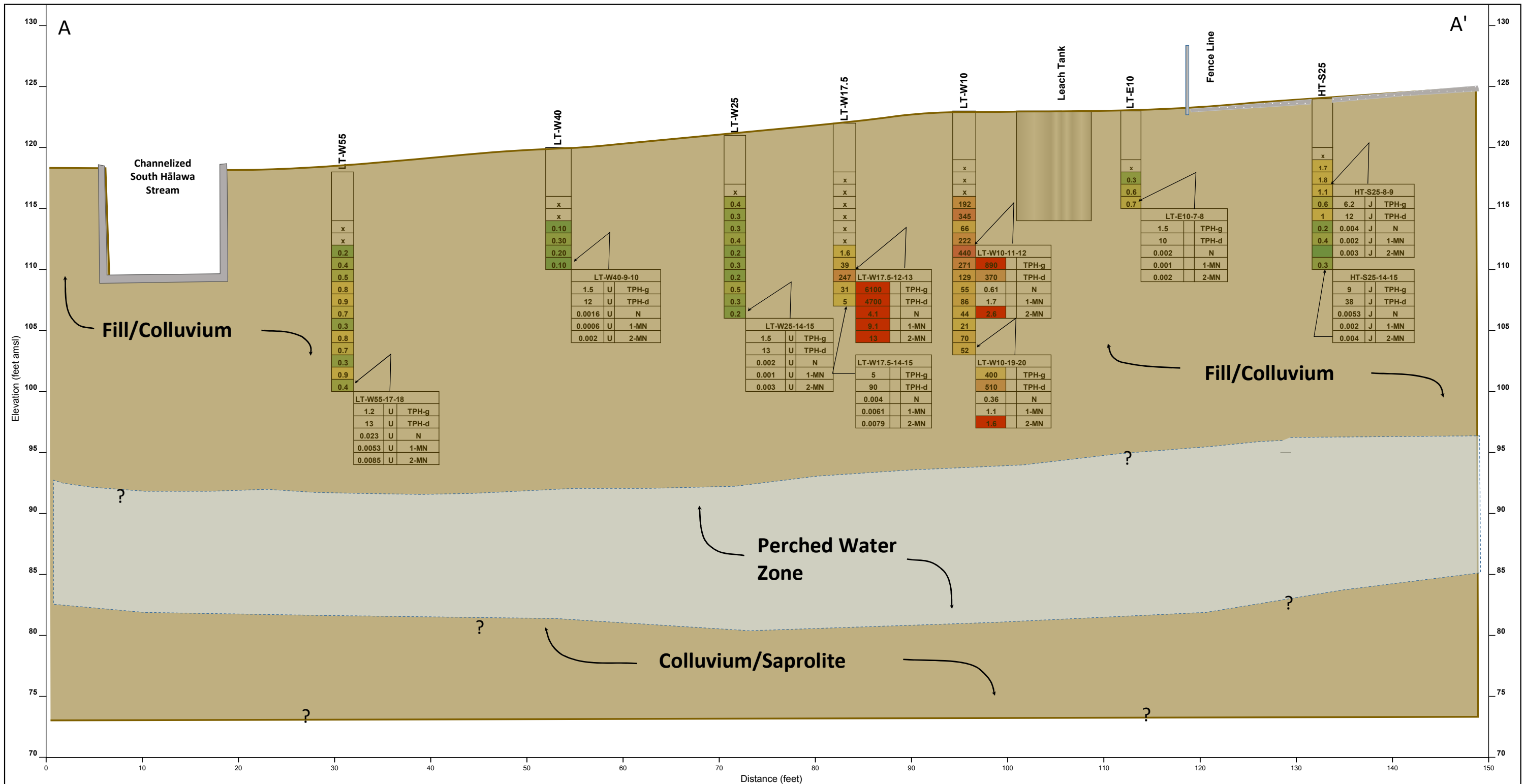
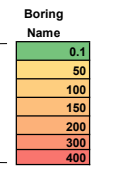


Figure 4. Cross-Section A-A'
Holding Tank and Leach Tank Characterization
November 20, 2021 Release Response

Organic Vapor Measurement (parts per million by volume)



Analyte (mg/kg)	Acronym	Gross Odor	Direct Exposure	Leaching to Groundwater
Gasoline Range Organics (C6-C12)	TPH-g	100	451	596
C10-C24	TPH-d	500	219	940
Naphthalene	N	500	28	3.1
2-Methylnaphthalene	1MN	500	39	1.9
1-Methylnaphthalene	2MN	500	169	0.9

Hawai'i Department of Health Environmental Action Levels (EALs), Table A-2

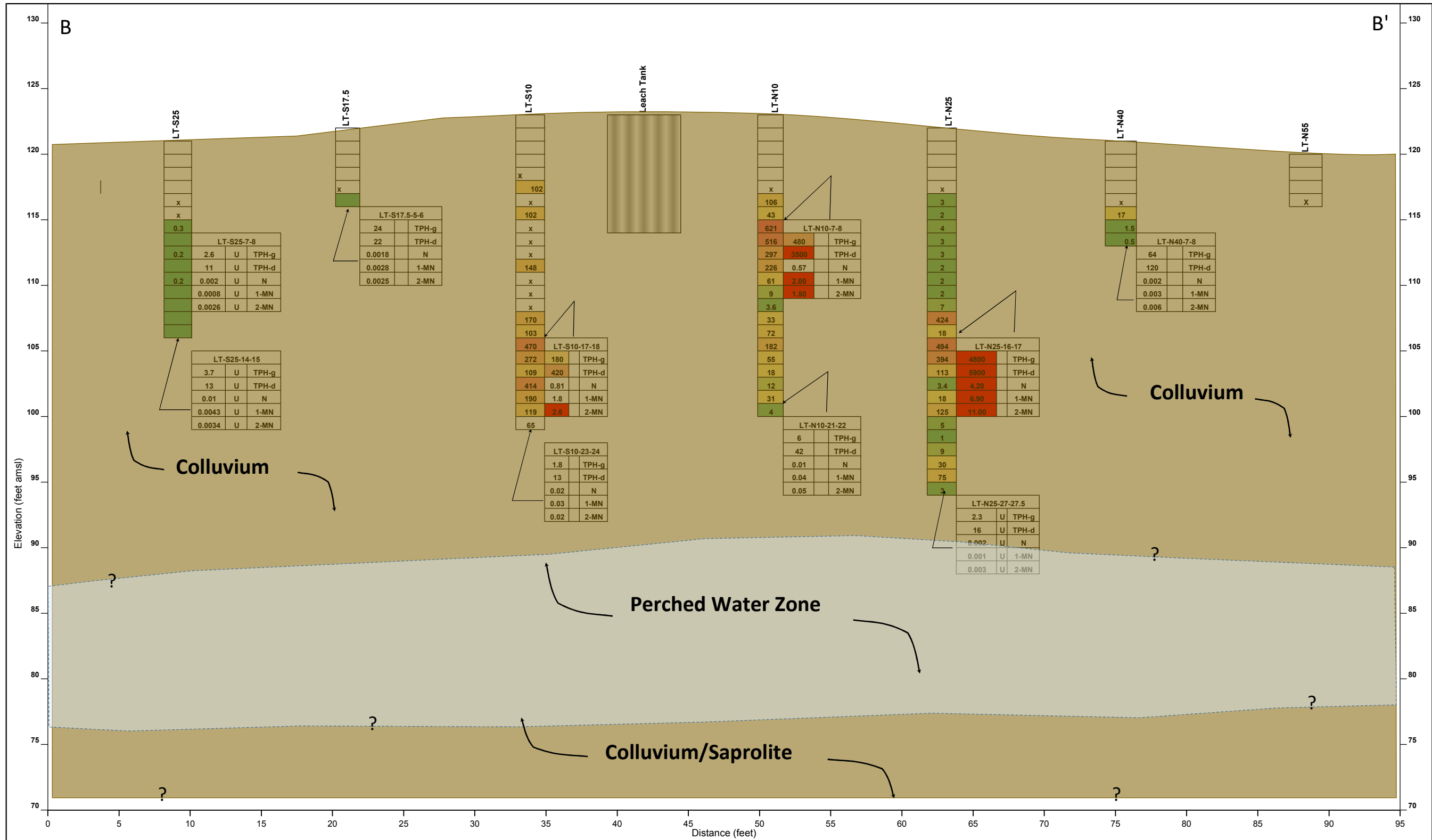
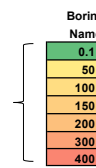


Figure 5. Cross-Section B-B'
Holding Tank and Leach Tank Characterization
November 20, 2021 Release Response

Organic
 Vapor
 Measurement
 (parts per million
 by volume)



Analyte	(mg/kg)	Acronym	Gross Odor	Direct Exposure	Leaching to Groundwater
Gasoline Range Organics (C6-C12)		TPH-g	100	451	696
C10-C24		TPH-d	500	219	940
Naphthalene		N	500	28	3.1
1-Methylnaphthalene		1MN	500	169	0.9
2-Methylnaphthalene		2MN	500	39	1.9

Hawai'i Department of Health Environmental Action Levels (EALs), Table A-2

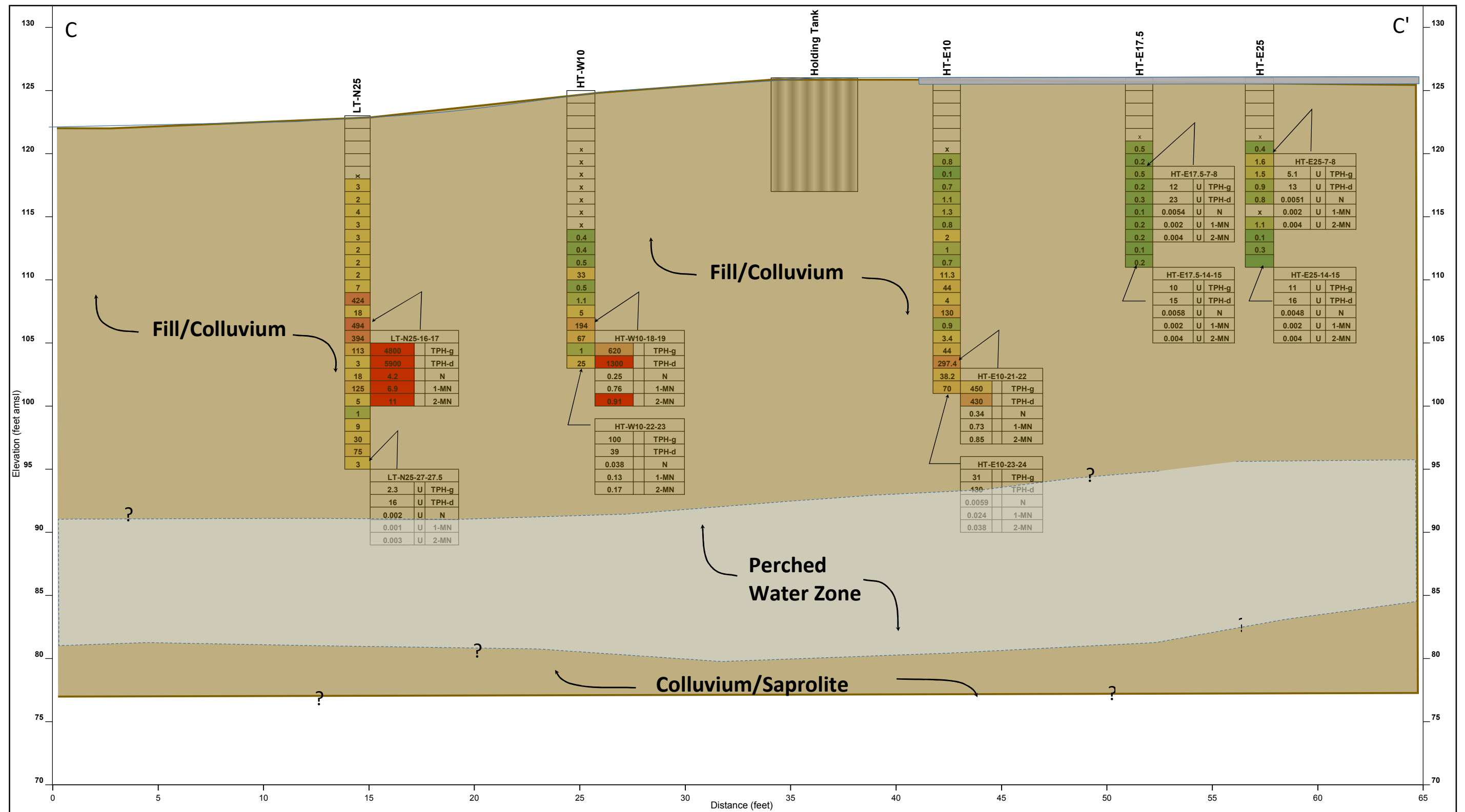
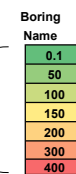


Figure 6. Cross-Section C-C'
Holding Tank and Leach Tank Characterization
November 20, 2021 Release Response

Organic Vapor Measurement (parts per million by volume)



Analyte	(mg/kg)	Acronym	Gross Exposure	Direct Exposure	Leaching to Groundwater
Gasoline Range Organics (C6-C12)	100	TPH-g	100	451	696
C10-C24	500	TPH-d	500	219	940
Naphthalene	500	N	500	28	3.1
2-Methylnaphthalene	500	1MN	500	39	1.9
1-Methylnaphthalene	500	2MN	500	169	0.9

Hawai'i Department of Health Environmental Action Levels (EALs), Table A-2

Table 6: Groundwater Analytical Results for Sample Collected from OWDFMW06B on January 26, 2022

Sample ID	Constituent	Groundwater EAL ^a (µg/L)	Result (µg/L)	Method Detection Limit (µg/L)	Limit of Quantitation (µg/L)
ERH2495	TPH-o (C24-C40)	500	ND	180	360
ERH2495	TPH-d (C9-C25)	400	250	92	110
ERH2495	TPH-g (C6-C12)	300	260	31	100
ERH2495	Benzene	5	ND	0.24	1.0
ERH2495	Ethylbenzene	7.3	ND	0.50	1.0
ERH2495	m-Xylene & p-Xylene	13	ND	0.53	2.0
ERH2495	o-Xylene	13	ND	0.39	1.0
ERH2495	Toluene	9.8	ND	0.39	1.0
ERH2495	1-Methylnaphthalene	2.1	1.7	0.019	0.10
ERH2495	2-Methylnaphthalene	4.7	0.27	0.040	0.20
ERH2495	Naphthalene	12	0.64	0.032	0.10

Notes:

^a (DOH 2017b) Hawai'i Department of Health Environmental Action Level Surfer (Fall 2017), Table D1-a (i.e., groundwater EALs for sites where groundwater is a current or potential drinking water source and the nearest surface water body is located within 150 meters of the release site).

µg/L micrograms per liter

ID sample identification

ND Constituent was not detected above the Method Detection Limit.

Appendix A – Field Notes and Bore Logs

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From: Mariano, Dominic
Sent: Tuesday, January 11, 2022 7:37 PM
To: Maman, Alex; Hart, Jeff
Cc: House, Ethan; Ferguson, Colin; Nutter, James
Subject: CTO 22F0106 Dailies
Attachments: RH_DPT_Adit3_Boringlogs_011122.pdf;
RH_DPT_Adit3_Notes_011122.pdf; RH_DPT_Adit3_Riginspection_011122.pdf;
RH_DPT_Adit3_Tailgate_011122.pdf

Alex, Jeff

Here are today's notes from the DPT investigation around the Adit 3 Leach tank.

We drilled all 4 borings along the 'west' axis from the leach tank.

Samples were collected from the TD of each boring (see logs for boring end depths)

Contamination was observed in the boring closest to the leach tank, and a sample was collected at 11-12 ft bgs.

Tomorrow we will meet at the warehouse at 0600 and be on site by 0700 which is when Navy staff will open up the fencing .

PCS will be on site tomorrow at 0800 to do additional vegetation cutting.

Thanks,

Dominic Mariano
Geologist III
D +1 808-529-7271
dominic.mariano@aecom.com

AECOM 1001 Bishop St
Suite 1600
Honolulu, HI, 96813, USA
T +1 808-521-3051
aecom.com

Client Name: <u>NAVFAC</u>	Boring/Well Name: <u>W10</u>
Job/Site Name: <u>RHTBFSF</u>	Utility Cleared to: <u>2'</u>
Location: <u>ADIT 3 TRENCH TANK</u>	Total Depth: <u>11122 (PH) 20'</u>
Project Number: <u>60574414</u>	Date(s) Drilled: <u>11/11/22</u>
Driller: <u>GEOTEK</u>	Screened Interval: <u>-</u>
Drilling Method: <u>DPT</u>	Depth to water (first encountered): <u>-</u>
Boring Diameter: <u>2"</u>	Depth to water (static): <u>-</u>
Logged By: <u>ETHAN HOUSE</u>	Location:
PG: <u>ETHAN HOUSE</u>	Misc. Notes:

RUN 1
 RUN 2
 RUN 3
 RUN 4
 RUN 5

DEPTH/SAMPLE INTERVAL	SAMPLE TIME	SAMPLE ID	P.I.D.	RECOVERY, %	USCS CLASS	GEOLOGIC DESCRIPTION AND FIELD NOTES	COLOR	Moisture	Stiffness/Density	ESTIMATED PERCENTAGES				ESTIMATED PLASTICITY	
										Clay	Silt	Sand	Gravel		
2-4			X	36%		BASALT - LIGHT GRAY, SMALL ANGULAR PIECES, TRACE OF CORAL + CLAYEY SILT (BROWN), DRY. 10YR 3/3	LT GRAY	d/m/w	VS	5	5	f/m/c	f/c	N/L/M/H	
			X									f/m/c	f/c	N/L/M/H	
			X												
6-8	1408		0.0	100%		SILTY CLAY - MOD. TO HIGH PLAS, FIRM, 10YR 3/3, 5% BASALT, 5-7.3 DRY, 7.3-10 DAMP	BR	d/m/w	FIRM	75	15	f/m/c	f/c	N/L/M/H	
			0.0									f/m/c	f/c	N/L/M/H	
			191.8												
			344.5												
10-12	1420	X	222.3	100%		SILTY CLAY - MOD. PLAS, SOFT, 7.5YR 2.5/2, MOIST, 10% SAPROLITE @ 14-15'	d/m/w	d/m/w	SOFT	75	15	f/m/c	f/c	N/L/M/H	
			439.6									f/m/c	f/c	N/L/M/H	
			270.8												
14-16			129.4				d/m/w	d/m/w				f/m/c	f/c	N/L/M/H	
			55.2												
16-18	1445		85.9	100%		SAME AS ABOVE	d/m/w	d/m/w	SOFT			f/m/c	f/c	N/L/M/H	
			44.3												
			21.4												
18-20			69.9				d/m/w	d/m/w				f/m/c	f/c	N/L/M/H	
			51.7												
20	1455	X	51.7	90%		SAME AS ABOVE	MOIST	S	75	15	-	-	M		
						TERMINATE BORING @ 20' DUE TO REFUSAL	d/m/w					f/m/c	f/c	N/L/M/H	
							d/m/w					f/m/c	f/c	N/L/M/H	
							d/m/w					f/m/c	f/c	N/L/M/H	
							d/m/w					f/m/c	f/c	N/L/M/H	
							d/m/w					f/m/c	f/c	N/L/M/H	

2 RH BPSF - CTO 106 DPT INV 1/11/21

0700 EH+ JN+ CF meet at warehouse,
DM at office

~~0800~~ 0850 All staff depart

0915 Meet Geotek on site

0950 Complete H+S triage

Objective Begin DPT Investigation

Staff: NIECOM (D. Mariano, E. House,
C. Ferguson, J. Nuttar) Geotek Hawaii
(S. Shjegsted, G. Gutierrez, Chad Nix)

Weather: 70-75°, 60% humidity, clear

Equipment: Mini Rax 2

1030 complete site walk, inspect
both drill rigs.

1145 DM finish up phone calls with
mgmt team and chemistry team, to confirm
bottle requirements and counts. JS depart site
to get hydraulic grease gun to repair rig.

Tread hydraulics pressure dropped and needed grease
gun to top off. CF+ JN+ EH depart site.

1215 discuss drilling requirements in the
tunnel with CN.

1240 CF+ JN+ EH return to site

1300 repair rig tread

1315 begin hand auguring at ^{SS} LT-W~~10~~ and
LTW-10

DM

RH BPSF - CTO 106 DPT INV GNT 1/11/22 3

1455 Soil sample [LT-W55-17-18] taken

1520 Soil sample [LT-W10-11-12] taken

1602 Soil sample [LT-W10-19-20] taken LT-W40

1610 Geo Tek off site after completing LT-W20

1620 move all equipment inside fence

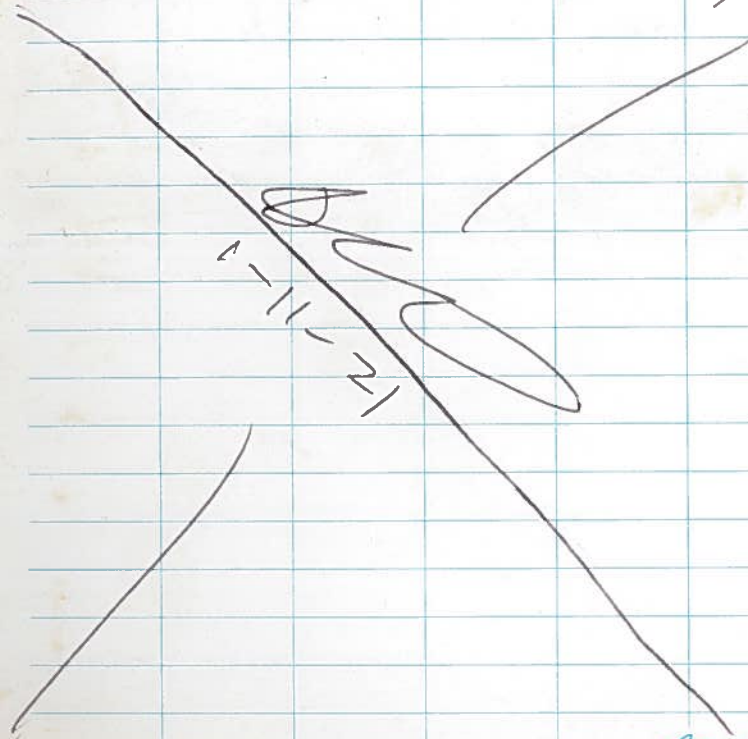
1639 soil sample [LT-W40-9-10] taken

~~1639~~ 1725 pack up supplies

late entry collect top blank ^{TBO1} at 1445

1757 secure IDW at staging area, all
staff depart site.

1820 return to Warehouse, end of field day



Americas

Daily Drilling, Boring & Direct-Push Equipment Inspection

S3NA-321-FM1

Site / Project Name RHSF - G0106, Direct Push Rig Inspector (Name/Company) Colin Ferguson AECOM

RIG INFORMATION:

Rig Type Rotary/Auger Drilling Rig Direct Push Type (DPT)
 Owner GeoTek VIN# Z8824T6620
 Year/Make 2005, Geo probe Mileage
 Model 6620-DT Drill Hrs 6870

INSTRUCTIONS: Each shift shall inspect all applicable items. If an unsatisfactory condition (fail) is observed, suspend operation of the equipment and report the condition to the site supervisor immediately.

Emergency Equipment / Devices / Switches	
Kill switches are located and accessible to workers on both sides of the rotating stem. NOTE: Location and number of switches depend on the rig manufacturer; please refer to owner's manual (DPT typically has one switch on control panel).	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Kill switches installed by the manufacturer, alarms and other devices (e.g. positive air shut-off valve) tested and in operable condition. All workers familiar with location and operation of devices. NEVER BYPASS, DISABLE, OR REMOVE KILL DEVICES.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
First aid kit adequate and on equipment / readily available.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Absorbent materials on equipment / readily available (spill response).	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
A fire extinguisher of appropriate size is located on drill rig and readily available/accessible for drilling crew (recommended 20 lb).	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Protective Guards	
Drive shafts, belts, chain drives, and universal joints are guarded to prevent accidental insertion of hands, fingers, or tools.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Cables	
Cables on drill rig free of kinks, frayed wires, birdcages, flat spots, grease, and worn or missing sections.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Cables are terminated at the working end with a proper eye splice; either swaged, coupled, or using cable clamps.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Cable clamps are installed with the saddle on the live or load side. Clamps are not alternated and are of the correct size and number for the cable size.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Wire ropes are not allowed to bend around sharp edges without cushion material.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Pulleys and Cable Winches	
Pulleys are not bent, cracked, or broken.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Pulleys operate smoothly and freely, without resistance.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Motor is mounted in correct location and tightly secured to drill rig.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Winch capable of being placed in the free spool (unwind smoothly) and locked position correctly, demonstrating that the cable is suitable for lifting during drilling operations.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Safety Latches	
Hooks installed on hoist cables are the safety type with a functional latch to prevent accidental separation.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Safety latches are functional and completely span the entire throat of the hook and have positive action to close the throat except when manually displaced for connecting or disconnecting a load.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Flights / Augers / Reamers	
Flights / Augers / Reamers are not bent, cracked, or broken. NOTE: Flights / Augers / Reamers failing inspection must be removed from jobsite.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A

Flights are blunt to prevent the risks of cuts.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Auger keys are not bent, cracked/fractured, excessively worn, or otherwise damaged.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Auger bolt holes and threads are not damaged.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Inspect flights/augers for metal burns. NOTE: Burrs must be filed to flat surface.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Augers / Reamers lying flat on the ground (avoid stacking).	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Augers / Reamers over 50lbs (22.7kg) moved mechanically. (Avoid manual lifting).	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Drill String	
Appropriate break out tool(s) available.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Rod box and power vice operating smoothly and freely.	
Drill string are not bent and do not have any cracks/fractures.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Drill string connections (e.g. pins, threads, couplers) are of the proper type, are not bent, have no cracks/fractures, and are not excessively worn.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Swivel connectors (for trailing horizontal drill stem) lubricated and freely rotating.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Mast	
Mast is free of bends, cracks, or broken sections.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
All mounting hardware (pins, bolts, etc) in place.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
No moving of drill rig or maintenance/repairs while mast is in vertical position.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Hammering Device	
Hammer free of cracks, fatigue, or other signs of excessive wear.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Hammer connections are secure.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Leveling Devices	
Outriggers move in/out and up/down smoothly and freely while using controls on drill rig, with no hydraulics leaks.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Outriggers are extended prior to and whenever the mast is raised off its cradle. Outriggers must maintain pressure to continuously support and stabilize the drill rig (even while unattended).	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Outriggers are properly supported on the ground surface to prevent setting into the soil (use of outrigger support pads).	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Controls	
Controls are intact, properly labeled, have freedom of movement, and have no loose wiring or connections.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Controls are not blocked or locked into an operating position.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Installed lights, signals, gauges, and alarms operate properly.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Lifting Devices	
Slings, chokers, and lifting devices (straps, not chains) inspected before using and are in proper working order. NOTE: Damaged units are labeled and removed from jobsite.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Shackles/Clevises are in proper working order with pins/screws in place that is to be used while lifting.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Cables and lifting devices are not operated erratically or with a jerking action to overcome resistance.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Hydraulic System	
Hydraulic lines are secure, in good condition with no signs of excessive wear, and not leaking. NOTE: Check while pressurized.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Hydraulic lines are not in a bent or pinched position causing additional fluid restrictions/pressures.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Hydraulic oil reservoir has appropriate amount of oil and not leaking.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Documentation available to confirm that pressure relief valve was checked during shop maintenance activity and noted on maintenance log.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Pump Lines (water, grout, etc)	
Suction/Discharge hoses, pipes, valves, and fittings are secured and not leaking.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
High pressure hoses have a safety chain, cable, or strap at each end to prevent whipping in the event of a failure.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A

Ladders	
Drill rig has a permanently attached or proper portable ladder to be used for access to drilling platform.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Ladders and platforms not to be used for tool storage- keep ladders and operator platforms clear during drilling.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Tires / Tracks	
Tires / Tracks on rig are not excessively worn and free of any debris or foreign material.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
General	
General condition – exterior (no structural damage, no loose bolts, platform tidy, etc.)	<i>Clean, maintained recently</i>
General condition – interior (cab clean, tidy)	<i>N/A</i>
Drill rig meets regulations for transport on state/federal highways (inspection sticker, license plate, etc.).	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Rig is of appropriate size to meet job requirements.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Maintenance log available for previous 3 months to confirm proper maintenance/inspection.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Exhaust	
Exhaust system is free from defect and routes engine exhaust away from drill rig workers.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Fuels	
Fuel stored in an approved and properly labeled container.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Fuel transfer lines free from signs of excessive wear and not leaking.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Refueling and transferring of fuel is performed in an approved area with sufficient containment to prevent spillage.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Exclusion/Work Zones	
The exclusion/work zone is centered over the borehole (and if applicable, bore exit point) and the radius equal to or greater than the height of the mast (measured from ground level).	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A <i>conf</i>
The exclusion/work zone is clear of tripping hazards.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
The exclusion/work zone communicated to concurrent/adjacent operations to prevent overlap of work zones or line of fire.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Subsurface Utilities / Installations and Overhead Obstructions	
Subsurface utilities / installations have been confirmed as identified and cleared through site observation and review of the completed <i>S3NA-331-FM1 Underground Utilities & Subsurface Installation Clearance Checklist</i> .	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Except where electrical distribution and transmission lines have been de-energized and visibly grounded, drill rigs will be operated proximate to under, by, or near power lines in accordance with the Minimum Approach Distance (MAD).	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Rig Repairs	
Repairs, when possible, are conducted offsite to reduce the risk of any onsite incidents.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Specialized PPE	
When working at elevated heights, workers are to wear a fall restraining device attached in a manner to restrict falls to less than six feet (1.83 meters).	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
When working in wet/slippery conditions, all workers have a lug-type sole or similar slip resistant sole, on their safety footwear to prevent slipping.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A

Comments:

Work area has stamps/rubble, it uneven. Discussed directly tail gate

Signature of Inspector: _____

CG

Date: _____

1/11/22

Americas

Daily Drilling, Boring & Direct-Push Equipment Inspection

S3NA-321-FM1

Site / Project Name RH-C0106-Direct Push RIG Inspector (Name/Company) Bob Ferguson

RIG INFORMATION:

Rig Type	Rotary/Auger Drilling Rig <input type="checkbox"/>	Direct Push Type (DPT) <input checked="" type="checkbox"/>
Owner	<u>GeoTek</u>	VIN# <u>ZT000T6620</u>
Year/Make	<u>Geopack 2006</u>	Mileage <u>-</u>
Model	<u>6620-DT</u>	Drill Hrs <u>1438</u>

INSTRUCTIONS: Each shift shall inspect all applicable items. If an unsatisfactory condition (fail) is observed, suspend operation of the equipment and report the condition to the site supervisor immediately.

Emergency Equipment / Devices / Switches	
Kill switches are located and accessible to workers on both sides of the rotating stem. NOTE: Location and number of switches depend on the rig manufacturer; please refer to owner's manual (DPT typically has one switch on control panel).	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Kill switches installed by the manufacturer, alarms and other devices (e.g. positive air shut-off valve) tested and in operable condition. All workers familiar with location and operation of devices. NEVER BYPASS, DISABLE, OR REMOVE KILL DEVICES.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
First aid kit adequate and on equipment / readily available.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Absorbent materials on equipment / readily available (spill response).	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
A fire extinguisher of appropriate size is located on drill rig and readily available/accessible for drilling crew (recommended 20 lb).	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Protective Guards	
Drive shafts, belts, chain drives, and universal joints are guarded to prevent accidental insertion of hands, fingers, or tools.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Cables	
Cables on drill rig free of kinks, frayed wires, birdcages, flat spots, grease, and worn or missing sections.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Cables are terminated at the working end with a proper eye splice; either swaged, coupled, or using cable clamps.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Cable clamps are installed with the saddle on the live or load side. Clamps are not alternated and are of the correct size and number for the cable size.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Wire ropes are not allowed to bend around sharp edges without cushion material.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Pulleys and Cable Winches	
Pulleys are not bent, cracked, or broken.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Pulleys operate smoothly and freely, without resistance.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Motor is mounted in correct location and tightly secured to drill rig.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Winch capable of being placed in the free spool (unwind smoothly) and locked position correctly, demonstrating that the cable is suitable for lifting during drilling operations.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Safety Latches	
Hooks installed on hoist cables are the safety type with a functional latch to prevent accidental separation.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Safety latches are functional and completely span the entire throat of the hook and have positive action to close the throat except when manually displaced for connecting or disconnecting a load.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Flights / Augers / Reamers	
Flights / Augers / Reamers are not bent, cracked, or broken. NOTE: Flights / Augers / Reamers failing inspection must be removed from jobsite.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A

Flights are blunt to prevent the risks of cuts.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Auger keys are not bent, cracked/fractured, excessively worn, or otherwise damaged.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Auger bolt holes and threads are not damaged.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Inspect flights/augers for metal burns. NOTE: Burrs must be filed to flat surface.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Augers / Reamers lying flat on the ground (avoid stacking).	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Augers / Reamers over 50lbs (22.7kg) moved mechanically. (Avoid manual lifting).	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Drill String	
Appropriate break out tool(s) available.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Rod box and power vice operating smoothly and freely.	
Drill string are not bent and do not have any cracks/fractures.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Drill string connections (e.g. pins, threads, couplers) are of the proper type, are not bent, have no cracks/fractures, and are not excessively worn.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Swivel connectors (for trailing horizontal drill stem) lubricated and freely rotating.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Mast	
Mast is free of bends, cracks, or broken sections.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
All mounting hardware (pins, bolts, etc) in place.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
No moving of drill rig or maintenance/repairs while mast is in vertical position.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Hammering Device	
Hammer free of cracks, fatigue, or other signs of excessive wear.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Hammer connections are secure.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Leveling Devices	
Outriggers move in/out and up/down smoothly and freely while using controls on drill rig, with no hydraulics leaks.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Outriggers are extended prior to and whenever the mast is raised off its cradle. Outriggers must maintain pressure to continuously support and stabilize the drill rig (even while unattended).	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Outriggers are properly supported on the ground surface to prevent setting into the soil (use of outrigger support pads).	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Controls	
Controls are intact, properly labeled, have freedom of movement, and have no loose wiring or connections.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Controls are not blocked or locked into an operating position.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Installed lights, signals, gauges, and alarms operate properly.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Lifting Devices	
Slings, chokers, and lifting devices (straps, not chains) inspected before using and are in proper working order. NOTE: Damaged units are labeled and removed from jobsite.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Shackles/Clevises are in proper working order with pins/screws in place that is to be used while lifting.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Cables and lifting devices are not operated erratically or with a jerking action to overcome resistance.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
Hydraulic System	
Hydraulic lines are secure, in good condition with no signs of excessive wear, and not leaking. NOTE: Check while pressurized.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Hydraulic lines are not in a bent or pinched position causing additional fluid restrictions/pressures.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Hydraulic oil reservoir has appropriate amount of oil and not leaking.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Documentation available to confirm that pressure relief valve was checked during shop maintenance activity and noted on maintenance log.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> N/A
Pump Lines (water, grout, etc)	
Suction/Discharge hoses, pipes, valves, and fittings are secured and not leaking.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A
High pressure hoses have a safety chain, cable, or strap at each end to prevent whipping in the event of a failure.	<input type="checkbox"/> Pass <input type="checkbox"/> Fail <input checked="" type="checkbox"/> N/A

Americas

Daily Tailgate Meeting

S3AM-209-FM5

Instructions: Conduct meeting prior to sending crews to individual tasks. Require attendance of all AECOM employees and subcontractors. Invite personnel from simultaneous operations for coordination purposes. Review scope of work and briefly discuss required and applicable topics. **This meeting is a daily refresher, not a full orientation.** Task-specific discussions associated with Task Hazard Assessment (THA) follow this meeting at the task location immediately before individual task is started.

AECOM Supervisor Name: D. Mariano
Phone Number: 7310-625-1283
AECOM SH&E Rep. Name: Devon Melita
Phone Number: 858-531-9666
Meeting Leader: D. Mariano / E. House

Date: 1/11/21	Project Name/Location: RH OWDF - Teach tank	Project Number:
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Today's Scope of Work: - DPT investigation

Muster Point Location: A.I.T 3	First Aid Kit Location: Field Vehicles	Fire Extinguisher Location: Field Vehicles/Drill Rig	Spill Kit Location: Drill Rig
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1. Required Topics	2. Discuss if Applicable to Today's Work
<input checked="" type="checkbox"/> Fitness for Duty requirements, all sign in / sign out <input checked="" type="checkbox"/> Required training (incl. task specific) completed and current <input checked="" type="checkbox"/> SH&E Plan onsite - understood, reviewed, signed by all (incl. scope, preplanning hazard assessments / risk registers, controls, procedures, requirements, etc.) <input checked="" type="checkbox"/> Task Hazard Assessments (THAs) are to be reviewed and completed for each task immediately prior to conducting <input checked="" type="checkbox"/> STOP WORK Right & Responsibility- all task changes/changed conditions re-assess with THA <input checked="" type="checkbox"/> Requirement to report to supervisor any injury, illness, damage, near miss, unsafe act / condition <input checked="" type="checkbox"/> Emergency Response Plan – including muster point, first aid kit, fire extinguisher, clinic/hospital location <input checked="" type="checkbox"/> Personal Protective Equipment (PPE) - Required items per hazard assessments in good condition / in use by all <input checked="" type="checkbox"/> Equipment/machinery inspected (documented as required) and in good condition - operators properly trained/certified <input checked="" type="checkbox"/> Work area set up and demarcation/ barricades in place to protect workers, site staff, and the public <input checked="" type="checkbox"/> Required checklists/records available, understood (describe): <input type="checkbox"/> Lessons Learned / SH&E improvements (describe):	<input checked="" type="checkbox"/> <input type="checkbox"/> Check <input checked="" type="checkbox"/> as reviewed or mark <input type="checkbox"/> as not applicable <input checked="" type="checkbox"/> <input type="checkbox"/> Biological/ Chemical / Electrical Hazards <input checked="" type="checkbox"/> <input type="checkbox"/> Ergonomics - Lifting, Body Position <input type="checkbox"/> <input checked="" type="checkbox"/> Lock Out/ Tag Out Short Service Employees - visual identifier and mentor/ oversight assignment <input checked="" type="checkbox"/> <input type="checkbox"/> Simultaneous/ Neighbouring Operations <input checked="" type="checkbox"/> <input type="checkbox"/> Slip/ Trip/ Fall Hazards <input checked="" type="checkbox"/> <input type="checkbox"/> Specialized PPE Needs <input type="checkbox"/> <input checked="" type="checkbox"/> Traffic Control <input checked="" type="checkbox"/> <input type="checkbox"/> Waste Management/ Decontamination <input checked="" type="checkbox"/> <input type="checkbox"/> Weather Hazards / Heat Stress / Cold Stress <input checked="" type="checkbox"/> <input type="checkbox"/> Subcontractor Requirements (e.g., JHAs, THAs, procedures, reporting, etc.) <input checked="" type="checkbox"/> <input type="checkbox"/> Work Permits / Plans required (e.g., Fall Protection, Confined Space, Hot Work, Critical Lifts, etc.); in place, understood (identify/attach): <i>Drilling Permit</i> <input type="checkbox"/> <input type="checkbox"/> Other Topics (describe/attach): <input type="checkbox"/> <input type="checkbox"/> Client specific requirements (describe):

3. Daily Check Out by Site Supervisor

Describe incidents, near misses, observations or Stop Work interventions from today:	Describe Lessons Learned/ Improvement Areas from today:
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The site is being left in a safe condition and work crew checked out as fit unless otherwise specified as above.

Site Supervisor Name Domingo Mariano	Signature 	Date 1/11/21 Time (at end of day / shift) 1915
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Worker Acknowledgement / Sign In Sign Out sheets applicable to this meeting are on reverse and, if applicable, attached.

All employees:

- STOP WORK if concerned / uncertain about safety / hazard or additional precaution is not recorded on the THA.
- Be alert and communicate any changes in personnel or conditions at the worksite to the supervisor.
- Reassess task, hazards, & mitigations on an ongoing basis; amend the THA if needed.

SITE WORKERS (including AECOM Contractors and Subcontractors): Your signature below means that you understand:

- * The requirement to participate in creating, reviewing, & updating hazard assessments (THA) applicable to your task(s).
- * The hazards & control measures associated with each task you are about to perform.
- * The permit to work requirements applicable to the work you are about to perform (if it includes permitted activities).
- * That no tasks or work is to be performed without a hazard assessment.
- * Your authority & obligation to "Stop Work" intervene, speak up/ listen up.

Your initials (right columns) certify that you arrived & departed fit for duty, & have reported all incidents/near misses; meaning:

- * You are physically and mentally fit for duty and have inspected your required PPE to ensure satisfactory condition.
- * You are not under the influence of any type of medication, drugs, or alcohol that could affect your ability to work safely.
- * You are aware of your responsibility to immediately report any illness, injury (regardless of where or when it occurred), or impairment/fatigue issue to the AECOM Supervisor.
- * You signed out as fit / uninjured unless you have otherwise informed the AECOM Supervisor.

Print Name & Company	Signature	Initials & Sign In Time	Initials & Sign Out Time
Dominic Mando AECOM		In & Fit 0945 DM	Out & Fit 1820 DM
Chad Nix GTH		In & Fit 0945 CN	Out & Fit 1610
Jon Shjegstad GTH		In & Fit 0945 JS	Out & Fit 1610
Rabe Butierrez ESTH		In & Fit 0945 RB	Out & Fit 1610
James Math AECOM		In & Fit 0945 JM	Out & Fit 1820
Glin Ferguson AECOM		In & Fit 0945 GUP	Out & Fit 1800 GUP
ETHAN HOUSE AECOM		In & Fit 0945 EAH	Out & Fit 1820
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit

(Attach additional Site Worker sign-in/out sheets if needed) Identify number of attached sheets: _____

SITE VISITOR / SITE REPRESENTATIVE

Name	Company Name	Arrival Time	Departure Time	Signature

From: Mariano, Dominic
Sent: Wednesday, January 12, 2022 7:39 PM
To: Maman, Alex; Hart, Jeff
Cc: House, Ethan; Ferguson, Colin; Nutter, James; Pascua, Margie; Ramos, Alethea; Womack, Chris
Subject: CTO 22F0106 Dailies
Attachments: RH_DPT_Adit3_Tailgate_01122022.pdf;
RH_DPT_Adit3_Notes_011222.pdf; RH_DPT_Adit3_Boringlogs_011222.pdf;
Sample_List_011222.xlsx

Alex, Jeff,

Here are today's notes from DP investigation.

We completed soil borings around the leach tank and did two around the holding tank.

We will continue investigation around the holding tank using the step-out methodology.

Samples are currently in the warehouse on ice in separate coolers (ie not in the fridge). Apparently these samples need to be frozen within 48 hours of collection if not brought to the lab within this period.

Chris Womack mentioned that a freezer was being brought to the warehouse, so I think we can have these stored there in the morning, however we may also end up shipping them during the day tomorrow.

I do not think anyone has been assigned to ship these, but I could be wrong.

I've attached a list of all the samples taken so far. We took one duplicate and one trip blank.

We will need grab two additional duplicates and an equipment blank tomorrow.

Thanks,

Dominic Mariano
Geologist III
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aecom.com

Client Name: NAVYAC	Boring/Well Name: LT-S10
Job/Site Name: RHBFSF	Utility Cleared to: 1' HAND AUGER
Location: ADITS TRENCH TANK	Total Depth: 24'
Project Number: 60574414	Date(s) Drilled: 11/2/22
Driller: GEOTEK	Screened Interval:
Drilling Method: DPT	Depth to water (first encountered):
Boring Diameter: 2"	Depth to water (static):
Logged By: ETHAN HOUSE	Location:
PG: ETHAN HOUSE	Misc. Notes:

DEPTH/ SAMPLE INTERVAL	SAMPLE TIME	SAMPLE ID	P.I.D.	RECOVERY, %	USCS CLASS	GEOLOGIC DESCRIPTION AND FIELD NOTES	COLOR	Moisture	Stiffness/Density	ESTIMATED PERCENTAGES				ESTIMATED PLASTICITY		
										Clay	Silt	Sand	Gravel			
2	0820		X	32%		BASALT - HARD, SMALL ANGULAR FRAGMENTED PIECES, VARIOUS COLORING OF MED. GRAYS TO MAROON, DRY		d/m/w					f/m/c	f/c	NL/MH	
			X					80								10
4			X						d/m/w					f/m/c	f/c	
			X													
6	0830		102.1	28%		SAME AS ABOVE (SAA) - MAINLY FILL MATERIAL, LOW RECOVERY, WET @ 5'			d/m/w						f/m/c	
			X													
8			X							d/m/w						
			X													
10			X										10	10		
			X													
12	0840		148.1	26%		CLAYEY SILT - LOW PLAS, 7.5YR3/3, SOFT, TRACE OF BASALT, MOIST.				d/m/w	SOFT					
			X													
14			X								d/m/w					
			X													
16	0847	LT-S10-17-18	169.5	100%		CLAYEY SILT - LOW PLAS, 7.5YR2.5/1, FIRM, TRACE OF BASALT, WET.					d/m/w	FIRM				
			X													
18	1005		470.4									d/m/w			10	
			X													
20			271.8													
			X													
22	0904		413.9	100%		SAA - LOW PLAS, FIRM, MOIST.						d/m/w	FIRM			
			X													
24	1010	LT-S10-23-24	189.6										d/m/w			
			X													
24			119.1										d/m/w			
			X													
24			65.1										d/m/w			
			X													
						REFUSAL @ 24'							d/m/w			
								d/m/w						f/m/c	f/c	NL/MH
								d/m/w						f/m/c	f/c	NL/MH

ONLY P.I.D. READING
 ER
 UE TO ACK OF
 RECOVERY

Client Name: <u>NAVFAC HF</u>	Boring/Well Name: <u>LT- M10</u>
Job/Site Name: <u>RHBI-SF</u>	Utility Cleared to: <u>1'</u>
Location: <u>Adit 3 Leach tank</u>	Total Depth: <u>22'</u>
Project Number: <u>60524414</u>	Date(s) Drilled: <u>1/12/22</u>
Driller: <u>Geotek</u>	Screened Interval:
Drilling Method: <u>DPT</u>	Depth to water (first encountered):
Boring Diameter:	Depth to water (static):
Logged By: <u>D. Morrison</u>	Location:
PG:	Misc. Notes:

DEPTH/ SAMPLE INTERVAL	SAMPLE TIME	SAMPLE ID	P.I.D. (ppm)	RECOVERY, %	USCS CLASS	GEOLOGIC DESCRIPTION AND FIELD NOTES	COLOR	Moisture	Stiffness/Density	ESTIMATED PERCENTAGES				ESTIMATED PLASTICITY
										Clay	Silt	Sand	Gravel	
1			↑	↑	ML	brn. sandy clay (ML) with clay silt (ML)	dark gray/bn. 10% 4/2	d/m/w	100%	30	50	10	10	NL/MH
2			↑	100			gray/bn. 10% 4/2	d/m/w						NL/MH
3			↑				gray/bn. 10% 4/2	d/m/w						NL/MH
4			↑		CL	Clay w/ minor silt	dk. gray/bn. 10% 4/2	d/m/w	med.	90	10	0	0	NL/MH
5			↓			dark gray/bn. (10% 4/2) gravel at 4.5'	reddish bn. + dk. gy	d/m/w	med.					NL/MH
6			106.2			saprolite, weathered basalt	reddish bn. + dk. gy	d/m/w	med.	30	0	0	70	NL/MH
7	1050	LT-M10-7-8 + duplicate	621.2 43.4	100%		basalt boulder, crushed.	light gray 10% 4/2	d/m/w		0	0	0	0	NL/MH
8			621.2				grayish red 5% 4/2	d/m/w	100%					NL/MH
9			516.3			saprolite, weathered basalt	reddish brown	d/m/w						NL/MH
10			296.5			soft clay silt, greenish gray 6/10GY	reddish brown	d/m/w						NL/MH
11			22.6			saprolite, dark reddish gray 5% 4/2, dark gray 5% 4/1	6/10GY + 6/10GY greenish gray	d/m/w						NL/MH
12			61.3	100%		becomes wet at 1.4' ss		d/m/w						NL/MH
13			9.1			becomes dark gray 5% 4/2, same as above, saprolite		d/m/w						NL/MH
14			3.6					d/m/w						NL/MH
15			32.9					d/m/w						NL/MH

Client Name: NAVFAC	Boring/Well Name: LT- 1010 E10
Job/Site Name: RHBFSE	Utility Cleared to: 1'
Location: ADIT 3 TRENCH TANK	Total Depth:
Project Number: 60574414	Date(s) Drilled: 1/12/22
Driller: GEOTEK	Screened Interval:
Drilling Method: DPT	Depth to water (first encountered):
Boring Diameter: 2"	Depth to water (static):
Logged By: ETHAN HOUSE	Location:
PG: ETHAN HOUSE	Misc. Notes:

DEPTH/ SAMPLE INTERVAL	SAMPLE TIME	SAMPLE ID	P.I.D.	RECOVERY, %	USCS CLASS	GEOLOGIC DESCRIPTION AND FIELD NOTES	COLOR	Moisture	Stiffness/Density	ESTIMATED PERCENTAGES				ESTIMATED PLASTICITY
										Clay	Silt	Sand	Gravel	
2	1145			80		0-2.7 - FILL - SILTY CLAY, 7.5YR3/2, STIFF, TRACE OF GRAVEL, DRY, MOD. PLAS.		d/m/w	STIFF	60	30	-	10	N/L/MH
4						2.7-3.4 - SMALL FRAGMENTS OF BASALT		d/m/w						N/L/MH
6			0.3			3.4-5 - SILTY CLAY - MOD. PLAS, 7.5YR3/3, FIRM, DAMP, 10% BASALT		d/m/w	FIRM	60	30		10	N/L/MH
8	1155	X	0.6	50		5-6.9 - SAA		d/m/w		25	25	-	50	N/L/MH
10	1325	LT-Eno -78	0.7			6.9-7.6' - SAA - 50% BASALT 7.6-8' - SILTY CLAY - SOFT, 5% BASALT FRAGMENTS, MOD PLAS, DAMP, 10R 4/6.		d/m/w		50	45		5	N/L/MH
12						REFUSAL @ 8' BGS		d/m/w						N/L/MH
14								d/m/w						N/L/MH
16								d/m/w						N/L/MH
18								d/m/w						N/L/MH
20								d/m/w						N/L/MH
22								d/m/w						N/L/MH
24								d/m/w						N/L/MH
26								d/m/w						N/L/MH
28								d/m/w						N/L/MH
30								d/m/w						N/L/MH

Client Name: NAVIFAC	Boring/Well Name: LT-NZS
Job/Site Name: RLBFSF	Utility Cleared to: 2' 2'
Location: Ad. 3 Leach Tank	Total Depth: 27.5
Project Number: 60524414	Date(s) Drilled: 1/12/21
Driller: Geotek	Screened Interval:
Drilling Method: DPT	Depth to water (first encountered):
Boring Diameter:	Depth to water (static):
Logged By: P. Manna	Location:
PG:	Misc. Notes:

DEPTH/ SAMPLE INTERVAL	SAMPLE TIME	SAMPLE ID	P.I.D.	RECOVERY, %	USCS CLASS	GEOLOGIC DESCRIPTION AND FIELD NOTES	COLOR	Moisture	Stiffness/Density	ESTIMATED PERCENTAGES				ESTIMATED PLASTICITY
										Clay	Silt	Sand	Gravel	
1						Hard cleaned		d/m/w			f/m/c	f/c	N/L/M/H	
2								d/m/w			f/m/c	f/c	N/L/M/H	
3				100	ML	Sandy silt with gravel and ^{clay} crushed coral; fill material.	dk. grey br. 10yr 4/2	d/m/w loose	10	60	20	10	N/L/M/H	
4								d/m/w			f/m/c	f/c	N/L/M/H	
5						same as above, crushed rocks as gravel		d/m/w loose	0	60	20	20	N/L/M/H	
6			3.2					d/m/w			f/m/c	f/c	N/L/M/H	
7			2.2	3/5				d/m/w			f/m/c	f/c	N/L/M/H	
8			3.9					d/m/w			f/m/c	f/c	N/L/M/H	
9			3.2					d/m/w			f/m/c	f/c	N/L/M/H	
10			2.9					d/m/w			f/m/c	f/c	N/L/M/H	
11			2.2					d/m/w			f/m/c	f/c	N/L/M/H	
12			1.8	5/5		Suprolite; reddish brown and dark grey 5yr 4/1	5yr 4/3	d/m/w ^{and dense} 30	0	30	30	0	N/L/M/H	
13			2.0					d/m/w			f/m/c	f/c	N/L/M/H	
14			7.2			color change to v. dk. grey 10yr 2/2		d/m/w			f/m/c	f/c	N/L/M/H	
			43.9					d/m/w			f/m/c	f/c	N/L/M/H	

Client Name:	Boring/Well Name: <u>LT-1025</u>
Job/Site Name:	Utility Cleared to:
Location:	Total Depth:
Project Number:	Date(s) Drilled:
Driller:	Screened Interval:
Drilling Method:	Depth to water (first encountered):
Boring Diameter:	Depth to water (static):
Logged By:	Location:
PG:	Misc. Notes:

DEPTH/ SAMPLE INTERVAL	SAMPLE TIME	SAMPLE ID	P.I.D.	RECOVERY, %	USCS CLASS	GEOLOGIC DESCRIPTION AND FIELD NOTES	COLOR	Moisture	Stiffness/Density	ESTIMATED PERCENTAGES				ESTIMATED PLASTICITY
										Clay	Silt	Sand	Gravel	
15			423.9 <u>17.5</u>	↑		Same as above, saprolite	dk. gy 10YR 3/1	d(m)/w md hmx		0	30	f(m)/c 70	f/c 0	N/L/M/H
16			17.5 <u>493.6</u>			crushed gravel		d/m/w				f/m/c	f/c	N/L/M/H
17	1336	LT-1025 -16-17	493.6 <u>392.7</u>	5/5				d/m/w				f/m/c	f/c	N/L/M/H
18			392.7 <u>113.1</u>					d/m/w				f/m/c	f/c	N/L/M/H
19			113.1 <u>3.4</u>					d/m/w				f/m/c	f/c	N/L/M/H
20			3.4 <u>18.3</u>	↓		banded staining		d/m/w				f/m/c	f/c	N/L/M/H
21			18.3					d/m/w				f/m/c	f/c	N/L/M/H
22			125.4 <u>4.5</u>	5/5				d/m/w				f/m/c	f/c	N/L/M/H
23			4.5					d/m/w				f/m/c	f/c	N/L/M/H
24			1.3					d/m/w				f/m/c	f/c	N/L/M/H
25			9.3			banded staining		d/m/w				f/m/c	f/c	N/L/M/H
26			30.1		cc	clayey (silty clay, v. dk. gy)	5YR 4/3 10YR 2/1	d(m)/w 50/7		70	30	f/m/c 0	f/c 0	N/L/M/H
27			74.9 <u>2.5</u>	2.5		Saprolite, dark grayish brown	10YR 4/2	d(m)/w		0	30	f(m)/c 70	f/c 0	N/L/M/H
27.5	1336	LT-1025 -27-27.5	2.6	↓				d/m/w				f/m/c	f/c	N/L/M/H
						end boring at 27.5' bgs		d/m/w				f/m/c	f/c	N/L/M/H

Client Name: NAVFAC	Boring/Well Name: LT-525
Job/Site Name: RHTBFSF	Utility Cleared to: 1'
Location: ADIT 3 TRENCH TANK	Total Depth:
Project Number: 60574414	Date(s) Drilled: 1/12/22
Driller: GEOTEK	Screened Interval:
Drilling Method: DPT	Depth to water (first encountered):
Boring Diameter: 2"	Depth to water (static):
Logged By: ETHAN HOUSE	Location:
PG: ETHAN HOUSE	Misc. Notes:

DEPTH/ SAMPLE INTERVAL	SAMPLE TIME	SAMPLE ID	P.I.D.	RECOVERY, %	USCS CLASS	GEOLOGIC DESCRIPTION AND FIELD NOTES	COLOR	Moisture	Stiffness/Density	ESTIMATED PERCENTAGES				ESTIMATED PLASTICITY
										Clay	Silt	Sand	Gravel	
2	0935		X	100		0-3.7' - FILL/BASALT - VARIOUS COLORING, VERY STIFF, DRY.		d/m/w	10	10	f/m/c	f/c	NL/MH	
4			X			3.7-5' - SILTY CLAY - MOD. PLAS, 7.5YR 3/3, FIRM, DRY.		d/m/w			f/m/c	f/c	NL/MH	
6			X			5-8.5 - SAME AS ABOVE, 30% BASALT, DRY.		d/m/w	70	30	f/m/c	f/c	NL/MH	
8	0940	LT-525-7-8	X	70		8.5-9.2 - CRUSHED BASALT LENSE		d/m/w	60	10	f/m/c	f/c	NL/MH	
10	1422		X			9.2-10 CLAYEY SILT W/ SAPROLITE - NO PLAS, 7.5YR 3/4, FRIABLE, DRY		d/m/w			f/m/c	f/c	NL/MH	
12	0950		X	92		10-11.7 - GRAVEL W/ CLAYEY SILT, 7.5YR 4/3, SMALL ANGULAR FRAGMENTS, DRY.		d/m/w	10	70	f/m/c	f/c	NL/MH	
14	1430	LT-525-1435	X			11.7-15' - SAPROLITE W/ TRACE OF SILT, 7.5YR 4/3, FRIABLE, DRY.		d/m/w		10	f/m/c	f/c	NL/MH	
16						TERMINATE @ 15'		d/m/w			f/m/c	f/c	NL/MH	
18								d/m/w			f/m/c	f/c	NL/MH	
20								d/m/w			f/m/c	f/c	NL/MH	
22								d/m/w			f/m/c	f/c	NL/MH	
24								d/m/w			f/m/c	f/c	NL/MH	
26								d/m/w			f/m/c	f/c	NL/MH	

Client Name: <u>NAVFAC</u>	Boring/Well Name: <u>LT-W17.5</u>
Job/Site Name: <u>RHBFSF</u>	Utility Cleared to: <u>1'</u>
Location: <u>ADIT 3 TRENCH TANK</u>	Total Depth: <u>15'</u>
Project Number: <u>60574414</u>	Date(s) Drilled: <u>1/12/22</u>
Driller: <u>GEOTEK</u>	Screened Interval:
Drilling Method: <u>DPT</u>	Depth to water (first encountered):
Boring Diameter: <u>2"</u>	Depth to water (static):
Logged By: <u>ETHAN HOUSE</u>	Location:
PG: <u>ETHAN HOUSE</u>	Misc. Notes:

DEPTH/SAMPLE INTERVAL	SAMPLE TIME	SAMPLE ID	P.I.D.	RECOVERY, %	USCS CLASS	GEOLOGIC DESCRIPTION AND FIELD NOTES	COLOR	Moisture	Stiffness/Density	ESTIMATED PERCENTAGES				ESTIMATED PLASTICITY
										Clay	Silt	Sand	Gravel	
2	1030		X			0-3' - FILL/BASALT - NO PLAS, 2.5Y 3/2, LOOSE, DRY, ORGANIC MATTER		d/m/w		25	25	f/m/c	f/c	N/L/M/H
4			X	100		3-5' - CLAY - HIGH PLAS, 2.5Y 3/3, TRACE OF BASALT, DRY; FIRM.		d/m/w		90		f/m/c	f/c	N/L/M/H
6	1035		X			ALLUVIAL - SILTY CLAY, SMALL GRAVEL, 7.5YR 5/4, FRIABLE, DRY, VERY STIFF, NO PLAS.		d/m/w	V.	35	35	f/m/c	f/c	N/L/M/H
8			X	92		8.2 - 8.5 BASALT - 7.5YR 7/1		d/m/w	T			f/m/c	f/c	N/L/M/H
10			X			SAME AS ABOVE FROM 10-12.6.		d/m/w	IF			f/m/c	f/c	N/L/M/H
12	1045		X			12.6 - 15 - SAA, 5% CRUSHED BASALT, 2.5YR 7/1, DRY, LOW PLAS, FRIABLE		d/m/w		45	45	f/m/c	f/c	N/L/M/H
14	1505	LT-W17.5 14-15	X		92			d/m/w		35	60	f/m/c	f/c	N/L/M/H
16	1604		X			TERMINATE BORING AT 15' BGS		d/m/w				f/m/c	f/c	N/L/M/H
18								d/m/w				f/m/c	f/c	N/L/M/H
20								d/m/w				f/m/c	f/c	N/L/M/H
22								d/m/w				f/m/c	f/c	N/L/M/H
24								d/m/w				f/m/c	f/c	N/L/M/H
								d/m/w				f/m/c	f/c	N/L/M/H
								d/m/w				f/m/c	f/c	N/L/M/H

Client Name: NAVFAC	Boring/Well Name: HT-N10
Job/Site Name: RHBFSF	Utility Cleared to: 1'
Location: ADIT3 HOLDING TANK	Total Depth: 24'
Project Number: 60574414	Date(s) Drilled: 1/12/22
Driller: GEOTEK	Screened Interval:
Drilling Method: DPT	Depth to water (first encountered):
Boring Diameter: 2"	Depth to water (static):
Logged By: ETHAN HOUSE	Location:
PG: ETHAN HOUSE	Misc. Notes:

DEPTH/SAMPLE INTERVAL	SAMPLE TIME	SAMPLE ID	P.I.D.	RECOVERY, %	USCS CLASS	GEOLOGIC DESCRIPTION AND FIELD NOTES	COLOR	Moisture	Stiffness/Density	ESTIMATED PERCENTAGES				ESTIMATED PLASTICITY		
										Clay	Silt	Sand	Gravel			
2	1355		X	80		0-2.7 - Fill - organic matter, roots, coral, basalt.		d/m/w				f/m/c	f/c	N/L/M/H		
4			X			2.7-5' - Silty clay - 7.5% 2-3/3, mod. plas, firm, 15% Basalt, damp.		d/m/w		50	35		15	N/L/M/H		
6			X			5-7 - Same as above		d/m/w				f/m/c	f/c	N/L/M/H		
8	1405		X	60		7-10 - Same as above, increase in basalt, damp, no plas.		d/m/w		25	25		50	N/L/M/H		
10			X			BASALT IS SMALL ANGULAR PIECES		d/m/w				f/m/c	f/c	N/L/M/H		
12	1415		X	40		SAME AS ABOVE - DAMP		d/m/w		25	25		50	N/L/M/H		
14			X					d/m/w				f/m/c	f/c	N/L/M/H		
16			X			SAPROLITE - CRUSHED BASALT, SMALL FRAGMENTS, STIFF,		d/m/w				f/m/c	f/c	N/L/M/H		
18	1435		X	60		2.5% 2-3/1, MOIST, FRIABLE, NO PLAS.		d/m/w		5	5		90	N/L/M/H		
20	1608	HT-110-19-20	X	65.5				d/m/w				f/m/c	f/c	N/L/M/H		
22	1445		X	171.5		SAME AS ABOVE		d/m/w				f/m/c	f/c	N/L/M/H		
24	1108	HT-110-24-25	X	3.5	100			d/m/w	F I R M			5	5	f/m/c	f/c	N/L/M/H
26			X	94.7				d/m/w				f/m/c	f/c	N/L/M/H		
26			X	3.5		REFUSAL @ 25'		d/m/w				f/m/c	f/c	N/L/M/H		
								d/m/w				f/m/c	f/c	N/L/M/H		

Client Name: <u>NAVEAC</u>	Boring/Well Name: <u>HT-W10</u>
Job/Site Name: <u>RHBFSF</u>	Utility Cleared to: <u>1'</u>
Location: <u>ADIT 3 HOLDING TANK</u>	Total Depth: <u>23'</u>
Project Number: <u>60574414</u>	Date(s) Drilled: <u>1/12/22</u>
Driller: <u>GEOTEK</u>	Screened Interval:
Drilling Method: <u>DPT</u>	Depth to water (first encountered):
Boring Diameter: <u>2"</u>	Depth to water (static):
Logged By: <u>ETHAN HOUSE</u>	Location:
PG: <u>ETHAN HOUSE</u>	Misc. Notes:

DEPTH/ SAMPLE INTERVAL	SAMPLE TIME	SAMPLE ID	P.I.D.	RECOVERY, %	USCS CLASS	GEOLOGIC DESCRIPTION AND FIELD NOTES	COLOR	Moisture	Stiffness/Density	ESTIMATED PERCENTAGES				ESTIMATED PLASTICITY
										Clay	Silt	Sand	Gravel	
2	1505		X	80		0-2.9 - FILL - ORGANIC MATTER, BASALT FRAGMENTS + SILTY CLAY.		d/m/w			f/m/c	f/c	N/L/M/H	
4						2.9-5' - CLAYEY SILT - 7.5YR3/2, SOFT, BASALT FRAGMENTS, LOOSE, DAMP, LOW PLAS.		d/m/w		35	45	-	30	N/L/M/H
6			X			SAPROLITE - 7.5YR3/2		d/m/w				f/m/c	f/c	N/L/M/H
8	1510		X	60		FIRM, LOOSE, BASALT FRAGMENTS, NO PLAS, DAMP.		d/m/w		5	5	-	90	N/L/M/H
		0.2	0.0					d/m/w				f/m/c	f/c	N/L/M/H
		0.6	0.0					d/m/w				f/m/c	f/c	N/L/M/H
		0.4	0.0					d/m/w				f/m/c	f/c	N/L/M/H
12	1515		X	90		10-12.5 - SAA		d/m/w				f/m/c	f/c	N/L/M/H
			0.4			12.5-15' - CLAYEY SILT - 7.5YR3/1, FIRM, LOW PLAS, DAMP.		d/m/w		10	90	-	-	N/L/M/H
14			0.5					d/m/w				f/m/c	f/c	N/L/M/H
			33.2					d/m/w				f/m/c	f/c	N/L/M/H
16	1535		0.5			SAME AS 5-10' - MOIST, STIFF, NO PLAS.		d/m/w	ST			f/m/c	f/c	N/L/M/H
18		HT-W10-18-19	4.9	100				d/m/w	FF			f/m/c	f/c	N/L/M/H
		X	194	3				d/m/w				f/m/c	f/c	N/L/M/H
20			66	5				d/m/w				f/m/c	f/c	N/L/M/H
22	1550	HT-W10-22-23	1.1	100		SAME AS ABOVE - TRACE OF SAPROLITE		d/m/w	ST	15	80	-	5	N/L/M/H
		X	0.7					d/m/w				f/m/c	f/c	N/L/M/H
24	1723		24.5					d/m/w	FF			f/m/c	f/c	N/L/M/H
			X					d/m/w				f/m/c	f/c	N/L/M/H
26						REFUSAL @ 23'		d/m/w				f/m/c	f/c	N/L/M/H
								d/m/w				f/m/c	f/c	N/L/M/H

4. RHBTSE - CTO 106 DPT Inv

11/12/22

0600 CF + EH + CF at warehouse

0610 DM at warehouse

0620 depart warehouse

0640 arrive on site

0705 JH on site.

0745 Complete site walk to review scope of work for the day. Navy staff open up fence.

Complete safety discussion. Drill rig not inspected.

late entry GeoTek on site at 0720, depart soon.

0800 begin drilling location LT-S10

0920 begin drilling location LT-M10, PCS on site for vegetation clearance

0900 CF depart to assist with ROV work in the tunnel, PCS drill LT-S10 S2S

0930 PCS return to site with veg cutting tools

0955 CF return from ROV, drill S17.5

1020 PCS complete veg clear, depart site to get a green waste bin, GeoTek begins drilling LT S17.5. boring refused at 6.5 twice.

late entry: at 1005, collect

1050 collect sample LT-N10-7-8

1058 collect sample LT-N10-1058 + duplicate

1200 Drillers depart for lunch.

1230 PCS return with roll-off bin

1-12-22 continued

¹³¹⁵~~1345~~ Angela Paolucci NAVER EX WC visit site for an update

1330 LT-N25-16-17 sample taken

1336 LT-N25-27-27.5 sample taken

~~1350~~ ~~res~~ ~~Dr~~

late entry: Driller returned to site at

1300; resume drilling at 1345. Drill

teams set up at LT-N40 and HT-N10

1405 LT-N40 refusal at ~~2~~ 8' bgs. slip out

with along fence line

1430 LT-N40 refused again at 8' and again

at 4' for each slip-out. logged the 1st

attempt only. Move on to LT-SS.

1448 HT-N10 refused at 24'. Borehole at

LT-SS & refused twice at 4'

1517 begin drilling HT-N10

1600 Drillers depart site

1650 deposit IDW in drum, all AECOM

staff depart site

1720 all of on AECOM staff return to

warehouse, end of field day. Sample

times recorded on a separate log sheet.

A total of 18 samples logged today.

1-12-22

Americas

Daily Tailgate Meeting

S3AM-209-FM5

Instructions: Conduct meeting prior to sending crews to individual tasks. Require attendance of all AECOM employees and subcontractors. Invite personnel from simultaneous operations for coordination purposes. Review scope of work and briefly discuss required and applicable topics. **This meeting is a daily refresher, not a full orientation.** Task-specific discussions associated with Task Hazard Assessment (THA) follow this meeting at the task location immediately before individual task is started.

AECOM Supervisor Name: Dominic Marano
Phone Number: 310-625-1243
AECOM SH&E Rep. Name: Devon Medina
Phone Number: 858-531-9666
Meeting Leader: _____

Date: 1/12/22	Project Name/Location: Adit 3 Leach tank	Project Number: 60574414
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Today's Scope of Work:
 DPT Investigation
 Adit 3 Leach tank

Muster Point Location: Adit 3	First Aid Kit Location: Field Vehicle	Fire Extinguisher Location: Field Vehicle / Drill Rig	Spill Kit Location: Drill Rig
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<p>1. Required Topics</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Fitness for Duty requirements, all sign in / sign out <input checked="" type="checkbox"/> Required training (incl. task specific) completed and current <input checked="" type="checkbox"/> SH&E Plan onsite - understood, reviewed, signed by all (incl. scope, preplanning hazard assessments / risk registers, controls, procedures, requirements, etc.) <input checked="" type="checkbox"/> Task Hazard Assessments (THAs) are to be reviewed and completed for each task immediately prior to conducting <input checked="" type="checkbox"/> STOP WORK Right & Responsibility- all task changes/changed conditions re-assess with THA <input checked="" type="checkbox"/> Requirement to report to supervisor any injury, illness, damage, near miss, unsafe act / condition <input checked="" type="checkbox"/> Emergency Response Plan – including muster point, first aid kit, fire extinguisher, clinic/hospital location <input checked="" type="checkbox"/> Personal Protective Equipment (PPE) - Required items per hazard assessments in good condition / in use by all <input checked="" type="checkbox"/> Equipment/machinery inspected (documented as required) and in good condition - operators properly trained/certified <input checked="" type="checkbox"/> Work area set up and demarcation/ barricades in place to protect workers, site staff, and the public <input checked="" type="checkbox"/> Required checklists/records available, understood (describe): <input type="checkbox"/> Lessons Learned / SH&E improvements (describe): 	<p>2. Discuss if Applicable to Today's Work</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> Check <input checked="" type="checkbox"/> as reviewed or mark <input type="checkbox"/> as not applicable</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> <input type="checkbox"/> Biological/ Chemical / Electrical Hazards <input checked="" type="checkbox"/> <input type="checkbox"/> Ergonomics - Lifting, Body Position <input type="checkbox"/> <input checked="" type="checkbox"/> Lock Out/ Tag Out Short Service Employees - visual identifier and mentor/ oversight assignment <input checked="" type="checkbox"/> <input type="checkbox"/> Simultaneous/ Neighbouring Operations <input checked="" type="checkbox"/> <input type="checkbox"/> Slip/ Trip/ Fall Hazards <input checked="" type="checkbox"/> <input type="checkbox"/> Specialized PPE Needs <input type="checkbox"/> <input checked="" type="checkbox"/> Traffic Control <input checked="" type="checkbox"/> <input type="checkbox"/> Waste Management/ Decontamination <input checked="" type="checkbox"/> <input type="checkbox"/> Weather Hazards / Heat Stress / Cold Stress <input checked="" type="checkbox"/> <input type="checkbox"/> Subcontractor Requirements (e.g., JHAs, THAs, procedures, reporting, etc.) <input checked="" type="checkbox"/> <input type="checkbox"/> Work Permits / Plans required (e.g., Fall Protection, Confined Space, Hot Work, Critical Lifts, etc.); in place, understood (identify/attach): <input type="checkbox"/> <input type="checkbox"/> Other Topics (describe/attach): <input type="checkbox"/> <input type="checkbox"/> Client specific requirements (describe):
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3. Daily Check Out by Site Supervisor

Describe incidents, near misses, observations or Stop Work interventions from today:	Describe Lessons Learned/ Improvement Areas from today:
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The site is being left in a safe condition and work crew checked out as fit unless otherwise specified as above.

Site Supervisor Name Dominic Marano	Signature 	Date 1-12-22 Time (at end of day / shift) 1750
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Worker Acknowledgement / Sign In Sign Out sheets applicable to this meeting are on reverse and, if applicable, attached.

All employees:

- STOP WORK if concerned / uncertain about safety / hazard or additional precaution is not recorded on the THA.
- Be alert and communicate any changes in personnel or conditions at the worksite to the supervisor.
- Reassess task, hazards, & mitigations on an ongoing basis; amend the THA if needed.

SITE WORKERS (including AECOM Contractors and Subcontractors): Your signature below means that you understand:

- * The requirement to participate in creating, reviewing, & updating hazard assessments (THA) applicable to your task(s).
- * The hazards & control measures associated with each task you are about to perform.
- * The permit to work requirements applicable to the work you are about to perform (if it includes permitted activities).
- * That no tasks or work is to be performed without a hazard assessment.
- * Your authority & obligation to "Stop Work" intervene, speak up/ listen up.

Your initials (right columns) certify that you arrived & departed fit for duty, & have reported all incidents/near misses; meaning:

- * You are physically and mentally fit for duty and have inspected your required PPE to ensure satisfactory condition.
- * You are not under the influence of any type of medication, drugs, or alcohol that could affect your ability to work safely.
- * You are aware of your responsibility to immediately report any illness, injury (regardless of where or when it occurred), or impairment/fatigue issue to the AECOM Supervisor.
- * You signed out as fit / uninjured unless you have otherwise informed the AECOM Supervisor.

Print Name & Company	Signature	Initials & Sign In Time	Initials & Sign Out Time
ETHAN HOUSE AECOM		EAH In & Fit 0700	Out & Fit
James Nutter AECOM		JN In & Fit 0700	Out & Fit
Chris Capobianco		CC In & Fit 730	Out & Fit
Jon Shjeystad GTH		JS In & Fit 0730	Out & Fit
Coli Ferguson AECOM		CF In & Fit 0730	Out & Fit
JEFF S. MAW		JSM In & Fit 0730	Out & Fit 0750
Bobo Outierres GTH		BO In & Fit 730	Out & Fit
Dominic Mariani		DM In & Fit 0730	Out & Fit
JCEPK JR. TILLI GAW 10XPO P GROFF.T		JTG In & Fit 0745	Out & Fit 1300
		G In & Fit	Out & Fit

(Attach additional Site Worker sign-in/out sheets if needed) Identify number of attached sheets: _____

SITE VISITOR / SITE REPRESENTATIVE				
Name	Company Name	Arrival Time	Departure Time	Signature

LT-W25-14-15	13:35	1/11/2022
Trip Blank 1	14:45	1/11/2022
LT-W55-17-18	14:55	1/11/2022
LT-W10-11-12	15:20	1/11/2022
LT-W10-19-20	16:02	1/11/2022
LT-S10-17-18	10:05	1/12/2022
LT-S10-23-24	10:10	1/12/2022
LT-N10-7-8	10:50	1/12/2022
LT-N10-7-8 DUP	10:50	1/12/2022
LT-N10-21-22	10:58	1/12/2022
LT-N10-24-25	11:08	1/12/2022
LT-E10-7-8	13:25	1/12/2022
LT-N25-16-17	13:36	1/12/2022
LT-N25-27-27.5	13:36	1/12/2022
LT-S17.5-5-6	13:43	1/12/2022
LT-S25-7-8	14:22	1/12/2022
LT-S25-14-15	14:30	1/12/2022
LT-W17.5-12-13	15:05	1/12/2022
LT-N40-7-8	15:42	1/12/2022
LT-W17.5-14-15	16:04	1/12/2022
HT-N10-19-20	16:08	1/12/2022
HT-W10-22-23	17:23	1/12/2022
HT-W10-18-19	17:29	1/12/2022

From: Mariano, Dominic
Sent: Thursday, January 13, 2022 6:31 PM
To: Maman, Alex; Hart, Jeff
Cc: House, Ethan; Ferguson, Colin; Nutter, James; Pascua, Margie; Ramos, Alethea
Subject: RE: CTO 22F0106 Dailies
Attachments: Sample_List_011322.xlsx

Here is the complete sample list from this week

Dominic Mariano
Geologist III
D +1 808-529-7271
dominic.mariano@aecom.com

AECOM
1001 Bishop St
Suite 1600
Honolulu, HI, 96813, USA
T +1 808-521-3051
aecom.com

From: Mariano, Dominic
Sent: Thursday, January 13, 2022 18:25
To: Maman, Alex <alexandre.maman@aecom.com>; Hart, Jeff <Jeff.Hart@aecom.com>
Cc: House, Ethan <Ethan.House@aecom.com>; Ferguson, Colin <Colin.Ferguson@aecom.com>; Nutter, James <james.nutter@aecom.com>; Pascua, Margie <Margie.Pascua@aecom.com>; Ramos, Alethea <alethea.ramos@aecom.com>
Subject: CTO 22F0106 Dailies

Alex, Jeff,

Here are today's dailies.

We completed the DPT investigation by completing step-out borings in accessible locations. We collected a composite sample from the 'sludge' at the bottom of the leach tank.

Jocelyn Tamashiro came by in the early afternoon to observe and get an update on our progress. We had no visitors from DOH or the state today.

We also took an equipment blank off one of the drill rig shoes.

All soil samples are in the freezer
The equipment blank is in the Red Hill Fridge

Thanks to Ethan, James, and Colin for stepping in to execute as best we could with such a short preparation window.
Extra special thank you to chemistry and shipping teams for helping get our bottle sets together and samples shipped out!

I took measurements and photos of our boring locations at the end of the day. Tomorrow I will put together a plot of the locations as drilled showing delineation.

Thanks,

Dominic Mariano
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Client Name: <u>NAVFAC</u>	Boring/Well Name: <u>HT- E10</u>
Job/Site Name: <u>CHBFSF</u>	Utility Cleared to: <u>1'</u>
Location: <u>ADIT 3 Leach tank</u>	Total Depth: <u>24'</u>
Project Number: <u>60574414</u>	Date(s) Drilled: <u>1/13/22</u>
Driller: <u>Geo Tek</u>	Screened Interval:
Drilling Method: <u>DPT</u>	Depth to water (first encountered):
Boring Diameter:	Depth to water (static):
Logged By: <u>D. Mariano</u>	Location:
PG:	Misc. Notes:

DEPTH/ SAMPLE INTERVAL	SAMPLE TIME	SAMPLE ID	P.I.D.	RECOVERY, %	USCS CLASS	GEOLOGIC DESCRIPTION AND FIELD NOTES	COLOR	Moisture	Stiffness/Density	ESTIMATED PERCENTAGES				ESTIMATED PLASTICITY	
										Clay	Silt	Sand	Gravel		
								d/m/w				f/m/c	f/c	N/L/M/H	
1					MC	Coarsely silty (MC) w/ sand and clay. Gill material.	dk. br 7.9 1/2	d/m/w dense		10	60	10	20		N/L/M/H
2				100%			br. 10 1/2 1/4	d/m/w				f/m/c	f/c	N/L/M/H	
3							gray 7.5 1/2 1/8	d/m/w				f/m/c	f/c	N/L/M/H	
4								d/m/w				f/m/c	f/c	N/L/M/H	
5				*		crushed boulder		d/m/w				f/m/c	f/c	N/L/M/H	
6			0.8									f/m/c	f/c	N/L/M/H	
7			0.1	4/5	LL	clay, stiff.	10 1/2 4/3	d/m/w stiff		100	0	0	0		N/L/M/H
8			0.7				brn	d/m/w				f/m/c	f/c	N/L/M/H	
9			1.1			crushed boulders, light gray 10 1/2 3/4 yach br 10 1/2 5/8		d/m/w				f/m/c	f/c	N/L/M/H	
10			1.3					d/m/w				f/m/c	f/c	N/L/M/H	
11			0.8		ML	Saprolite, weathered to silt with clay, very dark brown	10 1/2 2/2	d/m/w med. stiff		10	90	0	0		N/L/M/H
12			2.0					d/m/w				f/m/c	f/c	N/L/M/H	
13			1.0	4/5	SC	saprolite, weathered to sandy clayey sand. fine angular sand > pale brown layer 10 1/2 3/4	10 1/2 2/2	d/m/w stiff dense		30	0	70	0		N/L/M/H
14			0.7				v. dk. gray	d/m/w				f/m/c	f/c	N/L/M/H	
15			1.3		ML	Saprolite, weathered to silt/clay v. dk. gr.	v. dk. gray 10 1/2 3/1	d/m/w med. stiff		10	90	0	0		N/L/M/H

Client Name: NAVEAC HF	Boring/Well Name: HT - E17.5
Job/Site Name: RHBFSF	Utility Cleared to: 1'
Location: ADIT 3 laeach tank	Total Depth: 15'
Project Number: 60524414	Date(s) Drilled: 1-13-21
Driller: GeoTek Hawaii	Screened Interval:
Drilling Method: Direct Push	Depth to water (first encountered):
Boring Diameter:	Depth to water (static):
Logged By: D. Mawoo	Location:
PG:	Misc. Notes:

DEPTH/SAMPLE INTERVAL	SAMPLE TIME	SAMPLE ID	P.I.D.	RECOVERY, %	USCS CLASS	GEOLOGIC DESCRIPTION AND FIELD NOTES	COLOR	Moisture	Stiffness/Density	ESTIMATED PERCENTAGES				ESTIMATED PLASTICITY
										Clay	Silt	Sand	Gravel	
1								d/m/w			f/m/c	f/c	N/L/M/H	
2				↑	ML	Coarsely sandy silt, coral gravel	dark grey br. 10yr 4/2	d/m/w	loose		60	10	30	N/L/M/H
3				4/4		→ color change to dark yellowish brown 10yr 3/4, less gravel	whit 0yr 2 1/2	d/m/w	and dense	10	70	10	10	N/L/M/H
4						less gravel + or		d/m/w						N/L/M/H
5				*			10yr 4/3 brown	d/m/w						N/L/M/H
6			0.5			crushed boulder		d/m/w						N/L/M/H
7			0.2					d/m/w						N/L/M/H
8	1300	HT-E17.5 7-8	0.5			crushed boulder		d/m/w						N/L/M/H
9			0.2		ML	silt + clay	dark yellowish brown 10yr 2 1/2	d/m/w	v. dense	20	80	0	0	N/L/M/H
10			0.3			crushed boulder		d/m/w						N/L/M/H
11			0.1			med' gravel, rounded, moist		d/m/w		20	70	0	10	N/L/M/H
12			0.2					d/m/w						N/L/M/H
13			0.2					d/m/w						N/L/M/H
14	1315	HT-E17.5 -14-15	0.2		SM	stagnant sand weathered sup. silt. silty sand end of boring at 15' bgs	v. dark grey br. 10yr 2 1/2	d/m/w	dense	30	70	0	0	N/L/M/H

Client Name: <u>NAVFAC HI</u>	Boring/Well Name: <u>HT-E25</u>
Job/Site Name: <u>RTHBEXF</u>	Utility Cleared to: <u>1'</u>
Location: <u>Ad. 13 beach bank</u>	Total Depth: <u>15'</u>
Project Number: <u>60574414</u>	Date(s) Drilled: <u>1/13/22</u>
Driller: <u>Geotek HI</u>	Screened Interval:
Drilling Method: <u>DPT</u>	Depth to water (first encountered):
Boring Diameter:	Depth to water (static):
Logged By: <u>D. Mariano</u>	Location:
PG:	Misc. Notes:

DEPTH/ SAMPLE INTERVAL	SAMPLE TIME	SAMPLE ID	P.I.D.	RECOVERY, %	USCS CLASS	GEOLOGIC DESCRIPTION AND FIELD NOTES	COLOR	Moisture	Stiffness/Density	ESTIMATED PERCENTAGES				ESTIMATED PLASTICITY
										Clay	Silt	Sand	Gravel	
1								d/m/w			f/m/c	f/c	N/L/M/H	
2					ML	Gravelly silt w/ sand and clay, Fill material	dk/bn 7.5% 3/4	⊙ m/w loose		10	60	f/m/c 10	f/c 20	N/L/M/H
3				4/4	CL ML	Silt w/ minor sand and gravel brown dark grayish brown 10% 4/4	bn 10% 4/4 dark g 7.5% 4/4	d/m/w dense		10	70	f/m/c 10	f/c 10	N/L/M/H
4						crushed con		d/m/w				f/m/c	f/c	N/L/M/H
5						crushed basalt boulder. becomes extremely dense at 5'		⊙ m/w	extremely dense			f/m/c	f/c	N/L/M/H
6			0.4			no plasticity, dry		d/m/w				f/m/c	f/c	N/L/M/H
7			1.6			same as above		d/m/w				f/m/c	f/c	N/L/M/H
8	1235	HT-E25-7-8	1.5	5/5				d/m/w				f/m/c	f/c	N/L/M/H
9			0.9					d/m/w				f/m/c	f/c	N/L/M/H
10			0.8					d/m/w				f/m/c	f/c	N/L/M/H
11		no soil	0.8			crushed basalt boulders, gray 10% 6'		d/m/w				f/m/c	f/c	N/L/M/H
12			1.1			light		d/m/w				f/m/c	f/c	N/L/M/H
13			0.1	15	CL	Clay (CL) w silt	yellowish brown 10% 3/4	⊙ m/w hard stiff		80	20	f/m/c 0	f/c 0	N/L/M/H
14			0.3		SC			d/m/w				f/m/c	f/c	N/L/M/H
14	1245	HT-E25-14-15	0.0			weathered saprolite	v. dark grayish bn 10% 3/4	d/m/w dense		30	0	f/m/c 70	f/c 0	N/L/M/H

and at 15'

f

Client Name: <u>NAVFAC HI</u>	Boring/Well Name: <u>HT-N2S</u>
Job/Site Name: <u>RHBFSF</u>	Utility Cleared to: <u>1'</u>
Location: <u>Adit 3 leach tank</u>	Total Depth: <u>15'</u>
Project Number: <u>60574414</u>	Date(s) Drilled: <u>1-13-21</u>
Driller: <u>GeoTek Hawaii</u>	Screened Interval:
Drilling Method: <u>Direct Push</u>	Depth to water (first encountered):
Boring Diameter:	Depth to water (static):
Logged By: <u>D. Muriung</u>	Location:
PG:	Misc. Notes:

DEPTH/ SAMPLE INTERVAL	SAMPLE TIME	SAMPLE ID	P.I.D.	RECOVERY, %	USCS CLASS	GEOLOGIC DESCRIPTION AND FIELD NOTES	COLOR	Moisture	Stiffness/Density	ESTIMATED PERCENTAGES				ESTIMATED PLASTICITY
										Clay	Silt	Sand	Gravel	
1								d/m/w			f/m/c	f/c	N/L/MH	
2				4/4	ML	Coarsely silt	10% 2% dark gray	d/m/w	max	0	60	10	30	N/L/MH
3						← crushed basalt boulder		d/m/w						N/L/MH
4								d/m/w						N/L/MH
5			0.0	*	ML	Clayey silt	dark yush br.	d/m/w	sh/7	30	70	0	0	N/L/MH
6			0.0				10% 5/4	d/m/w						N/L/MH
7			0.0	5/5				d/m/w						N/L/MH
8			0.2					d/m/w						N/L/MH
9			0.2					d/m/w						N/L/MH
10	1415 dup	HT-N2S 10-11	5.2	*	ML	Coarsely silt, dry, friable	dk. yush br	d/m/w	sh/6	30	70	0	0	N/L/MH
11	1425 Dup	Dup	0.5				10% 4/9	d/m/w						N/L/MH
12			0.0	5/5				d/m/w						N/L/MH
13			0.4		SM	Silty sand	v. dk. gy	d/m/w	dk. mod. dense	0	30	70	0	N/L/MH
14	1401 dup	HT-N2S 14-15	0.0					d/m/w						N/L/MH
15				↓										

+ Dup
end of boring at 15' bgs

Client Name: NAVFAC	Boring/Well Name: HT-510
Job/Site Name: RHBFSF	Utility Cleared to: 1'
Location: ADIT 3 HOLDING TANK	Total Depth: 18'
Project Number: 60574414	Date(s) Drilled: 1/13/22
Driller: GEOTEK	Screened Interval:
Drilling Method: DPT	Depth to water (first encountered):
Boring Diameter: 2"	Depth to water (static):
Logged By: ETHAN HOUSE	Location:
PG: ETHAN HOUSE	Misc. Notes:

DEPTH/ SAMPLE INTERVAL	SAMPLE TIME	SAMPLE ID	P.I.D.	RECOVERY, %	USCS CLASS	GEOLOGIC DESCRIPTION AND FIELD NOTES	COLOR	Moisture	Stiffness/Density	ESTIMATED PERCENTAGES				ESTIMATED PLASTICITY
										Clay	Silt	Sand	Gravel	
2	0915		X	100		SILTY CLAY - MOD. PLAS, 7.5YR3/2, STIFF, DAMP, TRACE OF BASALT + CORAL		d/m/w		60	30	f/m/c	f/c	N/L/MH
4			X					d/m/w				f/m/c	f/c	N/L/MH
6			X					d/m/w				f/m/c	f/c	N/L/MH
6	0920		0.0	100		5-6' - SAA								
8			0.0			6-10 - SAPROLITE - 7.5YR3/2, COARSE GRAINED, STIFF, FRIABLE, DAMP, NO PLAS,		d/m/w		5		f/m/c	f/c	N/L/MH
8			0.0					d/m/w				f/m/c	f/c	N/L/MH
10			88.3											88
12	0930		1.2	90		BASALT - 5YR7/1, SMALL ANGULAR FRAGMENTS, SOME PULVERIZED, STIFF, LOOSE, DRY		d/m/w		10		f/m/c	f/c	N/L/MH
14			2.3			13.3 - 15' - CLAYEY SILT - LOW PLAS, SOFT, 7.5YR3/2, DAMP.		d/m/w		30	65	f/m/c	f/c	N/L/MH
14			0.3					d/m/w				f/m/c	f/c	N/L/MH
16	1140 →	X	0.3					d/m/w		30	65	f/m/c	f/c	N/L/MH
16			318.3	3		CLAYEY SILT - LOW PLAS, SOFT, 2.5YR3/2, DAMP.		d/m/w				f/m/c	f/c	N/L/MH
18	0940		308.7	100		17-18' - SAPROLITE - 7.5YR3/2, MED TO COARSE GRAINED, STIFF, FRIABLE, WET.		d/m/w				f/m/c	f/c	N/L/MH
18	1135 →	X	33.8					d/m/w		10		f/m/c	f/c	N/L/MH
20														90
22						REFUSAL @ 18'		d/m/w				f/m/c	f/c	N/L/MH
24								d/m/w				f/m/c	f/c	N/L/MH
26								d/m/w				f/m/c	f/c	N/L/MH
								d/m/w				f/m/c	f/c	N/L/MH

Client Name: NAVFAC	Boring/Well Name: HT-517.5
Job/Site Name: RHBSF	Utility Cleared to: 1
Location: ADIT 3 HOLDING TANK	Total Depth: 9'
Project Number: 60574414	Date(s) Drilled: 1/13/22
Driller: GEOTEK	Screened Interval:
Drilling Method: DPT	Depth to water (first encountered):
Boring Diameter: 2"	Depth to water (static):
Logged By: ETHAN HOUSE	Location:
PG: ETHAN HOUSE	Misc. Notes:

DEPTH/SAMPLE INTERVAL	SAMPLE TIME	SAMPLE ID	P.I.D.	RECOVERY, %	USCS CLASS	GEOLOGIC DESCRIPTION AND FIELD NOTES	COLOR	Moisture	Stiffness/Density	ESTIMATED PERCENTAGES				ESTIMATED PLASTICITY	
										Clay	Silt	Sand	Gravel		
2	1110		X	95		FILL - MIX OF BASALT, SOIL, CORAL + ORGANIC MATER, DRY + SOFT		d/m/w				f/m/c	f/c	N/L/M/H	
			X							30	30	-	40		
4			X				3.8-5' - SILTY CLAY - MOD. PLAS, 7.5% R ³ /L, STIFF, DAMP, MOD PLAS		d/m/w				f/m/c	f/c	N/L/M/H
			X				TRACE OF BASALT, DRY.		d/m/w				f/m/c	f/c	N/L/M/H
6			0.3	100		SAME AS ABOVE - VERY STIFF, TRACE OF BASALT, DRY.		d/m/w		50	45		5		
8	1115	HT-517.5 - 8.9	0.3						d/m/w				f/m/c	f/c	N/L/M/H
			1.3												
10	1220	X	0.3			8.5-9' BASALT - 5% R ³ /L, SMALL ANGULAR FRAGMENTS, STIFF, LOOSE, DRY		d/m/w				f/m/c	f/c	N/L/M/H	
			X			REFUSAL AT 9'		d/m/w				f/m/c	f/c	N/L/M/H	
12								d/m/w				f/m/c	f/c	N/L/M/H	
14								d/m/w				f/m/c	f/c	N/L/M/H	
16								d/m/w				f/m/c	f/c	N/L/M/H	
18								d/m/w				f/m/c	f/c	N/L/M/H	
20								d/m/w				f/m/c	f/c	N/L/M/H	
22								d/m/w				f/m/c	f/c	N/L/M/H	
24								d/m/w				f/m/c	f/c	N/L/M/H	
26								d/m/w				f/m/c	f/c	N/L/M/H	
28								d/m/w				f/m/c	f/c	N/L/M/H	
30								d/m/w				f/m/c	f/c	N/L/M/H	

Client Name: NAVFAC	Boring/Well Name: HT-S25
Job/Site Name: RHRSF	Utility Cleared to: 1'
Location: ADIT3 HOLDING TANK	Total Depth: 15'
Project Number: 605 74414	Date(s) Drilled: 1/13/22
Driller: GEOTEK	Screened Interval:
Drilling Method: DPT	Depth to water (first encountered):
Boring Diameter: 2"	Depth to water (static):
Logged By: ETHAN HOUSE	Location:
PG: ETHAN HOUSE	Misc. Notes:

DEPTH/ SAMPLE INTERVAL	SAMPLE TIME	SAMPLE ID	P.I.D.	RECOVERY, %	USCS CLASS	GEOLOGIC DESCRIPTION AND FIELD NOTES	COLOR	Moisture	Stiffness/Density	ESTIMATED PERCENTAGES				ESTIMATED PLASTICITY
										Clay	Silt	Sand	Gravel	
2	955		X			0-3' - FILL - MIX OF BASALT, SOIL, CORAL + ORGANIC MATTER, DRY.		d/m/w			f/m/c	f/c	N/L/MH	
4			X			3-5' - SILTY CLAY - MOD. PLAS, 7.5YR3/2, STIFF, DAMP, TRACE OF BASALT		d/m/w		55	40	5	N/L/MH	
6			X			5-8' - SAA - INCREASE IN TBASALT, DRY,		d/m/w		40	40	20	N/L/MH	
8	1000		X			8-10' - BASALT - SYR7/1, SMALL ANGULAR FRAGMENTS, STIFF, LOOSE DRY		d/m/w		5	5	90	N/L/MH	
10	1150		X			10-11.2 - SAA		d/m/w		5	5	90	N/L/MH	
12	1010		X			11.2-13' - SAME AS 3-5'		d/m/w		55	40	5	N/L/MH	
14	1155		X			13-15' - SAPROLITE - 7.5YR3/2, MED. GRAINED, STIFF, FRIABLE, DRY.		d/m/w		5	5	90	N/L/MH	
16						TERMINATE BORING AT 15' BGS		d/m/w					N/L/MH	
18								d/m/w					N/L/MH	
20								d/m/w					N/L/MH	
22								d/m/w					N/L/MH	
24								d/m/w					N/L/MH	
26								d/m/w					N/L/MH	
28								d/m/w					N/L/MH	
30								d/m/w					N/L/MH	

6 RUBESIF - CTO 0126 DPT Inv. 1/13/22

0700 SUT EHT+CMF arrive at Warehouse

0715 DM arrive at warehouse, hand paperwork to rest of team, return to office to get missing ID Badge

0800 SUT EHT+CMF meet Geotek on site, EHT lead tailgate meeting

0900 DM arrive on site, Geotek begin DPT operations at HT-~~S10~~^{S10} and HT-~~N25~~

HT-E10 simultaneously. CME calibrate PIDs
Objective: DPT investigation to delineate contaminants from leach tank and holding tank near Adif 3.

Staff: AECOM (D. Mariano, E. House, C. Ferguson, J. Nutter) Geotek Hawaii (J. Skjogsted, G. Gutierrez, Chris Capobianco, C. Nix)

Weather: 75°-80°, 75% humidity, sunny

Equipment: Mini Rac SW 914105, 908699

0418 ~~S10~~ HTS10 refused at 18'

0450 drill stop-outs at HT-S25 and HT-E25

1100 drill stop-outs at HT-S17.5 and HT-E17.5

1115 HT-S17.5 refused twice at 8' and 9', 3-ft off set.

1230 complete HT-N25 ~~OWD6B~~ x ~~HTN25~~
~~OWD6A~~ x

1315 Geotek depart site

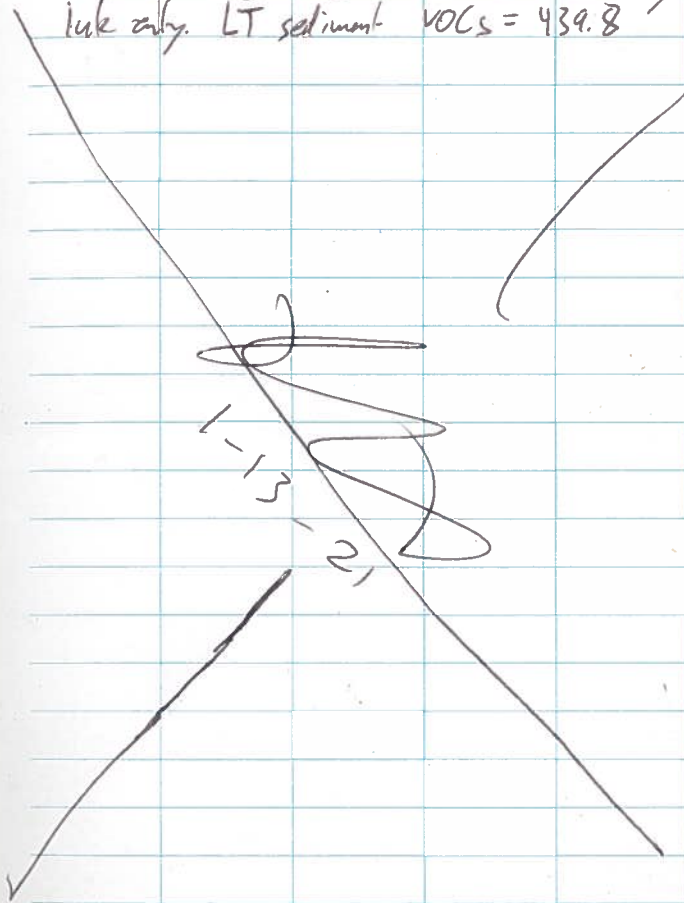
1330 Geotek

1/13/22 continued

1515 Geotek return to G11 ~~sample~~ hole that were missed. AECOM plot out actual boring locations

1524 IDW in down, AECOM staff depart site.

1552 Return to warehouse, update sample tracking log and of field day. Ink only. LT sediment VOCs = 439.8



Americas

Daily Tailgate Meeting

S3AM-209-FM5

Instructions: Conduct meeting prior to sending crews to individual tasks. Require attendance of all AECOM employees and subcontractors. Invite personnel from simultaneous operations for coordination purposes. Review scope of work and briefly discuss required and applicable topics. **This meeting is a daily refresher, not a full orientation.** Task-specific discussions associated with Task Hazard Assessment (THA) follow this meeting at the task location immediately before individual task is started.

AECOM Supervisor Name: <i>Dominic Mariano</i>
Phone Number: <i>310-625-1287</i>
AECOM SH&E Rep. Name: Devon Molitor
Phone Number: 858-531-9666
Meeting Leader: <i>ETHAN HOUSE</i>

Date: <i>1/13/22</i>	Project Name/Location: <i>RK and IE - Lock Tank</i>	Project Number: <i>60571032</i>
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Today's Scope of Work:
- DPI Investigation
- Adit 3 Holdy tank

Muster Point Location: <i>Adit 3</i>	First Aid Kit Location: <i>field vehicles</i>	Fire Extinguisher Location: <i>field vehicles / Drill rig</i>	Spill Kit Location: <i>Drill Rig</i>
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1. Required Topics	2. Discuss if Applicable to Today's Work
<input checked="" type="checkbox"/> Fitness for Duty requirements, all sign in / sign out <input checked="" type="checkbox"/> Required training (incl. task specific) completed and current <input checked="" type="checkbox"/> SH&E Plan onsite - understood, reviewed, signed by all (incl. scope, hazards, controls, procedures, requirements, etc.) <input checked="" type="checkbox"/> Pre-Job Hazard Assessments (JHA/JSAs) available and understood <input checked="" type="checkbox"/> Task Hazard Assessments (THAs) are to be completed for each task immediately prior to conducting <input checked="" type="checkbox"/> STOP WORK Right & Responsibility- all task changes/changed conditions re-assess with THA <input checked="" type="checkbox"/> Requirement to report to supervisor any injury, illness, damage, near miss, unsafe act / condition <input checked="" type="checkbox"/> Emergency Response Plan – including muster point, first aid kit, fire extinguisher, clinic/hospital location <input checked="" type="checkbox"/> Personal Protective Equipment (PPE) - Required items per hazard assessments in good condition / in use by all <input checked="" type="checkbox"/> Equipment/machinery inspected (documented as required) and in good condition - operators properly trained/certified <input checked="" type="checkbox"/> Work area set up and demarcation/ barricades in place to protect workers, site staff, and the public <input checked="" type="checkbox"/> Required checklists/records available, understood (describe): <input type="checkbox"/> Lessons Learned / SH&E improvements (describe):	<input checked="" type="checkbox"/> <input type="checkbox"/> Check <input checked="" type="checkbox"/> as reviewed or mark <input type="checkbox"/> as not applicable <input checked="" type="checkbox"/> <input type="checkbox"/> Biological/ Chemical / Electrical Hazards <input checked="" type="checkbox"/> <input type="checkbox"/> Ergonomics - Lifting, Body Position <input type="checkbox"/> <input checked="" type="checkbox"/> Lock Out/ Tag Out <input type="checkbox"/> <input checked="" type="checkbox"/> Short Service Employees - visual identifier and mentor/ oversight assignment <input checked="" type="checkbox"/> <input type="checkbox"/> Simultaneous/ Neighbouring Operations <input checked="" type="checkbox"/> <input type="checkbox"/> Slip/ Trip/ Fall Hazards <input checked="" type="checkbox"/> <input type="checkbox"/> Specialized PPE Needs <input type="checkbox"/> <input checked="" type="checkbox"/> Traffic Control <input checked="" type="checkbox"/> <input type="checkbox"/> Waste Management/ Decontamination <input checked="" type="checkbox"/> <input type="checkbox"/> Weather Hazards / Heat Stress / Cold Stress <input checked="" type="checkbox"/> <input type="checkbox"/> Subcontractor Requirements (e.g., JHAs, THAs, procedures, reporting, etc.) <input checked="" type="checkbox"/> <input type="checkbox"/> Work Permits / Plans required (e.g., Fall Protection, Confined Space, Hot Work, Critical Lifts, etc.); in place, understood (identify/attach): <input type="checkbox"/> <input type="checkbox"/> Other Topics (describe/attach): <input type="checkbox"/> <input type="checkbox"/> Client specific requirements (describe):

3. Daily Check Out by Site Supervisor	
Describe incidents, near misses, observations or Stop Work interventions from today:	Describe Lessons Learned/ Improvement Areas from today:

The site is being left in a safe condition and work crew checked out as fit unless otherwise specified as above.

Site Supervisor Name <i>ETHAN HOUSE</i>	Signature <i>Ethan House</i>	Date <i>1-13-22</i> Time (at end of day / shift) <i>1700</i>
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Worker Acknowledgement / Sign In Sign Out sheets applicable to this meeting are on reverse and, if applicable, attached.

All employees:

- **STOP WORK** if concerned / uncertain about safety / hazard or additional precaution is not recorded on the THA.
- **Be alert and communicate any changes in personnel or conditions at the worksite to the supervisor.**
- **Reassess task, hazards, & mitigations on an ongoing basis; amend the THA if needed.**

SITE WORKERS (including AECOM Contractors and Subcontractors): Your signature below means that you understand:

- * The requirement to participate in creating, reviewing, & updating hazard assessments (THA) applicable to your task(s).
- * The hazards & control measures associated with each task you are about to perform.
- * The permit to work requirements applicable to the work you are about to perform (if it includes permitted activities).
- * That no tasks or work is to be performed without a hazard assessment.
- * Your authority & obligation to "Stop Work" intervene, speak up/ listen up.

Your initials (right columns) certify that you arrived & departed fit for duty, & have reported all incidents/near misses; meaning:

- * You are physically and mentally fit for duty.
- * You are not under the influence of any type of medication, drugs, or alcohol that could affect your ability to work safely.
- * You are aware of your responsibility to immediately report any illness, injury (regardless of where or when it occurred), or impairment/fatigue issue to the AECOM Supervisor.
- * You signed out as fit / uninjured unless you have otherwise informed the AECOM Supervisor.

Print Name & Company	Signature	Initials & Sign In Time	Initials & Sign Out Time
ETHAN HOUSE AECOM		EAH In & Fit 0700	Out & Fit 1700
James Nuth AECOM		JN In & Fit 0700	Out & Fit 1700
Colin Ferguson AECOM		In & Fit 0700	Out & Fit 1700
Chad Nix GTH		In & Fit 0800 CN	Out & Fit 1330 CN
Chris Ruppel AECOM		In & Fit 0700 CR	Out & Fit 1330 CR
Jon Skjegstad GTH		In & Fit 0800 JS	Out & Fit 1330 JS
Dominic Mamuro		In & Fit 0900 DM	Out & Fit 1700
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit

(Attach additional Site Worker sign-in/out sheets if needed) Identify number of attached sheets: _____

SITE VISITOR / SITE REPRESENTATIVE				
Name	Company Name	Arrival Time	Departure Time	Signature
Jocelyn Tamashire	NAVFAC Pac	1225	1300	

1420 CF arrive WH. Prep kits, WH team calibrator devices.
1507 Depart WH for RHSP
1544 CF & PG @ OWDF6B w/ equipment. Access difficult due to co-ops.

Equipment: Minirae 3000 SN: 906455
Smartroll SN: 613179
Turbidimeter: DRT-15CE SN: HF3
MultiRae: SN 39939

Solinst Water Level 1000': SN: 288465
1550 PID Minirae: VOC 158.7 ppm
MultiRae: (no hose) 35.8 ppm

MultiRae reading above well cap only.

Heron Oilwater SN: 01-5920
1554 Oil-water reading 29.06'
intermittent sound / no product

1557 Solinst water level 29.07'

1610 TB ERT 2494
1615 Samples ERT 2495 ERT 2496 ERT 2497

1645 final DTW (Solinst) 29.13'
1712 Turb: 0.93 ntu

TDS: 619.21 ppm Temp: 21.64 C
pH: 6.92 ORP: 120.4 mV

SpC: 0.96 ms/cm Sal: 0.5 psu
RDO: 9.25 mg/L 104.9 % Sat

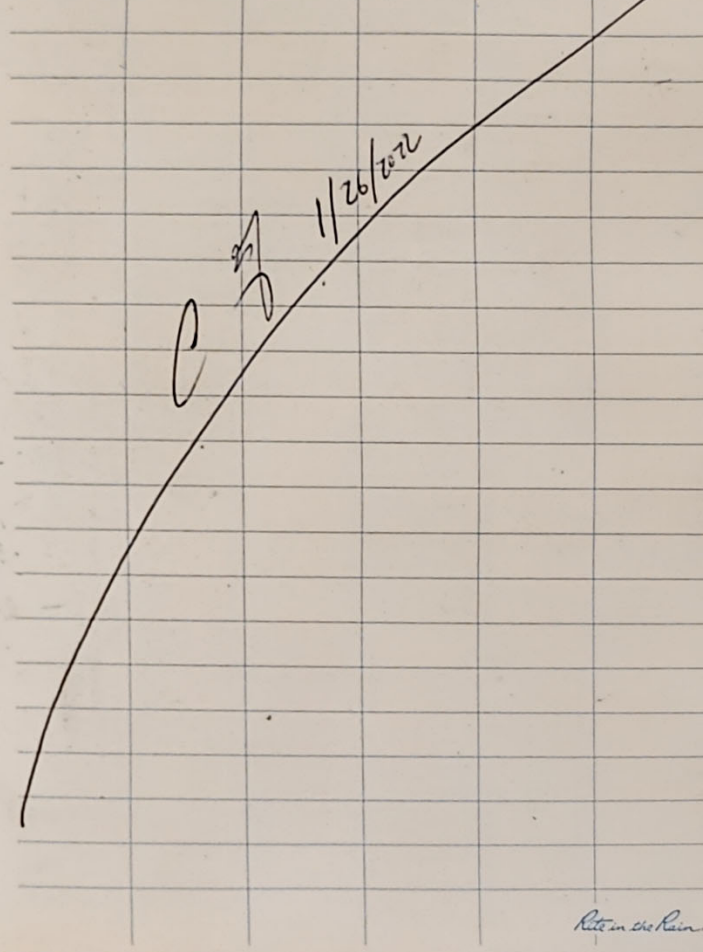
1719 A. Edwards arrives, departs w/ samples

1734 Depart OWDF6B, arrive lower staging for IDW disposal.

1752 Depart RH

1810 Arrive WH, unload vehicles

1830 Depart WH, CF & PG done for day



***Appendix B – Stratigraphic and Well Construction Logs for
Monitoring Wells OWDFMW06A and OWDFMW06B***

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Project: Site Assessment Red Hill Oily Waste Disposal Facility
Project Location: JBPHH, Oahu, HI
Project Number: 60513348 (CTO 0063)

Log of Boring OWDFMW06A

Sheet 1 of 15

Date(s) Drilled	03/29/21 to 04/07/21	Logged By	B. Mintz, E. Bonny, C. Brownson	Checked By (Date)	G. Datt, C. Anchieta
Drilling Method	Hand clear / HSA / HQ	Drill Bit Size/Type	17.5" rotary / 9.875" rotary / HQ diamond bit	Total Depth of Borehole	215.0 feet
Drill Rig Type	Mobile-B90 / Mobile-B80	Drilling Contractor	Valley Well Drilling	Approximate Surface Elevation	117.0
Groundwater Level	97.07 ft bgs / 18.93 ft msl 9/28/2021	Location	OWDFMW06A	Inclination from Horizontal/Bearing	90 degrees
Borehole Completion	4-inch diameter monitoring well			Hammer Data	140lb auto-hammer

Elevation, feet	Depth, feet	ROCK CORE					Lithology	MATERIAL DESCRIPTION	Well Schematic	SAMPLES				FIELD NOTES AND TEST RESULTS
		Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %				Fracture Drawing Number	Type	Number Blows per foot	PID (ppm)	
0	0						<u>FILL</u>						[50]	Hand auger to 5 ft bgs
-116	1													
	2	1												
-114	3													
	4													
-112	5													
	6			100							10	0.0	[75.7]	HSA starting at 5 ft bgs
	7										11			
-110	8	2									10			Smooth drilling
	9		1											
-108	10													
	11			67				<u>Sandy Silt (ML)</u> Very dark grayish brown (10YR 3/2), G 10 S 30 F 60, fines have some clay but predominantly silt			6	0.0	[13.7]	
-106	12							Broken basalt boulder, light gray (GLE Y1 7/N)			25			
	13							No recovery			18			Smooth drilling
-104	14	3												Chattering at ~12 ft bgs

Report: CTO63 RED HILL WITH WELL AND PID; File: OWDF_BORINGLOGS.GPJ; 1/3/2022 OWDFMW06A

Project: Site Assessment Red Hill Oily Waste Disposal Facility
 Project Location: JBPHH, Oahu, HI
 Project Number: 60513348 (CTO 0063)

Log of Boring OWDFMW06A

Sheet 2 of 15

Elevation, feet	Depth, feet	ROCK CORE					Lithology	MATERIAL DESCRIPTION	Well Schematic	SAMPLES			FIELD NOTES AND TEST RESULTS
		Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %				Fracture Drawing Number	Type	Number Blows per foot	
104	13												
	14												Smooth towards ~14 ft bgs
102	15						Silt with Sand (ML) Dark brown (7.5YR 3/2), G 5 S 15 F 80			8	0.0	[75.7]	
	16			100						9			
	17	4								19			Smooth drilling
	18												
98	19		1										
	20						Massive A'a Basalt boulder, black (5YR 2.5/1), completely weathered, extremely weak, 10% very weathered olivine phenocrysts				0.0	[301.2]	
96	21												
	22												Light brown WR
	23	5		70	0	IF							
94	24												
	25						No recovery						
92	26						same as above				0.0	[151.5]	
	27	6		60	0	IF							Light brown WR
	28												
	29						No recovery						

Project: Site Assessment Red Hill Oily Waste Disposal Facility
 Project Location: JBP HH, Oahu, HI
 Project Number: 60513348 (CTO 0063)

Log of Boring OWDFMW06A

Sheet 3 of 15

Elevation, feet	Depth, feet	ROCK CORE					Lithology	MATERIAL DESCRIPTION	Well Schematic	SAMPLES			FIELD NOTES AND TEST RESULTS
		Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %				Fracture Drawing Number	Type	Number Blows per foot	
88	29												
	30						No recovery						
							← same as above				0.0	[301.2]	
86	31						← becomes olive (5YR 5/3), moderate to highly weathered, weak to very weak, 5% vesicles, subrounded to subangular, 3 - 7 mm IF - Mn Fe clay, Sp Su						
	32												Light brown WR
84	33	7		40		0							
	34						No recovery						
	35						← same as above				0.0	[151.5]	
82	36		2										
80	37	8		18		0							Light brown, red WR
	38						No recovery						
78	39												
	40						← same as above				0.0	[301.2]	
76	41												
	42												Light brown WR
74	43	9		60		0							
	44						No recovery						
72	45												End coring for 03/29/21

Report: CTO63 RED HILL WITH WELL AND PID; File: OWDF BORING LOGS.GPJ; 1/3/2022 OWDFMW06A

Project: Site Assessment Red Hill Oily Waste Disposal Facility
 Project Location: JBP HH, Oahu, HI
 Project Number: 60513348 (CTO 0063)

Log of Boring OWDFMW06A

Sheet 4 of 15

Elevation, feet	Depth, feet	ROCK CORE					Lithology	MATERIAL DESCRIPTION	Well Schematic	SAMPLES			FIELD NOTES AND TEST RESULTS	
		Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %				Fracture Drawing Number	Type	Number Blows per foot		PID (ppm)
72	45							← same as above				0.0	[151.5]	Resume coring on 03/30/21
	46						IF	← becomes highly weathered, very weak with more lean clay (CL), dark reddish brown (5YR 3/3)						
70	47	10		30		0	UR	No recovery						Light brown WR
	48													
68	49													
	50							← becomes olive (5YR 5/3), dark brown (10YR 3/3), moderate to highly weathered, weak to very weak, 5% vesicles, subrounded to subangular, 2-5 mm, very small amount of lean clay (CL), dark brown (10YR 3/3) IF - Mn Fe clay, Sp Su				0.0	[301.2]	
66	51						IF							Light brown WR
	52	11		56		0	NR	No recovery						
64	53													
	54													
62	55							← same as above				0.0	[151.5]	
	56						IF							
60	57	12		60		0	IF							Light brown WR
	58							No recovery						
58	59													
	60							← same as above						
	61												[75.7]	

Report: CTO53 RED HILL WITH WELL AND PID; File: OWDF BORING LOGS.GPJ; 1/3/2022 OWDFMW06A

Project: Site Assessment Red Hill Oily Waste Disposal Facility
 Project Location: JBP HH, Oahu, HI
 Project Number: 60513348 (CTO 0063)

Log of Boring OWDFMW06A

Sheet 5 of 15

Elevation, feet	Depth, feet	ROCK CORE					Lithology	MATERIAL DESCRIPTION	Well Schematic	SAMPLES			FIELD NOTES AND TEST RESULTS
		Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %				Fracture Drawing Number	Type	Number Blows per foot	
56	61												
	62	13		54		0	NR	No recovery					Light brown WR
54	63							Fat Clay with Sand (CH) Dark brown (10YR 3/3), G 0, S 15, F 70, moderate to high plasticity, dry inside					
	64							Collect HU046 (62.8-65 ft bgs)					
52	65							← same as above, some weathered basalt "disks" in clay towards the end of run			0.0		Note less material in box because some was taken for samples HU046 and HU047.
	66							Collect HU047 (65-70 ft bgs)					
50	67	14		100		0							Light brown WR
	68												
48	69												End coring on 03/30/21. 10" casing set ~70 ft bgs.
	70										0.0	[151.5]	Resume coring on 04/06/21
46	71						NR						
	72	15		0		0		No recovery					Brown WR
44	73												
	74												
42	75						IF	Broken basalt Massive A'a and Pahoehoe pieces, very dark gray (10YR 3/1), brown (7.5YR 4/3), moderate weathered, moderately strong to strong, some lean clay (CL) staining, reddish yellow (5YR 6/6), Mn staining			0.0	[301.2]	
	76												Brown WR
40	77												

Project: Site Assessment Red Hill Oily Waste Disposal Facility
 Project Location: JBP HH, Oahu, HI
 Project Number: 60513348 (CTO 0063)

Log of Boring OWDFMW06A

Sheet 6 of 15

Elevation, feet	Depth, feet	ROCK CORE					Lithology	MATERIAL DESCRIPTION	Well Schematic	SAMPLES			FIELD NOTES AND TEST RESULTS	
		Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %				Fracture Drawing Number	Type	Number Blows per foot		PID (ppm)
40	77	16		50		0								
	78													
38	79						NR							
	80										0.0	[301.2]		
36	81							No recovery						
	82												Brown WR	
34	83	17		14		0								
	84													
32	85							Loose and Welded A'a Clinker Black (10YR 2/1), dark reddish brown (5YR 3/2), reddish yellow (5YR 7/6), moderate to highly weathered, moderate strength to weak			0.0	[301.2]		
	86		4											
30	87							Massive A'a Very dark grayish brown (10YR 3/2), moderately weathered, moderate strength, 2% vesicles, subrounded, 2-20 mm						Brown WR
	88	18		46		0								
28	89						NR							
	90							No recovery			0.0	[301.2]		
26	91												Brown WR	
	92													
	92							← same as above, Mn staining on fractures						
	93	19		60		0								

Report: CTO53 RED HILL WITH WELL AND PID; File: OWDF BORING LOGS.GPJ; 1/3/2022 OWDFMW06A

Project: Site Assessment Red Hill Oily Waste Disposal Facility
 Project Location: JBPHH, Oahu, HI
 Project Number: 60513348 (CTO 0063)

Log of Boring OWDFMW06A

Sheet 7 of 15

Elevation, feet	Depth, feet	ROCK CORE					Lithology	MATERIAL DESCRIPTION	Well Schematic	SAMPLES			FIELD NOTES AND TEST RESULTS
		Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %				Fracture Drawing Number	Type	Number Blows per foot	
24	93												
	94						<p>Loose A'a Clinker, brown (7.5YR 4/4), highly weathered, weak</p> <p>Pahoehoe Very dark grayish brown (10YR 3/2), moderately weathered, moderate strength, 15% vesicles, subrounded, 1-5 mm</p>						
22	95						No recovery			0.0	[151.5]		
	96												
20	97	20		36		0						Light brown WR, some WL, partial circulation	
	98												
18	99						<p>Loose A'a Clinker, dark grayish brown (10YR 4/2), moderately weathered, moderate strength, Mn staining</p> <p>← Lean clay (CL) present among clinker clasts, dark grayish brown (10YR 4/2), clasts covered in clay</p>						
	100						<p>Pahoehoe Dark brown (10YR 3/2), moderately weathered, moderate strength, 10% vesicles, subrounded, 2-10 mm</p> <p>1: 0, J, MW, Mn Fe, Sp Su, clay Pa, Pl, SR 2: 0, J, MW, Mn Fe, Sp Su, clay Pa, Pl, SR</p>			0.0	[151.5]		
16	101						<p>Loose A'a Clinker Very dark gray (10YR 3/1), moderately weathered, moderate strength</p>						
	102						<p>Massive A'a Black (10YR 2/1), moderately weathered, moderate strength, Mn and clay in fractures</p>					Light brown WR	
14	103	21		34		24	No recovery						
	104												
12	105						← same as above			0.0	[301.2]		
	106												
10	107						← becomes dark yellowish brown (10YR 4/6), moderately weathered, moderate strength, some lean clay (CL), Mn staining on fractures					Light brown WR	
	108	22		50		0							
8	109												

Project: Site Assessment Red Hill Oily Waste Disposal Facility
 Project Location: JBPBH, Oahu, HI
 Project Number: 60513348 (CTO 0063)

Log of Boring OWDFMW06A

Sheet 8 of 15

Elevation, feet	Depth, feet	ROCK CORE					Lithology	MATERIAL DESCRIPTION	Well Schematic	SAMPLES			FIELD NOTES AND TEST RESULTS
		Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %				Fracture Drawing Number	Type	Number Blows per foot	
8	109												
	110						No recovery				0.0	[151.5]	
6	111					NR							
	112	23		40		0							Light brown WR
4	113						Loose A'a Clinker Brown (10YR 4/3), yellowish brown (10YR 5/4), moderately weathered, moderate strength, Mn staining becomes highly weathered, very weak to extremely weak						
	114		5										
2	115						Massive A'a Dark gray (7.5YR 4/1), moderately weathered, moderate strength, Mn and clay staining, 1% vesicles, elongate, 2-10 mm				0.0	[301.2]	
	116						Loose A'a Clinker Dark brown (10YR 3/3), very pale brown (10YR 7/3), strong brown (7.5YR 4/6), moderately weathered, moderate strength to strong, Mn staining						
0	117	24		44		0							Light brown WR, slight WL
	118												
-2	119						No recovery						
	120										0.0	[50]	
-4	121												
	122	25		52		15	← same as above						Light brown WR, slight WL
-6	123												
	124						Massive A'a Very dark grayish (10YR 3/2), moderately weathered, strong, lean clay (CL) in fractures 1: 20, J, VN, Mn Su, clay Pa, Ir, SR 2: 10, J, N, Mn Su, clay Pa, Ir, SR						
-8	125												

Project: Site Assessment Red Hill Oily Waste Disposal Facility
 Project Location: JBPHH, Oahu, HI
 Project Number: 60513348 (CTO 0063)

Log of Boring OWDFMW06A

Sheet 9 of 15

Elevation, feet	Depth, feet	ROCK CORE					Lithology	MATERIAL DESCRIPTION	Well Schematic	SAMPLES			FIELD NOTES AND TEST RESULTS
		Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %				Fracture Drawing Number	Type	Number Blows per foot	
-8	125						Saprolite Black (10YR 2/1), brown (7.5YR 4/4), pale brown (10YR 6/3), rounded clasts covered in clay, relic A'a Clinker clasts			0.0	[75.7]		
	126						Pahoehoe Very dark gray (10YR 3/1), slightly weathered, strong, 25% vesicles, rounded to subrounded, 1-3 mm						
-10	127	26		68		35	No recovery					Light brown WR	
	128						Massive A'a Grayish brown (2.5Y 5/2), slightly weathered, strong, 3% vesicles, subrounded, elongate, 1-5 mm, fractures filled with clay						
-12	129						← becomes 10% vesicles, subrounded, elongate, 1-2 mm, some >20 mm						
	130						Saprolite A'a Clinker/Saprolite/Clay, rounded A'a Clinker clasts covered in clay, relic A'a Clinker clasts, saprolite structure, lean clay (CL), brown (7.5YR 4/3)			0.0	[60.2]		
-14	131		6				Massive A'a Dark gray (10YR 4/1), moderately weathered, strong, 2% vesicles, subrounded, irregular, 2-20 mm, lean clay (CL) infilling fractures						
	132	27		40		0						Light brown WR	
-16	133												
	134						No recovery						
-18	135									0.0	[50]		
	136												
-20	137	28		50		0						Light brown WR	
	138						Loose A'a Clinker Dark gray (7.5YR 4/1), reddish yellow (7.5YR 6/6), moderately weathered, moderate strength, rounded clasts, Mn staining						
-22	139												
	140						Massive A'a Very dark gray (7.5YR 3/1), slightly to moderately weathered, moderate strength to strong, 1% vesicles, irregular, 2-6 mm, covered and completely infilled with lean clay (CL), very dark brown (7.5YR 2.5/2)			0.0			
-24	141												

Project: Site Assessment Red Hill Oily Waste Disposal Facility
 Project Location: JBPBH, Oahu, HI
 Project Number: 60513348 (CTO 0063)

Log of Boring OWDFMW06A

Sheet 10 of 15

Report: CTO63 RED HILL WITH WELL AND PID; File: OWDF BORING LOGS.GPJ; 1/3/2022 OWDFMW06A

Elevation, feet	Depth, feet	ROCK CORE					Lithology	MATERIAL DESCRIPTION	Well Schematic	SAMPLES			FIELD NOTES AND TEST RESULTS
		Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %				Fracture Drawing Number	Type	Number Blows per foot	
-24	141						IF	IF - clay infilling					
	142	29		30		0							Light brown WR
-26	143												
	144							No recovery					End coring for 04/06/21
-28	145										0.0	[25]	Resume coring on 04/07/21
	146												Light brown WR
-30	147	30		60		0		Silt (ML) Very dark brown (7.5YR 2.5/2), G 0 S 0 F 100					1 ft of saprolite, ~2 ft of silt - hard to tell based on recovery, see photos
	148												
-32	149							Saprolite Very dark brown (7.5YR 2.5/2), dark reddish brown (5YR 3/2), relic rock structures, rounded relic A'a Clinker clasts, very dark grayish brown (10YR 3/2)					
	150							Loose A'a Clinker Very dark gray (5YR 3/1), reddish brown (5YR 4/1), yellowish red (5YR 3/6), moderate to slightly weathered, strong			0.0	[60.2]	
-34	151							Massive A'a Very dark gray (5YR 3/1), slightly weathered, very strong, 3% vesicles, subrounded to subangular, <4 mm					Chattering
	152	31		80		18	1	IF - Mn clay Sp 1: 20, J, N, Mn clay, Sp, Ir, R 2: 30, J, Mn, Fe clay, Sp, Wa, SR					
-36	153						2						Brown WR
	154						IF	IF - Mn Sp, clay infilling					
	155							No recovery					
-38	155						1	← becomes 5% vesicles, elongate, subrounded, 1-15 mm			0.0	[75.7]	
	156	7					2	1: 5, J, N, Mn Fe Sp, Ir, SR 2: 5, J, N, Mn Fe Sp, Wa, SR 3: 0, J, W, Mn Sp, St, SR					Light brown WR
	157						3	← becomes 1% vesicles, elongate, subrounded, <3 mm					

Project: Site Assessment Red Hill Oily Waste Disposal Facility

Project Location: JBPHH, Oahu, HI

Project Number: 60513348 (CTO 0063)

Log of Boring OWDFMW06A

Sheet 11 of 15

Report: CTO63 RED HILL WITH WELL AND PID; File: OWDF BORING LOGS.GPJ; 1/3/2022 OWDFMW06A

Elevation, feet	Depth, feet	ROCK CORE					Lithology	MATERIAL DESCRIPTION	Well Schematic	SAMPLES			FIELD NOTES AND TEST RESULTS	
		Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %				Fracture Drawing Number	Type	Number Blows per foot		PID (ppm)
-40	157	32		96		27	5	← becomes 3% vesicles, subrounded, elongate, irregular, 2-18 mm						
							6	5: 0, J, MW, Mn Fe clay Sp, Wa, SR						
							7	6: 0, J, N, Mn Fe Sp, Wa, SR						
							8	7: 0, J, MW, Mn Fe Sp, St, SR						
							9	8: 0, J, N, Mn Fe Sp, clay Su, St, SR						
							IF	9: 0, J, MW, Mn Fe Sp, Wa, SR						
								10: 0, J, VN, Mn Fe Sp, Wa, SR						
								IF - Mn Fe clay Sp						
-42	159						10	← vug - 50 mm x 18 mm						
	160							No recovery			0.0	[33.3]		
-44	161													
	162	33		70	40	1	1: 5, J, W, Mn Su, Fe clay Sp, Wa, SR							
						IF	2: 10, J, VN, Mn Fe Sp, clay Su, St, SR							
							3: 0, J, N, Mn Fe clay Sp, Wa, SR							
							4: 0, J, N, Mn Fe Sp, clay Su, Wa, S							
							5: 60, J, N, Mn Fe clay Sp, Wa, SR							
	163						IF	IF - Mn Su, clay Fe Sp					Slight chattering, light brown WR	
	164						2	← becomes 3% vesicles, elongate, 6-30 mm						
	165													
	166							No recovery			0.0	[100]		
	167	34		76	58	IF	Loose and Welded A'a Clinker Dark reddish brown							
						M	← becomes completely (2.5YR 3/3), red (2.5YR 5/6), weathered, very black (2.5YR 2/1), moderately weak							
						1	Pahoehoe Dark gray (5YR 4/1), slightly weathered, strong, 10% vesicles, rounded to subrounded, 2-9 mm							
						2	← becomes 15% vesicles, subrounded to rounded, some clay in vesicles, 3-30 mm							
						3	← becomes 20% vesicles, rounded to subrounded, 1-13 mm							
	168													
	169													
	170													
	171							No recovery			0.0	[100]		
	172													
	173	35		62		0		Loose and Welded A'a Clinker Black (5YR 2.5/1), dark reddish brown (5YR 3/2), moderately weathered, moderately strong, clay coating clasts, yellowish red (5YR 5/6)						

Project: Site Assessment Red Hill Oily Waste Disposal Facility

Project Location: JBPHH, Oahu, HI

Project Number: 60513348 (CTO 0063)

Log of Boring OWDFMW06A

Sheet 12 of 15

Elevation, feet	Depth, feet	ROCK CORE					Lithology	MATERIAL DESCRIPTION	Well Schematic	SAMPLES			FIELD NOTES AND TEST RESULTS
		Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %				Fracture Drawing Number	Type	Number Blows per foot	
-56	173												
	174												
-58	175						Massive A'a Dark gray (5YR 4/1), slightly weathered strong, 1% vesicles, <4 mm; vug - 35 x 17 mm at 175.2 ft bgs IF - Mn clay Su 1: 60, J, VN, Mn Fe clay Sp, Wa, R 2: 20, J, VN, Mn Fe Su, Wa, SR 3: 5, J, MW, Mn clay Su, Ir, SR			0.0	[100]		
	176												
-60	177	36		40		0							Light brown WR
	178						No recovery						
-62	179												
	180						← becomes 10% vesicles, elongate, subrounded, 2-20 mm						[301.2]
-64	181						1: 0, J, VN, Mn Fe Sp, Wa, SR 2: 0, J, VN, Mn Fe Sp, Ir, SR 3: 40, J, VN, Mn Fe Sp, Wa, SR						
	182						No recovery, possibly loose A'a Clinker						
-66	183	37		96		54	Pahoehoe Black (5YR 2.5/1), moderately weathered, moderately strong, 20% vesicles, rounded to subangular, 1-15 mm, partially infilled with clay, reddish yellow (5YR 6/6) 4: 90, J, N, Mn clay Sp, Wa, SR 5: 80, J, MW, Mn clay Sp, Ir, SR						Light brown WR, 40 gal WL, partial circulation
	184												
-68	185						← becomes highly weathered, very weak ← becomes weak, clay in fractures, reddish yellow (5YR 6/8)						0.0 [151.5]
	186												
-70	187	38		66		0	Massive A'a Dark gray (5YR 4/1), slightly weathered, very strong, 10% vesicles, subrounded, elongate, 1-18 mm 1: 45, J, MW, clay Pa, Wa, SR 2: 30, J, N, Mn Fe clay Sp, Wa, SR 3: 20, J, N, Mn Fe clay Sp, Wa, SR 4: 10, J, N, Mn Fe clay Sp, Wa, SR 5: 45, J, N, Mn clay Sp, Wa, SR						Light brown WR, 60 gal WL, partial circulation.
	188						← becomes very dark gray (5YR 3/1), moderately weathered, strong, 15% vesicles, 2-15 mm						
-72	189												

Report: CTO63 RED HILL WITH WELL AND PID. File: OWDF BORING LOGS.GPJ. 1/3/2022 OWDFMW06A

Project: Site Assessment Red Hill Oily Waste Disposal Facility

Project Location: JBPHH, Oahu, HI

Project Number: 60513348 (CTO 0063)

Log of Boring OWDFMW06A

Sheet 14 of 15

Elevation, feet	Depth, feet	ROCK CORE					Lithology	MATERIAL DESCRIPTION	Well Schematic	SAMPLES			FIELD NOTES AND TEST RESULTS
		Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %				Fracture Drawing Number	Type	Number Blows per foot	
-88	205							No recovery				0.0 [75.7]	
	206						<ul style="list-style-type: none"> 1. 0, J, N, clay Su Pa, Wa, SR 2. 5, J, MW, clay Sp, Wa, SR 3. 5, J, MW, clay Mn Sp, Wa, SR 						
	207	42		86		0	<p>Loose A'a Clinker Dark brown (7.5YR 3/2), moderately weathered, moderately strong</p> <p>Silty Sand (ML) Black (7.5YR 2.5/1), G 5 S 15 F 80, lithics present, wet</p>					100 gal WL	
	208												
	209												
	210											0.0 [100]	
	211		11					No recovery					
	212	43		60		13	<p>Massive A'a Dark gray (7.5YR 4/1), moderately weathered, strong, 15% vesicles, subrounded to subangular, irregular, 2-15 mm</p> <p>IF - fractures and vesicles infilled with clay, reddish yellow (7.5YR 7/6)</p> <p>1: 5, J, VN, Mn Fe clay Sp, Wa, SR</p> <p>2: 5, J, VN, Mn clay Sp, Wa, SR</p>					100 gal WL	
	213												
	214												
	215												
	216												
	217												
	218												
	219												
	220												
	221												
													End coring on 04/07/21. TD = 215 ft bgs

Report: CTO63 RED HILL WITH WELL AND PID. File: OWDF BORING LOGS.GPJ. 1/3/2022 OWDFMW06A

Project: Site Assessment Red Hill Oily Waste Disposal Facility

Project Location: JBPHH, Oahu, HI

Project Number: 60513348 (CTO 0063)

Log of Boring OWDFMW06A

Sheet 15 of 15

Elevation, feet	Depth, feet	ROCK CORE					Lithology	MATERIAL DESCRIPTION	Well Schematic	SAMPLES				FIELD NOTES AND TEST RESULTS
		Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %				Fracture Drawing Number	Type	Number Blows per foot	PID (ppm)	
-104	221							<p>placed from 179 ft bgs to 184 ft bgs (-62 ft msl to -67 ft msl). A 100% bentonite slurry was placed from 67 ft bgs to 179 ft bgs (50 ft msl to -62ft msl [into the 10-inch conductor casing]). Cement/grout was placed to the ground surface. The surface completion consists of an approximately 2.8 foot stick up monument inside of an 8-inch diameter protective steel casing set on a concrete well pad approximately 1-foot above ground surface. A total of approximately 5,670 gallons of development water was removed during development, after well construction.</p> <p>* All ground surface elevations are preliminary. Final elevation surveys have not been completed at this time.</p>						
	222													
-106	223													
	224													
-108	225													
	226													
-110	227													
	228													
-112	229													
	230													
-114	231													
	232													
-116	233													
	234													
-118	235													
	236													
-120	237													

Project: Site Assessment Red Hill Oily Waste Disposal Facility
 Project Location: JBPHH, Oahu, HI
 Project Number: 60513348 (CTO 0063)

Log of Boring OWDFMW06B

Sheet 1 of 3

Date(s) Drilled	02/12/21 to 2/17/21	Logged By	B. Mintz	Checked By (Date)	G. Datt, C. Anchieta
Drilling Method	Hand clear / HSA	Drill Bit Size/Type	7 3/4" OD HSA	Total Depth of Borehole	35.0 feet
Drill Rig Type	Mobile B-59	Drilling Contractor	GeoTek	Approximate Surface Elevation	115.0
Groundwater Level	35.06 ft bgs / 79.94 ft msl 9/28/2021	Location	OWDFMW06B	Inclination from Horizontal/Bearing	90 degrees
Borehole Completion	4-inch diameter monitoring well			Hammer Data	140lb auto-hammer

Elevation, feet	Depth, feet	ROCK CORE					Lithology	MATERIAL DESCRIPTION	Well Schematic	SAMPLES				FIELD NOTES AND TEST RESULTS	
		Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %				Fracture Drawing Number	Type	Number Blows per foot	PID (ppm)		Drill Time [Rate, ft/hr]
0	0							Fill						[50]	Hand Clear to 4 ft bgs, until refusal
-114	1							Very dark brown (7.5YR 2.5/2), some boulders							18-inch split spoon used for core collection every 5 ft starting at 5 ft bgs
	2	1													
-112	3														
	4														
	5								← same as above						
-110	6			50						4	0.0	[23]			Mostly smooth drilling. Some chattering ~6 ft bgs to 10 ft bgs
	7									3					
-108	8	2								2					
	9														End drilling for 2/12/21
-106	10							← becomes very weathered basalt towards bottom							
	11			15						2	0.0	[15]			Resume drilling from 10 ft bgs on 2/17/21 Mostly smooth drilling, some chattering
-104	12									2					
	13	3								1					
-102															

Report: CTO63 RED HILL WITH WELL AND PID. File: OWDF_BORINGLOGS.GPJ. 1/3/2022 OWDFMW06B

Project: Site Assessment Red Hill Oily Waste Disposal Facility
 Project Location: JBP HH, Oahu, HI
 Project Number: 60513348 (CTO 0063)

Log of Boring OWDFMW06B

Sheet 2 of 3

Elevation, feet	Depth, feet	ROCK CORE					Lithology	MATERIAL DESCRIPTION	Well Schematic	SAMPLES			FIELD NOTES AND TEST RESULTS
		Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %				Fracture Drawing Number	Type	Number Blows per foot	
102	13												
	14												
100	15						Split spoon empty, some crushed up dust basalt.						
	16			0						30	0.0	[7]	
	17	4								3			Difficulty drilling at ~ 16 ft bgs
98	18									1.5			Easier drilling at ~ 18 ft bgs
	19									1.5			More grinding below 19 ft bgs to bottom of run
96	20												Pieces of broken basalt and tuff coming up auger last 1/2 foot easier
	21			100			<u>Sandy Silt (ML)</u> very dark gray (2.5 Y 3/1), sand - pale brown (2.5 Y 7/4), G5 S25 F70			10	0.0	[12.5]	
94	22	5								9			
	23									12			
92	24									14			
	25						<u>Silt (ML)</u> less sand some clay, very dark gray (2.5 Y 3/1), G5 S10 F 85, mostly silt some clay						
90	26			100						8	0.0	[60]	Smooth drilling
	27	6								10			
88	28									10			
	29									11			

Project: Site Assessment Red Hill Oily Waste Disposal Facility

Project Location: JBP HH, Oahu, HI

Project Number: 60513348 (CTO 0063)

Log of Boring OWDFMW06B

Sheet 3 of 3

Elevation, feet	Depth, feet	ROCK CORE					Lithology	MATERIAL DESCRIPTION	Well Schematic	SAMPLES				FIELD NOTES AND TEST RESULTS
		Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %				Fracture Drawing Number	Type	Number Blows per foot	PID (ppm)	
86	29													
	30						Gravelly Silt with Sand (ML) Very dark gray (2.5 Y 3/1), G15 S15 F 70 some clay, basalt gravel (7.5 YR 2.5/1 black), sand reddish yellow (7.5 YR 1/6)							
84	31			100			Collect HU016							
	32	7												
82	33													
	34													Around 33.5 ft bgs cuttings no longer coming off auger
80	35						← becomes very dark grayish brown (10YR 3/2), slightly weathered gravel, G15 S5 F80, some clay ← ML silt with sand, G5 S15 F80 some clay							
	36	8		100			Lean Clay with Sand (CL) G 0 S10 F90							
78	37						Collect HU017 and HU018 (35-37 ft bgs)							
	38						OWDFMW06B was hand cleared from ground surface to 4 ft bgs (115 ft msl to 111 ft msl). The borehole was then drilled using 7 3/4-inch outer diameter hollow stem auger to 35 ft bgs (80 ft msl). An 18-inch split spoon used for core collection every 5 ft starting at 5 ft bgs.							
76	39						OWDFMW06B well construction was completed on February 17, 2021. The well was completed with 4-inch diameter Schedule 80 polyvinyl chloride (PVC) blank well casing from ground surface to 24.63 ft bgs (115 ft msl to 90.37 ft msl) and a 0.020-inch slotted screen between 24.63 ft bgs to 34.63 ft bgs (100.37 ft msl to 90.37 ft msl). The filter pack extended from 35 ft bgs to 20 ft bgs (85 ft msl to 95 ft msl). The bentonite seal was placed from 20.00 ft bgs to 15.00 ft bgs (95 ft msl to 90 ft msl). Cement/grout was placed to the ground surface. The surface completion consists of above ground completion. A total of approximately 140 gallons of development water was removed during development, after well construction.							
74	41													
	42						* All ground surface elevations are preliminary. Final elevation surveys have not been completed at this time.							
72	43													
	44													
70	45													

***Appendix C – Level II Laboratory Reports
Eurofins Seattle***

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Appendix C.1 – Soil Analytical Data

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ANALYTICAL REPORT

Eurofins Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-109299-1

Client Project/Site: Red Hill JBPHH N62742-17-D-1800
CV18F0126

For:

AECOM
1001 Bishop Street
Honolulu, Hawaii 96813

Attn: Jeff Hart

Kristine D. Allen

Authorized for release by:
1/17/2022 5:54:16 PM

Kristine Allen, Client Service Manager
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Designee for

Elaine Walker, Project Manager II
(253)248-4972

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Case Narrative

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Job ID: 580-109299-1

Laboratory: Eurofins Seattle

Narrative

CASE NARRATIVE

Client: AECOM
Project: Red Hill JBPHH N62742-17-D-1800 CV18F0126
Report Number: 580-109299-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

Following DoD QSM guidelines, manual integrations were performed only when necessary and are in compliance with the laboratory's standard operating procedure, Acceptable Manual Integration Practices, SOP No.: Q-S-002. The reason(s) for manual integration have been documented on the affected chromatogram(s), which is/are provided in the raw data package. The raw data also includes the original chromatogram(s) prior to any manual integration being performed. Manual integrations are detailed in the manual integration summary forms following this narrative.

It should be noted that samples with elevated Limits of Quantitation (LOQs) resulting from a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the LOQs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes within the calibration range of the instrument or that reduces the interferences thereby enabling the quantification of target analytes.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 01/14/2022 and 01/14/2022; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.7 C.

Receipt Exceptions

One or more containers for the following samples were received broken: TB01 (580-109299-24). This trip blank was unable to be salvaged since it had completely frozen and burst the container's bottom.

The cooler containing all of the VOA vials did not arrive by FedEx with the other containers. They were picked up from the FedEx Facility and arrived at the lab 1620 1/14/22.

Insufficient sample volume was provided for the following samples for the Moisture analysis: LT-N10-7-8-Dup (580-109299-23). There is no bulk soil for this field duplicate sample and cannot be corrected for Dry Weight.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples LT-W17.5-12-13 (580-109299-1), LT-N10-21-22 (580-109299-2), LT-E10-7-8 (580-109299-3), LT-S25-7-8 (580-109299-4), LT-W10-11-12 (580-109299-5), LT-W10-19-20 (580-109299-6), LT-N10-19-20 (580-109299-7), LT-N40-7-8 (580-109299-8), LT-N25-16-17 (580-109299-9), LT-S10-17-18 (580-109299-10), LT-N10-7-8 (580-109299-11), HT-N10-24-25 (580-109299-12), HT-W10-18-19 (580-109299-13), HT-W10-22-23 (580-109299-14), LT-S17.5-5-6 (580-109299-15), LT-W55-17-18 (580-109299-16), LT-W19.5-14-15 (580-109299-17), LT-S10-23-24 (580-109299-18), LT-W40-9-10 (580-109299-19), LT-N25-27-27.5 (580-109299-20), LT-S25-14-15 (580-109299-21), LT-W25-14-15 (580-109299-22) and LT-N10-7-8-Dup (580-109299-23) were analyzed for volatile organic compounds

Case Narrative

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Job ID: 580-109299-1 (Continued)

Laboratory: Eurofins Seattle (Continued)

(GC-MS) in accordance with 8260D_DOD5. The samples were prepared on 01/15/2022 and analyzed on 01/16/2022 and 01/17/2022.

Sample LT-W17.5-12-13 (580-109299-1) which was used for the MS/MSD was non detect when run at dilution. It was reanalyzed at a lesser dilution. Both sets of data are reported due to this sample being used as the MS/MSD in the initial batch. LT-W17.5-12-13 (580-109299-1), (580-109299-D-1-B MS) and (580-109299-D-1-C MSD)

Surrogate recovery was outside drift limits for the CCVIS but within surrogate recovery limits for 1,2-Dichloroethane-d4 (Surr): (CCVIS 580-378538/3). Recovery limit 71%, CCVIS recovered at 75%. All samples are within recovery limits.

The following samples were analyzed at reduced volume due to high concentrations of target analytes: LT-W17.5-12-13 (580-109299-1), LT-W10-11-12 (580-109299-5), LT-W10-19-20 (580-109299-6), LT-N25-16-17 (580-109299-9), (580-109299-D-1-B MS) and (580-109299-D-1-C MSD). The calculation was performed using an initial volume adjustment rather than a dilution factor. The reporting limits have been elevated by the appropriate factor.

The following sample was analyzed at reduced volume due to high concentrations of target analytes: LT-N10-7-8-Dup (580-109299-23). The calculation was performed using an initial volume adjustment rather than a dilution factor. The reporting limits have been elevated by the appropriate factor.

Surrogate recovery for the following sample was outside control limits: LT-N10-7-8-Dup (580-109299-23). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

VOA Prep

Method 5035: The following samples was provided to the laboratory with a significantly different initial weight than that required by the reference method: LT-W17.5-12-13 (580-109299-1), LT-S25-7-8 (580-109299-4), LT-N10-19-20 (580-109299-7), LT-N40-7-8 (580-109299-8), LT-N25-16-17 (580-109299-9), HT-N10-24-25 (580-109299-12), HT-W10-18-19 (580-109299-13), HT-W10-22-23 (580-109299-14), LT-S17.5-5-6 (580-109299-15), LT-W19.5-14-15 (580-109299-17), LT-N25-27-27.5 (580-109299-20), (580-109299-D-1 MS) and (580-109299-D-1 MSD). Deviations in the weight by more than 20% may affect reporting limits and potentially method performance. The method specifies 10g. The amount provided was below this range.

Method 5035: The following samples were provided to the laboratory with a significantly different initial weight than that required by the reference method: LT-S25-14-15 (580-109299-21), LT-W25-14-15 (580-109299-22) and LT-N10-7-8-Dup (580-109299-23). Deviations in the weight by more than 20% may affect reporting limits and potentially method performance. The method specifies 10g. The amount provided was below this range.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SEMIVOLATILE ORGANIC COMPOUNDS - SELECTED ION MODE (SIM)

Samples LT-W17.5-12-13 (580-109299-1), LT-N10-21-22 (580-109299-2), LT-E10-7-8 (580-109299-3), LT-S25-7-8 (580-109299-4), LT-W10-11-12 (580-109299-5), LT-W10-19-20 (580-109299-6), LT-N10-19-20 (580-109299-7), LT-N40-7-8 (580-109299-8), LT-N25-16-17 (580-109299-9), LT-S10-17-18 (580-109299-10), LT-N10-7-8 (580-109299-11), HT-N10-24-25 (580-109299-12), HT-W10-18-19 (580-109299-13), HT-W10-22-23 (580-109299-14), LT-S17.5-5-6 (580-109299-15), LT-W55-17-18 (580-109299-16), LT-W19.5-14-15 (580-109299-17), LT-S10-23-24 (580-109299-18), LT-W40-9-10 (580-109299-19), LT-N25-27-27.5 (580-109299-20), LT-S25-14-15 (580-109299-21) and LT-W25-14-15 (580-109299-22) were analyzed for semivolatile organic compounds - Selected Ion Mode (SIM) in accordance with 8270E SIM. The samples were prepared on 01/14/2022 and analyzed on 01/15/2022.

The following samples was diluted due to the black color and odor of the sample: LT-N40-7-8 (580-109299-8). Elevated reporting limits (RL) are provided.

1-Methylnaphthalene, 2-Methylnaphthalene and Naphthalene failed the recovery criteria high for the MS of sample LT-W17.5-12-13MS (580-109299-1) in batch 580-378418. 1-Methylnaphthalene and 2-Methylnaphthalene failed the recovery criteria low for the MSD. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits. In addition, 1-Methylnaphthalene, 2-Methylnaphthalene and Naphthalene exceeded the RPD limit.

The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount.

Case Narrative

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Job ID: 580-109299-1 (Continued)

Laboratory: Eurofins Seattle (Continued)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GASOLINE RANGE ORGANICS (GRO)

Samples LT-W17.5-12-13 (580-109299-1), LT-N10-21-22 (580-109299-2), LT-E10-7-8 (580-109299-3), LT-S25-7-8 (580-109299-4), LT-W10-11-12 (580-109299-5), LT-W10-19-20 (580-109299-6), LT-N10-19-20 (580-109299-7), LT-N40-7-8 (580-109299-8), LT-N25-16-17 (580-109299-9), LT-S10-17-18 (580-109299-10), LT-N10-7-8 (580-109299-11), HT-N10-24-25 (580-109299-12), HT-W10-18-19 (580-109299-13), HT-W10-22-23 (580-109299-14), LT-S17.5-5-6 (580-109299-15), LT-W55-17-18 (580-109299-16), LT-W19.5-14-15 (580-109299-17), LT-S10-23-24 (580-109299-18), LT-W40-9-10 (580-109299-19), LT-N25-27-27.5 (580-109299-20), LT-S25-14-15 (580-109299-21), LT-W25-14-15 (580-109299-22) and LT-N10-7-8-Dup (580-109299-23) were analyzed for gasoline range organics (GRO) in accordance with 8260B CALUFT. The samples were prepared on 01/15/2022 and analyzed on 01/15/2022, 01/16/2022 and 01/17/2022.

The following samples were analyzed at reduced volume due to high concentrations of target analytes: LT-W17.5-12-13 (580-109299-1), LT-W10-11-12 (580-109299-5) and LT-N25-16-17 (580-109299-9). The calculation was performed using an initial volume adjustment rather than a dilution factor. The reporting limits have been elevated by the appropriate factor.

Surrogate recovery for the following samples was outside control limits high for 4-Bromofluorobenzene (Surr): LT-W10-19-20 (580-109299-6) and LT-N10-7-8 (580-109299-11). Evidence of matrix interference is present; therefore, re-analysis was not performed.

The following sample was analyzed at reduced volume due to high concentrations of target analytes: LT-N10-7-8-Dup (580-109299-23). The calculation was performed using an initial volume adjustment rather than a dilution factor. The reporting limits have been elevated by the appropriate factor.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DIESEL RANGE ORGANICS

Samples LT-W17.5-12-13 (580-109299-1), LT-N10-21-22 (580-109299-2), LT-E10-7-8 (580-109299-3), LT-S25-7-8 (580-109299-4), LT-W10-11-12 (580-109299-5), LT-W10-19-20 (580-109299-6), LT-N10-19-20 (580-109299-7), LT-N40-7-8 (580-109299-8), LT-N25-16-17 (580-109299-9), LT-S10-17-18 (580-109299-10), LT-N10-7-8 (580-109299-11), HT-N10-24-25 (580-109299-12), HT-W10-18-19 (580-109299-13), HT-W10-22-23 (580-109299-14), LT-S17.5-5-6 (580-109299-15), LT-W55-17-18 (580-109299-16), LT-W19.5-14-15 (580-109299-17), LT-S10-23-24 (580-109299-18), LT-W40-9-10 (580-109299-19), LT-N25-27-27.5 (580-109299-20), LT-S25-14-15 (580-109299-21) and LT-W25-14-15 (580-109299-22) were analyzed for diesel range organics in accordance with 8015DRO. The samples were prepared on 01/14/2022 and analyzed on 01/15/2022 and 01/16/2022.

Sample LT-N40-7-8 (580-109299-8)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

C10-C24 failed the recovery criteria high for the MS/MSD of sample LT-W17.5-12-13 (580-109299-1) in batch 580-378473. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample / laboratory sample control duplicate (LCS/LCSD) precision was within acceptance limits.

The peak profile present in this sample LT-S17.5-5-6 (580-109299-15) and LT-W19.5-14-15 (580-109299-17) is atypical of a hydrocarbon pattern and consists of discrete peaks.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PERCENT SOLIDS

Samples LT-W17.5-12-13 (580-109299-1), LT-N10-21-22 (580-109299-2), LT-E10-7-8 (580-109299-3), LT-S25-7-8 (580-109299-4), LT-W10-11-12 (580-109299-5), LT-W10-19-20 (580-109299-6), LT-N10-19-20 (580-109299-7), LT-N40-7-8 (580-109299-8), LT-N25-16-17 (580-109299-9), LT-S10-17-18 (580-109299-10), LT-N10-7-8 (580-109299-11), HT-N10-24-25 (580-109299-12), HT-W10-18-19 (580-109299-13), HT-W10-22-23 (580-109299-14), LT-S17.5-5-6 (580-109299-15), LT-W55-17-18 (580-109299-16), LT-W19.5-14-15 (580-109299-17), LT-S10-23-24 (580-109299-18), LT-W40-9-10 (580-109299-19), LT-N25-27-27.5 (580-109299-20), LT-S25-14-15 (580-109299-21) and LT-W25-14-15 (580-109299-22) were analyzed for percent solids in accordance with ASTM D2216. The samples were analyzed on 01/14/2022.

Case Narrative

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Job ID: 580-109299-1 (Continued)

Laboratory: Eurofins Seattle (Continued)

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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Definitions/Glossary

Client: AECOM

Job ID: 580-109299-1

Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

GC/MS Semi VOA

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

GC Semi VOA

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
D	The reported value is from a dilution.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)

Eurofins Seattle

Definitions/Glossary

Client: AECOM

Job ID: 580-109299-1

Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

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Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W17.5-12-13

Lab Sample ID: 580-109299-1

Date Collected: 01/12/22 15:05

Matrix: Solid

Date Received: 01/14/22 15:12

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	6100		870	280	mg/Kg		01/15/22 11:51	01/15/22 14:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	95		67 - 134				01/15/22 11:51	01/15/22 14:45	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	3.3	U	4.3	0.82	mg/Kg		01/15/22 11:14	01/16/22 14:56	1
Toluene	6.5	U	13	2.9	mg/Kg		01/15/22 11:14	01/16/22 14:56	1
Ethylbenzene	6.5	U	8.7	2.0	mg/Kg		01/15/22 11:14	01/16/22 14:56	1
m-Xylene & p-Xylene	3.3	U	8.7	1.5	mg/Kg		01/15/22 11:14	01/16/22 14:56	1
o-Xylene	3.3	U	8.7	1.1	mg/Kg		01/15/22 11:14	01/16/22 14:56	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	97		85 - 116				01/15/22 11:14	01/16/22 14:56	1
4-Bromofluorobenzene (Surr)	101		79 - 119				01/15/22 11:14	01/16/22 14:56	1
Dibromofluoromethane (Surr)	101		78 - 119				01/15/22 11:14	01/16/22 14:56	1
1,2-Dichloroethane-d4 (Surr)	99	M	71 - 136				01/15/22 11:14	01/16/22 14:56	1

Method: 8260D - Volatile Organic Compounds (GC/MS) - RA

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.33	U	0.43	0.082	mg/Kg		01/15/22 11:14	01/17/22 12:25	1
Toluene	0.65	U	1.3	0.29	mg/Kg		01/15/22 11:14	01/17/22 12:25	1
Ethylbenzene	0.65	U	0.87	0.20	mg/Kg		01/15/22 11:14	01/17/22 12:25	1
m-Xylene & p-Xylene	0.78	J	0.87	0.15	mg/Kg		01/15/22 11:14	01/17/22 12:25	1
o-Xylene	1.7		0.87	0.11	mg/Kg		01/15/22 11:14	01/17/22 12:25	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	100		85 - 116				01/15/22 11:14	01/17/22 12:25	1
4-Bromofluorobenzene (Surr)	100		79 - 119				01/15/22 11:14	01/17/22 12:25	1
Dibromofluoromethane (Surr)	94		78 - 119				01/15/22 11:14	01/17/22 12:25	1
1,2-Dichloroethane-d4 (Surr)	84	Q	71 - 136				01/15/22 11:14	01/17/22 12:25	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	57.1		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	42.9		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W17.5-12-13

Lab Sample ID: 580-109299-1

Date Collected: 01/12/22 15:05

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 57.1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	9.1	J1	0.0084	0.0011	mg/Kg	☼	01/14/22 16:26	01/15/22 00:57	1
2-Methylnaphthalene	13	J1	0.0084	0.0035	mg/Kg	☼	01/14/22 16:26	01/15/22 00:57	1
Naphthalene	4.1	J1	0.0084	0.0027	mg/Kg	☼	01/14/22 16:26	01/15/22 00:57	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	32		28 - 143	01/14/22 16:26	01/15/22 00:57	1
2-methylnaphthalene-d10	63		40 - 140	01/14/22 16:26	01/15/22 00:57	1
Fluoranthene-d10 (Surr)	79		40 - 140	01/14/22 16:26	01/15/22 00:57	1
Terphenyl-d14	95		58 - 132	01/14/22 16:26	01/15/22 00:57	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	4700	J1	77	15	mg/Kg	☼	01/14/22 16:25	01/15/22 21:42	1
C24-C40	46	U	77	31	mg/Kg	☼	01/14/22 16:25	01/15/22 21:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	90		45 - 130	01/14/22 16:25	01/15/22 21:42	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-N10-21-22

Lab Sample ID: 580-109299-2

Date Collected: 01/12/22 10:58

Matrix: Solid

Date Received: 01/14/22 15:12

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	6.0		3.5	1.1	mg/Kg		01/15/22 11:51	01/15/22 15:09	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	93		67 - 134				01/15/22 11:51	01/15/22 15:09	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.013	U	0.018	0.0033	mg/Kg		01/15/22 11:14	01/16/22 16:05	1
Toluene	0.026	U	0.053	0.012	mg/Kg		01/15/22 11:14	01/16/22 16:05	1
Ethylbenzene	0.026	U	0.035	0.0080	mg/Kg		01/15/22 11:14	01/16/22 16:05	1
m-Xylene & p-Xylene	0.013	U	0.035	0.0063	mg/Kg		01/15/22 11:14	01/16/22 16:05	1
o-Xylene	0.013	U	0.035	0.0044	mg/Kg		01/15/22 11:14	01/16/22 16:05	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	99		85 - 116				01/15/22 11:14	01/16/22 16:05	1
4-Bromofluorobenzene (Surr)	99		79 - 119				01/15/22 11:14	01/16/22 16:05	1
Dibromofluoromethane (Surr)	95	M	78 - 119				01/15/22 11:14	01/16/22 16:05	1
1,2-Dichloroethane-d4 (Surr)	96	M	71 - 136				01/15/22 11:14	01/16/22 16:05	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	67.3		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	32.7		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-N10-21-22

Lab Sample ID: 580-109299-2

Date Collected: 01/12/22 10:58

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 67.3

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.039		0.0065	0.00081	mg/Kg	☼	01/14/22 16:26	01/15/22 02:09	1
2-Methylnaphthalene	0.053		0.0065	0.0026	mg/Kg	☼	01/14/22 16:26	01/15/22 02:09	1
Naphthalene	0.011	M	0.0065	0.0021	mg/Kg	☼	01/14/22 16:26	01/15/22 02:09	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	64		28 - 143	01/14/22 16:26	01/15/22 02:09	1
2-methylnaphthalene-d10	71		40 - 140	01/14/22 16:26	01/15/22 02:09	1
Fluoranthene-d10 (Surr)	88		40 - 140	01/14/22 16:26	01/15/22 02:09	1
Terphenyl-d14	91		58 - 132	01/14/22 16:26	01/15/22 02:09	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	42	J	69	14	mg/Kg	☼	01/14/22 16:25	01/15/22 22:40	1
C24-C40	42	U	69	28	mg/Kg	☼	01/14/22 16:25	01/15/22 22:40	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	83		45 - 130	01/14/22 16:25	01/15/22 22:40	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-E10-7-8

Lab Sample ID: 580-109299-3

Date Collected: 01/12/22 13:25

Matrix: Solid

Date Received: 01/14/22 15:12

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	1.5	J	3.5	1.1	mg/Kg		01/15/22 11:51	01/15/22 15:32	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	85		67 - 134				01/15/22 11:51	01/15/22 15:32	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.013	U	0.018	0.0033	mg/Kg		01/15/22 11:14	01/16/22 16:28	1
Toluene	0.026	U	0.053	0.012	mg/Kg		01/15/22 11:14	01/16/22 16:28	1
Ethylbenzene	0.026	U	0.035	0.0080	mg/Kg		01/15/22 11:14	01/16/22 16:28	1
m-Xylene & p-Xylene	0.013	U	0.035	0.0062	mg/Kg		01/15/22 11:14	01/16/22 16:28	1
o-Xylene	0.013	U	0.035	0.0044	mg/Kg		01/15/22 11:14	01/16/22 16:28	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	99		85 - 116				01/15/22 11:14	01/16/22 16:28	1
4-Bromofluorobenzene (Surr)	97		79 - 119				01/15/22 11:14	01/16/22 16:28	1
Dibromofluoromethane (Surr)	95		78 - 119				01/15/22 11:14	01/16/22 16:28	1
1,2-Dichloroethane-d4 (Surr)	94		71 - 136				01/15/22 11:14	01/16/22 16:28	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	70.6		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	29.4		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-E10-7-8

Lab Sample ID: 580-109299-3

Date Collected: 01/12/22 13:25

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 70.6

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0017	U	0.0057	0.00072	mg/Kg	☼	01/14/22 16:26	01/15/22 02:33	1
2-Methylnaphthalene	0.0034	U	0.0057	0.0023	mg/Kg	☼	01/14/22 16:26	01/15/22 02:33	1
Naphthalene	0.0046	U	0.0057	0.0019	mg/Kg	☼	01/14/22 16:26	01/15/22 02:33	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	69		28 - 143	01/14/22 16:26	01/15/22 02:33	1
2-methylnaphthalene-d10	68		40 - 140	01/14/22 16:26	01/15/22 02:33	1
Fluoranthene-d10 (Surr)	79		40 - 140	01/14/22 16:26	01/15/22 02:33	1
Terphenyl-d14	89		58 - 132	01/14/22 16:26	01/15/22 02:33	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	31	U	52	10	mg/Kg	☼	01/14/22 16:25	01/15/22 22:59	1
C24-C40	25	J	52	21	mg/Kg	☼	01/14/22 16:25	01/15/22 22:59	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	81		45 - 130	01/14/22 16:25	01/15/22 22:59	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-S25-7-8

Lab Sample ID: 580-109299-4

Date Collected: 01/12/22 14:22

Matrix: Solid

Date Received: 01/14/22 15:12

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	6.1	U	8.1	2.6	mg/Kg		01/15/22 11:51	01/15/22 13:36	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	83		67 - 134	01/15/22 11:51	01/15/22 13:36	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.030	U	0.041	0.0077	mg/Kg		01/15/22 11:14	01/16/22 16:51	1
Toluene	0.061	U	0.12	0.027	mg/Kg		01/15/22 11:14	01/16/22 16:51	1
Ethylbenzene	0.061	U	0.081	0.018	mg/Kg		01/15/22 11:14	01/16/22 16:51	1
m-Xylene & p-Xylene	0.030	U	0.081	0.014	mg/Kg		01/15/22 11:14	01/16/22 16:51	1
o-Xylene	0.030	U	0.081	0.010	mg/Kg		01/15/22 11:14	01/16/22 16:51	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	98		85 - 116	01/15/22 11:14	01/16/22 16:51	1
4-Bromofluorobenzene (Surr)	93		79 - 119	01/15/22 11:14	01/16/22 16:51	1
Dibromofluoromethane (Surr)	92		78 - 119	01/15/22 11:14	01/16/22 16:51	1
1,2-Dichloroethane-d4 (Surr)	94		71 - 136	01/15/22 11:14	01/16/22 16:51	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	78.0		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	22.0		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-S25-7-8

Lab Sample ID: 580-109299-4

Date Collected: 01/12/22 14:22

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 78.0

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0019	U	0.0063	0.00080	mg/Kg	☼	01/14/22 16:26	01/15/22 02:57	1
2-Methylnaphthalene	0.0038	U	0.0063	0.0026	mg/Kg	☼	01/14/22 16:26	01/15/22 02:57	1
Naphthalene	0.0051	U	0.0063	0.0020	mg/Kg	☼	01/14/22 16:26	01/15/22 02:57	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	69		28 - 143	01/14/22 16:26	01/15/22 02:57	1
2-methylnaphthalene-d10	77		40 - 140	01/14/22 16:26	01/15/22 02:57	1
Fluoranthene-d10 (Surr)	95		40 - 140	01/14/22 16:26	01/15/22 02:57	1
Terphenyl-d14	114		58 - 132	01/14/22 16:26	01/15/22 02:57	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	33	U	55	11	mg/Kg	☼	01/14/22 16:25	01/15/22 23:18	1
C24-C40	33	U	55	22	mg/Kg	☼	01/14/22 16:25	01/15/22 23:18	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	84		45 - 130	01/14/22 16:25	01/15/22 23:18	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W10-11-12

Lab Sample ID: 580-109299-5

Date Collected: 01/11/22 15:20

Matrix: Solid

Date Received: 01/14/22 15:12

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	890		390	130	mg/Kg		01/15/22 11:51	01/15/22 15:55	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	90		67 - 134				01/15/22 11:51	01/15/22 15:55	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.029	U	0.039	0.0075	mg/Kg		01/15/22 11:14	01/17/22 13:35	1
Toluene	0.059	U	0.12	0.026	mg/Kg		01/15/22 11:14	01/17/22 13:35	1
Ethylbenzene	0.059	U	0.079	0.018	mg/Kg		01/15/22 11:14	01/17/22 13:35	1
m-Xylene & p-Xylene	0.37		0.079	0.014	mg/Kg		01/15/22 11:14	01/17/22 13:35	1
o-Xylene	1.3		0.079	0.0098	mg/Kg		01/15/22 11:14	01/17/22 13:35	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	111		85 - 116				01/15/22 11:14	01/17/22 13:35	1
4-Bromofluorobenzene (Surr)	92		79 - 119				01/15/22 11:14	01/17/22 13:35	1
Dibromofluoromethane (Surr)	82		78 - 119				01/15/22 11:14	01/17/22 13:35	1
1,2-Dichloroethane-d4 (Surr)	78	Q	71 - 136				01/15/22 11:14	01/17/22 13:35	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	77.9		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	22.1		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W10-11-12

Lab Sample ID: 580-109299-5

Date Collected: 01/11/22 15:20

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 77.9

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	1.7		0.0058	0.00073	mg/Kg	☼	01/14/22 16:26	01/15/22 03:20	1
2-Methylnaphthalene	2.6		0.0058	0.0024	mg/Kg	☼	01/14/22 16:26	01/15/22 03:20	1
Naphthalene	0.61		0.0058	0.0019	mg/Kg	☼	01/14/22 16:26	01/15/22 03:20	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	52		28 - 143	01/14/22 16:26	01/15/22 03:20	1
2-methylnaphthalene-d10	73		40 - 140	01/14/22 16:26	01/15/22 03:20	1
Fluoranthene-d10 (Surr)	87		40 - 140	01/14/22 16:26	01/15/22 03:20	1
Terphenyl-d14	103		58 - 132	01/14/22 16:26	01/15/22 03:20	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	370		58	11	mg/Kg	☼	01/14/22 16:25	01/15/22 23:38	1
C24-C40	140		58	23	mg/Kg	☼	01/14/22 16:25	01/15/22 23:38	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	83		45 - 130	01/14/22 16:25	01/15/22 23:38	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W10-19-20

Lab Sample ID: 580-109299-6

Date Collected: 01/11/22 16:02

Matrix: Solid

Date Received: 01/14/22 15:12

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	400		3.6	1.2	mg/Kg		01/15/22 11:51	01/15/22 16:41	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	140	Q	67 - 134				01/15/22 11:51	01/15/22 16:41	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.029	U	0.039	0.0073	mg/Kg		01/15/22 11:14	01/17/22 13:58	1
Toluene	0.058	U	0.12	0.026	mg/Kg		01/15/22 11:14	01/17/22 13:58	1
Ethylbenzene	0.058	U	0.077	0.018	mg/Kg		01/15/22 11:14	01/17/22 13:58	1
m-Xylene & p-Xylene	0.23	M	0.077	0.014	mg/Kg		01/15/22 11:14	01/17/22 13:58	1
o-Xylene	0.43		0.077	0.0096	mg/Kg		01/15/22 11:14	01/17/22 13:58	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	104		85 - 116				01/15/22 11:14	01/17/22 13:58	1
4-Bromofluorobenzene (Surr)	94		79 - 119				01/15/22 11:14	01/17/22 13:58	1
Dibromofluoromethane (Surr)	80		78 - 119				01/15/22 11:14	01/17/22 13:58	1
1,2-Dichloroethane-d4 (Surr)	74	Q	71 - 136				01/15/22 11:14	01/17/22 13:58	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	66.2		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	33.8		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W10-19-20

Lab Sample ID: 580-109299-6

Date Collected: 01/11/22 16:02

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 66.2

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	1.1		0.0072	0.00091	mg/Kg	☼	01/14/22 16:26	01/15/22 03:44	1
2-Methylnaphthalene	1.6		0.0072	0.0029	mg/Kg	☼	01/14/22 16:26	01/15/22 03:44	1
Naphthalene	0.36		0.0072	0.0023	mg/Kg	☼	01/14/22 16:26	01/15/22 03:44	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	62		28 - 143	01/14/22 16:26	01/15/22 03:44	1
2-methylnaphthalene-d10	73		40 - 140	01/14/22 16:26	01/15/22 03:44	1
Fluoranthene-d10 (Surr)	83		40 - 140	01/14/22 16:26	01/15/22 03:44	1
Terphenyl-d14	104		58 - 132	01/14/22 16:26	01/15/22 03:44	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	510		54	11	mg/Kg	☼	01/14/22 16:25	01/16/22 00:16	1
C24-C40	29	J	54	22	mg/Kg	☼	01/14/22 16:25	01/16/22 00:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	81		45 - 130	01/14/22 16:25	01/16/22 00:16	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-N10-19-20

Lab Sample ID: 580-109299-7

Date Collected: 01/12/22 16:08

Matrix: Solid

Date Received: 01/14/22 15:12

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	450		9.1	3.0	mg/Kg		01/15/22 11:51	01/15/22 17:04	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	113		67 - 134				01/15/22 11:51	01/15/22 17:04	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.034	U	0.045	0.0086	mg/Kg		01/15/22 11:14	01/16/22 18:00	1
Toluene	0.068	U	0.14	0.031	mg/Kg		01/15/22 11:14	01/16/22 18:00	1
Ethylbenzene	0.068	U	0.091	0.021	mg/Kg		01/15/22 11:14	01/16/22 18:00	1
m-Xylene & p-Xylene	0.034	U	0.091	0.016	mg/Kg		01/15/22 11:14	01/16/22 18:00	1
o-Xylene	0.13		0.091	0.011	mg/Kg		01/15/22 11:14	01/16/22 18:00	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	103		85 - 116				01/15/22 11:14	01/16/22 18:00	1
4-Bromofluorobenzene (Surr)	105		79 - 119				01/15/22 11:14	01/16/22 18:00	1
Dibromofluoromethane (Surr)	101		78 - 119				01/15/22 11:14	01/16/22 18:00	1
1,2-Dichloroethane-d4 (Surr)	96		71 - 136				01/15/22 11:14	01/16/22 18:00	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	66.8		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	33.2		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-N10-19-20

Lab Sample ID: 580-109299-7

Date Collected: 01/12/22 16:08

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 66.8

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	1.2		0.0071	0.00089	mg/Kg	☼	01/14/22 16:26	01/15/22 04:08	1
2-Methylnaphthalene	1.7		0.0071	0.0029	mg/Kg	☼	01/14/22 16:26	01/15/22 04:08	1
Naphthalene	0.40		0.0071	0.0023	mg/Kg	☼	01/14/22 16:26	01/15/22 04:08	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	51		28 - 143	01/14/22 16:26	01/15/22 04:08	1
2-methylnaphthalene-d10	65		40 - 140	01/14/22 16:26	01/15/22 04:08	1
Fluoranthene-d10 (Surr)	73		40 - 140	01/14/22 16:26	01/15/22 04:08	1
Terphenyl-d14	90		58 - 132	01/14/22 16:26	01/15/22 04:08	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	1200		62	12	mg/Kg	☼	01/14/22 16:25	01/16/22 00:35	1
C24-C40	37	U	62	25	mg/Kg	☼	01/14/22 16:25	01/16/22 00:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	88		45 - 130	01/14/22 16:25	01/16/22 00:35	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-N40-7-8

Lab Sample ID: 580-109299-8

Date Collected: 01/12/22 15:42

Matrix: Solid

Date Received: 01/14/22 15:12

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	64		8.2	2.7	mg/Kg		01/15/22 11:51	01/15/22 17:28	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	105		67 - 134				01/15/22 11:51	01/15/22 17:28	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.031	U	0.041	0.0078	mg/Kg		01/15/22 11:14	01/16/22 18:23	1
Toluene	0.061	U	0.12	0.028	mg/Kg		01/15/22 11:14	01/16/22 18:23	1
Ethylbenzene	0.061	U	0.082	0.019	mg/Kg		01/15/22 11:14	01/16/22 18:23	1
m-Xylene & p-Xylene	0.031	U	0.082	0.015	mg/Kg		01/15/22 11:14	01/16/22 18:23	1
o-Xylene	0.031	U	0.082	0.010	mg/Kg		01/15/22 11:14	01/16/22 18:23	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	98		85 - 116				01/15/22 11:14	01/16/22 18:23	1
4-Bromofluorobenzene (Surr)	94		79 - 119				01/15/22 11:14	01/16/22 18:23	1
Dibromofluoromethane (Surr)	92		78 - 119				01/15/22 11:14	01/16/22 18:23	1
1,2-Dichloroethane-d4 (Surr)	93		71 - 136				01/15/22 11:14	01/16/22 18:23	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	79.7		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	20.3		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-N40-7-8

Lab Sample ID: 580-109299-8

Date Collected: 01/12/22 15:42

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 79.7

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0026	J M	0.0050	0.00063	mg/Kg	☼	01/14/22 16:26	01/15/22 19:29	1
2-Methylnaphthalene	0.0056	M	0.0050	0.0020	mg/Kg	☼	01/14/22 16:26	01/15/22 19:29	1
Naphthalene	0.0040	U M	0.0050	0.0016	mg/Kg	☼	01/14/22 16:26	01/15/22 19:29	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	60		28 - 143	01/14/22 16:26	01/15/22 19:29	1
2-methylnaphthalene-d10	78		40 - 140	01/14/22 16:26	01/15/22 19:29	1
Fluoranthene-d10 (Surr)	62		40 - 140	01/14/22 16:26	01/15/22 19:29	1
Terphenyl-d14	77		58 - 132	01/14/22 16:26	01/15/22 19:29	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	370	U	610	120	mg/Kg	☼	01/14/22 16:25	01/16/22 16:17	10
C24-C40	640	D	610	240	mg/Kg	☼	01/14/22 16:25	01/16/22 16:17	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	88		45 - 130	01/14/22 16:25	01/16/22 16:17	10

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-N25-16-17

Lab Sample ID: 580-109299-9

Date Collected: 01/12/22 13:36

Matrix: Solid

Date Received: 01/14/22 15:12

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	4800		840	270	mg/Kg		01/15/22 11:51	01/15/22 17:51	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		67 - 134				01/15/22 11:51	01/15/22 17:51	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.31	U	0.42	0.080	mg/Kg		01/15/22 11:14	01/17/22 13:12	1
Toluene	0.63	U	1.3	0.28	mg/Kg		01/15/22 11:14	01/17/22 13:12	1
Ethylbenzene	0.21	J	0.84	0.19	mg/Kg		01/15/22 11:14	01/17/22 13:12	1
m-Xylene & p-Xylene	1.5		0.84	0.15	mg/Kg		01/15/22 11:14	01/17/22 13:12	1
o-Xylene	2.6		0.84	0.10	mg/Kg		01/15/22 11:14	01/17/22 13:12	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	104		85 - 116				01/15/22 11:14	01/17/22 13:12	1
4-Bromofluorobenzene (Surr)	97		79 - 119				01/15/22 11:14	01/17/22 13:12	1
Dibromofluoromethane (Surr)	91		78 - 119				01/15/22 11:14	01/17/22 13:12	1
1,2-Dichloroethane-d4 (Surr)	83	Q	71 - 136				01/15/22 11:14	01/17/22 13:12	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	66.1		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	33.9		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-N25-16-17

Lab Sample ID: 580-109299-9

Date Collected: 01/12/22 13:36

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 66.1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	6.9		0.0069	0.00087	mg/Kg	☼	01/14/22 16:26	01/15/22 04:56	1
2-Methylnaphthalene	11		0.0069	0.0028	mg/Kg	☼	01/14/22 16:26	01/15/22 04:56	1
Naphthalene	4.2		0.0069	0.0022	mg/Kg	☼	01/14/22 16:26	01/15/22 04:56	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	31		28 - 143	01/14/22 16:26	01/15/22 04:56	1
2-methylnaphthalene-d10	42		40 - 140	01/14/22 16:26	01/15/22 04:56	1
Fluoranthene-d10 (Surr)	76		40 - 140	01/14/22 16:26	01/15/22 04:56	1
Terphenyl-d14	78		58 - 132	01/14/22 16:26	01/15/22 04:56	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	5900		73	15	mg/Kg	☼	01/14/22 16:25	01/16/22 01:14	1
C24-C40	44	U	73	29	mg/Kg	☼	01/14/22 16:25	01/16/22 01:14	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	85		45 - 130	01/14/22 16:25	01/16/22 01:14	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-S10-17-18

Lab Sample ID: 580-109299-10

Date Collected: 01/12/22 10:05

Matrix: Solid

Date Received: 01/14/22 15:12

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	180		3.8	1.2	mg/Kg		01/15/22 11:51	01/15/22 18:14	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	120		67 - 134				01/15/22 11:51	01/15/22 18:14	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.014	U	0.019	0.0036	mg/Kg		01/15/22 11:14	01/16/22 19:08	1
Toluene	0.028	U	0.057	0.013	mg/Kg		01/15/22 11:14	01/16/22 19:08	1
Ethylbenzene	0.028	U M	0.038	0.0086	mg/Kg		01/15/22 11:14	01/16/22 19:08	1
m-Xylene & p-Xylene	0.034	J M	0.038	0.0067	mg/Kg		01/15/22 11:14	01/16/22 19:08	1
o-Xylene	0.030	J	0.038	0.0047	mg/Kg		01/15/22 11:14	01/16/22 19:08	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	100		85 - 116				01/15/22 11:14	01/16/22 19:08	1
4-Bromofluorobenzene (Surr)	100		79 - 119				01/15/22 11:14	01/16/22 19:08	1
Dibromofluoromethane (Surr)	99	M	78 - 119				01/15/22 11:14	01/16/22 19:08	1
1,2-Dichloroethane-d4 (Surr)	94	M	71 - 136				01/15/22 11:14	01/16/22 19:08	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	64.4		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	35.6		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-S10-17-18

Lab Sample ID: 580-109299-10

Date Collected: 01/12/22 10:05

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 64.4

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	1.8		0.0075	0.00095	mg/Kg	☼	01/14/22 16:26	01/15/22 05:20	1
2-Methylnaphthalene	2.6		0.0075	0.0031	mg/Kg	☼	01/14/22 16:26	01/15/22 05:20	1
Naphthalene	0.81		0.0075	0.0024	mg/Kg	☼	01/14/22 16:26	01/15/22 05:20	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	53		28 - 143	01/14/22 16:26	01/15/22 05:20	1
2-methylnaphthalene-d10	73		40 - 140	01/14/22 16:26	01/15/22 05:20	1
Fluoranthene-d10 (Surr)	76		40 - 140	01/14/22 16:26	01/15/22 05:20	1
Terphenyl-d14	94		58 - 132	01/14/22 16:26	01/15/22 05:20	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	420		68	14	mg/Kg	☼	01/14/22 16:25	01/16/22 01:33	1
C24-C40	41	U	68	27	mg/Kg	☼	01/14/22 16:25	01/16/22 01:33	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	83		45 - 130	01/14/22 16:25	01/16/22 01:33	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-N10-7-8

Lab Sample ID: 580-109299-11

Date Collected: 01/12/22 10:50

Matrix: Solid

Date Received: 01/14/22 15:12

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	480		3.5	1.1	mg/Kg		01/15/22 11:51	01/15/22 18:37	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	153	Q	67 - 134				01/15/22 11:51	01/15/22 18:37	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.013	U	0.018	0.0033	mg/Kg		01/15/22 11:14	01/16/22 19:31	1
Toluene	0.026	U	0.053	0.012	mg/Kg		01/15/22 11:14	01/16/22 19:31	1
Ethylbenzene	0.026	U	0.035	0.0080	mg/Kg		01/15/22 11:14	01/16/22 19:31	1
m-Xylene & p-Xylene	0.035		0.035	0.0062	mg/Kg		01/15/22 11:14	01/16/22 19:31	1
o-Xylene	0.23		0.035	0.0044	mg/Kg		01/15/22 11:14	01/16/22 19:31	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	105		85 - 116				01/15/22 11:14	01/16/22 19:31	1
4-Bromofluorobenzene (Surr)	94		79 - 119				01/15/22 11:14	01/16/22 19:31	1
Dibromofluoromethane (Surr)	92	M	78 - 119				01/15/22 11:14	01/16/22 19:31	1
1,2-Dichloroethane-d4 (Surr)	95	M	71 - 136				01/15/22 11:14	01/16/22 19:31	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	72.9		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	27.1		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-N10-7-8

Lab Sample ID: 580-109299-11

Date Collected: 01/12/22 10:50

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 72.9

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	2.0		0.0066	0.00084	mg/Kg	☼	01/14/22 16:26	01/15/22 05:44	1
2-Methylnaphthalene	1.5		0.0066	0.0027	mg/Kg	☼	01/14/22 16:26	01/15/22 05:44	1
Naphthalene	0.57		0.0066	0.0022	mg/Kg	☼	01/14/22 16:26	01/15/22 05:44	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	34		28 - 143	01/14/22 16:26	01/15/22 05:44	1
2-methylnaphthalene-d10	85		40 - 140	01/14/22 16:26	01/15/22 05:44	1
Fluoranthene-d10 (Surr)	70		40 - 140	01/14/22 16:26	01/15/22 05:44	1
Terphenyl-d14	90		58 - 132	01/14/22 16:26	01/15/22 05:44	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	3500		65	13	mg/Kg	☼	01/14/22 16:25	01/16/22 01:52	1
C24-C40	39	U	65	26	mg/Kg	☼	01/14/22 16:25	01/16/22 01:52	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	85		45 - 130	01/14/22 16:25	01/16/22 01:52	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: HT-N10-24-25

Lab Sample ID: 580-109299-12

Date Collected: 01/12/22 16:08

Matrix: Solid

Date Received: 01/14/22 15:12

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	240		6.7	2.2	mg/Kg		01/15/22 11:51	01/15/22 19:01	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	109		67 - 134				01/15/22 11:51	01/15/22 19:01	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.025	U	0.033	0.0063	mg/Kg		01/15/22 11:14	01/16/22 19:54	1
Toluene	0.050	U	0.10	0.022	mg/Kg		01/15/22 11:14	01/16/22 19:54	1
Ethylbenzene	0.050	U	0.067	0.015	mg/Kg		01/15/22 11:14	01/16/22 19:54	1
m-Xylene & p-Xylene	0.025	U M	0.067	0.012	mg/Kg		01/15/22 11:14	01/16/22 19:54	1
o-Xylene	0.025	U M	0.067	0.0083	mg/Kg		01/15/22 11:14	01/16/22 19:54	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	100		85 - 116				01/15/22 11:14	01/16/22 19:54	1
4-Bromofluorobenzene (Surr)	97		79 - 119				01/15/22 11:14	01/16/22 19:54	1
Dibromofluoromethane (Surr)	92		78 - 119				01/15/22 11:14	01/16/22 19:54	1
1,2-Dichloroethane-d4 (Surr)	88	M	71 - 136				01/15/22 11:14	01/16/22 19:54	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	68.2		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	31.8		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: HT-N10-24-25

Lab Sample ID: 580-109299-12

Date Collected: 01/12/22 16:08

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 68.2

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.039		0.0064	0.00080	mg/Kg	☼	01/14/22 16:26	01/15/22 06:07	1
2-Methylnaphthalene	0.060	M	0.0064	0.0026	mg/Kg	☼	01/14/22 16:26	01/15/22 06:07	1
Naphthalene	0.021	M	0.0064	0.0021	mg/Kg	☼	01/14/22 16:26	01/15/22 06:07	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	55		28 - 143	01/14/22 16:26	01/15/22 06:07	1
2-methylnaphthalene-d10	71		40 - 140	01/14/22 16:26	01/15/22 06:07	1
Fluoranthene-d10 (Surr)	87		40 - 140	01/14/22 16:26	01/15/22 06:07	1
Terphenyl-d14	99		58 - 132	01/14/22 16:26	01/15/22 06:07	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	95		71	14	mg/Kg	☼	01/14/22 16:25	01/16/22 02:11	1
C24-C40	43	U	71	29	mg/Kg	☼	01/14/22 16:25	01/16/22 02:11	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	82		45 - 130	01/14/22 16:25	01/16/22 02:11	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: HT-W10-18-19

Lab Sample ID: 580-109299-13

Date Collected: 01/12/22 17:29

Matrix: Solid

Date Received: 01/14/22 15:12

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	620		8.1	2.6	mg/Kg		01/15/22 11:51	01/15/22 19:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	124		67 - 134				01/15/22 11:51	01/15/22 19:24	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.030	U	0.040	0.0077	mg/Kg		01/15/22 11:14	01/16/22 20:17	1
Toluene	0.061	U	0.12	0.027	mg/Kg		01/15/22 11:14	01/16/22 20:17	1
Ethylbenzene	0.061	U	0.081	0.018	mg/Kg		01/15/22 11:14	01/16/22 20:17	1
m-Xylene & p-Xylene	0.038	J	0.081	0.014	mg/Kg		01/15/22 11:14	01/16/22 20:17	1
o-Xylene	0.32		0.081	0.010	mg/Kg		01/15/22 11:14	01/16/22 20:17	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	102		85 - 116				01/15/22 11:14	01/16/22 20:17	1
4-Bromofluorobenzene (Surr)	100		79 - 119				01/15/22 11:14	01/16/22 20:17	1
Dibromofluoromethane (Surr)	98		78 - 119				01/15/22 11:14	01/16/22 20:17	1
1,2-Dichloroethane-d4 (Surr)	93		71 - 136				01/15/22 11:14	01/16/22 20:17	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	65.7		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	34.3		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: HT-W10-18-19

Lab Sample ID: 580-109299-13

Date Collected: 01/12/22 17:29

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 65.7

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.76		0.0071	0.00089	mg/Kg	☼	01/14/22 16:26	01/15/22 06:31	1
2-Methylnaphthalene	0.91		0.0071	0.0029	mg/Kg	☼	01/14/22 16:26	01/15/22 06:31	1
Naphthalene	0.25		0.0071	0.0023	mg/Kg	☼	01/14/22 16:26	01/15/22 06:31	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	42		28 - 143	01/14/22 16:26	01/15/22 06:31	1
2-methylnaphthalene-d10	55		40 - 140	01/14/22 16:26	01/15/22 06:31	1
Fluoranthene-d10 (Surr)	62		40 - 140	01/14/22 16:26	01/15/22 06:31	1
Terphenyl-d14	74		58 - 132	01/14/22 16:26	01/15/22 06:31	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	1300		56	11	mg/Kg	☼	01/14/22 16:25	01/16/22 02:30	1
C24-C40	33	U	56	22	mg/Kg	☼	01/14/22 16:25	01/16/22 02:30	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	88		45 - 130	01/14/22 16:25	01/16/22 02:30	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: HT-W10-22-23

Lab Sample ID: 580-109299-14

Date Collected: 01/12/22 17:23

Matrix: Solid

Date Received: 01/14/22 15:12

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	100		8.7	2.8	mg/Kg		01/15/22 11:51	01/15/22 19:47	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	106		67 - 134				01/15/22 11:51	01/15/22 19:47	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.033	U	0.044	0.0083	mg/Kg		01/15/22 11:14	01/16/22 20:40	1
Toluene	0.065	U	0.13	0.029	mg/Kg		01/15/22 11:14	01/16/22 20:40	1
Ethylbenzene	0.065	U	0.087	0.020	mg/Kg		01/15/22 11:14	01/16/22 20:40	1
m-Xylene & p-Xylene	0.033	U	0.087	0.015	mg/Kg		01/15/22 11:14	01/16/22 20:40	1
o-Xylene	0.033	U	0.087	0.011	mg/Kg		01/15/22 11:14	01/16/22 20:40	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	98		85 - 116				01/15/22 11:14	01/16/22 20:40	1
4-Bromofluorobenzene (Surr)	92		79 - 119				01/15/22 11:14	01/16/22 20:40	1
Dibromofluoromethane (Surr)	90		78 - 119				01/15/22 11:14	01/16/22 20:40	1
1,2-Dichloroethane-d4 (Surr)	90		71 - 136				01/15/22 11:14	01/16/22 20:40	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	75.3		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	24.7		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: HT-W10-22-23

Lab Sample ID: 580-109299-14

Date Collected: 01/12/22 17:23

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 75.3

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.13		0.0061	0.00077	mg/Kg	☼	01/14/22 16:26	01/15/22 06:55	1
2-Methylnaphthalene	0.17		0.0061	0.0025	mg/Kg	☼	01/14/22 16:26	01/15/22 06:55	1
Naphthalene	0.038		0.0061	0.0020	mg/Kg	☼	01/14/22 16:26	01/15/22 06:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	55		28 - 143	01/14/22 16:26	01/15/22 06:55	1
2-methylnaphthalene-d10	67		40 - 140	01/14/22 16:26	01/15/22 06:55	1
Fluoranthene-d10 (Surr)	71		40 - 140	01/14/22 16:26	01/15/22 06:55	1
Terphenyl-d14	94		58 - 132	01/14/22 16:26	01/15/22 06:55	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	39	J	56	11	mg/Kg	☼	01/14/22 16:25	01/16/22 02:49	1
C24-C40	33	U	56	22	mg/Kg	☼	01/14/22 16:25	01/16/22 02:49	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	83		45 - 130	01/14/22 16:25	01/16/22 02:49	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-S17.5-5-6

Lab Sample ID: 580-109299-15

Date Collected: 01/12/22 13:43

Matrix: Solid

Date Received: 01/14/22 15:12

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	24		8.1	2.6	mg/Kg		01/15/22 11:51	01/15/22 20:10	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	100		67 - 134				01/15/22 11:51	01/15/22 20:10	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.030	U	0.041	0.0077	mg/Kg		01/15/22 11:14	01/16/22 21:03	1
Toluene	0.061	U	0.12	0.027	mg/Kg		01/15/22 11:14	01/16/22 21:03	1
Ethylbenzene	0.061	U	0.081	0.018	mg/Kg		01/15/22 11:14	01/16/22 21:03	1
m-Xylene & p-Xylene	0.030	U	0.081	0.014	mg/Kg		01/15/22 11:14	01/16/22 21:03	1
o-Xylene	0.030	U	0.081	0.010	mg/Kg		01/15/22 11:14	01/16/22 21:03	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	99		85 - 116				01/15/22 11:14	01/16/22 21:03	1
4-Bromofluorobenzene (Surr)	96		79 - 119				01/15/22 11:14	01/16/22 21:03	1
Dibromofluoromethane (Surr)	91		78 - 119				01/15/22 11:14	01/16/22 21:03	1
1,2-Dichloroethane-d4 (Surr)	94		71 - 136				01/15/22 11:14	01/16/22 21:03	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	84.0		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	16.0		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-S17.5-5-6

Lab Sample ID: 580-109299-15

Date Collected: 01/12/22 13:43

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 84.0

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0028	J M	0.0055	0.00069	mg/Kg	☼	01/14/22 16:26	01/15/22 07:19	1
2-Methylnaphthalene	0.0025	J M	0.0055	0.0023	mg/Kg	☼	01/14/22 16:26	01/15/22 07:19	1
Naphthalene	0.0044	U	0.0055	0.0018	mg/Kg	☼	01/14/22 16:26	01/15/22 07:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	69		28 - 143	01/14/22 16:26	01/15/22 07:19	1
2-methylnaphthalene-d10	69		40 - 140	01/14/22 16:26	01/15/22 07:19	1
Fluoranthene-d10 (Surr)	77		40 - 140	01/14/22 16:26	01/15/22 07:19	1
Terphenyl-d14	92		58 - 132	01/14/22 16:26	01/15/22 07:19	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	22	J	54	11	mg/Kg	☼	01/14/22 16:25	01/16/22 03:08	1
C24-C40	110		54	22	mg/Kg	☼	01/14/22 16:25	01/16/22 03:08	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	86		45 - 130	01/14/22 16:25	01/16/22 03:08	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W55-17-18

Lab Sample ID: 580-109299-16

Date Collected: 01/11/22 14:55

Matrix: Solid

Date Received: 01/14/22 15:12

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	2.7	U	3.6	1.2	mg/Kg		01/15/22 11:51	01/15/22 20:57	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	91		67 - 134	01/15/22 11:51	01/15/22 20:57	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.014	U	0.018	0.0034	mg/Kg		01/15/22 11:14	01/16/22 21:25	1
Toluene	0.027	U	0.054	0.012	mg/Kg		01/15/22 11:14	01/16/22 21:25	1
Ethylbenzene	0.027	U	0.036	0.0082	mg/Kg		01/15/22 11:14	01/16/22 21:25	1
m-Xylene & p-Xylene	0.014	U	0.036	0.0064	mg/Kg		01/15/22 11:14	01/16/22 21:25	1
o-Xylene	0.020	J	0.036	0.0045	mg/Kg		01/15/22 11:14	01/16/22 21:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	100		85 - 116	01/15/22 11:14	01/16/22 21:25	1
4-Bromofluorobenzene (Surr)	98		79 - 119	01/15/22 11:14	01/16/22 21:25	1
Dibromofluoromethane (Surr)	93	M	78 - 119	01/15/22 11:14	01/16/22 21:25	1
1,2-Dichloroethane-d4 (Surr)	92	M	71 - 136	01/15/22 11:14	01/16/22 21:25	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	75.2		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	24.8		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W55-17-18

Lab Sample ID: 580-109299-16

Date Collected: 01/11/22 14:55

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 75.2

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0053	J M	0.0062	0.00078	mg/Kg	☼	01/14/22 16:26	01/15/22 07:43	1
2-Methylnaphthalene	0.0085	M	0.0062	0.0025	mg/Kg	☼	01/14/22 16:26	01/15/22 07:43	1
Naphthalene	0.023	M	0.0062	0.0020	mg/Kg	☼	01/14/22 16:26	01/15/22 07:43	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	69		28 - 143	01/14/22 16:26	01/15/22 07:43	1
2-methylnaphthalene-d10	69		40 - 140	01/14/22 16:26	01/15/22 07:43	1
Fluoranthene-d10 (Surr)	82		40 - 140	01/14/22 16:26	01/15/22 07:43	1
Terphenyl-d14	99		58 - 132	01/14/22 16:26	01/15/22 07:43	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	39	U	65	13	mg/Kg	☼	01/14/22 16:25	01/16/22 03:47	1
C24-C40	39	U	65	26	mg/Kg	☼	01/14/22 16:25	01/16/22 03:47	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	79		45 - 130	01/14/22 16:25	01/16/22 03:47	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W19.5-14-15

Lab Sample ID: 580-109299-17

Date Collected: 01/12/22 16:08

Matrix: Solid

Date Received: 01/14/22 15:12

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	5.0	J	9.0	2.9	mg/Kg		01/15/22 11:51	01/15/22 21:20	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	90		67 - 134				01/15/22 11:51	01/15/22 21:20	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.034	U	0.045	0.0086	mg/Kg		01/15/22 11:14	01/16/22 21:48	1
Toluene	0.068	U	0.14	0.030	mg/Kg		01/15/22 11:14	01/16/22 21:48	1
Ethylbenzene	0.068	U	0.090	0.021	mg/Kg		01/15/22 11:14	01/16/22 21:48	1
m-Xylene & p-Xylene	0.034	U	0.090	0.016	mg/Kg		01/15/22 11:14	01/16/22 21:48	1
o-Xylene	0.034	U	0.090	0.011	mg/Kg		01/15/22 11:14	01/16/22 21:48	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	99		85 - 116				01/15/22 11:14	01/16/22 21:48	1
4-Bromofluorobenzene (Surr)	99		79 - 119				01/15/22 11:14	01/16/22 21:48	1
Dibromofluoromethane (Surr)	89		78 - 119				01/15/22 11:14	01/16/22 21:48	1
1,2-Dichloroethane-d4 (Surr)	91		71 - 136				01/15/22 11:14	01/16/22 21:48	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	75.7		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	24.3		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W19.5-14-15

Lab Sample ID: 580-109299-17

Date Collected: 01/12/22 16:08

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 75.7

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0061	M	0.0059	0.00075	mg/Kg	☼	01/14/22 16:26	01/15/22 08:07	1
2-Methylnaphthalene	0.0079	M	0.0059	0.0024	mg/Kg	☼	01/14/22 16:26	01/15/22 08:07	1
Naphthalene	0.0040	J M	0.0059	0.0019	mg/Kg	☼	01/14/22 16:26	01/15/22 08:07	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	58		28 - 143	01/14/22 16:26	01/15/22 08:07	1
2-methylnaphthalene-d10	62		40 - 140	01/14/22 16:26	01/15/22 08:07	1
Fluoranthene-d10 (Surr)	75		40 - 140	01/14/22 16:26	01/15/22 08:07	1
Terphenyl-d14	91		58 - 132	01/14/22 16:26	01/15/22 08:07	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	90		59	12	mg/Kg	☼	01/14/22 16:25	01/16/22 04:06	1
C24-C40	110		59	24	mg/Kg	☼	01/14/22 16:25	01/16/22 04:06	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	78		45 - 130	01/14/22 16:25	01/16/22 04:06	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-S10-23-24

Lab Sample ID: 580-109299-18

Date Collected: 01/12/22 10:10

Matrix: Solid

Date Received: 01/14/22 15:12

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	1.8	J	3.8	1.2	mg/Kg		01/15/22 11:51	01/15/22 21:43	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	91		67 - 134				01/15/22 11:51	01/15/22 21:43	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.014	U	0.019	0.0036	mg/Kg		01/15/22 11:14	01/16/22 22:11	1
Toluene	0.029	U	0.057	0.013	mg/Kg		01/15/22 11:14	01/16/22 22:11	1
Ethylbenzene	0.029	U	0.038	0.0087	mg/Kg		01/15/22 11:14	01/16/22 22:11	1
m-Xylene & p-Xylene	0.014	U	0.038	0.0068	mg/Kg		01/15/22 11:14	01/16/22 22:11	1
o-Xylene	0.014	U	0.038	0.0048	mg/Kg		01/15/22 11:14	01/16/22 22:11	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	100		85 - 116				01/15/22 11:14	01/16/22 22:11	1
4-Bromofluorobenzene (Surr)	100		79 - 119				01/15/22 11:14	01/16/22 22:11	1
Dibromofluoromethane (Surr)	91	M	78 - 119				01/15/22 11:14	01/16/22 22:11	1
1,2-Dichloroethane-d4 (Surr)	93		71 - 136				01/15/22 11:14	01/16/22 22:11	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	67.7		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	32.3		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-S10-23-24

Lab Sample ID: 580-109299-18

Date Collected: 01/12/22 10:10

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 67.7

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.027		0.0059	0.00075	mg/Kg	☼	01/14/22 16:26	01/15/22 08:31	1
2-Methylnaphthalene	0.021		0.0059	0.0024	mg/Kg	☼	01/14/22 16:26	01/15/22 08:31	1
Naphthalene	0.017	M	0.0059	0.0019	mg/Kg	☼	01/14/22 16:26	01/15/22 08:31	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	61		28 - 143	01/14/22 16:26	01/15/22 08:31	1
2-methylnaphthalene-d10	69		40 - 140	01/14/22 16:26	01/15/22 08:31	1
Fluoranthene-d10 (Surr)	79		40 - 140	01/14/22 16:26	01/15/22 08:31	1
Terphenyl-d14	93		58 - 132	01/14/22 16:26	01/15/22 08:31	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	13	J	65	13	mg/Kg	☼	01/14/22 16:25	01/16/22 04:25	1
C24-C40	39	U	65	26	mg/Kg	☼	01/14/22 16:25	01/16/22 04:25	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	84		45 - 130	01/14/22 16:25	01/16/22 04:25	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W40-9-10

Lab Sample ID: 580-109299-19

Date Collected: 01/11/22 16:51

Matrix: Solid

Date Received: 01/14/22 15:12

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	3.4	U	4.6	1.5	mg/Kg		01/15/22 11:51	01/15/22 22:06	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	89		67 - 134				01/15/22 11:51	01/15/22 22:06	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.017	U	0.023	0.0043	mg/Kg		01/15/22 11:14	01/16/22 22:34	1
Toluene	0.034	U	0.068	0.015	mg/Kg		01/15/22 11:14	01/16/22 22:34	1
Ethylbenzene	0.034	U	0.046	0.010	mg/Kg		01/15/22 11:14	01/16/22 22:34	1
m-Xylene & p-Xylene	0.017	U	0.046	0.0081	mg/Kg		01/15/22 11:14	01/16/22 22:34	1
o-Xylene	0.017	U	0.046	0.0057	mg/Kg		01/15/22 11:14	01/16/22 22:34	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	101		85 - 116				01/15/22 11:14	01/16/22 22:34	1
4-Bromofluorobenzene (Surr)	95		79 - 119				01/15/22 11:14	01/16/22 22:34	1
Dibromofluoromethane (Surr)	90		78 - 119				01/15/22 11:14	01/16/22 22:34	1
1,2-Dichloroethane-d4 (Surr)	91		71 - 136				01/15/22 11:14	01/16/22 22:34	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	78.4		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	21.6		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W40-9-10

Lab Sample ID: 580-109299-19

Date Collected: 01/11/22 16:51

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 78.4

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0015	U	0.0050	0.00063	mg/Kg	☼	01/14/22 16:26	01/15/22 08:55	1
2-Methylnaphthalene	0.0030	U	0.0050	0.0020	mg/Kg	☼	01/14/22 16:26	01/15/22 08:55	1
Naphthalene	0.0040	U	0.0050	0.0016	mg/Kg	☼	01/14/22 16:26	01/15/22 08:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	57		28 - 143	01/14/22 16:26	01/15/22 08:55	1
2-methylnaphthalene-d10	62		40 - 140	01/14/22 16:26	01/15/22 08:55	1
Fluoranthene-d10 (Surr)	84		40 - 140	01/14/22 16:26	01/15/22 08:55	1
Terphenyl-d14	98		58 - 132	01/14/22 16:26	01/15/22 08:55	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	38	U	63	12	mg/Kg	☼	01/14/22 16:25	01/16/22 04:44	1
C24-C40	38	U	63	25	mg/Kg	☼	01/14/22 16:25	01/16/22 04:44	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	76		45 - 130	01/14/22 16:25	01/16/22 04:44	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-N25-27-27.5

Lab Sample ID: 580-109299-20

Date Collected: 01/12/22 13:36

Matrix: Solid

Date Received: 01/14/22 15:12

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	5.4	U	7.2	2.3	mg/Kg		01/15/22 11:51	01/15/22 22:29	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	89		67 - 134				01/15/22 11:51	01/15/22 22:29	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.027	U	0.036	0.0069	mg/Kg		01/15/22 11:14	01/16/22 22:57	1
Toluene	0.054	U	0.11	0.024	mg/Kg		01/15/22 11:14	01/16/22 22:57	1
Ethylbenzene	0.054	U	0.072	0.016	mg/Kg		01/15/22 11:14	01/16/22 22:57	1
m-Xylene & p-Xylene	0.027	U	0.072	0.013	mg/Kg		01/15/22 11:14	01/16/22 22:57	1
o-Xylene	0.027	U	0.072	0.0090	mg/Kg		01/15/22 11:14	01/16/22 22:57	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	103		85 - 116				01/15/22 11:14	01/16/22 22:57	1
4-Bromofluorobenzene (Surr)	98		79 - 119				01/15/22 11:14	01/16/22 22:57	1
Dibromofluoromethane (Surr)	90	M	78 - 119				01/15/22 11:14	01/16/22 22:57	1
1,2-Dichloroethane-d4 (Surr)	90		71 - 136				01/15/22 11:14	01/16/22 22:57	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	68.4		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	31.6		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-N25-27-27.5

Lab Sample ID: 580-109299-20

Date Collected: 01/12/22 13:36

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 68.4

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0020	U	0.0067	0.00085	mg/Kg	☼	01/14/22 16:26	01/15/22 09:18	1
2-Methylnaphthalene	0.0040	U	0.0067	0.0028	mg/Kg	☼	01/14/22 16:26	01/15/22 09:18	1
Naphthalene	0.0054	U	0.0067	0.0022	mg/Kg	☼	01/14/22 16:26	01/15/22 09:18	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	59		28 - 143	01/14/22 16:26	01/15/22 09:18	1
2-methylnaphthalene-d10	69		40 - 140	01/14/22 16:26	01/15/22 09:18	1
Fluoranthene-d10 (Surr)	83		40 - 140	01/14/22 16:26	01/15/22 09:18	1
Terphenyl-d14	91		58 - 132	01/14/22 16:26	01/15/22 09:18	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	16	J	67	13	mg/Kg	☼	01/14/22 16:25	01/16/22 05:03	1
C24-C40	40	U	67	27	mg/Kg	☼	01/14/22 16:25	01/16/22 05:03	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	87		45 - 130	01/14/22 16:25	01/16/22 05:03	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-S25-14-15

Lab Sample ID: 580-109299-21

Date Collected: 01/12/22 14:30

Matrix: Solid

Date Received: 01/14/22 15:12

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	8.4	U	11	3.7	mg/Kg		01/15/22 16:57	01/16/22 02:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	88		67 - 134				01/15/22 16:57	01/16/22 02:45	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.042	U	0.056	0.011	mg/Kg		01/15/22 17:17	01/17/22 01:59	1
Toluene	0.084	U	0.17	0.038	mg/Kg		01/15/22 17:17	01/17/22 01:59	1
Ethylbenzene	0.084	U	0.11	0.026	mg/Kg		01/15/22 17:17	01/17/22 01:59	1
m-Xylene & p-Xylene	0.042	U	0.11	0.020	mg/Kg		01/15/22 17:17	01/17/22 01:59	1
o-Xylene	0.042	U	0.11	0.014	mg/Kg		01/15/22 17:17	01/17/22 01:59	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	101		85 - 116				01/15/22 17:17	01/17/22 01:59	1
4-Bromofluorobenzene (Surr)	97		79 - 119				01/15/22 17:17	01/17/22 01:59	1
Dibromofluoromethane (Surr)	86		78 - 119				01/15/22 17:17	01/17/22 01:59	1
1,2-Dichloroethane-d4 (Surr)	89	M	71 - 136				01/15/22 17:17	01/17/22 01:59	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	72.0		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	28.0		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-S25-14-15

Lab Sample ID: 580-109299-21

Date Collected: 01/12/22 14:30

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 72.0

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0043	J M	0.0058	0.00073	mg/Kg	☼	01/14/22 17:22	01/15/22 17:53	1
2-Methylnaphthalene	0.0034	J M	0.0058	0.0024	mg/Kg	☼	01/14/22 17:22	01/15/22 17:53	1
Naphthalene	0.010	M	0.0058	0.0019	mg/Kg	☼	01/14/22 17:22	01/15/22 17:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	59	M	28 - 143	01/14/22 17:22	01/15/22 17:53	1
2-methylnaphthalene-d10	68		40 - 140	01/14/22 17:22	01/15/22 17:53	1
Fluoranthene-d10 (Surr)	77		40 - 140	01/14/22 17:22	01/15/22 17:53	1
Terphenyl-d14	90		58 - 132	01/14/22 17:22	01/15/22 17:53	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	40	U	66	13	mg/Kg	☼	01/14/22 18:32	01/16/22 06:20	1
C24-C40	40	U	66	26	mg/Kg	☼	01/14/22 18:32	01/16/22 06:20	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	75		45 - 130	01/14/22 18:32	01/16/22 06:20	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W25-14-15

Lab Sample ID: 580-109299-22

Date Collected: 01/11/22 16:35

Matrix: Solid

Date Received: 01/14/22 15:12

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	3.5	U	4.7	1.5	mg/Kg		01/15/22 16:57	01/16/22 03:08	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	92		67 - 134	01/15/22 16:57	01/16/22 03:08	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.018	U	0.023	0.0044	mg/Kg		01/15/22 17:17	01/17/22 08:15	1
Toluene	0.035	U	0.070	0.016	mg/Kg		01/15/22 17:17	01/17/22 08:15	1
Ethylbenzene	0.035	U	0.047	0.011	mg/Kg		01/15/22 17:17	01/17/22 08:15	1
m-Xylene & p-Xylene	0.018	U	0.047	0.0083	mg/Kg		01/15/22 17:17	01/17/22 08:15	1
o-Xylene	0.018	U	0.047	0.0058	mg/Kg		01/15/22 17:17	01/17/22 08:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	99		85 - 116	01/15/22 17:17	01/17/22 08:15	1
4-Bromofluorobenzene (Surr)	98		79 - 119	01/15/22 17:17	01/17/22 08:15	1
Dibromofluoromethane (Surr)	101		78 - 119	01/15/22 17:17	01/17/22 08:15	1
1,2-Dichloroethane-d4 (Surr)	131		71 - 136	01/15/22 17:17	01/17/22 08:15	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	75.1		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	24.9		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W25-14-15

Lab Sample ID: 580-109299-22

Date Collected: 01/11/22 16:35

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 75.1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0019	U	0.0063	0.00080	mg/Kg	☼	01/14/22 17:22	01/15/22 19:05	1
2-Methylnaphthalene	0.0038	U	0.0063	0.0026	mg/Kg	☼	01/14/22 17:22	01/15/22 19:05	1
Naphthalene	0.0024	J M	0.0063	0.0021	mg/Kg	☼	01/14/22 17:22	01/15/22 19:05	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	66		28 - 143	01/14/22 17:22	01/15/22 19:05	1
2-methylnaphthalene-d10	72		40 - 140	01/14/22 17:22	01/15/22 19:05	1
Fluoranthene-d10 (Surr)	99		40 - 140	01/14/22 17:22	01/15/22 19:05	1
Terphenyl-d14	117		58 - 132	01/14/22 17:22	01/15/22 19:05	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	39	U	65	13	mg/Kg	☼	01/14/22 18:32	01/16/22 07:37	1
C24-C40	39	U	65	26	mg/Kg	☼	01/14/22 18:32	01/16/22 07:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	80		45 - 130	01/14/22 18:32	01/16/22 07:37	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-N10-7-8-Dup

Lab Sample ID: 580-109299-23

Date Collected: 01/12/22 10:50

Matrix: Solid

Date Received: 01/14/22 10:30

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	890		36	12	mg/Kg		01/15/22 16:57	01/17/22 11:49	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	119		67 - 134				01/15/22 16:57	01/17/22 11:49	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.14	U Q	0.18	0.034	mg/Kg		01/15/22 17:17	01/17/22 09:00	1
Toluene	0.48	J Q	0.54	0.12	mg/Kg		01/15/22 17:17	01/17/22 09:00	1
Ethylbenzene	0.091	J Q	0.36	0.082	mg/Kg		01/15/22 17:17	01/17/22 09:00	1
m-Xylene & p-Xylene	0.60	Q	0.36	0.064	mg/Kg		01/15/22 17:17	01/17/22 09:00	1
o-Xylene	0.47	M Q	0.36	0.045	mg/Kg		01/15/22 17:17	01/17/22 09:00	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	117	Q	85 - 116				01/15/22 17:17	01/17/22 09:00	1
4-Bromofluorobenzene (Surr)	96		79 - 119				01/15/22 17:17	01/17/22 09:00	1
Dibromofluoromethane (Surr)	106	M	78 - 119				01/15/22 17:17	01/17/22 09:00	1
1,2-Dichloroethane-d4 (Surr)	140	Q	71 - 136				01/15/22 17:17	01/17/22 09:00	1

QC Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-378434/1-A
Matrix: Solid
Analysis Batch: 378437

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378434

Analyte	MB MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Gasoline Range Organics (C6-C12)	3.0	U	4.0	1.3	mg/Kg		01/15/22 11:51	01/15/22 12:26	1
Surrogate	MB MB		Limits			D	Prepared	Analyzed	Dil Fac
%Recovery	Qualifier								
4-Bromofluorobenzene (Surr)	82		67 - 134				01/15/22 11:51	01/15/22 12:26	1

Lab Sample ID: LCS 580-378434/2-A
Matrix: Solid
Analysis Batch: 378437

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378434

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec. Limits
		Result	Qualifier				
Gasoline Range Organics (C6-C12)	40.0	36.3		mg/Kg		91	79 - 122
Surrogate	LCS LCS		Limits			%Rec	Limits
%Recovery	Qualifier						
4-Bromofluorobenzene (Surr)	97		67 - 134				

Lab Sample ID: LCSD 580-378434/3-A
Matrix: Solid
Analysis Batch: 378437

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378434

Analyte	Spike Added	LCSD LCSD		Unit	D	%Rec	%Rec. Limits	RPD	Limit
		Result	Qualifier						
Gasoline Range Organics (C6-C12)	40.0	35.7		mg/Kg		89	79 - 122	1	30
Surrogate	LCSD LCSD		Limits			%Rec	Limits	RPD	Limit
%Recovery	Qualifier								
4-Bromofluorobenzene (Surr)	96		67 - 134						

Lab Sample ID: 580-109299-4 MS
Matrix: Solid
Analysis Batch: 378437

Client Sample ID: LT-S25-7-8
Prep Type: Total/NA
Prep Batch: 378434

Analyte	Sample Result	Sample Qualifier	Spike Added	MS MS		Unit	D	%Rec	%Rec. Limits
				Result	Qualifier				
Gasoline Range Organics (C6-C12)	6.1	U	81.0	80.0		mg/Kg		99	79 - 122
Surrogate	MS MS		Limits			D	%Rec	%Rec. Limits	
%Recovery	Qualifier								
4-Bromofluorobenzene (Surr)	100		67 - 134						

Lab Sample ID: 580-109299-4 MSD
Matrix: Solid
Analysis Batch: 378437

Client Sample ID: LT-S25-7-8
Prep Type: Total/NA
Prep Batch: 378434

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD MSD		Unit	D	%Rec	%Rec. Limits	RPD	Limit
				Result	Qualifier						
Gasoline Range Organics (C6-C12)	6.1	U	81.0	79.4		mg/Kg		98	79 - 122	1	30
Surrogate	MSD MSD		Limits			D	%Rec	%Rec. Limits			
%Recovery	Qualifier										
4-Bromofluorobenzene (Surr)	97		67 - 134								

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QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-378452/1-A
Matrix: Solid
Analysis Batch: 378464

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378452

Analyte	MB	MB	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Gasoline Range Organics (C6-C12)	3.0	U	4.0	1.3	mg/Kg		01/15/22 16:57	01/16/22 00:25	1
Surrogate	MB	MB	Limits			D	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier							
4-Bromofluorobenzene (Surr)	88		67 - 134				01/15/22 16:57	01/16/22 00:25	1

Lab Sample ID: LCS 580-378452/2-A
Matrix: Solid
Analysis Batch: 378464

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378452

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec. Limits
		Result	Qualifier				
Gasoline Range Organics (C6-C12)	40.0	34.8		mg/Kg		87	79 - 122
Surrogate	LCS	LCS	Limits				
	%Recovery	Qualifier					
4-Bromofluorobenzene (Surr)	100		67 - 134				

Lab Sample ID: LCSD 580-378452/3-A
Matrix: Solid
Analysis Batch: 378464

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378452

Analyte	Spike Added	LCSD	LCSD	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
		Result	Qualifier						
Gasoline Range Organics (C6-C12)	40.0	33.6		mg/Kg		84	79 - 122	4	30
Surrogate	LCSD	LCSD	Limits						
	%Recovery	Qualifier							
4-Bromofluorobenzene (Surr)	99		67 - 134						

Method: 8260D - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 580-378429/1-A
Matrix: Solid
Analysis Batch: 378485

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378429

Analyte	MB	MB	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Benzene	0.015	U	0.020	0.0038	mg/Kg		01/15/22 11:14	01/16/22 13:48	1
Toluene	0.030	U	0.060	0.014	mg/Kg		01/15/22 11:14	01/16/22 13:48	1
Ethylbenzene	0.030	U	0.040	0.0091	mg/Kg		01/15/22 11:14	01/16/22 13:48	1
m-Xylene & p-Xylene	0.015	U	0.040	0.0071	mg/Kg		01/15/22 11:14	01/16/22 13:48	1
o-Xylene	0.015	U	0.040	0.0050	mg/Kg		01/15/22 11:14	01/16/22 13:48	1
Surrogate	MB	MB	Limits			D	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier							
Toluene-d8 (Surr)	99		85 - 116				01/15/22 11:14	01/16/22 13:48	1
4-Bromofluorobenzene (Surr)	96		79 - 119				01/15/22 11:14	01/16/22 13:48	1
Dibromofluoromethane (Surr)	96	M	78 - 119				01/15/22 11:14	01/16/22 13:48	1
1,2-Dichloroethane-d4 (Surr)	98	M	71 - 136				01/15/22 11:14	01/16/22 13:48	1

QC Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 580-378429/2-A
Matrix: Solid
Analysis Batch: 378485

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378429
%Rec.

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Benzene	0.800	0.809		mg/Kg		101	77 - 121
Toluene	0.800	0.814		mg/Kg		102	77 - 121
Ethylbenzene	0.800	0.795		mg/Kg		99	76 - 122
m-Xylene & p-Xylene	0.800	0.783		mg/Kg		98	77 - 124
o-Xylene	0.800	0.778	M	mg/Kg		97	77 - 123
Naphthalene	0.800	0.701		mg/Kg		88	62 - 129

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Toluene-d8 (Surr)	101		85 - 116
4-Bromofluorobenzene (Surr)	98		79 - 119
Dibromofluoromethane (Surr)	96		78 - 119
1,2-Dichloroethane-d4 (Surr)	91		71 - 136

Lab Sample ID: LCSD 580-378429/3-A
Matrix: Solid
Analysis Batch: 378485

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378429
%Rec.

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Benzene	0.800	0.886		mg/Kg		111	77 - 121	9	20
Toluene	0.800	0.899		mg/Kg		112	77 - 121	10	20
Ethylbenzene	0.800	0.879		mg/Kg		110	76 - 122	10	20
m-Xylene & p-Xylene	0.800	0.864		mg/Kg		108	77 - 124	10	20
o-Xylene	0.800	0.844	M	mg/Kg		105	77 - 123	8	20
Naphthalene	0.800	0.813		mg/Kg		102	62 - 129	15	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Toluene-d8 (Surr)	102		85 - 116
4-Bromofluorobenzene (Surr)	100		79 - 119
Dibromofluoromethane (Surr)	96	M	78 - 119
1,2-Dichloroethane-d4 (Surr)	89		71 - 136

Lab Sample ID: 580-109299-1 MS
Matrix: Solid
Analysis Batch: 378485

Client Sample ID: LT-W17.5-12-13
Prep Type: Total/NA
Prep Batch: 378429
%Rec.

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Benzene	3.3	U	86.8	94.1		mg/Kg		108	77 - 121
Toluene	6.5	U	86.8	96.5		mg/Kg		111	77 - 121
Ethylbenzene	6.5	U	86.8	96.1		mg/Kg		111	76 - 122
m-Xylene & p-Xylene	3.3	U	86.8	95.9		mg/Kg		110	77 - 124
o-Xylene	3.3	U	86.8	94.3	M	mg/Kg		109	77 - 123
Naphthalene	10	J	86.8	108		mg/Kg		113	62 - 129

Surrogate	MS %Recovery	MS Qualifier	Limits
Toluene-d8 (Surr)	100		85 - 116
4-Bromofluorobenzene (Surr)	102		79 - 119
Dibromofluoromethane (Surr)	95		78 - 119

QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 580-109299-1 MS
Matrix: Solid
Analysis Batch: 378485

Client Sample ID: LT-W17.5-12-13
Prep Type: Total/NA
Prep Batch: 378429

Surrogate	%Recovery	MS MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	92		71 - 136

Lab Sample ID: 580-109299-1 MSD
Matrix: Solid
Analysis Batch: 378485

Client Sample ID: LT-W17.5-12-13
Prep Type: Total/NA
Prep Batch: 378429

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	3.3	U	86.8	95.1		mg/Kg		110	77 - 121	1	20
Toluene	6.5	U	86.8	94.7		mg/Kg		109	77 - 121	2	20
Ethylbenzene	6.5	U	86.8	91.8		mg/Kg		106	76 - 122	5	20
m-Xylene & p-Xylene	3.3	U	86.8	92.7		mg/Kg		107	77 - 124	3	20
o-Xylene	3.3	U	86.8	93.4	M	mg/Kg		108	77 - 123	1	20
Naphthalene	10	J	86.8	110		mg/Kg		115	62 - 129	1	20

Surrogate	%Recovery	MSD MSD Qualifier	Limits
Toluene-d8 (Surr)	99		85 - 116
4-Bromofluorobenzene (Surr)	102		79 - 119
Dibromofluoromethane (Surr)	98		78 - 119
1,2-Dichloroethane-d4 (Surr)	94		71 - 136

Lab Sample ID: MB 580-378453/1-A
Matrix: Solid
Analysis Batch: 378460

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378453

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.015	U	0.020	0.0038	mg/Kg		01/15/22 17:17	01/17/22 00:51	1
Toluene	0.030	U	0.060	0.014	mg/Kg		01/15/22 17:17	01/17/22 00:51	1
Ethylbenzene	0.030	U	0.040	0.0091	mg/Kg		01/15/22 17:17	01/17/22 00:51	1
m-Xylene & p-Xylene	0.015	U	0.040	0.0071	mg/Kg		01/15/22 17:17	01/17/22 00:51	1
o-Xylene	0.015	U	0.040	0.0050	mg/Kg		01/15/22 17:17	01/17/22 00:51	1

Surrogate	%Recovery	MB MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	99		85 - 116	01/15/22 17:17	01/17/22 00:51	1
4-Bromofluorobenzene (Surr)	97		79 - 119	01/15/22 17:17	01/17/22 00:51	1
Dibromofluoromethane (Surr)	96	M	78 - 119	01/15/22 17:17	01/17/22 00:51	1
1,2-Dichloroethane-d4 (Surr)	95	M	71 - 136	01/15/22 17:17	01/17/22 00:51	1

Lab Sample ID: LCS 580-378453/2-A
Matrix: Solid
Analysis Batch: 378460

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378453

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	0.800	0.885		mg/Kg		111	77 - 121
Toluene	0.800	0.922		mg/Kg		115	77 - 121
Ethylbenzene	0.800	0.894		mg/Kg		112	76 - 122
m-Xylene & p-Xylene	0.800	0.889		mg/Kg		111	77 - 124
o-Xylene	0.800	0.871	M	mg/Kg		109	77 - 123
Naphthalene	0.800	0.987		mg/Kg		123	62 - 129

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QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
Toluene-d8 (Surr)	99		85 - 116
4-Bromofluorobenzene (Surr)	98		79 - 119
Dibromofluoromethane (Surr)	90	M	78 - 119
1,2-Dichloroethane-d4 (Surr)	87		71 - 136

Lab Sample ID: LCSD 580-378453/3-A
Matrix: Solid
Analysis Batch: 378460

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378453

Analyte	Spike Added	LCSD LCSD		Unit	D	%Rec	%Rec. Limits	RPD	Limit
		Result	Qualifier						
Benzene	0.800	0.782		mg/Kg		98	77 - 121	12	20
Toluene	0.800	0.783		mg/Kg		98	77 - 121	16	20
Ethylbenzene	0.800	0.761		mg/Kg		95	76 - 122	16	20
m-Xylene & p-Xylene	0.800	0.763		mg/Kg		95	77 - 124	15	20
o-Xylene	0.800	0.755	M	mg/Kg		94	77 - 123	14	20
Naphthalene	0.800	0.845		mg/Kg		106	62 - 129	16	20

Surrogate	LCSD LCSD		Limits
	%Recovery	Qualifier	
Toluene-d8 (Surr)	97		85 - 116
4-Bromofluorobenzene (Surr)	98		79 - 119
Dibromofluoromethane (Surr)	92	M	78 - 119
1,2-Dichloroethane-d4 (Surr)	89	M	71 - 136

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 580-378391/1-A
Matrix: Solid
Analysis Batch: 378418

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378391

Analyte	MB MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1-Methylnaphthalene	0.0015	U	0.0050	0.00063	mg/Kg		01/14/22 16:26	01/15/22 00:09	1
2-Methylnaphthalene	0.0030	U	0.0050	0.0021	mg/Kg		01/14/22 16:26	01/15/22 00:09	1
Naphthalene	0.0040	U	0.0050	0.0016	mg/Kg		01/14/22 16:26	01/15/22 00:09	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
2,4,6-Tribromophenol	63	M	28 - 143	01/14/22 16:26	01/15/22 00:09	1
2-methylnaphthalene-d10	82		40 - 140	01/14/22 16:26	01/15/22 00:09	1
Fluoranthene-d10 (Surr)	82		40 - 140	01/14/22 16:26	01/15/22 00:09	1
Terphenyl-d14	103		58 - 132	01/14/22 16:26	01/15/22 00:09	1

Lab Sample ID: LCS 580-378391/2-A
Matrix: Solid
Analysis Batch: 378418

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378391

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec. Limits
		Result	Qualifier				
1-Methylnaphthalene	1.00	0.835		mg/Kg		84	43 - 111
2-Methylnaphthalene	1.00	1.05		mg/Kg		105	39 - 114
Naphthalene	1.00	0.950		mg/Kg		95	38 - 111

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
2,4,6-Tribromophenol	80		28 - 143

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QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCS 580-378391/2-A
Matrix: Solid
Analysis Batch: 378418

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378391

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
2-methylnaphthalene-d10	115		40 - 140
Fluoranthene-d10 (Surr)	85		40 - 140
Terphenyl-d14	100		58 - 132

Lab Sample ID: 580-109299-1 MS
Matrix: Solid
Analysis Batch: 378418

Client Sample ID: LT-W17.5-12-13
Prep Type: Total/NA
Prep Batch: 378391

Analyte	Sample	Sample	Spike	MS MS		Unit	D	%Rec	Limits
	Result	Qualifier		Result	Qualifier				
1-Methylnaphthalene	9.1	J1	1.65	11.6	4	mg/Kg	☼	150	43 - 111
2-Methylnaphthalene	13	J1	1.65	16.4	M 4	mg/Kg	☼	214	39 - 114
Naphthalene	4.1	J1	1.65	6.72	J1	mg/Kg	☼	161	38 - 111

Surrogate	MS MS		Limits
	%Recovery	Qualifier	
2,4,6-Tribromophenol	36		28 - 143
2-methylnaphthalene-d10	94		40 - 140
Fluoranthene-d10 (Surr)	74		40 - 140
Terphenyl-d14	88		58 - 132

Lab Sample ID: 580-109299-1 MSD
Matrix: Solid
Analysis Batch: 378418

Client Sample ID: LT-W17.5-12-13
Prep Type: Total/NA
Prep Batch: 378391

Analyte	Sample	Sample	Spike	MSD MSD		Unit	D	%Rec	Limits	RPD	Limit
	Result	Qualifier		Result	Qualifier						
1-Methylnaphthalene	9.1	J1	1.60	8.17	4 J1	mg/Kg	☼	-59	43 - 111	35	20
2-Methylnaphthalene	13	J1	1.60	12.5	4 J1	mg/Kg	☼	-27	39 - 114	27	20
Naphthalene	4.1	J1	1.60	5.07	J1	mg/Kg	☼	63	38 - 111	28	20

Surrogate	MSD MSD		Limits
	%Recovery	Qualifier	
2,4,6-Tribromophenol	32		28 - 143
2-methylnaphthalene-d10	67		40 - 140
Fluoranthene-d10 (Surr)	83		40 - 140
Terphenyl-d14	97		58 - 132

Lab Sample ID: MB 580-378402/1-A
Matrix: Solid
Analysis Batch: 378443

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378402

Analyte	MB MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1-Methylnaphthalene	0.0015	U	0.0050	0.00063	mg/Kg		01/14/22 17:22	01/15/22 15:54	1
2-Methylnaphthalene	0.0030	U	0.0050	0.0021	mg/Kg		01/14/22 17:22	01/15/22 15:54	1
Naphthalene	0.0040	U	0.0050	0.0016	mg/Kg		01/14/22 17:22	01/15/22 15:54	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
2,4,6-Tribromophenol	83	M	28 - 143	01/14/22 17:22	01/15/22 15:54	1
2-methylnaphthalene-d10	92		40 - 140	01/14/22 17:22	01/15/22 15:54	1
Fluoranthene-d10 (Surr)	86		40 - 140	01/14/22 17:22	01/15/22 15:54	1

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QC Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: MB 580-378402/1-A
Matrix: Solid
Analysis Batch: 378443

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378402

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
Terphenyl-d14	108		58 - 132	01/14/22 17:22	01/15/22 15:54	1

Lab Sample ID: LCS 580-378402/2-A
Matrix: Solid
Analysis Batch: 378443

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378402

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	Limits
		Result	Qualifier				
1-Methylnaphthalene	1.00	0.834		mg/Kg		83	43 - 111
2-Methylnaphthalene	1.00	1.04		mg/Kg		104	39 - 114
Naphthalene	1.00	0.975		mg/Kg		97	38 - 111

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
2,4,6-Tribromophenol	88		28 - 143
2-methylnaphthalene-d10	120	M	40 - 140
Fluoranthene-d10 (Surr)	88		40 - 140
Terphenyl-d14	112		58 - 132

Lab Sample ID: 580-109299-21 MS
Matrix: Solid
Analysis Batch: 378443

Client Sample ID: LT-S25-14-15
Prep Type: Total/NA
Prep Batch: 378402

Analyte	Sample Result	Sample Qualifier	Spike Added	MS MS		Unit	D	%Rec	Limits
				Result	Qualifier				
1-Methylnaphthalene	0.0043	J M	1.37	1.05		mg/Kg	⊛	76	43 - 111
2-Methylnaphthalene	0.0034	J M	1.37	1.31		mg/Kg	⊛	95	39 - 114
Naphthalene	0.010	M	1.37	1.27		mg/Kg	⊛	92	38 - 111

Surrogate	MS MS		Limits
	%Recovery	Qualifier	
2,4,6-Tribromophenol	77		28 - 143
2-methylnaphthalene-d10	102		40 - 140
Fluoranthene-d10 (Surr)	71		40 - 140
Terphenyl-d14	80		58 - 132

Lab Sample ID: 580-109299-21 MSD
Matrix: Solid
Analysis Batch: 378443

Client Sample ID: LT-S25-14-15
Prep Type: Total/NA
Prep Batch: 378402

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD MSD		Unit	D	%Rec	Limits	RPD	Limit
				Result	Qualifier						
1-Methylnaphthalene	0.0043	J M	1.36	0.923		mg/Kg	⊛	67	43 - 111	12	20
2-Methylnaphthalene	0.0034	J M	1.36	1.14		mg/Kg	⊛	83	39 - 114	14	20
Naphthalene	0.010	M	1.36	1.21		mg/Kg	⊛	88	38 - 111	5	20

Surrogate	MSD MSD		Limits
	%Recovery	Qualifier	
2,4,6-Tribromophenol	69		28 - 143
2-methylnaphthalene-d10	81		40 - 140
Fluoranthene-d10 (Surr)	80		40 - 140
Terphenyl-d14	98		58 - 132

QC Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 580-378393/1-A
Matrix: Solid
Analysis Batch: 378473

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378393

Analyte	MB MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
C10-C24	30	U	50	9.9	mg/Kg		01/14/22 16:25	01/15/22 20:44	1
C24-C40	30	U	50	20	mg/Kg		01/14/22 16:25	01/15/22 20:44	1
Surrogate	MB MB		Limits			D	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier							
<i>o</i> -Terphenyl	78	M	45 - 130				01/14/22 16:25	01/15/22 20:44	1

Lab Sample ID: LCS 580-378393/2-A
Matrix: Solid
Analysis Batch: 378473

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378393

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits	RPD	Limit
C10-C24	500	461		mg/Kg		92	75 - 125	9	20
C24-C40	500	430		mg/Kg		86	39 - 106	7	20
Surrogate	LCS LCS		Limits			D	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier							
<i>o</i> -Terphenyl	98		45 - 130						

Lab Sample ID: LCSD 580-378393/3-A
Matrix: Solid
Analysis Batch: 378473

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378393

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
C10-C24	500	506		mg/Kg		101	75 - 125	9	20
C24-C40	500	462		mg/Kg		92	39 - 106	7	20
Surrogate	LCSD LCSD		Limits			D	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier							
<i>o</i> -Terphenyl	104		45 - 130						

Lab Sample ID: 580-109299-1 MS
Matrix: Solid
Analysis Batch: 378473

Client Sample ID: LT-W17.5-12-13
Prep Type: Total/NA
Prep Batch: 378393

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits	RPD	Limit
C10-C24	4700	J1	832	6090	4	mg/Kg	⊛	164	75 - 125	9	20
C24-C40	46	U	832	845		mg/Kg	⊛	102	39 - 106	6	20
Surrogate	MS MS		Limits			D	Prepared	Analyzed	Dil Fac		
	%Recovery	Qualifier									
<i>o</i> -Terphenyl	98		45 - 130								

Lab Sample ID: 580-109299-1 MSD
Matrix: Solid
Analysis Batch: 378473

Client Sample ID: LT-W17.5-12-13
Prep Type: Total/NA
Prep Batch: 378393

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
C10-C24	4700	J1	853	6630	4	mg/Kg	⊛	225	75 - 125	9	20
C24-C40	46	U	853	897		mg/Kg	⊛	105	39 - 106	6	20

QC Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC) (Continued)

Lab Sample ID: 580-109299-1 MSD
Matrix: Solid
Analysis Batch: 378473

Client Sample ID: LT-W17.5-12-13
Prep Type: Total/NA
Prep Batch: 378393

Surrogate	MSD %Recovery	MSD Qualifier	Limits
<i>o</i> -Terphenyl	110		45 - 130

Lab Sample ID: MB 580-378410/1-A
Matrix: Solid
Analysis Batch: 378473

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378410

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	30	U	50	9.9	mg/Kg		01/14/22 18:32	01/16/22 05:22	1
C24-C40	30	U	50	20	mg/Kg		01/14/22 18:32	01/16/22 05:22	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	90		45 - 130	01/14/22 18:32	01/16/22 05:22	1

Lab Sample ID: LCS 580-378410/2-A
Matrix: Solid
Analysis Batch: 378473

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378410

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
C10-C24	500	493		mg/Kg		99	75 - 125
C24-C40	500	528		mg/Kg		106	39 - 106

Surrogate	LCS %Recovery	LCS Qualifier	Limits
<i>o</i> -Terphenyl	104		45 - 130

Lab Sample ID: LCSD 580-378410/3-A
Matrix: Solid
Analysis Batch: 378473

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378410

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
C10-C24	500	517		mg/Kg		103	75 - 125	5	20
C24-C40	500	494		mg/Kg		99	39 - 106	7	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
<i>o</i> -Terphenyl	102		45 - 130

Lab Sample ID: 580-109299-21 MS
Matrix: Solid
Analysis Batch: 378473

Client Sample ID: LT-S25-14-15
Prep Type: Total/NA
Prep Batch: 378410

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
C10-C24	40	U	652	588		mg/Kg	☼	90	75 - 125
C24-C40	40	U	652	518		mg/Kg	☼	79	39 - 106

Surrogate	MS %Recovery	MS Qualifier	Limits
<i>o</i> -Terphenyl	89		45 - 130

QC Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC) (Continued)

Lab Sample ID: 580-109299-21 MSD
Matrix: Solid
Analysis Batch: 378473

Client Sample ID: LT-S25-14-15
Prep Type: Total/NA
Prep Batch: 378410

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.	RPD	Limit
	Result	Qualifier		Result	Qualifier				Limits		
C10-C24	40	U	642	562		mg/Kg	✳	87	75 - 125	5	20
C24-C40	40	U	642	497		mg/Kg	✳	77	39 - 106	4	20
		<i>MSD</i>	<i>MSD</i>								
<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>								
<i>o-Terphenyl</i>	85		45 - 130								

Method: 2540G - SM 2540G

Lab Sample ID: 580-109299-1 DU
Matrix: Solid
Analysis Batch: 378411

Client Sample ID: LT-W17.5-12-13
Prep Type: Total/NA

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	Limit
	Result	Qualifier		Result				
Percent Solids	57.1		55.6		%		3	20
Percent Moisture	42.9		44.4		%		4	20

Lab Sample ID: 580-109299-19 DU
Matrix: Solid
Analysis Batch: 378411

Client Sample ID: LT-W40-9-10
Prep Type: Total/NA

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	Limit
	Result	Qualifier		Result				
Percent Solids	78.4		79.2		%		1	20
Percent Moisture	21.6		20.8		%		4	20

Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W17.5-12-13

Lab Sample ID: 580-109299-1

Date Collected: 01/12/22 15:05

Matrix: Solid

Date Received: 01/14/22 15:12

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378434	01/15/22 11:51	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378437	01/15/22 14:45	JBT	FGS SEA
Total/NA	Prep	5035			378429	01/15/22 11:14	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378485	01/16/22 14:56	JBT	FGS SEA
Total/NA	Prep	5035	RA		378429	01/15/22 11:14	JBT	FGS SEA
Total/NA	Analysis	8260D	RA	1	378538	01/17/22 12:25	JSM	FGS SEA
Total/NA	Analysis	2540G		1	378411	01/14/22 18:41	BJM	FGS SEA

Client Sample ID: LT-W17.5-12-13

Lab Sample ID: 580-109299-1

Date Collected: 01/12/22 15:05

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 57.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			378391	01/14/22 16:26	RJL	FGS SEA
Total/NA	Analysis	8270E SIM		1	378418	01/15/22 00:57	T1L	FGS SEA
Total/NA	Prep	3546			378393	01/14/22 16:25	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378473	01/15/22 21:42	JCM	FGS SEA

Client Sample ID: LT-N10-21-22

Lab Sample ID: 580-109299-2

Date Collected: 01/12/22 10:58

Matrix: Solid

Date Received: 01/14/22 15:12

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378434	01/15/22 11:51	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378437	01/15/22 15:09	JBT	FGS SEA
Total/NA	Prep	5035			378429	01/15/22 11:14	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378485	01/16/22 16:05	JBT	FGS SEA
Total/NA	Analysis	2540G		1	378411	01/14/22 18:41	BJM	FGS SEA

Client Sample ID: LT-N10-21-22

Lab Sample ID: 580-109299-2

Date Collected: 01/12/22 10:58

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 67.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			378391	01/14/22 16:26	RJL	FGS SEA
Total/NA	Analysis	8270E SIM		1	378418	01/15/22 02:09	T1L	FGS SEA
Total/NA	Prep	3546			378393	01/14/22 16:25	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378473	01/15/22 22:40	JCM	FGS SEA

Client Sample ID: LT-E10-7-8

Lab Sample ID: 580-109299-3

Date Collected: 01/12/22 13:25

Matrix: Solid

Date Received: 01/14/22 15:12

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378434	01/15/22 11:51	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378437	01/15/22 15:32	JBT	FGS SEA

Eurofins Seattle

Lab Chronicle

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-E10-7-8

Date Collected: 01/12/22 13:25

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-3

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378429	01/15/22 11:14	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378485	01/16/22 16:28	JBT	FGS SEA
Total/NA	Analysis	2540G		1	378411	01/14/22 18:41	BJM	FGS SEA

Client Sample ID: LT-E10-7-8

Date Collected: 01/12/22 13:25

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-3

Matrix: Solid

Percent Solids: 70.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			378391	01/14/22 16:26	RJL	FGS SEA
Total/NA	Analysis	8270E SIM		1	378418	01/15/22 02:33	T1L	FGS SEA
Total/NA	Prep	3546			378393	01/14/22 16:25	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378473	01/15/22 22:59	JCM	FGS SEA

Client Sample ID: LT-S25-7-8

Date Collected: 01/12/22 14:22

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-4

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378434	01/15/22 11:51	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378437	01/15/22 13:36	JBT	FGS SEA
Total/NA	Prep	5035			378429	01/15/22 11:14	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378485	01/16/22 16:51	JBT	FGS SEA
Total/NA	Analysis	2540G		1	378411	01/14/22 18:41	BJM	FGS SEA

Client Sample ID: LT-S25-7-8

Date Collected: 01/12/22 14:22

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-4

Matrix: Solid

Percent Solids: 78.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			378391	01/14/22 16:26	RJL	FGS SEA
Total/NA	Analysis	8270E SIM		1	378418	01/15/22 02:57	T1L	FGS SEA
Total/NA	Prep	3546			378393	01/14/22 16:25	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378473	01/15/22 23:18	JCM	FGS SEA

Client Sample ID: LT-W10-11-12

Date Collected: 01/11/22 15:20

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-5

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378434	01/15/22 11:51	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378437	01/15/22 15:55	JBT	FGS SEA
Total/NA	Prep	5035			378429	01/15/22 11:14	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378538	01/17/22 13:35	JSM	FGS SEA
Total/NA	Analysis	2540G		1	378411	01/14/22 18:41	BJM	FGS SEA

Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W10-11-12

Lab Sample ID: 580-109299-5

Date Collected: 01/11/22 15:20

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 77.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			378391	01/14/22 16:26	RJL	FGS SEA
Total/NA	Analysis	8270E SIM		1	378418	01/15/22 03:20	T1L	FGS SEA
Total/NA	Prep	3546			378393	01/14/22 16:25	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378473	01/15/22 23:38	JCM	FGS SEA

Client Sample ID: LT-W10-19-20

Lab Sample ID: 580-109299-6

Date Collected: 01/11/22 16:02

Matrix: Solid

Date Received: 01/14/22 15:12

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378434	01/15/22 11:51	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378437	01/15/22 16:41	JBT	FGS SEA
Total/NA	Prep	5035			378429	01/15/22 11:14	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378538	01/17/22 13:58	JSM	FGS SEA
Total/NA	Analysis	2540G		1	378411	01/14/22 18:41	BJM	FGS SEA

Client Sample ID: LT-W10-19-20

Lab Sample ID: 580-109299-6

Date Collected: 01/11/22 16:02

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 66.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			378391	01/14/22 16:26	RJL	FGS SEA
Total/NA	Analysis	8270E SIM		1	378418	01/15/22 03:44	T1L	FGS SEA
Total/NA	Prep	3546			378393	01/14/22 16:25	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378473	01/16/22 00:16	JCM	FGS SEA

Client Sample ID: LT-N10-19-20

Lab Sample ID: 580-109299-7

Date Collected: 01/12/22 16:08

Matrix: Solid

Date Received: 01/14/22 15:12

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378434	01/15/22 11:51	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378437	01/15/22 17:04	JBT	FGS SEA
Total/NA	Prep	5035			378429	01/15/22 11:14	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378485	01/16/22 18:00	JBT	FGS SEA
Total/NA	Analysis	2540G		1	378411	01/14/22 18:41	BJM	FGS SEA

Client Sample ID: LT-N10-19-20

Lab Sample ID: 580-109299-7

Date Collected: 01/12/22 16:08

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 66.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			378391	01/14/22 16:26	RJL	FGS SEA
Total/NA	Analysis	8270E SIM		1	378418	01/15/22 04:08	T1L	FGS SEA
Total/NA	Prep	3546			378393	01/14/22 16:25	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378473	01/16/22 00:35	JCM	FGS SEA

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Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-N40-7-8
Date Collected: 01/12/22 15:42
Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-8
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378434	01/15/22 11:51	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378437	01/15/22 17:28	JBT	FGS SEA
Total/NA	Prep	5035			378429	01/15/22 11:14	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378485	01/16/22 18:23	JBT	FGS SEA
Total/NA	Analysis	2540G		1	378411	01/14/22 18:41	BJM	FGS SEA

Client Sample ID: LT-N40-7-8
Date Collected: 01/12/22 15:42
Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-8
Matrix: Solid
Percent Solids: 79.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			378391	01/14/22 16:26	RJL	FGS SEA
Total/NA	Analysis	8270E SIM		1	378443	01/15/22 19:29	T1L	FGS SEA
Total/NA	Prep	3546			378393	01/14/22 16:25	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		10	378473	01/16/22 16:17	JCM	FGS SEA

Client Sample ID: LT-N25-16-17
Date Collected: 01/12/22 13:36
Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-9
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378434	01/15/22 11:51	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378437	01/15/22 17:51	JBT	FGS SEA
Total/NA	Prep	5035			378429	01/15/22 11:14	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378538	01/17/22 13:12	JSM	FGS SEA
Total/NA	Analysis	2540G		1	378411	01/14/22 18:41	BJM	FGS SEA

Client Sample ID: LT-N25-16-17
Date Collected: 01/12/22 13:36
Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-9
Matrix: Solid
Percent Solids: 66.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			378391	01/14/22 16:26	RJL	FGS SEA
Total/NA	Analysis	8270E SIM		1	378418	01/15/22 04:56	T1L	FGS SEA
Total/NA	Prep	3546			378393	01/14/22 16:25	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378473	01/16/22 01:14	JCM	FGS SEA

Client Sample ID: LT-S10-17-18
Date Collected: 01/12/22 10:05
Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-10
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378434	01/15/22 11:51	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378437	01/15/22 18:14	JBT	FGS SEA
Total/NA	Prep	5035			378429	01/15/22 11:14	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378485	01/16/22 19:08	JBT	FGS SEA

Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-S10-17-18
Date Collected: 01/12/22 10:05
Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-10
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	378411	01/14/22 18:41	BJM	FGS SEA

Client Sample ID: LT-S10-17-18
Date Collected: 01/12/22 10:05
Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-10
Matrix: Solid
Percent Solids: 64.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			378391	01/14/22 16:26	RJL	FGS SEA
Total/NA	Analysis	8270E SIM		1	378418	01/15/22 05:20	T1L	FGS SEA
Total/NA	Prep	3546			378393	01/14/22 16:25	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378473	01/16/22 01:33	JCM	FGS SEA

Client Sample ID: LT-N10-7-8
Date Collected: 01/12/22 10:50
Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-11
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378434	01/15/22 11:51	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378437	01/15/22 18:37	JBT	FGS SEA
Total/NA	Prep	5035			378429	01/15/22 11:14	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378485	01/16/22 19:31	JBT	FGS SEA
Total/NA	Analysis	2540G		1	378411	01/14/22 18:41	BJM	FGS SEA

Client Sample ID: LT-N10-7-8
Date Collected: 01/12/22 10:50
Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-11
Matrix: Solid
Percent Solids: 72.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			378391	01/14/22 16:26	RJL	FGS SEA
Total/NA	Analysis	8270E SIM		1	378418	01/15/22 05:44	T1L	FGS SEA
Total/NA	Prep	3546			378393	01/14/22 16:25	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378473	01/16/22 01:52	JCM	FGS SEA

Client Sample ID: HT-N10-24-25
Date Collected: 01/12/22 16:08
Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-12
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378434	01/15/22 11:51	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378437	01/15/22 19:01	JBT	FGS SEA
Total/NA	Prep	5035			378429	01/15/22 11:14	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378485	01/16/22 19:54	JBT	FGS SEA
Total/NA	Analysis	2540G		1	378411	01/14/22 18:41	BJM	FGS SEA

Lab Chronicle

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: HT-N10-24-25

Date Collected: 01/12/22 16:08

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-12

Matrix: Solid

Percent Solids: 68.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			378391	01/14/22 16:26	RJL	FGS SEA
Total/NA	Analysis	8270E SIM		1	378418	01/15/22 06:07	T1L	FGS SEA
Total/NA	Prep	3546			378393	01/14/22 16:25	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378473	01/16/22 02:11	JCM	FGS SEA

Client Sample ID: HT-W10-18-19

Date Collected: 01/12/22 17:29

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-13

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378434	01/15/22 11:51	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378437	01/15/22 19:24	JBT	FGS SEA
Total/NA	Prep	5035			378429	01/15/22 11:14	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378485	01/16/22 20:17	JBT	FGS SEA
Total/NA	Analysis	2540G		1	378411	01/14/22 18:41	BJM	FGS SEA

Client Sample ID: HT-W10-18-19

Date Collected: 01/12/22 17:29

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-13

Matrix: Solid

Percent Solids: 65.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			378391	01/14/22 16:26	RJL	FGS SEA
Total/NA	Analysis	8270E SIM		1	378418	01/15/22 06:31	T1L	FGS SEA
Total/NA	Prep	3546			378393	01/14/22 16:25	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378473	01/16/22 02:30	JCM	FGS SEA

Client Sample ID: HT-W10-22-23

Date Collected: 01/12/22 17:23

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-14

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378434	01/15/22 11:51	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378437	01/15/22 19:47	JBT	FGS SEA
Total/NA	Prep	5035			378429	01/15/22 11:14	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378485	01/16/22 20:40	JBT	FGS SEA
Total/NA	Analysis	2540G		1	378411	01/14/22 18:41	BJM	FGS SEA

Client Sample ID: HT-W10-22-23

Date Collected: 01/12/22 17:23

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-14

Matrix: Solid

Percent Solids: 75.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			378391	01/14/22 16:26	RJL	FGS SEA
Total/NA	Analysis	8270E SIM		1	378418	01/15/22 06:55	T1L	FGS SEA
Total/NA	Prep	3546			378393	01/14/22 16:25	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378473	01/16/22 02:49	JCM	FGS SEA

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Lab Chronicle

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-S17.5-5-6

Lab Sample ID: 580-109299-15

Date Collected: 01/12/22 13:43

Matrix: Solid

Date Received: 01/14/22 15:12

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378434	01/15/22 11:51	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378437	01/15/22 20:10	JBT	FGS SEA
Total/NA	Prep	5035			378429	01/15/22 11:14	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378485	01/16/22 21:03	JBT	FGS SEA
Total/NA	Analysis	2540G		1	378411	01/14/22 18:41	BJM	FGS SEA

Client Sample ID: LT-S17.5-5-6

Lab Sample ID: 580-109299-15

Date Collected: 01/12/22 13:43

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 84.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			378391	01/14/22 16:26	RJL	FGS SEA
Total/NA	Analysis	8270E SIM		1	378418	01/15/22 07:19	T1L	FGS SEA
Total/NA	Prep	3546			378393	01/14/22 16:25	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378473	01/16/22 03:08	JCM	FGS SEA

Client Sample ID: LT-W55-17-18

Lab Sample ID: 580-109299-16

Date Collected: 01/11/22 14:55

Matrix: Solid

Date Received: 01/14/22 15:12

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378434	01/15/22 11:51	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378437	01/15/22 20:57	JBT	FGS SEA
Total/NA	Prep	5035			378429	01/15/22 11:14	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378485	01/16/22 21:25	JBT	FGS SEA
Total/NA	Analysis	2540G		1	378411	01/14/22 18:41	BJM	FGS SEA

Client Sample ID: LT-W55-17-18

Lab Sample ID: 580-109299-16

Date Collected: 01/11/22 14:55

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 75.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			378391	01/14/22 16:26	RJL	FGS SEA
Total/NA	Analysis	8270E SIM		1	378418	01/15/22 07:43	T1L	FGS SEA
Total/NA	Prep	3546			378393	01/14/22 16:25	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378473	01/16/22 03:47	JCM	FGS SEA

Client Sample ID: LT-W19.5-14-15

Lab Sample ID: 580-109299-17

Date Collected: 01/12/22 16:08

Matrix: Solid

Date Received: 01/14/22 15:12

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378434	01/15/22 11:51	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378437	01/15/22 21:20	JBT	FGS SEA
Total/NA	Prep	5035			378429	01/15/22 11:14	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378485	01/16/22 21:48	JBT	FGS SEA

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Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W19.5-14-15

Lab Sample ID: 580-109299-17

Date Collected: 01/12/22 16:08

Matrix: Solid

Date Received: 01/14/22 15:12

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	378411	01/14/22 18:41	BJM	FGS SEA

Client Sample ID: LT-W19.5-14-15

Lab Sample ID: 580-109299-17

Date Collected: 01/12/22 16:08

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 75.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			378391	01/14/22 16:26	RJL	FGS SEA
Total/NA	Analysis	8270E SIM		1	378418	01/15/22 08:07	T1L	FGS SEA
Total/NA	Prep	3546			378393	01/14/22 16:25	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378473	01/16/22 04:06	JCM	FGS SEA

Client Sample ID: LT-S10-23-24

Lab Sample ID: 580-109299-18

Date Collected: 01/12/22 10:10

Matrix: Solid

Date Received: 01/14/22 15:12

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378434	01/15/22 11:51	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378437	01/15/22 21:43	JBT	FGS SEA
Total/NA	Prep	5035			378429	01/15/22 11:14	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378485	01/16/22 22:11	JBT	FGS SEA
Total/NA	Analysis	2540G		1	378411	01/14/22 18:41	BJM	FGS SEA

Client Sample ID: LT-S10-23-24

Lab Sample ID: 580-109299-18

Date Collected: 01/12/22 10:10

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 67.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			378391	01/14/22 16:26	RJL	FGS SEA
Total/NA	Analysis	8270E SIM		1	378418	01/15/22 08:31	T1L	FGS SEA
Total/NA	Prep	3546			378393	01/14/22 16:25	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378473	01/16/22 04:25	JCM	FGS SEA

Client Sample ID: LT-W40-9-10

Lab Sample ID: 580-109299-19

Date Collected: 01/11/22 16:51

Matrix: Solid

Date Received: 01/14/22 15:12

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378434	01/15/22 11:51	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378437	01/15/22 22:06	JBT	FGS SEA
Total/NA	Prep	5035			378429	01/15/22 11:14	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378485	01/16/22 22:34	JBT	FGS SEA
Total/NA	Analysis	2540G		1	378411	01/14/22 18:41	BJM	FGS SEA

Lab Chronicle

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W40-9-10

Date Collected: 01/11/22 16:51

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-19

Matrix: Solid

Percent Solids: 78.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			378391	01/14/22 16:26	RJL	FGS SEA
Total/NA	Analysis	8270E SIM		1	378418	01/15/22 08:55	T1L	FGS SEA
Total/NA	Prep	3546			378393	01/14/22 16:25	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378473	01/16/22 04:44	JCM	FGS SEA

Client Sample ID: LT-N25-27-27.5

Date Collected: 01/12/22 13:36

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-20

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378434	01/15/22 11:51	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378437	01/15/22 22:29	JBT	FGS SEA
Total/NA	Prep	5035			378429	01/15/22 11:14	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378485	01/16/22 22:57	JBT	FGS SEA
Total/NA	Analysis	2540G		1	378411	01/14/22 18:41	BJM	FGS SEA

Client Sample ID: LT-N25-27-27.5

Date Collected: 01/12/22 13:36

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-20

Matrix: Solid

Percent Solids: 68.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			378391	01/14/22 16:26	RJL	FGS SEA
Total/NA	Analysis	8270E SIM		1	378418	01/15/22 09:18	T1L	FGS SEA
Total/NA	Prep	3546			378393	01/14/22 16:25	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378473	01/16/22 05:03	JCM	FGS SEA

Client Sample ID: LT-S25-14-15

Date Collected: 01/12/22 14:30

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-21

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378452	01/15/22 16:57	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378464	01/16/22 02:45	CJ	FGS SEA
Total/NA	Prep	5035			378453	01/15/22 17:17	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378460	01/17/22 01:59	JSM	FGS SEA
Total/NA	Analysis	2540G		1	378411	01/14/22 18:41	BJM	FGS SEA

Client Sample ID: LT-S25-14-15

Date Collected: 01/12/22 14:30

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-21

Matrix: Solid

Percent Solids: 72.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			378402	01/14/22 17:22	RJL	FGS SEA
Total/NA	Analysis	8270E SIM		1	378443	01/15/22 17:53	T1L	FGS SEA
Total/NA	Prep	3546			378410	01/14/22 18:32	RJL	FGS SEA
Total/NA	Analysis	8015D DRO		1	378473	01/16/22 06:20	JCM	FGS SEA

Eurofins Seattle

Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W25-14-15

Lab Sample ID: 580-109299-22

Date Collected: 01/11/22 16:35

Matrix: Solid

Date Received: 01/14/22 15:12

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378452	01/15/22 16:57	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378464	01/16/22 03:08	CJ	FGS SEA
Total/NA	Prep	5035			378453	01/15/22 17:17	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378460	01/17/22 08:15	JSM	FGS SEA
Total/NA	Analysis	2540G		1	378411	01/14/22 18:41	BJM	FGS SEA

Client Sample ID: LT-W25-14-15

Lab Sample ID: 580-109299-22

Date Collected: 01/11/22 16:35

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 75.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			378402	01/14/22 17:22	RJL	FGS SEA
Total/NA	Analysis	8270E SIM		1	378443	01/15/22 19:05	T1L	FGS SEA
Total/NA	Prep	3546			378410	01/14/22 18:32	RJL	FGS SEA
Total/NA	Analysis	8015D DRO		1	378473	01/16/22 07:37	JCM	FGS SEA

Client Sample ID: LT-N10-7-8-Dup

Lab Sample ID: 580-109299-23

Date Collected: 01/12/22 10:50

Matrix: Solid

Date Received: 01/14/22 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378452	01/15/22 16:57	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378543	01/17/22 11:49	JSM	FGS SEA
Total/NA	Prep	5035			378453	01/15/22 17:17	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378460	01/17/22 09:00	JSM	FGS SEA

Laboratory References:

FGS SEA = Eurofins Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Laboratory: Eurofins Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2236	01-19-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
2540G		Solid	Percent Moisture
2540G		Solid	Percent Solids
8015D DRO	3546	Solid	C10-C24



Sample Summary

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

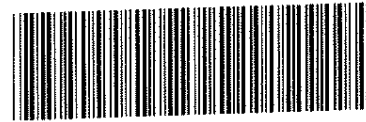
Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-109299-1	LT-W17.5-12-13	Solid	01/12/22 15:05	01/14/22 15:12
580-109299-2	LT-N10-21-22	Solid	01/12/22 10:58	01/14/22 15:12
580-109299-3	LT-E10-7-8	Solid	01/12/22 13:25	01/14/22 15:12
580-109299-4	LT-S25-7-8	Solid	01/12/22 14:22	01/14/22 15:12
580-109299-5	LT-W10-11-12	Solid	01/11/22 15:20	01/14/22 15:12
580-109299-6	LT-W10-19-20	Solid	01/11/22 16:02	01/14/22 15:12
580-109299-7	LT-N10-19-20	Solid	01/12/22 16:08	01/14/22 15:12
580-109299-8	LT-N40-7-8	Solid	01/12/22 15:42	01/14/22 15:12
580-109299-9	LT-N25-16-17	Solid	01/12/22 13:36	01/14/22 15:12
580-109299-10	LT-S10-17-18	Solid	01/12/22 10:05	01/14/22 15:12
580-109299-11	LT-N10-7-8	Solid	01/12/22 10:50	01/14/22 15:12
580-109299-12	HT-N10-24-25	Solid	01/12/22 16:08	01/14/22 15:12
580-109299-13	HT-W10-18-19	Solid	01/12/22 17:29	01/14/22 15:12
580-109299-14	HT-W10-22-23	Solid	01/12/22 17:23	01/14/22 15:12
580-109299-15	LT-S17.5-5-6	Solid	01/12/22 13:43	01/14/22 15:12
580-109299-16	LT-W55-17-18	Solid	01/11/22 14:55	01/14/22 15:12
580-109299-17	LT-W19.5-14-15	Solid	01/12/22 16:08	01/14/22 15:12
580-109299-18	LT-S10-23-24	Solid	01/12/22 10:10	01/14/22 15:12
580-109299-19	LT-W40-9-10	Solid	01/11/22 16:51	01/14/22 15:12
580-109299-20	LT-N25-27-27.5	Solid	01/12/22 13:36	01/14/22 15:12
580-109299-21	LT-S25-14-15	Solid	01/12/22 14:30	01/14/22 15:12
580-109299-22	LT-W25-14-15	Solid	01/11/22 16:35	01/14/22 15:12
580-109299-23	LT-N10-7-8-Dup	Solid	01/12/22 10:50	01/14/22 10:30



Eurofins FGS, Seattle

5755 8th Street East
Tacoma, WA 98424

Chain of Custody Record



580-109299 Chain of Custody

eurofins Environment Testing
America

Client Information		Sampler: Dominic Mariano		Lab PM: Elaine Walker		COC No: 202201-01 Soil									
Client Contact: Alethea Ramos (alternate: Margie Pascua)		Phone: 310-625-1283		E-Mail: M.Elaine.Walker@EurofinsET.com		State of Origin: Hawaii									
Company: AECOM		FWSID:		Analysis Requested		Page: Page 1 of 4									
Address: 1001 Bishop St. Suite 1600		Due Date Requested: see subcontract		Field Filtered Sample (Yes or No) Perform MS/MSD (Yes or No) EPA 8260 BTEX+Naph EPA 8260 TPH-G (C6-C10) EPA 8015 TPH-D/O (C10-C24, C24-C40) EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)		Job #: 109299									
City: Honolulu		TAT Requested (days): 3 working days				Preservation Codes:									
State, Zip: Hawaii 96813		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No				A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA		M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)							
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)		PO #: Note to AECOM before printing COC: put in PO# w				Total Number of containers		Other:							
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)		WO #:													
Project Name: CV18F0126		Project #: 60674414													
Site: RH		SSOW#: Note to AECOM before printing COC: put in subk#													
Sample Identification		Sample Date		Sample Time		Sample Type (C=comp, G=grab)		Matrix (W=water, S=solid, O=soil, BT=tissue, A=air)		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		Special Instructions/Note:	
-1 LT-W17.5-12-13		1/12/22		1505		G S		S		N N		X X X		1	
LT-N10-21-22		1/12/22		1058		G S		S		N N		X X X		1	
-3 LT-E10-7-8		1/12/22		1325		G S		S		N N		X X X		1	
LT-S25-7-8		1/12/22		1422		G S		S		N N		X X X		1	
-5 LT-W10-11-12		1/11/22		1520		G S		S		N N		X X X		1	
LT-W10-19-20		1/11/22		1602		G S		S		N N		X X X		1	
-7 HT-N10-19-20		1/12/22		1608		G S		S		N N		X X X		1	
LT-N40-7-8		1/12/22		1542		G S		S		N N		X X X		1	
-9 LT-N25-16-17		1/12/22		1336		G S		S		N N		X X X		1	
LT-S10-17-18		1/12/22		1005		G S		S		N N		X X X		1	
-11 LT-N10-7-8		1/12/22		1050		G S		S		N N		X X X		1	
Possible Hazard Identification						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)									
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological						<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months									
Deliverable Requested: I, II, III, IV, Other (specify)						Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQUS EDD.									
Empty Kit Relinquished by:						Date:									
Relinquished by: Matthew Yim <i>Matthew Yim</i>						Date/Time: 1/13/22 1530									
Relinquished by:						Date/Time:									
Relinquished by:						Date/Time:									
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No						Custody Seal No.:									
Therm. ID: 329 Cor: 27° Unc: 2.2°						Cooler Dsc: <i>Bo</i> FedEx: <i>Bo</i>									
Packing: <i>Bo</i>						UPS:									
Cust. Seal: Yes <input checked="" type="checkbox"/> No						Lab Cour:									
Blue Ice, <input checked="" type="checkbox"/> Wet, <input checked="" type="checkbox"/> Dry, None						Other:									

Eurofins FGS, Seattle

5755 8th Street East
Tacoma, WA 98424

Chain of Custody Record



Environment Testing
America

Client Information		Sampler: Dominic Mariano		Lab PM: Elaine Walker		Carrier Tracking No(s): FedEx		COC No: 202201-02 Soil			
Client Contact: Alethea Ramos (alternate: Margie Pascua)		Phone: 310-625-1283		E-Mail: M.Elaine.Walker@EurofinsET.com		State of Origin: Hawaii		Page: Page 2 of 4			
Company: AECOM		PWSID:		Analysis Requested						Job #:	
Address: 1001 Bishop St. Suite 1600		Due Date Requested: see subcontract		Field Filtered Sample (Yes or No) Perform MSA/MSD (Yes or No) EPA 8260 BTEX+Naph EPA 8260 TPH-G (C6-C10) EPA 8015 TPH-D/O (C10-C24, C24-C40) EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)		Total Number of containers		Preservation Codes:			
City: Honolulu		TAT Requested (days): 3 working days						A - HCL		M - Hexane	
State, Zip: Hawaii 96813		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No						B - NaOH		N - None	
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)		PO #: Note to AECOM before printing COC: put in PO# w						C - Zn Acetate		O - AsNaO2	
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)		WO #:		D - Nitric Acid		P - Na2O4S		E - NaHSO4		Q - Na2SO3	
Project Name: CV18F0126		Project #: 60674414		H - Amchlor		R - Na2S2O3		G - Ice		S - H2SO4	
Site: RH		SSOW #: Note to AECOM before printing COC: put in subk#		I - Ascorbic Acid		T - TSP Dodecahydrate		J - DI Water		U - Acetone	
				K - EDTA		W - pH 4-5		L - EDA		Z - other (specify)	
				Other:							
Sample Identification		Sample Date		Sample Time		Sample Type (C=Comp, G=grab)		Matrix (W=water, S=solid, O=waste/water, BT=Soil, As=Air)		Special Instructions/Note:	
HT-N10-24-25		1/12/22		1608		G S		S			
HT-W10-18-19		1/12/22		1729		G S		S			
HT-W10-22-23		1/12/22		1723		G S		S			
LT-S17.5-5-6		1/12/22		1343		G S		S			
LT-W55-17-18		1/11/22		1455		G S		S			
LT-W19.5-14-15		1/12/22		1608		G S		S			
LT-S10-23-24		1/12/22		1010		G S		S			
LT-W40-9-10		1/11/22		1651		G S		S			
LT-N25-27-27.5		1/12/22		1336		G S		S			
LT-S25-14-15		1/12/22		1430		G S		S			
LT-W25-14-15		1/11/22		1635		G S		S			
Possible Hazard Identification						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)					
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological						<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months					
Deliverable Requested: I, II, III, IV, Other (specify)				Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQUS EDD.		Special Instructions/QC Requirements: DOD QSM project.					
Empty Kit Relinquished by:				Date:		Time:		Method of Shipment:			
Relinquished by: Matthew Yim <i>Matthew Yim</i>				Date/Time: 1/13/22 1530		Company: AECOM		Received by: <i>[Signature]</i>		Date/Time: 1/14/22 1030	
Relinquished by:				Date/Time:		Company:		Received by:		Date/Time:	
Relinquished by:				Date/Time:		Company:		Received by:		Date/Time:	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:							

Chain of Custody Record

Client Information		Sampler: Dominic Mariano		Lab PM: Elaine Walker		Carrier Tracking No(s): FedEx		COC No: 202201-01 Sol																			
Client Contact: Alethea Ramos (alternate: Margie Pascua)		Phone: 310-625-1283		E-Mail: M.Elaine.Walker@EurofinsET.com		State of Origin: Hawaii		Page: Page 1 of 4																			
Company: AECOM		PWSID:		Analysis Requested						Job #:																	
Address: 1001 Bishop St. Suite 1600		Due Date Requested: see subcontract		<table border="1"> <tr> <th>Field Filtered Samples (Yes or No)</th> <th>Performance MS/MSD (Yes or No)</th> <th>EPA 8260 BTEX + Naph</th> <th>EPA 8260 TPH-G (C8-C10)</th> <th>EPA 8015 TPH-D10 (C10-C24, C24-C40)</th> <th>EPA 8915 TPH-918 (C10-C24, C24-C40) w/ silica gel cleanup</th> <th>EPA 8270 SIM PAHs (benzophenanthrene, 1-methylnaphthalene, 2-methylnaphthalene)</th> <th>Total Number of Containers</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>						Field Filtered Samples (Yes or No)	Performance MS/MSD (Yes or No)	EPA 8260 BTEX + Naph	EPA 8260 TPH-G (C8-C10)	EPA 8015 TPH-D10 (C10-C24, C24-C40)	EPA 8915 TPH-918 (C10-C24, C24-C40) w/ silica gel cleanup	EPA 8270 SIM PAHs (benzophenanthrene, 1-methylnaphthalene, 2-methylnaphthalene)	Total Number of Containers									Preservation Codes:	
Field Filtered Samples (Yes or No)	Performance MS/MSD (Yes or No)	EPA 8260 BTEX + Naph	EPA 8260 TPH-G (C8-C10)							EPA 8015 TPH-D10 (C10-C24, C24-C40)	EPA 8915 TPH-918 (C10-C24, C24-C40) w/ silica gel cleanup	EPA 8270 SIM PAHs (benzophenanthrene, 1-methylnaphthalene, 2-methylnaphthalene)	Total Number of Containers														
City: Honolulu		TAT Requested (days): 3 working days								A - HCL		M - Hexane															
State, Zip: Hawaii 96813		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No								B - NaOH		N - None															
Phone: 808-521-3051 (direct: 808-528-7283) (alternate: 808-356-5373)		PO #:		C - Zn Acetate		O - AsNaO2																					
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)		Note to AECOM before printing COC: put in PO# w/		D - Nitric Acid		P - Na2O4S																					
Project Name: CV18F0126		WO #:		E - NaHSO4		Q - Na2SO3																					
Site: RH		Project #:		F - MeOH		R - Na2S2O3																					
SSOW#:		Note to AECOM before printing COC: put in subk#		G - Amchlor		S - H2SO4																					
				H - Ascorbic Acid		T - TSP Dodecahydrate																					
				I - Ice		U - Acetone																					
				J - DI Water		V - MCAA																					
				K - EDTA		W - pH 4-5																					
				L - EDA		Z - other (specify)																					
				Other:																							
				Do not do silica gel cleanup on soil																							
				Special Instructions/Note:																							

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=oil, B=BTX, T=THP, A=Air)	Preservation Code	N	N	I	I	I	I	I	I	I	I	I	I	Total Number of Containers
LT-W17.5-12-13	1/12/22	1505	G	S		N	N			X	X	X						1
LT-N10-21-22	1/12/22	1058	G	S		N	N			X	X	X						1
LT-E10-7-8	1/12/22	1325	G	S		N	N			X	X	X						1
LT-S25-7-8	1/12/22	1422	G	S		N	N			X	X	X						1
LT-W10-11-12	1/11/22	1520	G	S		N	N			X	X	X						1
LT-W10-19-20	1/11/22	1602	G	S		N	N			X	X	X						1
HT-N10-19-20	1/12/22	1608	G	S		N	N			X	X	X						1
LT-N40-7-8	1/12/22	1542	G	S		N	N			X	X	X						1
LT-N25-16-17	1/12/22	1336	G	S		N	N			X	X	X						1
LT-S10-17-18	1/12/22	1005	G	S		N	N			X	X	X						1
LT-N10-7-8	1/12/22	1050	G	S		N	N			X	X	X						1

PID = 39 ppmv
= 621 ppmv
= 0.7
= 0.0
= 440
= 70
= 70
= 0.5
= 50
= 470
= 662 ^{4/11/22} (P) Predict

Possible Hazard Identification
 Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client Disposal By Lab Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify) Prelim data (Level 1 or 2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQ/IS EDD. Special instructions/QC Requirements: DOD QSM project.

Empty Kit Relinquished by: _____ Date: _____ Time: _____ Method of Shipment: _____

Relinquished by: Matthew Yim *Matthew Yim* Date/Time: 1/13/22 1530 Company: AECOM Received by: _____ Date/Time: _____ Company: _____

Relinquished by: _____ Date/Time: _____ Company: _____ Received by: _____ Date/Time: _____ Company: _____

Relinquished by: _____ Date/Time: _____ Company: _____ Received by: _____ Date/Time: _____ Company: _____

Custody Seals Intact: Yes No Custody Seal No.: _____

Hart, Jeff Digitally signed by Hart, Jeff DN: cn=Hart, Jeff, ou=USP/HL1, email=Jeff.Hart@aecom.com Date: 2022.01.14 12:39:00 -1000

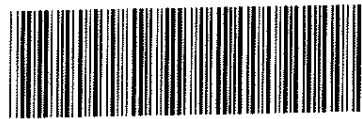
Therm ID: _____ Cor: _____ ° Unc: _____ °
Cooler Desc: _____ FedEx: _____
Packing: _____ UPS: _____
Cust. Seal: Yes ___ No ___ Lab Cour: _____
Blue Ice, Wet, Dry, None Other: _____

Chain of Custody Record

Client Information		Sampler: Dominic Mariano		Lab PM: Elaine Walker		Carrier Tracking No(s): FedEx		COC No: 202201-02 Soil											
Client Contact: Alethea Ramos (alternate: Margie Pascua)		Phone: 310-625-1283		E-Mail: M.Elaine.Walker@EurofinsET.com		State of Origin: Hawaii		Page: Page 2 of 4											
Company: AECOM		PWSD:		Analysis Requested						Job #:									
Address: 1001 Bishop St. Suite 1600		Due Date Requested: see subcontract		Field Filtered Sample (Yes or No) Particulate Matter (Yes or No) EPA 8200 BTEX+Naph EPA 8260 TPH-G (CS-C10) EPA 8016 TPH-DIO (C10-C24, C24-C40) EPA 8218 TPH-DAP (C10-C24, C24-C40) w/ silica gel cleanup EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)		TAT Requested (days): 3 working days		Total Number of Containers		Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify)									
City: Honolulu		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No																	
State, Zip: Hawaii 96813		PO #: Note to AECOM before printing COC: put in PO# w/																	
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)		WO #:																	
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)		Project #: G0674414		SSOW #: Note to AECOM before printing COC: put in subk#															
Project Name: CV18F0126																			
Site: RH																			
Sample Identification		Sample Date		Sample Time		Sample Type (C=Comp, G=grab)		Matrix (W=water, S=solid, O=waste/Oil, BT=Trace, AA=Air)		Field Filtered Sample (Yes or No)		Particulate Matter (Yes or No)		Preservation Codes:		Other:			
HT-N10-24-25		1/12/22		1608		G S		S		N N						297 ppmv			
HT-W10-18-19		1/12/22		1729		G S		S		N N						580			
HT-W10-22-23		1/12/22		1723		G S		S		N N						25			
LT-S17.5-5-6		1/12/22		1343		G S		S		N N						0			
LT-W55-17-18		1/11/22		1455		G S		S		N N						0			
LT-W19.5-14-15		1/12/22		1608		G S		S		N N						247			
LT-S10-23-24		1/12/22		1010		G S		S		N N						414			
LT-W40-9-10		1/11/22		1651		G S		S		N N						0.1			
LT-N25-27-27.5		1/12/22		1336		G S		S		N N						30			
LT-S25-14-15		1/12/22		1430		G S		S		N N						0			
LT-W25-14-15		1/11/22		1635		G S		S		N N						0			
Possible Hazard Identification										Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)									
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological										<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months									
Deliverable Requested: I, II, III, IV, Other (specify)										Special Instructions/QC Requirements: DOD QSM project.									
Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQUIS EDD.																			
Empty Kit Relinquished by:					Date:					Time:					Method of Shipment:				
Relinquished by: Matthew Yun <i>Matthew Yun</i>					Date/Time: 1/13/22 1530					Company: AECOM					Received by:				
Relinquished by:					Date/Time:					Company:					Received by:				
Relinquished by:					Date/Time:					Company:					Received by:				
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No					Custody Seal No.:					Digitally signed by Hart, Jeff DN: cn=Hart, Jeff, ou=USHNL1, email=Jeff.Hart@aecom.com Date: 2022.01.14 12:40:37 -1000					Cooler Temperature(s) °C and Other Remarks:				

Hart, Jeff

Chain of Custody Record



580-109299 Chain of Custody

Client Information		Sampler: Dominic Mariano		Lab PM: Elaine Walker		COC No: 202201-01 Soil									
Client Contact: Alethea Ramos (alternate: Margie Pascua)		Phone: 310-625-1283		E-Mail: M.Elaine.Walker@EurofinsET.com		Page: Page 1 of 4									
Company: AECOM		PWSID:		Analysis Requested		Job #: 109299									
Address: 1001 Bishop St. Suite 1600		Due Date Requested: see subcontract		Field Filtered Sample (Yes or No) Perform MS/MSD (Yes or No) EPA 8260 BTEX+Naph EPA 8260 TPH-G (C6-C10) EPA 8015 TPH-D/O (C10-C24, C24-C40) EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)		Preservation Codes:									
City: Honolulu		TAT Requested (days): 3 working days				A - HCL		M - Hexane							
State, Zip: Hawaii 96813		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No				B - NaOH		N - None							
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)		PO #:				C - Zn Acetate		O - AsNaO2							
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)		WO #:				D - Nitric Acid		P - Na2O4S							
Project Name: CV18F0126		Project #: 60674414		E - NaHSO4		Q - Na2SO3									
Site: RH		SSOW#: Note to AECOM before printing COC: put in subk#		F - MeOH		R - Na2S2O3									
				G - Amchlor		S - H2SO4									
				H - Ascorbic Acid		T - TSP Dodecahydrate									
				I - Ice		U - Acetone									
				J - DI Water		V - MCAA									
				K - EDTA		W - pH 4-5									
				L - EDA		Z - other (specify)									
				Other:											
				Total Number of containers:											
Sample Identification		Sample Date		Sample Time		Sample Type (C=comp, G=grab)		Matrix (Water, Sealed, Sewage/Oil, BT-Tissue, A=Air)		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		Special Instructions/Note:	
-1 LT-W17.5-12-13		1/12/22		1505		G S		S		N N					
LT-N10-21-22		1/12/22		1058		G S		S		N N					
-3 LT-E10-7-8		1/12/22		1325		G S		S		N N					
LT-S25-7-8		1/12/22		1422		G S		S		N N					
-5 LT-W10-11-12		1/11/22		1520		G S		S		N N					
LT-W10-19-20		1/11/22		1602		G S		S		N N					
-7 HT-N10-19-20		1/12/22		1608		G S		S		N N					
LT-N40-7-8		1/12/22		1542		G S		S		N N					
-9 LT-N25-16-17		1/12/22		1336		G S		S		N N					
LT-S10-17-18		1/12/22		1005		G S		S		N N					
-11 LT-N10-7-8		1/12/22		1050		G S		S		N N					
Possible Hazard Identification										Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)					
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological										<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months					
Deliverable Requested: I, II, III, IV, Other (specify)					Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQHS FDD.					Special Instructions/QC Requirements: DOD QSM project.					
Empty Kit Relinquished by:				Date:		Time:				Method of Shipment:					
Relinquished by: Matthew Yim <i>Matthew Yim</i>				Date/Time: 1/13/22 1530		Company: AECOM				Received by: <i>[Signature]</i>		Date/Time: 1/14/22 1030		Company: EFGS	
Relinquished by:				Date/Time:		Company:				Received by:		Company:		Company:	
Relinquished by:				Date/Time:		Company:				Received by:		Company:		Company:	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature:		Therm. ID: <i>IL9</i> Cor: <i>2.7</i> Unc: <i>2.2</i>				Cooler Dsc: <i>Rg</i>		FedEx: <i>Rg</i>		Company:	
						Packing: <i>Bubs</i>				UPS:		Lab Cour:		Company:	
						Cust. Seal: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				Other:				Company:	
						Blue Ice, <input checked="" type="checkbox"/> Wet, <input type="checkbox"/> Dry, None								Company:	

Chain of Custody Record

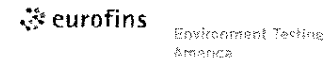
Client Information			Sampler: Dominic Mariano		Lab PM: Elaine Walker		Carrier Tracking No(s): FedEx			COC No: 202201-02 Soil							
Client Contact: Alethea Ramos (alternate: Margie Pascua)			Phone: 310-625-1283		E-Mail: M.Elaine.Walker@EurofinsET.com		State of Origin: Hawaii			Page: Page 2 of 4							
Company: AECOM			PWSID:		Analysis Requested			Total Number of containers									
Address: 1001 Bishop St. Suite 1600			Due Date Requested: see subcontract										Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2SO3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify)				
City: Honolulu			TAT Requested (days): 3 working days														
State, Zip: Hawaii 96813			Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No		EPA 8260 BTEX+Naph EPA 8260 TPH-G (C6-C10) EPA 8015 TPH-D/O (C10-C24, C24-C40) EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)			Other:									
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)			PO #: Note to AECOM before printing COC: put in PO# w														
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)			WO #:		Project Name: CV18F0126			Project #: 60674414									
Site: RH			SSOW#: Note to AECOM before printing COC: put in subk#														
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=wast/Oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform IIS/MSD (Yes or No)							Special Instructions/Note:			
				Preservation Code:				I	J,F	I,J,F	I	I					
HT-N10-24-25		1/12/22	1608	G	S	N	N				X	X	X				
HT-W10-18-19		1/12/22	1729	G	S	N	N				X	X	X				
HT-W10-22-23		1/12/22	1723	G	S	N	N				X	X	X				
LT-S17.5-5-6		1/12/22	1343	G	S	N	N				X	X	X				
LT-W55-17-18		1/11/22	1455	G	S	N	N				X	X	X				
LT-W19.5-14-15		1/12/22	1608	G	S	N	N				X	X	X				
LT-S10-23-24		1/12/22	1010	G	S	N	N				X	X	X				
LT-W40-9-10		1/11/22	1651	G	S	N	N				X	X	X				
LT-N25-27-27.5		1/12/22	1336	G	S	N	N				X	X	X				
LT-S25-14-15		1/12/22	1430	G	S	N	N				X	X	X				
LT-W25-14-15		1/11/22	1635	G	S	N	N				X	X	X				
Possible Hazard Identification						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)											
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological						<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months											
Deliverable Requested: I, II, III, IV, Other (specify)						Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQ/IS FDD.			Special Instructions/QC Requirements: DOD QSM project.								
Empty Kit Relinquished by:			Date:		Time:			Method of Shipment:									
Relinquished by: Matthew Yim			Date/Time: 1/13/22 1530		Company: AECOM			Received by: [Signature]		Date/Time: 1/14/22 1030		Company: FGS					
Relinquished by:			Date/Time:		Company:			Received by:		Date/Time:		Company:					
Relinquished by:			Date/Time:		Company:			Received by:		Date/Time:		Company:					
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:													

Handwritten notes on the left margin: 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

Eurofins FGS, Seattle

5755 8th Street East
Tacoma, WA 98424

Chain of Custody Record



Client Information: Client Contact: Althea Ramos, Phone: 310-625-1283, Lab PM: Elaine Walker, Carrier Tracking Note: FedEx, COC No: 202201-01 Soil

Company: AECOM, PWSID, Analysis Requested (Table header), Job #:

Address: 1001 Bishop St. Suite 1600, Honolulu, Hawaii 96813, Due Date Requested: see subcontract, TAT Requested: 3 working days, Compliance Project: Yes No, PO #, WO #, Project #: 60674414, Project Name: CV18F0126, Site: RH

Table with columns: Sample Identification, Sample Date, Sample Time, Sample Type (C-comp, G-grab), Matrix (Water, Soils, etc.), Field Filtered Sample (Yes or No), Preservatives (EPA 8250, 8260, etc.), Total Number of Containers, Preservation Codes, Special Instructions/Note

Table with 12 columns for sample analysis results. Includes rows for LT-W17.5-12-13, LT-N10-21-22, LT-E10-7-8, LT-S25-7-8, LT-W10-11-12, LT-W10-19-20, HT-N10-19-20, LT-N40-7-8, LT-N25-16-17, LT-S10-17-18, and LT-N10-7-8. Results show various concentrations (e.g., 39 ppmv, 621 ppmv) and detection limits.

Possible Hazard Identification: Non-Hazard, Flammable, Skin Irritant, Poison B, Unknown, Radiological. Sample Disposal: Return To Client, Disposal By Lab, Archive For Months.

Deliverable Requested: I, II, III, IV, Other (specify). Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQUIS EDD. Special Instructions/QC Requirements: DOD QSM project.

Empty Kit Relinquished by: Matthew Ylm, Date: 1/13/22 1530, Company: AECOM, Received by: , Date/Time: , Company:

Relinquished by: , Date/Time: , Company: , Received by: , Date/Time: , Company:

Relinquished by: , Date/Time: , Company: , Received by: , Date/Time: , Company:

Custody Seals Intact: Yes No, Custody Seal No.: , Digitally signed by Hart, Jeff, Date: 2022.01.14 12:39:00 -

Hart, Jeff

Therm. ID: , Cor: , Unc: , Cooler Dsc: , FedEx: , Packing: , UPS: , Cust. Seal: Yes No, Lab Cour: , Blue Ice, Wet, Dry, None, Other:

Do not do silica gel cleanup on soil

4/14/22 (P) Per client

Chain of Custody Record

Client Information		Sampler: Dominic Mariano		Lab PM: Elaine Walker		Carrier Tracking No(s): FedEx		COC No: 202201-04 Soil	
Client Contact: Alethea Ramos (alternate: Margie Pascua)		Phone: 310-625-1283		E-Mail: M.Elaine.Walker@EurofinsET.com		State of Origin: Hawaii		Page: Page 4 of 4	
Company: AECOM		PWSID:		Analysis Requested		Job #:		Preservation Codes:	
Address: 1001 Bishop St. Suite 1600		Due Date Requested: See subcontract		Field Filtered Sample (Yes or No) Perform MS/MSD (Yes or No) EPA 8260 BTEX+Naph EPA 8260 TPH-G (CS-C10) EPA 8015 TPH-D/D (C10-C24, C24-C40) EPA 8015 TPH-D/D (C10-C24, C24-C40) w/ silica gel cleanup EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)		Total Number of containers		A - HCL M - Hexane	
City: Honolulu		TAT Requested (days): 3 working days						B - NaOH N - None	
State, Zip: Hawaii 96813		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No						C - Zn Acetate O - AsNaO2	
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)		PO #: Note to AECOM before printing COC: put in PO# v.						D - Nitric Acid P - Na2O4S	
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)		WO #:						E - NaHSO4 Q - Na2SO3	
Project Name: CV18F0126		Project #: 60674414		F - MeOH R - Na2S2O3		G - Amchlor S - H2SO4		H - Ascorbic Acid T - TSP Dodecahydrate	
Site: RH		SSOW#: Note to AECOM before printing COC: put in subk#		I - Ice U - Acetone		J - DI Water V - MCAA		K - EDTA W - pH 4.5	
L - EDA Z - other (specify)		Other:							
Sample Identification		Sample Date		Sample Time		Sample Type (C=comp, G=grab)		Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	
						Preservation Code:			
-23 LT-N10-7-8-Dup		1/12/22		1050		G S		S	
-13 HT-N10-24-25		1/12/22		1608		G S		S	
HT-W10-18-19		1/12/22		1729		G S		S	
-15 HT-W10-22-23		1/12/22		1723		G S		S	
LT-S17.5-5-6		1/12/22		1343		G S		S	
-16 LT-W55-17-18		1/11/22		1455		G S		S	
LT-W19.5-14-15		1/12/22		1608		G S		S	
-18 LT-S10-23-24		1/12/22		1010		G S		S	
LT-W40-9-10		1/11/22		1651		G S		S	
-20 LT-N25-27-27.5		1/12/22		1336		G S		S	
LT-S25-14-15		1/12/22		1430		G S		S	
-23 LT-W25-14-15		1/11/22		1635		G S		S	
-24 TB01		1/11/22		1445		QC W		W	
Possible Hazard Identification					Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)				
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological					<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months				
Deliverable Requested: I, II, III, IV, Other (specify)			Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQUIS EDD.			Special Instructions/QC Requirements: DOD QSM project.			
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:			
Relinquished by: Matthew Yim <i>Matthew Yim</i>		Date/Time: 1/13/22 1530		Company: AECOM		Received by:		Date/Time:	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:	
Relinquished by:		Date/Time:		Company:		Received by: <i>K. Jones</i>		Date/Time: 1/14/22 1605	
Company:		Company:		Company:		Company:		Company:	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:					



Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-109299-1

Login Number: 109299

List Number: 1

Creator: Grable, Heather D

List Source: Eurofins Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	False	Refer to Job Narrative for details.
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

Eurofins Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-109327-1

Client Project/Site: Red Hill JBPHH N62742-17-D-1800-
CV22F0106

For:

AECOM
1001 Bishop Street
Honolulu, Hawaii 96813

Attn: Jeff Hart

M. Elaine Walker

Authorized for release by:
1/18/2022 10:01:06 PM

Elaine Walker, Project Manager II
(253)248-4972
m.elaine.walker@eurofinset.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Case Narrative

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Job ID: 580-109327-1

Laboratory: Eurofins Seattle

Narrative

CASE NARRATIVE

Client: AECOM

Project: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Report Number: 580-109327-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

Following DoD QSM guidelines, manual integrations were performed only when necessary and are in compliance with the laboratory's standard operating procedure, Acceptable Manual Integration Practices, SOP No.: Q-S-002. The reason(s) for manual integration have been documented on the affected chromatogram(s), which is/are provided in the raw data package. The raw data also includes the original chromatogram(s) prior to any manual integration being performed. Manual integrations are detailed in the manual integration summary forms following this narrative.

It should be noted that samples with elevated Limits of Quantitation (LOQs) resulting from a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the LOQs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes within the calibration range of the instrument or that reduces the interferences thereby enabling the quantification of target analytes.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

Seventeen samples were received on 1/15/2022 11:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.5° C and 1.4° C.

Receipt Exceptions

109327-1: Three 40 ml VOA Vials were submitted for analysis and there are only two listed on the COC.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

GASOLINE RANGE ORGANICS (GRO)

Samples HT-E25-7-8 (580-109327-2), HT-E17.5-14-15 (580-109327-3), HT-S17.5-8-9 (580-109327-4), HT-E10-23-24 (580-109327-5), HT-S10-17-18 (580-109327-6), HT-N25-10-11 DUPLICATE (580-109327-7), HT-E25-14-15 (580-109327-8), HT-S10-15-16 (580-109327-9), HT-E17.5-7-8 (580-109327-10), HT-N25-14-15 (580-109327-11), HT-N25-14-15 DUPLICATE (580-109327-12), HT-E10-21-22 (580-109327-13), HT-N25-10-11 (580-109327-14), HT-S25-14-15 (580-109327-15) and HT-S25-8-9 (580-109327-16) were analyzed for gasoline range organics (GRO) in accordance with 8260B CALUFT. The samples were prepared on 01/15/2022 and analyzed on 01/16/2022 and 01/17/2022.

The following samples were analyzed at reduced volume due to high concentrations of target analytes: HT-S10-17-18 (580-109327-6) and HT-S10-15-16 (580-109327-9). The calculation was performed using an initial volume adjustment rather than a dilution factor. The reporting limits have been elevated by the appropriate factor.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GASOLINE RANGE ORGANICS (GRO) - EB

Case Narrative

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Job ID: 580-109327-1 (Continued)

Laboratory: Eurofins Seattle (Continued)

Sample EB (580-109327-1) was analyzed for gasoline range organics (GRO) in accordance with 8260B CALUFT. The sample was analyzed on 01/17/2022.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples HT-E25-7-8 (580-109327-2), HT-E17.5-14-15 (580-109327-3), HT-S17.5-8-9 (580-109327-4), HT-E10-23-24 (580-109327-5), HT-S10-17-18 (580-109327-6), HT-N25-10-11 DUPLICATE (580-109327-7), HT-E25-14-15 (580-109327-8), HT-S10-15-16 (580-109327-9), HT-E17.5-7-8 (580-109327-10), HT-N25-14-15 (580-109327-11), HT-N25-14-15 DUPLICATE (580-109327-12), HT-E10-21-22 (580-109327-13), HT-N25-10-11 (580-109327-14), HT-S25-14-15 (580-109327-15) and HT-S25-8-9 (580-109327-16) were analyzed for volatile organic compounds (GC-MS) in accordance with 8260D_DOD5. The samples were prepared on 01/15/2022 and analyzed on 01/17/2022 and 01/18/2022.

The continuing calibration verification (CCV) associated with batch 580-378597 recovered above the upper control limit for Benzene and Toluene. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated samples are impacted: HT-S10-17-18 (580-109327-6), HT-S10-15-16 (580-109327-9), HT-S25-8-9 (580-109327-16) and (CCVIS 580-378597/3).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOLATILE ORGANIC COMPOUNDS (GC-MS) - EB

Sample EB (580-109327-1) was analyzed for volatile organic compounds (GC-MS) in accordance with 8260D_DOD5. The sample was analyzed on 01/17/2022.

The continuing calibration verification (CCV) associated with batch 580-378553 recovered above the upper control limit for m-Xylene & p-Xylene and Toluene. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated samples are impacted: EB (580-109327-1) and (CCVIS 580-378553/2).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SEMIVOLATILE ORGANIC COMPOUNDS - SELECTED ION MODE (SIM)

Samples HT-E25-7-8 (580-109327-2), HT-E17.5-14-15 (580-109327-3), HT-S17.5-8-9 (580-109327-4), HT-E10-23-24 (580-109327-5), HT-S10-17-18 (580-109327-6), HT-N25-10-11 DUPLICATE (580-109327-7), HT-E25-14-15 (580-109327-8), HT-S10-15-16 (580-109327-9), HT-E17.5-7-8 (580-109327-10), HT-N25-14-15 (580-109327-11), HT-N25-14-15 DUPLICATE (580-109327-12), HT-E10-21-22 (580-109327-13), HT-N25-10-11 (580-109327-14), HT-S25-14-15 (580-109327-15), HT-S25-8-9 (580-109327-16) and LT-SEDIMENT (580-109327-17) were analyzed for semivolatile organic compounds - Selected Ion Mode (SIM) in accordance with 8270E SIM. The samples were prepared on 01/15/2022 and analyzed on 01/17/2022 and 01/18/2022.

The following samples was diluted to bring the concentration of target analytes within the calibration range: HT-S10-15-16 (580-109327-9) and LT-SEDIMENT (580-109327-17). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SEMIVOLATILE ORGANIC COMPOUNDS - SELECTED ION MODE (SIM) - EB

Sample EB (580-109327-1) was analyzed for semivolatile organic compounds - Selected Ion Mode (SIM) in accordance with 8270E SIM. The sample was prepared on 01/16/2022 and analyzed on 01/17/2022.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DIESEL RANGE ORGANICS

Samples HT-E25-7-8 (580-109327-2), HT-E17.5-14-15 (580-109327-3), HT-S17.5-8-9 (580-109327-4), HT-E10-23-24 (580-109327-5), HT-S10-17-18 (580-109327-6), HT-N25-10-11 DUPLICATE (580-109327-7), HT-E25-14-15 (580-109327-8), HT-S10-15-16 (580-109327-9), HT-E17.5-7-8 (580-109327-10), HT-N25-14-15 (580-109327-11), HT-N25-14-15 DUPLICATE (580-109327-12), HT-E10-21-22 (580-109327-13), HT-N25-10-11 (580-109327-14), HT-S25-14-15 (580-109327-15), HT-S25-8-9 (580-109327-16) and LT-SEDIMENT (580-109327-17) were analyzed for diesel range organics in accordance with 8015DRO. The samples were prepared on 01/15/2022

Case Narrative

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Job ID: 580-109327-1 (Continued)

Laboratory: Eurofins Seattle (Continued)

and analyzed on 01/16/2022 and 01/17/2022.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DIESEL RANGE ORGANICS - EB

Sample EB (580-109327-1) was analyzed for Diesel Range Organics in accordance with 8015D DRO. The sample was prepared and analyzed on 01/16/2022.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PERCENT SOLIDS

Samples HT-E25-7-8 (580-109327-2), HT-E17.5-14-15 (580-109327-3), HT-S17.5-8-9 (580-109327-4), HT-E10-23-24 (580-109327-5), HT-S10-17-18 (580-109327-6), HT-N25-10-11 DUPLICATE (580-109327-7), HT-E25-14-15 (580-109327-8), HT-S10-15-16 (580-109327-9), HT-E17.5-7-8 (580-109327-10), HT-N25-14-15 (580-109327-11), HT-N25-14-15 DUPLICATE (580-109327-12), HT-E10-21-22 (580-109327-13), HT-N25-10-11 (580-109327-14), HT-S25-14-15 (580-109327-15), HT-S25-8-9 (580-109327-16) and LT-SEDIMENT (580-109327-17) were analyzed for percent solids in accordance with ASTM D2216. The samples were analyzed on 01/16/2022.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.



Definitions/Glossary

Client: AECOM

Job ID: 580-109327-1

Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

GC/MS Semi VOA

Qualifier	Qualifier Description
D	The reported value is from a dilution.
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

GC Semi VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: EB
Date Collected: 01/13/22 16:15
Date Received: 01/15/22 11:00

Lab Sample ID: 580-109327-1
Matrix: Water

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	0.080	U	0.10	0.031	mg/L			01/17/22 21:28	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	96		69 - 133					01/17/22 21:28	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.50	U	1.0	0.24	ug/L			01/17/22 21:28	1
Toluene	0.80	U Q	1.0	0.39	ug/L			01/17/22 21:28	1
Ethylbenzene	0.80	U	1.0	0.50	ug/L			01/17/22 21:28	1
m-Xylene & p-Xylene	0.80	U Q	2.0	0.53	ug/L			01/17/22 21:28	1
o-Xylene	0.80	U	1.0	0.39	ug/L			01/17/22 21:28	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	96		85 - 114					01/17/22 21:28	1
Toluene-d8 (Surr)	97		89 - 112					01/17/22 21:28	1
Dibromofluoromethane (Surr)	90		80 - 119					01/17/22 21:28	1
1,2-Dichloroethane-d4 (Surr)	88		81 - 118					01/17/22 21:28	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	0.079	U M	0.099	0.031	ug/L		01/16/22 11:03	01/17/22 13:25	1
2-Methylnaphthalene	0.079	U M	0.20	0.039	ug/L		01/16/22 11:03	01/17/22 13:25	1
1-Methylnaphthalene	0.032	U M	0.099	0.019	ug/L		01/16/22 11:03	01/17/22 13:25	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	68		46 - 122				01/16/22 11:03	01/17/22 13:25	1
Terphenyl-d14	93		58 - 132				01/16/22 11:03	01/17/22 13:25	1
2-methylnaphthalene-d10	63		40 - 140				01/16/22 11:03	01/17/22 13:25	1
Fluoranthene-d10 (Surr)	87		40 - 140				01/16/22 11:03	01/17/22 13:25	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C24-C40	0.29	U	0.34	0.17	mg/L		01/16/22 11:08	01/16/22 22:45	1
C10-C24	0.097	U	0.11	0.063	mg/L		01/16/22 11:08	01/16/22 22:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	84		56 - 125				01/16/22 11:08	01/16/22 22:45	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-E25-7-8

Lab Sample ID: 580-109327-2

Date Collected: 01/13/22 12:35

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 73.9

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	5.1	U	6.8	2.2	mg/Kg	☼	01/15/22 16:57	01/16/22 03:55	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	90		67 - 134				01/15/22 16:57	01/16/22 03:55	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.026	U	0.034	0.0065	mg/Kg	☼	01/15/22 17:17	01/17/22 15:52	1
Toluene	0.051	U	0.10	0.023	mg/Kg	☼	01/15/22 17:17	01/17/22 15:52	1
Ethylbenzene	0.051	U	0.068	0.016	mg/Kg	☼	01/15/22 17:17	01/17/22 15:52	1
m-Xylene & p-Xylene	0.026	U	0.068	0.012	mg/Kg	☼	01/15/22 17:17	01/17/22 15:52	1
o-Xylene	0.026	U	0.068	0.0085	mg/Kg	☼	01/15/22 17:17	01/17/22 15:52	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	106		85 - 116				01/15/22 17:17	01/17/22 15:52	1
4-Bromofluorobenzene (Surr)	93		79 - 119				01/15/22 17:17	01/17/22 15:52	1
Dibromofluoromethane (Surr)	83		78 - 119				01/15/22 17:17	01/17/22 15:52	1
1,2-Dichloroethane-d4 (Surr)	81		71 - 136				01/15/22 17:17	01/17/22 15:52	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0019	U	0.0063	0.00080	mg/Kg	☼	01/15/22 18:03	01/17/22 14:32	1
2-Methylnaphthalene	0.0038	U	0.0063	0.0026	mg/Kg	☼	01/15/22 18:03	01/17/22 14:32	1
Naphthalene	0.0051	U	0.0063	0.0021	mg/Kg	☼	01/15/22 18:03	01/17/22 14:32	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	82		28 - 143				01/15/22 18:03	01/17/22 14:32	1
2-methylnaphthalene-d10	89		40 - 140				01/15/22 18:03	01/17/22 14:32	1
Fluoranthene-d10 (Surr)	104		40 - 140				01/15/22 18:03	01/17/22 14:32	1
Terphenyl-d14	114		58 - 132				01/15/22 18:03	01/17/22 14:32	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	13	J	61	12	mg/Kg	☼	01/15/22 16:21	01/16/22 17:55	1
C24-C40	36	U	61	24	mg/Kg	☼	01/15/22 16:21	01/16/22 17:55	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	98		45 - 130				01/15/22 16:21	01/16/22 17:55	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	73.9		0.1	0.1	%			01/16/22 09:46	1
Percent Solids	73.9		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	26.1		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	26.1		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-E17.5-14-15

Lab Sample ID: 580-109327-3

Date Collected: 01/13/22 13:15

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 65.0

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	10	U	13	4.3	mg/Kg	☼	01/15/22 16:57	01/16/22 01:35	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	88		67 - 134				01/15/22 16:57	01/16/22 01:35	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.050	U	0.067	0.013	mg/Kg	☼	01/15/22 17:17	01/17/22 16:15	1
Toluene	0.10	U	0.20	0.045	mg/Kg	☼	01/15/22 17:17	01/17/22 16:15	1
Ethylbenzene	0.10	U	0.13	0.030	mg/Kg	☼	01/15/22 17:17	01/17/22 16:15	1
m-Xylene & p-Xylene	0.050	U	0.13	0.024	mg/Kg	☼	01/15/22 17:17	01/17/22 16:15	1
o-Xylene	0.050	U	0.13	0.017	mg/Kg	☼	01/15/22 17:17	01/17/22 16:15	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	106		85 - 116				01/15/22 17:17	01/17/22 16:15	1
4-Bromofluorobenzene (Surr)	94		79 - 119				01/15/22 17:17	01/17/22 16:15	1
Dibromofluoromethane (Surr)	83	M	78 - 119				01/15/22 17:17	01/17/22 16:15	1
1,2-Dichloroethane-d4 (Surr)	80		71 - 136				01/15/22 17:17	01/17/22 16:15	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0022	U	0.0072	0.00091	mg/Kg	☼	01/15/22 18:03	01/17/22 15:45	1
2-Methylnaphthalene	0.0043	U	0.0072	0.0030	mg/Kg	☼	01/15/22 18:03	01/17/22 15:45	1
Naphthalene	0.0058	U	0.0072	0.0023	mg/Kg	☼	01/15/22 18:03	01/17/22 15:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	75		28 - 143				01/15/22 18:03	01/17/22 15:45	1
2-methylnaphthalene-d10	89		40 - 140				01/15/22 18:03	01/17/22 15:45	1
Fluoranthene-d10 (Surr)	108		40 - 140				01/15/22 18:03	01/17/22 15:45	1
Terphenyl-d14	117		58 - 132				01/15/22 18:03	01/17/22 15:45	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	15	J	72	14	mg/Kg	☼	01/15/22 16:21	01/16/22 18:55	1
C24-C40	43	U	72	29	mg/Kg	☼	01/15/22 16:21	01/16/22 18:55	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	101		45 - 130				01/15/22 16:21	01/16/22 18:55	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	65.0		0.1	0.1	%			01/16/22 09:46	1
Percent Solids	65.0		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	35.0		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	35.0		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-S17.5-8-9

Lab Sample ID: 580-109327-4

Date Collected: 01/13/22 12:20

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 75.9

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	10	U	14	4.4	mg/Kg	☼	01/15/22 16:57	01/16/22 04:41	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	88		67 - 134				01/15/22 16:57	01/16/22 04:41	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.051	U	0.068	0.013	mg/Kg	☼	01/15/22 17:17	01/17/22 16:38	1
Toluene	0.10	U	0.20	0.046	mg/Kg	☼	01/15/22 17:17	01/17/22 16:38	1
Ethylbenzene	0.10	U	0.14	0.031	mg/Kg	☼	01/15/22 17:17	01/17/22 16:38	1
m-Xylene & p-Xylene	0.051	U	0.14	0.024	mg/Kg	☼	01/15/22 17:17	01/17/22 16:38	1
o-Xylene	0.051	U	0.14	0.017	mg/Kg	☼	01/15/22 17:17	01/17/22 16:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	97		85 - 116				01/15/22 17:17	01/17/22 16:38	1
4-Bromofluorobenzene (Surr)	98		79 - 119				01/15/22 17:17	01/17/22 16:38	1
Dibromofluoromethane (Surr)	86		78 - 119				01/15/22 17:17	01/17/22 16:38	1
1,2-Dichloroethane-d4 (Surr)	75		71 - 136				01/15/22 17:17	01/17/22 16:38	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0019	U	0.0065	0.00082	mg/Kg	☼	01/15/22 18:03	01/17/22 16:10	1
2-Methylnaphthalene	0.0039	U	0.0065	0.0027	mg/Kg	☼	01/15/22 18:03	01/17/22 16:10	1
Naphthalene	0.0052	U	0.0065	0.0021	mg/Kg	☼	01/15/22 18:03	01/17/22 16:10	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	78		28 - 143				01/15/22 18:03	01/17/22 16:10	1
2-methylnaphthalene-d10	88		40 - 140				01/15/22 18:03	01/17/22 16:10	1
Fluoranthene-d10 (Surr)	109		40 - 140				01/15/22 18:03	01/17/22 16:10	1
Terphenyl-d14	117		58 - 132				01/15/22 18:03	01/17/22 16:10	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	39	U	66	13	mg/Kg	☼	01/15/22 16:21	01/16/22 19:15	1
C24-C40	39	U	66	26	mg/Kg	☼	01/15/22 16:21	01/16/22 19:15	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	97		45 - 130				01/15/22 16:21	01/16/22 19:15	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	75.9		0.1	0.1	%			01/16/22 09:46	1
Percent Solids	75.9		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	24.1		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	24.1		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-E10-23-24

Lab Sample ID: 580-109327-5

Date Collected: 01/13/22 11:22

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 64.3

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	31		14	4.7	mg/Kg	☼	01/15/22 16:57	01/16/22 05:04	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	94		67 - 134				01/15/22 16:57	01/16/22 05:04	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.054	U	0.072	0.014	mg/Kg	☼	01/15/22 17:17	01/17/22 17:01	1
Toluene	0.11	U	0.22	0.049	mg/Kg	☼	01/15/22 17:17	01/17/22 17:01	1
Ethylbenzene	0.11	U	0.14	0.033	mg/Kg	☼	01/15/22 17:17	01/17/22 17:01	1
m-Xylene & p-Xylene	0.054	U	0.14	0.026	mg/Kg	☼	01/15/22 17:17	01/17/22 17:01	1
o-Xylene	0.054	U	0.14	0.018	mg/Kg	☼	01/15/22 17:17	01/17/22 17:01	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	106		85 - 116				01/15/22 17:17	01/17/22 17:01	1
4-Bromofluorobenzene (Surr)	96		79 - 119				01/15/22 17:17	01/17/22 17:01	1
Dibromofluoromethane (Surr)	85		78 - 119				01/15/22 17:17	01/17/22 17:01	1
1,2-Dichloroethane-d4 (Surr)	83		71 - 136				01/15/22 17:17	01/17/22 17:01	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.024	M	0.0073	0.00092	mg/Kg	☼	01/15/22 18:03	01/17/22 16:34	1
2-Methylnaphthalene	0.038	M	0.0073	0.0030	mg/Kg	☼	01/15/22 18:03	01/17/22 16:34	1
Naphthalene	0.0059	U	0.0073	0.0024	mg/Kg	☼	01/15/22 18:03	01/17/22 16:34	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	75	M	28 - 143				01/15/22 18:03	01/17/22 16:34	1
2-methylnaphthalene-d10	86		40 - 140				01/15/22 18:03	01/17/22 16:34	1
Fluoranthene-d10 (Surr)	108		40 - 140				01/15/22 18:03	01/17/22 16:34	1
Terphenyl-d14	114		58 - 132				01/15/22 18:03	01/17/22 16:34	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	130		68	14	mg/Kg	☼	01/15/22 16:21	01/16/22 19:36	1
C24-C40	41	U	68	27	mg/Kg	☼	01/15/22 16:21	01/16/22 19:36	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	98		45 - 130				01/15/22 16:21	01/16/22 19:36	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	64.3		0.1	0.1	%			01/16/22 09:46	1
Percent Solids	64.3		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	35.7		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	35.7		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-S10-17-18

Lab Sample ID: 580-109327-6

Date Collected: 01/13/22 11:35

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 65.9

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	2500		140	46	mg/Kg	☆	01/15/22 16:57	01/16/22 05:28	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	108		67 - 134				01/15/22 16:57	01/16/22 05:28	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.11	U Q	0.14	0.027	mg/Kg	☆	01/15/22 17:17	01/18/22 08:33	1
Toluene	0.21	U Q	0.43	0.096	mg/Kg	☆	01/15/22 17:17	01/18/22 08:33	1
Ethylbenzene	0.21	U	0.28	0.065	mg/Kg	☆	01/15/22 17:17	01/18/22 08:33	1
m-Xylene & p-Xylene	0.69		0.28	0.050	mg/Kg	☆	01/15/22 17:17	01/18/22 08:33	1
o-Xylene	1.6		0.28	0.035	mg/Kg	☆	01/15/22 17:17	01/18/22 08:33	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	109		85 - 116				01/15/22 17:17	01/18/22 08:33	1
4-Bromofluorobenzene (Surr)	93		79 - 119				01/15/22 17:17	01/18/22 08:33	1
Dibromofluoromethane (Surr)	83		78 - 119				01/15/22 17:17	01/18/22 08:33	1
1,2-Dichloroethane-d4 (Surr)	80		71 - 136				01/15/22 17:17	01/18/22 08:33	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	4.4		0.0060	0.00075	mg/Kg	☆	01/15/22 18:03	01/17/22 16:59	1
2-Methylnaphthalene	6.5		0.0060	0.0024	mg/Kg	☆	01/15/22 18:03	01/17/22 16:59	1
Naphthalene	1.4	M	0.0060	0.0019	mg/Kg	☆	01/15/22 18:03	01/17/22 16:59	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	69		28 - 143				01/15/22 18:03	01/17/22 16:59	1
2-methylnaphthalene-d10	119		40 - 140				01/15/22 18:03	01/17/22 16:59	1
Fluoranthene-d10 (Surr)	100		40 - 140				01/15/22 18:03	01/17/22 16:59	1
Terphenyl-d14	111		58 - 132				01/15/22 18:03	01/17/22 16:59	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	2600		63	12	mg/Kg	☆	01/15/22 16:21	01/16/22 19:56	1
C24-C40	38	U	63	25	mg/Kg	☆	01/15/22 16:21	01/16/22 19:56	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	97		45 - 130				01/15/22 16:21	01/16/22 19:56	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	65.9		0.1	0.1	%			01/16/22 09:46	1
Percent Solids	65.9		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	34.1		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	34.1		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-N25-10-11 DUPLICATE

Lab Sample ID: 580-109327-7

Date Collected: 01/13/22 14:25

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 74.6

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	21		13	4.3	mg/Kg	☆	01/15/22 16:57	01/16/22 05:51	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	98		67 - 134				01/15/22 16:57	01/16/22 05:51	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.049	U	0.066	0.012	mg/Kg	☆	01/15/22 17:17	01/17/22 18:32	1
Toluene	0.099	U	0.20	0.044	mg/Kg	☆	01/15/22 17:17	01/17/22 18:32	1
Ethylbenzene	0.099	U	0.13	0.030	mg/Kg	☆	01/15/22 17:17	01/17/22 18:32	1
m-Xylene & p-Xylene	0.049	U	0.13	0.023	mg/Kg	☆	01/15/22 17:17	01/17/22 18:32	1
o-Xylene	0.049	U	0.13	0.016	mg/Kg	☆	01/15/22 17:17	01/17/22 18:32	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	107		85 - 116				01/15/22 17:17	01/17/22 18:32	1
4-Bromofluorobenzene (Surr)	96		79 - 119				01/15/22 17:17	01/17/22 18:32	1
Dibromofluoromethane (Surr)	81		78 - 119				01/15/22 17:17	01/17/22 18:32	1
1,2-Dichloroethane-d4 (Surr)	79		71 - 136				01/15/22 17:17	01/17/22 18:32	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.013	M	0.0056	0.00070	mg/Kg	☆	01/15/22 18:03	01/17/22 17:23	1
2-Methylnaphthalene	0.019	M	0.0056	0.0023	mg/Kg	☆	01/15/22 18:03	01/17/22 17:23	1
Naphthalene	0.0045	U	0.0056	0.0018	mg/Kg	☆	01/15/22 18:03	01/17/22 17:23	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	88		28 - 143				01/15/22 18:03	01/17/22 17:23	1
2-methylnaphthalene-d10	97		40 - 140				01/15/22 18:03	01/17/22 17:23	1
Fluoranthene-d10 (Surr)	110		40 - 140				01/15/22 18:03	01/17/22 17:23	1
Terphenyl-d14	120		58 - 132				01/15/22 18:03	01/17/22 17:23	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	18	J	60	12	mg/Kg	☆	01/15/22 16:21	01/16/22 20:36	1
C24-C40	40	J	60	24	mg/Kg	☆	01/15/22 16:21	01/16/22 20:36	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	102		45 - 130				01/15/22 16:21	01/16/22 20:36	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	74.6		0.1	0.1	%			01/16/22 09:46	1
Percent Solids	74.6		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	25.4		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	25.4		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-E25-14-15

Lab Sample ID: 580-109327-8

Date Collected: 01/13/22 12:45

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 65.6

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	11	U	15	4.7	mg/Kg	☼	01/15/22 16:57	01/16/22 06:14	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	88		67 - 134				01/15/22 16:57	01/16/22 06:14	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.055	U	0.073	0.014	mg/Kg	☼	01/15/22 17:17	01/17/22 18:55	1
Toluene	0.11	U	0.22	0.049	mg/Kg	☼	01/15/22 17:17	01/17/22 18:55	1
Ethylbenzene	0.11	U	0.15	0.033	mg/Kg	☼	01/15/22 17:17	01/17/22 18:55	1
m-Xylene & p-Xylene	0.055	U	0.15	0.026	mg/Kg	☼	01/15/22 17:17	01/17/22 18:55	1
o-Xylene	0.055	U	0.15	0.018	mg/Kg	☼	01/15/22 17:17	01/17/22 18:55	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	106		85 - 116				01/15/22 17:17	01/17/22 18:55	1
4-Bromofluorobenzene (Surr)	97		79 - 119				01/15/22 17:17	01/17/22 18:55	1
Dibromofluoromethane (Surr)	84		78 - 119				01/15/22 17:17	01/17/22 18:55	1
1,2-Dichloroethane-d4 (Surr)	81		71 - 136				01/15/22 17:17	01/17/22 18:55	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0018	U	0.0059	0.00075	mg/Kg	☼	01/15/22 18:03	01/17/22 17:47	1
2-Methylnaphthalene	0.0036	U	0.0059	0.0024	mg/Kg	☼	01/15/22 18:03	01/17/22 17:47	1
Naphthalene	0.0048	U	0.0059	0.0019	mg/Kg	☼	01/15/22 18:03	01/17/22 17:47	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	83		28 - 143				01/15/22 18:03	01/17/22 17:47	1
2-methylnaphthalene-d10	89		40 - 140				01/15/22 18:03	01/17/22 17:47	1
Fluoranthene-d10 (Surr)	107		40 - 140				01/15/22 18:03	01/17/22 17:47	1
Terphenyl-d14	114		58 - 132				01/15/22 18:03	01/17/22 17:47	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	16	J	74	15	mg/Kg	☼	01/15/22 16:21	01/16/22 20:56	1
C24-C40	44	U	74	30	mg/Kg	☼	01/15/22 16:21	01/16/22 20:56	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	101		45 - 130				01/15/22 16:21	01/16/22 20:56	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	65.6		0.1	0.1	%			01/16/22 09:46	1
Percent Solids	65.6		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	34.4		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	34.4		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-S10-15-16

Lab Sample ID: 580-109327-9

Date Collected: 01/13/22 11:40

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 67.8

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	3900		1400	450	mg/Kg	✱	01/15/22 16:57	01/16/22 06:37	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	97		67 - 134				01/15/22 16:57	01/16/22 06:37	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.10	U Q	0.14	0.026	mg/Kg	✱	01/15/22 17:17	01/18/22 08:57	1
Toluene	0.21	U Q	0.42	0.094	mg/Kg	✱	01/15/22 17:17	01/18/22 08:57	1
Ethylbenzene	0.29		0.28	0.063	mg/Kg	✱	01/15/22 17:17	01/18/22 08:57	1
m-Xylene & p-Xylene	1.9		0.28	0.050	mg/Kg	✱	01/15/22 17:17	01/18/22 08:57	1
o-Xylene	6.1		0.28	0.035	mg/Kg	✱	01/15/22 17:17	01/18/22 08:57	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	110		85 - 116				01/15/22 17:17	01/18/22 08:57	1
4-Bromofluorobenzene (Surr)	93		79 - 119				01/15/22 17:17	01/18/22 08:57	1
Dibromofluoromethane (Surr)	85		78 - 119				01/15/22 17:17	01/18/22 08:57	1
1,2-Dichloroethane-d4 (Surr)	82		71 - 136				01/15/22 17:17	01/18/22 08:57	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	8.9		0.0067	0.0022	mg/Kg	✱	01/15/22 18:03	01/17/22 18:11	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	48		28 - 143				01/15/22 18:03	01/17/22 18:11	1
2-methylnaphthalene-d10	82	M	40 - 140				01/15/22 18:03	01/17/22 18:11	1
Fluoranthene-d10 (Surr)	105		40 - 140				01/15/22 18:03	01/17/22 18:11	1
Terphenyl-d14	111		58 - 132				01/15/22 18:03	01/17/22 18:11	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	29	D	0.067	0.0085	mg/Kg	✱	01/15/22 18:03	01/18/22 10:49	10
2-Methylnaphthalene	45	D	0.067	0.028	mg/Kg	✱	01/15/22 18:03	01/18/22 10:49	10
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	76	M	28 - 143				01/15/22 18:03	01/18/22 10:49	10
2-methylnaphthalene-d10	127	M	40 - 140				01/15/22 18:03	01/18/22 10:49	10
Fluoranthene-d10 (Surr)	102		40 - 140				01/15/22 18:03	01/18/22 10:49	10
Terphenyl-d14	116		58 - 132				01/15/22 18:03	01/18/22 10:49	10

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	3200		55	11	mg/Kg	✱	01/15/22 16:21	01/16/22 21:16	1
C24-C40	61		55	22	mg/Kg	✱	01/15/22 16:21	01/16/22 21:16	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	89		45 - 130				01/15/22 16:21	01/16/22 21:16	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	67.8		0.1	0.1	%			01/16/22 09:46	1

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Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-S10-15-16

Lab Sample ID: 580-109327-9

Date Collected: 01/13/22 11:40

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 67.8

General Chemistry (Continued)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	67.8		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	32.2		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	32.2		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-E17.5-7-8

Lab Sample ID: 580-109327-10

Date Collected: 01/13/22 13:00

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 70.1

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	12	U	16	5.3	mg/Kg	☼	01/15/22 16:57	01/16/22 07:01	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	91		67 - 134				01/15/22 16:57	01/16/22 07:01	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.061	U	0.081	0.015	mg/Kg	☼	01/15/22 17:17	01/17/22 19:42	1
Toluene	0.12	U	0.24	0.055	mg/Kg	☼	01/15/22 17:17	01/17/22 19:42	1
Ethylbenzene	0.12	U	0.16	0.037	mg/Kg	☼	01/15/22 17:17	01/17/22 19:42	1
m-Xylene & p-Xylene	0.061	U	0.16	0.029	mg/Kg	☼	01/15/22 17:17	01/17/22 19:42	1
o-Xylene	0.061	U	0.16	0.020	mg/Kg	☼	01/15/22 17:17	01/17/22 19:42	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	105		85 - 116				01/15/22 17:17	01/17/22 19:42	1
4-Bromofluorobenzene (Surr)	92		79 - 119				01/15/22 17:17	01/17/22 19:42	1
Dibromofluoromethane (Surr)	83		78 - 119				01/15/22 17:17	01/17/22 19:42	1
1,2-Dichloroethane-d4 (Surr)	79		71 - 136				01/15/22 17:17	01/17/22 19:42	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0020	U	0.0068	0.00086	mg/Kg	☼	01/15/22 18:03	01/17/22 18:36	1
2-Methylnaphthalene	0.0041	U	0.0068	0.0028	mg/Kg	☼	01/15/22 18:03	01/17/22 18:36	1
Naphthalene	0.0054	U	0.0068	0.0022	mg/Kg	☼	01/15/22 18:03	01/17/22 18:36	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	78	M	28 - 143				01/15/22 18:03	01/17/22 18:36	1
2-methylnaphthalene-d10	92		40 - 140				01/15/22 18:03	01/17/22 18:36	1
Fluoranthene-d10 (Surr)	106		40 - 140				01/15/22 18:03	01/17/22 18:36	1
Terphenyl-d14	112		58 - 132				01/15/22 18:03	01/17/22 18:36	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	23	J	67	13	mg/Kg	☼	01/15/22 16:21	01/16/22 21:37	1
C24-C40	72		67	27	mg/Kg	☼	01/15/22 16:21	01/16/22 21:37	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	101		45 - 130				01/15/22 16:21	01/16/22 21:37	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	70.1		0.1	0.1	%			01/16/22 09:46	1
Percent Solids	70.1		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	29.9		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	29.9		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-N25-14-15

Lab Sample ID: 580-109327-11

Date Collected: 01/13/22 14:01

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 64.8

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	9.8	U	13	4.2	mg/Kg	☼	01/15/22 16:57	01/16/22 07:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	86		67 - 134				01/15/22 16:57	01/16/22 07:24	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.049	U	0.065	0.012	mg/Kg	☼	01/15/22 17:17	01/17/22 20:04	1
Toluene	0.098	U	0.20	0.044	mg/Kg	☼	01/15/22 17:17	01/17/22 20:04	1
Ethylbenzene	0.098	U	0.13	0.030	mg/Kg	☼	01/15/22 17:17	01/17/22 20:04	1
m-Xylene & p-Xylene	0.049	U	0.13	0.023	mg/Kg	☼	01/15/22 17:17	01/17/22 20:04	1
o-Xylene	0.049	U	0.13	0.016	mg/Kg	☼	01/15/22 17:17	01/17/22 20:04	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	106		85 - 116				01/15/22 17:17	01/17/22 20:04	1
4-Bromofluorobenzene (Surr)	93		79 - 119				01/15/22 17:17	01/17/22 20:04	1
Dibromofluoromethane (Surr)	85		78 - 119				01/15/22 17:17	01/17/22 20:04	1
1,2-Dichloroethane-d4 (Surr)	80		71 - 136				01/15/22 17:17	01/17/22 20:04	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0023	U	0.0076	0.00096	mg/Kg	☼	01/15/22 18:03	01/17/22 19:00	1
2-Methylnaphthalene	0.0046	U	0.0076	0.0031	mg/Kg	☼	01/15/22 18:03	01/17/22 19:00	1
Naphthalene	0.0061	U	0.0076	0.0025	mg/Kg	☼	01/15/22 18:03	01/17/22 19:00	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	81		28 - 143				01/15/22 18:03	01/17/22 19:00	1
2-methylnaphthalene-d10	88		40 - 140				01/15/22 18:03	01/17/22 19:00	1
Fluoranthene-d10 (Surr)	105		40 - 140				01/15/22 18:03	01/17/22 19:00	1
Terphenyl-d14	118		58 - 132				01/15/22 18:03	01/17/22 19:00	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	20	J	77	15	mg/Kg	☼	01/15/22 16:21	01/16/22 21:57	1
C24-C40	46	U	77	31	mg/Kg	☼	01/15/22 16:21	01/16/22 21:57	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	103		45 - 130				01/15/22 16:21	01/16/22 21:57	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	64.8		0.1	0.1	%			01/16/22 09:46	1
Percent Solids	64.8		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	35.2		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	35.2		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-N25-14-15 DUPLICATE

Lab Sample ID: 580-109327-12

Date Collected: 01/13/22 14:20

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 65.4

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	12	U	15	5.0	mg/Kg	☼	01/15/22 16:57	01/16/22 07:47	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	89		67 - 134				01/15/22 16:57	01/16/22 07:47	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.058	U	0.077	0.015	mg/Kg	☼	01/15/22 17:17	01/17/22 20:27	1
Toluene	0.12	U	0.23	0.052	mg/Kg	☼	01/15/22 17:17	01/17/22 20:27	1
Ethylbenzene	0.12	U	0.15	0.035	mg/Kg	☼	01/15/22 17:17	01/17/22 20:27	1
m-Xylene & p-Xylene	0.058	U	0.15	0.027	mg/Kg	☼	01/15/22 17:17	01/17/22 20:27	1
o-Xylene	0.058	U	0.15	0.019	mg/Kg	☼	01/15/22 17:17	01/17/22 20:27	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	106		85 - 116				01/15/22 17:17	01/17/22 20:27	1
4-Bromofluorobenzene (Surr)	91		79 - 119				01/15/22 17:17	01/17/22 20:27	1
Dibromofluoromethane (Surr)	85		78 - 119				01/15/22 17:17	01/17/22 20:27	1
1,2-Dichloroethane-d4 (Surr)	82		71 - 136				01/15/22 17:17	01/17/22 20:27	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0021	U	0.0069	0.00087	mg/Kg	☼	01/15/22 18:03	01/17/22 19:25	1
2-Methylnaphthalene	0.0042	U	0.0069	0.0028	mg/Kg	☼	01/15/22 18:03	01/17/22 19:25	1
Naphthalene	0.0055	U	0.0069	0.0022	mg/Kg	☼	01/15/22 18:03	01/17/22 19:25	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	79		28 - 143				01/15/22 18:03	01/17/22 19:25	1
2-methylnaphthalene-d10	94		40 - 140				01/15/22 18:03	01/17/22 19:25	1
Fluoranthene-d10 (Surr)	109		40 - 140				01/15/22 18:03	01/17/22 19:25	1
Terphenyl-d14	121		58 - 132				01/15/22 18:03	01/17/22 19:25	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	25	J	67	13	mg/Kg	☼	01/15/22 16:21	01/16/22 22:17	1
C24-C40	40	U	67	27	mg/Kg	☼	01/15/22 16:21	01/16/22 22:17	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	98		45 - 130				01/15/22 16:21	01/16/22 22:17	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	65.4		0.1	0.1	%			01/16/22 09:46	1
Percent Solids	65.4		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	34.6		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	34.6		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-E10-21-22

Lab Sample ID: 580-109327-13

Date Collected: 01/13/22 12:00

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 61.8

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	450		14	4.6	mg/Kg	☆	01/15/22 16:57	01/16/22 08:10	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	112		67 - 134				01/15/22 16:57	01/16/22 08:10	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.053	U	0.071	0.014	mg/Kg	☆	01/15/22 17:17	01/17/22 20:50	1
Toluene	0.11	U	0.21	0.048	mg/Kg	☆	01/15/22 17:17	01/17/22 20:50	1
Ethylbenzene	0.11	U	0.14	0.032	mg/Kg	☆	01/15/22 17:17	01/17/22 20:50	1
m-Xylene & p-Xylene	0.053	U	0.14	0.025	mg/Kg	☆	01/15/22 17:17	01/17/22 20:50	1
o-Xylene	0.053	U	0.14	0.018	mg/Kg	☆	01/15/22 17:17	01/17/22 20:50	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	104		85 - 116				01/15/22 17:17	01/17/22 20:50	1
4-Bromofluorobenzene (Surr)	95		79 - 119				01/15/22 17:17	01/17/22 20:50	1
Dibromofluoromethane (Surr)	84		78 - 119				01/15/22 17:17	01/17/22 20:50	1
1,2-Dichloroethane-d4 (Surr)	82		71 - 136				01/15/22 17:17	01/17/22 20:50	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.73		0.0078	0.00098	mg/Kg	☆	01/15/22 18:03	01/17/22 19:49	1
2-Methylnaphthalene	0.85		0.0078	0.0032	mg/Kg	☆	01/15/22 18:03	01/17/22 19:49	1
Naphthalene	0.34		0.0078	0.0025	mg/Kg	☆	01/15/22 18:03	01/17/22 19:49	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	67		28 - 143				01/15/22 18:03	01/17/22 19:49	1
2-methylnaphthalene-d10	84		40 - 140				01/15/22 18:03	01/17/22 19:49	1
Fluoranthene-d10 (Surr)	99		40 - 140				01/15/22 18:03	01/17/22 19:49	1
Terphenyl-d14	108		58 - 132				01/15/22 18:03	01/17/22 19:49	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	430		67	13	mg/Kg	☆	01/15/22 16:21	01/16/22 22:37	1
C24-C40	40	U	67	27	mg/Kg	☆	01/15/22 16:21	01/16/22 22:37	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	93		45 - 130				01/15/22 16:21	01/16/22 22:37	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	61.8		0.1	0.1	%			01/16/22 09:46	1
Percent Solids	61.8		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	38.2		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	38.2		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-N25-10-11

Lab Sample ID: 580-109327-14

Date Collected: 01/13/22 14:15

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 75.6

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	6.6	J	12	4.0	mg/Kg	☼	01/15/22 16:57	01/17/22 10:39	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	79		67 - 134				01/15/22 16:57	01/17/22 10:39	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.046	U	0.061	0.012	mg/Kg	☼	01/15/22 17:17	01/17/22 21:13	1
Toluene	0.091	U	0.18	0.041	mg/Kg	☼	01/15/22 17:17	01/17/22 21:13	1
Ethylbenzene	0.091	U	0.12	0.028	mg/Kg	☼	01/15/22 17:17	01/17/22 21:13	1
m-Xylene & p-Xylene	0.046	U	0.12	0.022	mg/Kg	☼	01/15/22 17:17	01/17/22 21:13	1
o-Xylene	0.046	U	0.12	0.015	mg/Kg	☼	01/15/22 17:17	01/17/22 21:13	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	108		85 - 116				01/15/22 17:17	01/17/22 21:13	1
4-Bromofluorobenzene (Surr)	97		79 - 119				01/15/22 17:17	01/17/22 21:13	1
Dibromofluoromethane (Surr)	82		78 - 119				01/15/22 17:17	01/17/22 21:13	1
1,2-Dichloroethane-d4 (Surr)	77		71 - 136				01/15/22 17:17	01/17/22 21:13	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0016	U	0.0054	0.00068	mg/Kg	☼	01/15/22 18:03	01/17/22 20:14	1
2-Methylnaphthalene	0.0032	U	0.0054	0.0022	mg/Kg	☼	01/15/22 18:03	01/17/22 20:14	1
Naphthalene	0.0043	U	0.0054	0.0017	mg/Kg	☼	01/15/22 18:03	01/17/22 20:14	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	80		28 - 143				01/15/22 18:03	01/17/22 20:14	1
2-methylnaphthalene-d10	91		40 - 140				01/15/22 18:03	01/17/22 20:14	1
Fluoranthene-d10 (Surr)	103		40 - 140				01/15/22 18:03	01/17/22 20:14	1
Terphenyl-d14	115		58 - 132				01/15/22 18:03	01/17/22 20:14	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	21	J	61	12	mg/Kg	☼	01/15/22 16:21	01/16/22 22:57	1
C24-C40	36	U	61	24	mg/Kg	☼	01/15/22 16:21	01/16/22 22:57	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	94		45 - 130				01/15/22 16:21	01/16/22 22:57	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	75.6		0.1	0.1	%			01/16/22 09:46	1
Percent Solids	75.6		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	24.4		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	24.4		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-S25-14-15

Lab Sample ID: 580-109327-15

Date Collected: 01/13/22 11:55

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 68.1

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	9.0	J	14	4.6	mg/Kg	☼	01/15/22 16:57	01/17/22 11:03	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	82		67 - 134				01/15/22 16:57	01/17/22 11:03	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.053	U	0.070	0.013	mg/Kg	☼	01/15/22 17:17	01/17/22 21:36	1
Toluene	0.11	U	0.21	0.047	mg/Kg	☼	01/15/22 17:17	01/17/22 21:36	1
Ethylbenzene	0.11	U	0.14	0.032	mg/Kg	☼	01/15/22 17:17	01/17/22 21:36	1
m-Xylene & p-Xylene	0.053	U	0.14	0.025	mg/Kg	☼	01/15/22 17:17	01/17/22 21:36	1
o-Xylene	0.053	U	0.14	0.018	mg/Kg	☼	01/15/22 17:17	01/17/22 21:36	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	108		85 - 116				01/15/22 17:17	01/17/22 21:36	1
4-Bromofluorobenzene (Surr)	93		79 - 119				01/15/22 17:17	01/17/22 21:36	1
Dibromofluoromethane (Surr)	85		78 - 119				01/15/22 17:17	01/17/22 21:36	1
1,2-Dichloroethane-d4 (Surr)	83		71 - 136				01/15/22 17:17	01/17/22 21:36	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0020	U	0.0067	0.00084	mg/Kg	☼	01/15/22 18:03	01/17/22 20:38	1
2-Methylnaphthalene	0.0040	U	0.0067	0.0027	mg/Kg	☼	01/15/22 18:03	01/17/22 20:38	1
Naphthalene	0.0053	U	0.0067	0.0022	mg/Kg	☼	01/15/22 18:03	01/17/22 20:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	79		28 - 143				01/15/22 18:03	01/17/22 20:38	1
2-methylnaphthalene-d10	90		40 - 140				01/15/22 18:03	01/17/22 20:38	1
Fluoranthene-d10 (Surr)	105		40 - 140				01/15/22 18:03	01/17/22 20:38	1
Terphenyl-d14	113		58 - 132				01/15/22 18:03	01/17/22 20:38	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	38	U	64	13	mg/Kg	☼	01/15/22 16:21	01/16/22 23:17	1
C24-C40	38	U	64	25	mg/Kg	☼	01/15/22 16:21	01/16/22 23:17	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	87		45 - 130				01/15/22 16:21	01/16/22 23:17	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	68.1		0.1	0.1	%			01/16/22 09:46	1
Percent Solids	68.1		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	31.9		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	31.9		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-S25-8-9

Lab Sample ID: 580-109327-16

Date Collected: 01/13/22 11:50

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 92.8

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	6.2	J	11	3.5	mg/Kg	☼	01/15/22 16:57	01/17/22 11:26	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	86		67 - 134				01/15/22 16:57	01/17/22 11:26	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.040	U Q	0.054	0.010	mg/Kg	☼	01/15/22 17:17	01/18/22 08:10	1
Toluene	0.081	U Q	0.16	0.036	mg/Kg	☼	01/15/22 17:17	01/18/22 08:10	1
Ethylbenzene	0.081	U	0.11	0.024	mg/Kg	☼	01/15/22 17:17	01/18/22 08:10	1
m-Xylene & p-Xylene	0.040	U	0.11	0.019	mg/Kg	☼	01/15/22 17:17	01/18/22 08:10	1
o-Xylene	0.040	U	0.11	0.013	mg/Kg	☼	01/15/22 17:17	01/18/22 08:10	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	104		85 - 116				01/15/22 17:17	01/18/22 08:10	1
4-Bromofluorobenzene (Surr)	93		79 - 119				01/15/22 17:17	01/18/22 08:10	1
Dibromofluoromethane (Surr)	87		78 - 119				01/15/22 17:17	01/18/22 08:10	1
1,2-Dichloroethane-d4 (Surr)	80		71 - 136				01/15/22 17:17	01/18/22 08:10	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0016	U	0.0053	0.00067	mg/Kg	☼	01/15/22 18:03	01/17/22 21:02	1
2-Methylnaphthalene	0.0032	U	0.0053	0.0022	mg/Kg	☼	01/15/22 18:03	01/17/22 21:02	1
Naphthalene	0.0042	U	0.0053	0.0017	mg/Kg	☼	01/15/22 18:03	01/17/22 21:02	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	86		28 - 143				01/15/22 18:03	01/17/22 21:02	1
2-methylnaphthalene-d10	93		40 - 140				01/15/22 18:03	01/17/22 21:02	1
Fluoranthene-d10 (Surr)	114		40 - 140				01/15/22 18:03	01/17/22 21:02	1
Terphenyl-d14	120		58 - 132				01/15/22 18:03	01/17/22 21:02	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	12	J	50	9.8	mg/Kg	☼	01/15/22 16:21	01/16/22 23:37	1
C24-C40	30	U	50	20	mg/Kg	☼	01/15/22 16:21	01/16/22 23:37	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	96		45 - 130				01/15/22 16:21	01/16/22 23:37	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	92.8		0.1	0.1	%			01/16/22 09:46	1
Percent Solids	92.8		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	7.2		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	7.2		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: LT-SEDIMENT

Lab Sample ID: 580-109327-17

Date Collected: 01/13/22 13:50

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 66.7

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	7.2		0.0073	0.0024	mg/Kg	☼	01/15/22 18:03	01/17/22 21:27	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	49	M	28 - 143				01/15/22 18:03	01/17/22 21:27	1
2-methylnaphthalene-d10	71	M	40 - 140				01/15/22 18:03	01/17/22 21:27	1
Fluoranthene-d10 (Surr)	94		40 - 140				01/15/22 18:03	01/17/22 21:27	1
Terphenyl-d14	98		58 - 132				01/15/22 18:03	01/17/22 21:27	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	52	D	0.073	0.0092	mg/Kg	☼	01/15/22 18:03	01/18/22 11:13	10
2-Methylnaphthalene	74	D	0.073	0.030	mg/Kg	☼	01/15/22 18:03	01/18/22 11:13	10
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	75	M	28 - 143				01/15/22 18:03	01/18/22 11:13	10
2-methylnaphthalene-d10	131	M	40 - 140				01/15/22 18:03	01/18/22 11:13	10
Fluoranthene-d10 (Surr)	96		40 - 140				01/15/22 18:03	01/18/22 11:13	10
Terphenyl-d14	104		58 - 132				01/15/22 18:03	01/18/22 11:13	10

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	13000		70	14	mg/Kg	☼	01/15/22 16:21	01/17/22 00:17	1
C24-C40	250		70	28	mg/Kg	☼	01/15/22 16:21	01/17/22 00:17	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	92		45 - 130				01/15/22 16:21	01/17/22 00:17	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	66.7		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	33.3		0.1	0.1	%			01/16/22 09:46	1

QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-378452/1-A
Matrix: Solid
Analysis Batch: 378464

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378452

Analyte	MB MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Gasoline Range Organics (C6-C12)	3.0	U	4.0	1.3	mg/Kg		01/15/22 16:57	01/16/22 00:25	1
Surrogate	MB MB		Limits			D	Prepared	Analyzed	Dil Fac
%Recovery	Qualifier								
4-Bromofluorobenzene (Surr)	88		67 - 134				01/15/22 16:57	01/16/22 00:25	1

Lab Sample ID: LCS 580-378452/2-A
Matrix: Solid
Analysis Batch: 378464

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378452

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits	
								Gasoline Range Organics (C6-C12)
Surrogate	LCS LCS		Limits			D	%Rec	%Rec. Limits
%Recovery	Qualifier							
4-Bromofluorobenzene (Surr)	100		67 - 134					

Lab Sample ID: LCSD 580-378452/3-A
Matrix: Solid
Analysis Batch: 378464

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378452

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Surrogate	LCSD LCSD		Limits			D	%Rec	%Rec. Limits	RPD
%Recovery	Qualifier								
4-Bromofluorobenzene (Surr)	99		67 - 134						

Lab Sample ID: MB 580-378552/4
Matrix: Water
Analysis Batch: 378552

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Gasoline Range Organics (C6-C12)	0.080	U	0.10	0.031	mg/L			01/17/22 18:41	1
Surrogate	MB MB		Limits			D	Prepared	Analyzed	Dil Fac
%Recovery	Qualifier								
4-Bromofluorobenzene (Surr)	92		69 - 133					01/17/22 18:41	1

Lab Sample ID: LCS 580-378552/7
Matrix: Water
Analysis Batch: 378552

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits	
								Gasoline Range Organics (C6-C12)
Surrogate	LCS LCS		Limits			D	%Rec	%Rec. Limits
%Recovery	Qualifier							
4-Bromofluorobenzene (Surr)	100		69 - 133					

QC Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 580-378552/8
Matrix: Water
Analysis Batch: 378552

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline Range Organics (C6-C12)	1.00	1.01		mg/L		101	78 - 122	0	30

Surrogate	%Recovery	LCSD Qualifier	LCSD Limits
4-Bromofluorobenzene (Surr)	97		69 - 133

Method: 8260D - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 580-378453/1-A
Matrix: Solid
Analysis Batch: 378460

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378453

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.015	U	0.020	0.0038	mg/Kg		01/15/22 17:17	01/17/22 00:51	1
Toluene	0.030	U	0.060	0.014	mg/Kg		01/15/22 17:17	01/17/22 00:51	1
Ethylbenzene	0.030	U	0.040	0.0091	mg/Kg		01/15/22 17:17	01/17/22 00:51	1
m-Xylene & p-Xylene	0.015	U	0.040	0.0071	mg/Kg		01/15/22 17:17	01/17/22 00:51	1
o-Xylene	0.015	U	0.040	0.0050	mg/Kg		01/15/22 17:17	01/17/22 00:51	1

Surrogate	%Recovery	MB Qualifier	MB Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	97		79 - 119	01/15/22 17:17	01/17/22 00:51	1
Toluene-d8 (Surr)	99		85 - 116	01/15/22 17:17	01/17/22 00:51	1
Dibromofluoromethane (Surr)	96	M	78 - 119	01/15/22 17:17	01/17/22 00:51	1
1,2-Dichloroethane-d4 (Surr)	95	M	71 - 136	01/15/22 17:17	01/17/22 00:51	1

Lab Sample ID: LCS 580-378453/2-A
Matrix: Solid
Analysis Batch: 378460

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378453

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	0.800	0.885		mg/Kg		111	77 - 121
Toluene	0.800	0.922		mg/Kg		115	77 - 121
Ethylbenzene	0.800	0.894		mg/Kg		112	76 - 122
m-Xylene & p-Xylene	0.800	0.889		mg/Kg		111	77 - 124
o-Xylene	0.800	0.871	M	mg/Kg		109	77 - 123
Naphthalene	0.800	0.987		mg/Kg		123	62 - 129

Surrogate	%Recovery	LCS Qualifier	LCS Limits
4-Bromofluorobenzene (Surr)	98		79 - 119
Toluene-d8 (Surr)	99		85 - 116
Dibromofluoromethane (Surr)	90	M	78 - 119
1,2-Dichloroethane-d4 (Surr)	87		71 - 136

QC Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 580-378453/3-A
Matrix: Solid
Analysis Batch: 378460

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378453

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec.		RPD
							Limits	RPD	
Benzene	0.800	0.782		mg/Kg		98	77 - 121	12	20
Toluene	0.800	0.783		mg/Kg		98	77 - 121	16	20
Ethylbenzene	0.800	0.761		mg/Kg		95	76 - 122	16	20
m-Xylene & p-Xylene	0.800	0.763		mg/Kg		95	77 - 124	15	20
o-Xylene	0.800	0.755	M	mg/Kg		94	77 - 123	14	20
Naphthalene	0.800	0.845		mg/Kg		106	62 - 129	16	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	98		79 - 119
Toluene-d8 (Surr)	97		85 - 116
Dibromofluoromethane (Surr)	92	M	78 - 119
1,2-Dichloroethane-d4 (Surr)	89	M	71 - 136

Lab Sample ID: MB 580-378553/4
Matrix: Water
Analysis Batch: 378553

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	0.80	U	1.0	0.39	ug/L		01/17/22 18:41	1	
Ethylbenzene	0.80	U	1.0	0.50	ug/L		01/17/22 18:41	1	
m-Xylene & p-Xylene	0.80	U	2.0	0.53	ug/L		01/17/22 18:41	1	
o-Xylene	0.80	U	1.0	0.39	ug/L		01/17/22 18:41	1	

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	92		85 - 114		01/17/22 18:41	1
Toluene-d8 (Surr)	98		89 - 112		01/17/22 18:41	1
Dibromofluoromethane (Surr)	88		80 - 119		01/17/22 18:41	1
1,2-Dichloroethane-d4 (Surr)	86	M	81 - 118		01/17/22 18:41	1

Lab Sample ID: LCS 580-378553/5
Matrix: Water
Analysis Batch: 378553

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.	
							Limits	RPD
Benzene	10.0	10.7		ug/L		107	79 - 120	
Toluene	10.0	10.3		ug/L		103	80 - 121	
Ethylbenzene	10.0	10.6		ug/L		106	79 - 121	
m-Xylene & p-Xylene	10.0	10.1		ug/L		101	80 - 121	
o-Xylene	10.0	10.2		ug/L		102	78 - 122	
Naphthalene	10.0	9.56		ug/L		96	61 - 128	

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	96		85 - 114
Toluene-d8 (Surr)	99		89 - 112
Dibromofluoromethane (Surr)	90		80 - 119
1,2-Dichloroethane-d4 (Surr)	87		81 - 118

QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 580-378553/6
Matrix: Water
Analysis Batch: 378553

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	10.0	10.7		ug/L		107	79 - 120	0	20
Toluene	10.0	10.1		ug/L		101	80 - 121	2	20
Ethylbenzene	10.0	10.4		ug/L		104	79 - 121	1	20
m-Xylene & p-Xylene	10.0	10.2		ug/L		102	80 - 121	1	20
o-Xylene	10.0	10.1		ug/L		101	78 - 122	1	20
Naphthalene	10.0	9.22		ug/L		92	61 - 128	4	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	98		85 - 114
Toluene-d8 (Surr)	98		89 - 112
Dibromofluoromethane (Surr)	92		80 - 119
1,2-Dichloroethane-d4 (Surr)	89		81 - 118

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 580-378465/1-A
Matrix: Solid
Analysis Batch: 378516

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378465

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
2-Methylnaphthalene	0.0030	U	0.0050	0.0021	mg/Kg		01/15/22 18:03	01/17/22 13:44	1
1-Methylnaphthalene	0.0015	U	0.0050	0.00063	mg/Kg		01/15/22 18:03	01/17/22 13:44	1
Naphthalene	0.0040	U	0.0050	0.0016	mg/Kg		01/15/22 18:03	01/17/22 13:44	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	73	M	28 - 143	01/15/22 18:03	01/17/22 13:44	1
2-methylnaphthalene-d10	91		40 - 140	01/15/22 18:03	01/17/22 13:44	1
Fluoranthene-d10 (Surr)	111		40 - 140	01/15/22 18:03	01/17/22 13:44	1
Terphenyl-d14	123		58 - 132	01/15/22 18:03	01/17/22 13:44	1

Lab Sample ID: LCS 580-378465/2-A
Matrix: Solid
Analysis Batch: 378516

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378465

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2-Methylnaphthalene	1.00	1.11		mg/Kg		111	39 - 114
1-Methylnaphthalene	1.00	0.887		mg/Kg		89	43 - 111
Naphthalene	1.00	1.01		mg/Kg		101	38 - 111

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2,4,6-Tribromophenol	100		28 - 143
2-methylnaphthalene-d10	137		40 - 140
Fluoranthene-d10 (Surr)	96		40 - 140
Terphenyl-d14	104		58 - 132

QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: 580-109327-2 MS
Matrix: Solid
Analysis Batch: 378516

Client Sample ID: HT-E25-7-8
Prep Type: Total/NA
Prep Batch: 378465

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	Limits	%Rec.
	Result	Qualifier	Added	Result	Qualifier					
2-Methylnaphthalene	0.0038	U	1.27	1.35	M	mg/Kg	☼	106	39 - 114	
1-Methylnaphthalene	0.0019	U	1.27	1.13	M	mg/Kg	☼	89	43 - 111	
Naphthalene	0.0051	U	1.27	1.35		mg/Kg	☼	106	38 - 111	
MS MS										
Surrogate	%Recovery	Qualifier	Limits							
2,4,6-Tribromophenol	106		28 - 143							
2-methylnaphthalene-d10	105		40 - 140							
Fluoranthene-d10 (Surr)	103		40 - 140							
Terphenyl-d14	109		58 - 132							

Lab Sample ID: 580-109327-2 MSD
Matrix: Solid
Analysis Batch: 378516

Client Sample ID: HT-E25-7-8
Prep Type: Total/NA
Prep Batch: 378465

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	Limits	RPD	Limit
	Result	Qualifier	Added	Result	Qualifier						
2-Methylnaphthalene	0.0038	U	1.30	1.34	M	mg/Kg	☼	103	39 - 114	1	20
1-Methylnaphthalene	0.0019	U	1.30	1.12	M	mg/Kg	☼	86	43 - 111	1	20
Naphthalene	0.0051	U	1.30	1.33		mg/Kg	☼	103	38 - 111	1	20
MSD MSD											
Surrogate	%Recovery	Qualifier	Limits								
2,4,6-Tribromophenol	104		28 - 143								
2-methylnaphthalene-d10	105		40 - 140								
Fluoranthene-d10 (Surr)	101		40 - 140								
Terphenyl-d14	106		58 - 132								

Lab Sample ID: MB 580-378478/1-A
Matrix: Water
Analysis Batch: 378522

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378478

Analyte	MB	MB	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
2-Methylnaphthalene	0.080	U M	0.20	0.039	ug/L		01/16/22 11:03	01/17/22 12:28	1
1-Methylnaphthalene	0.032	U M	0.10	0.019	ug/L		01/16/22 11:03	01/17/22 12:28	1
Naphthalene	0.080	U M	0.10	0.031	ug/L		01/16/22 11:03	01/17/22 12:28	1
MB MB									
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac			
2,4,6-Tribromophenol	56		46 - 122	01/16/22 11:03	01/17/22 12:28	1			
2-methylnaphthalene-d10	70		40 - 140	01/16/22 11:03	01/17/22 12:28	1			
Fluoranthene-d10 (Surr)	87		40 - 140	01/16/22 11:03	01/17/22 12:28	1			
Terphenyl-d14	93		58 - 132	01/16/22 11:03	01/17/22 12:28	1			

Lab Sample ID: LCS 580-378478/2-A
Matrix: Water
Analysis Batch: 378522

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378478

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	Limits
2-Methylnaphthalene	2.00	1.54		ug/L		77	39 - 114
1-Methylnaphthalene	2.00	1.54		ug/L		77	41 - 115
Naphthalene	2.00	1.53		ug/L		77	43 - 114

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QC Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
2,4,6-Tribromophenol	72		46 - 122
2-methylnaphthalene-d10	70		40 - 140
Fluoranthene-d10 (Surr)	75		40 - 140
Terphenyl-d14	85		58 - 132

Lab Sample ID: LCSD 580-378478/3-A
Matrix: Water
Analysis Batch: 378522

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378478

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.		RPD	Limit
							Limits	RPD		
2-Methylnaphthalene	2.00	1.57		ug/L		79	39 - 114	2	20	
1-Methylnaphthalene	2.00	1.57		ug/L		79	41 - 115	2	20	
Naphthalene	2.00	1.57		ug/L		79	43 - 114	2	20	

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
2,4,6-Tribromophenol	78		46 - 122
2-methylnaphthalene-d10	72		40 - 140
Fluoranthene-d10 (Surr)	81		40 - 140
Terphenyl-d14	90		58 - 132

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 580-378451/1-A
Matrix: Solid
Analysis Batch: 378495

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378451

Analyte	MB MB		LOQ	DL	Unit	D	Prepared		Analyzed		Dil Fac
	Result	Qualifier					Time	Time	Time	Time	
C24-C40	30	U	50	20	mg/Kg		01/15/22 16:21	01/16/22 16:55			1
C10-C24	30	U	50	9.9	mg/Kg		01/15/22 16:21	01/16/22 16:55			1

Surrogate	MB MB		Limits	Prepared		Analyzed		Dil Fac
	%Recovery	Qualifier		Time	Time	Time	Time	
o-Terphenyl	103		45 - 130	01/15/22 16:21		01/16/22 16:55		1

Lab Sample ID: LCS 580-378451/2-A
Matrix: Solid
Analysis Batch: 378495

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378451

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.		RPD	Limit
							Limits	RPD		
C24-C40	500	464		mg/Kg		93	39 - 106		5	20
C10-C24	500	501		mg/Kg		100	75 - 125		1	20

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
o-Terphenyl	95		45 - 130

Lab Sample ID: LCSD 580-378451/3-A
Matrix: Solid
Analysis Batch: 378495

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378451

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.		RPD	Limit
							Limits	RPD		
C24-C40	500	490		mg/Kg		98	39 - 106	5	20	
C10-C24	500	505		mg/Kg		101	75 - 125	1	20	

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QC Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC) (Continued)

	LCSD	LCSD	
Surrogate	%Recovery	Qualifier	Limits
<i>o</i> -Terphenyl	92		45 - 130

Lab Sample ID: 580-109327-2 MS
 Matrix: Solid
 Analysis Batch: 378495

Client Sample ID: HT-E25-7-8
 Prep Type: Total/NA
 Prep Batch: 378451

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	Limits
	Result	Qualifier	Added	Result	Qualifier				
C24-C40	36	U	646	603		mg/Kg	☼	93	39 - 106
C10-C24	13	J	646	617		mg/Kg	☼	93	75 - 125

	MS	MS	
Surrogate	%Recovery	Qualifier	Limits
<i>o</i> -Terphenyl	86		45 - 130

Lab Sample ID: 580-109327-2 MSD
 Matrix: Solid
 Analysis Batch: 378495

Client Sample ID: HT-E25-7-8
 Prep Type: Total/NA
 Prep Batch: 378451

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	Limits	RPD	Limit
	Result	Qualifier	Added	Result	Qualifier						
C24-C40	36	U	624	604		mg/Kg	☼	97	39 - 106	0	20
C10-C24	13	J	624	606		mg/Kg	☼	95	75 - 125	2	20

	MSD	MSD	
Surrogate	%Recovery	Qualifier	Limits
<i>o</i> -Terphenyl	89		45 - 130

Lab Sample ID: MB 580-378479/1-A
 Matrix: Water
 Analysis Batch: 378500

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 378479

Analyte	MB	MB	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
C24-C40	0.30	U	0.35	0.18	mg/L		01/16/22 11:08	01/16/22 21:47	1
C10-C24	0.10	U	0.11	0.065	mg/L		01/16/22 11:08	01/16/22 21:47	1

	MB	MB		Prepared	Analyzed	Dil Fac
Surrogate	%Recovery	Qualifier	Limits			
<i>o</i> -Terphenyl	74		56 - 125	01/16/22 11:08	01/16/22 21:47	1

Lab Sample ID: LCS 580-378479/2-A
 Matrix: Water
 Analysis Batch: 378500

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 378479

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	Limits
		Result	Qualifier				
C24-C40	0.500	0.495		mg/L		99	41 - 113
C10-C24	0.500	0.408		mg/L		82	36 - 132

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
<i>o</i> -Terphenyl	89		56 - 125

QC Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC) (Continued)

Lab Sample ID: LCSD 580-378479/3-A
Matrix: Water
Analysis Batch: 378500

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378479

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD
									Limit
C24-C40	0.500	0.496		mg/L		99	41 - 113	0	20
C10-C24	0.500	0.385		mg/L		77	36 - 132	6	20
LCSD LCSD									
Surrogate	%Recovery	Qualifier	Limits						
<i>o-Terphenyl</i>	91		56 - 125						

Method: 2540G - SM 2540G

Lab Sample ID: 580-109327-2 DU
Matrix: Solid
Analysis Batch: 378477

Client Sample ID: HT-E25-7-8
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD
								Limit
Percent Solids	73.9		74.2		%		0.4	20
Percent Solids	73.9		74.2		%		0.4	20
Percent Moisture	26.1		25.8		%		1	20
Percent Moisture	26.1		25.8		%		1	20

Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: EB
Date Collected: 01/13/22 16:15
Date Received: 01/15/22 11:00

Lab Sample ID: 580-109327-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260/CALUFT DOD		1	378552	01/17/22 21:28	JSM	FGS SEA
Total/NA	Analysis	8260D		1	378553	01/17/22 21:28	JSM	FGS SEA
Total/NA	Prep	3510C			378478	01/16/22 11:03	JHR	FGS SEA
Total/NA	Analysis	8270E SIM		1	378522	01/17/22 13:25	W1T	FGS SEA
Total/NA	Prep	3510C			378479	01/16/22 11:08	JHR	FGS SEA
Total/NA	Analysis	8015D DRO		1	378500	01/16/22 22:45	JCM	FGS SEA

Client Sample ID: HT-E25-7-8
Date Collected: 01/13/22 12:35
Date Received: 01/15/22 11:00

Lab Sample ID: 580-109327-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	378477	01/16/22 09:46	RJL	FGS SEA

Client Sample ID: HT-E25-7-8
Date Collected: 01/13/22 12:35
Date Received: 01/15/22 11:00

Lab Sample ID: 580-109327-2
Matrix: Solid
Percent Solids: 73.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378452	01/15/22 16:57	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378464	01/16/22 03:55	CJ	FGS SEA
Total/NA	Prep	5035			378453	01/15/22 17:17	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378592	01/17/22 15:52	JSM	FGS SEA
Total/NA	Prep	3546			378465	01/15/22 18:03	BJM	FGS SEA
Total/NA	Analysis	8270E SIM		1	378516	01/17/22 14:32	CJ	FGS SEA
Total/NA	Prep	3546			378451	01/15/22 16:21	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378495	01/16/22 17:55	JCM	FGS SEA

Client Sample ID: HT-E17.5-14-15
Date Collected: 01/13/22 13:15
Date Received: 01/15/22 11:00

Lab Sample ID: 580-109327-3
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	378477	01/16/22 09:46	RJL	FGS SEA

Client Sample ID: HT-E17.5-14-15
Date Collected: 01/13/22 13:15
Date Received: 01/15/22 11:00

Lab Sample ID: 580-109327-3
Matrix: Solid
Percent Solids: 65.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378452	01/15/22 16:57	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378464	01/16/22 01:35	CJ	FGS SEA
Total/NA	Prep	5035			378453	01/15/22 17:17	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378592	01/17/22 16:15	JSM	FGS SEA

Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-E17.5-14-15
Date Collected: 01/13/22 13:15
Date Received: 01/15/22 11:00

Lab Sample ID: 580-109327-3
Matrix: Solid
Percent Solids: 65.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			378465	01/15/22 18:03	BJM	FGS SEA
Total/NA	Analysis	8270E SIM		1	378516	01/17/22 15:45	CJ	FGS SEA
Total/NA	Prep	3546			378451	01/15/22 16:21	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378495	01/16/22 18:55	JCM	FGS SEA

Client Sample ID: HT-S17.5-8-9
Date Collected: 01/13/22 12:20
Date Received: 01/15/22 11:00

Lab Sample ID: 580-109327-4
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	378477	01/16/22 09:46	RJL	FGS SEA

Client Sample ID: HT-S17.5-8-9
Date Collected: 01/13/22 12:20
Date Received: 01/15/22 11:00

Lab Sample ID: 580-109327-4
Matrix: Solid
Percent Solids: 75.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378452	01/15/22 16:57	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378464	01/16/22 04:41	CJ	FGS SEA
Total/NA	Prep	5035			378453	01/15/22 17:17	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378592	01/17/22 16:38	JSM	FGS SEA
Total/NA	Prep	3546			378465	01/15/22 18:03	BJM	FGS SEA
Total/NA	Analysis	8270E SIM		1	378516	01/17/22 16:10	CJ	FGS SEA
Total/NA	Prep	3546			378451	01/15/22 16:21	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378495	01/16/22 19:15	JCM	FGS SEA

Client Sample ID: HT-E10-23-24
Date Collected: 01/13/22 11:22
Date Received: 01/15/22 11:00

Lab Sample ID: 580-109327-5
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	378477	01/16/22 09:46	RJL	FGS SEA

Client Sample ID: HT-E10-23-24
Date Collected: 01/13/22 11:22
Date Received: 01/15/22 11:00

Lab Sample ID: 580-109327-5
Matrix: Solid
Percent Solids: 64.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378452	01/15/22 16:57	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378464	01/16/22 05:04	CJ	FGS SEA
Total/NA	Prep	5035			378453	01/15/22 17:17	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378592	01/17/22 17:01	JSM	FGS SEA
Total/NA	Prep	3546			378465	01/15/22 18:03	BJM	FGS SEA
Total/NA	Analysis	8270E SIM		1	378516	01/17/22 16:34	CJ	FGS SEA
Total/NA	Prep	3546			378451	01/15/22 16:21	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378495	01/16/22 19:36	JCM	FGS SEA

Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-S10-17-18

Lab Sample ID: 580-109327-6

Date Collected: 01/13/22 11:35

Matrix: Solid

Date Received: 01/15/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	378477	01/16/22 09:46	RJL	FGS SEA

Client Sample ID: HT-S10-17-18

Lab Sample ID: 580-109327-6

Date Collected: 01/13/22 11:35

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 65.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378452	01/15/22 16:57	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378464	01/16/22 05:28	CJ	FGS SEA
Total/NA	Prep	5035			378453	01/15/22 17:17	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378597	01/18/22 08:33	JSM	FGS SEA
Total/NA	Prep	3546			378465	01/15/22 18:03	BJM	FGS SEA
Total/NA	Analysis	8270E SIM		1	378516	01/17/22 16:59	CJ	FGS SEA
Total/NA	Prep	3546			378451	01/15/22 16:21	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378495	01/16/22 19:56	JCM	FGS SEA

Client Sample ID: HT-N25-10-11 DUPLICATE

Lab Sample ID: 580-109327-7

Date Collected: 01/13/22 14:25

Matrix: Solid

Date Received: 01/15/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	378477	01/16/22 09:46	RJL	FGS SEA

Client Sample ID: HT-N25-10-11 DUPLICATE

Lab Sample ID: 580-109327-7

Date Collected: 01/13/22 14:25

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 74.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378452	01/15/22 16:57	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378464	01/16/22 05:51	CJ	FGS SEA
Total/NA	Prep	5035			378453	01/15/22 17:17	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378592	01/17/22 18:32	JSM	FGS SEA
Total/NA	Prep	3546			378465	01/15/22 18:03	BJM	FGS SEA
Total/NA	Analysis	8270E SIM		1	378516	01/17/22 17:23	CJ	FGS SEA
Total/NA	Prep	3546			378451	01/15/22 16:21	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378495	01/16/22 20:36	JCM	FGS SEA

Client Sample ID: HT-E25-14-15

Lab Sample ID: 580-109327-8

Date Collected: 01/13/22 12:45

Matrix: Solid

Date Received: 01/15/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	378477	01/16/22 09:46	RJL	FGS SEA

Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-E25-14-15

Lab Sample ID: 580-109327-8

Date Collected: 01/13/22 12:45

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 65.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378452	01/15/22 16:57	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378464	01/16/22 06:14	CJ	FGS SEA
Total/NA	Prep	5035			378453	01/15/22 17:17	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378592	01/17/22 18:55	JSM	FGS SEA
Total/NA	Prep	3546			378465	01/15/22 18:03	BJM	FGS SEA
Total/NA	Analysis	8270E SIM		1	378516	01/17/22 17:47	CJ	FGS SEA
Total/NA	Prep	3546			378451	01/15/22 16:21	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378495	01/16/22 20:56	JCM	FGS SEA

Client Sample ID: HT-S10-15-16

Lab Sample ID: 580-109327-9

Date Collected: 01/13/22 11:40

Matrix: Solid

Date Received: 01/15/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	378477	01/16/22 09:46	RJL	FGS SEA

Client Sample ID: HT-S10-15-16

Lab Sample ID: 580-109327-9

Date Collected: 01/13/22 11:40

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 67.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378452	01/15/22 16:57	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378464	01/16/22 06:37	CJ	FGS SEA
Total/NA	Prep	5035			378453	01/15/22 17:17	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378597	01/18/22 08:57	JSM	FGS SEA
Total/NA	Prep	3546			378465	01/15/22 18:03	BJM	FGS SEA
Total/NA	Analysis	8270E SIM		1	378516	01/17/22 18:11	CJ	FGS SEA
Total/NA	Prep	3546	DL		378465	01/15/22 18:03	BJM	FGS SEA
Total/NA	Analysis	8270E SIM	DL	10	378609	01/18/22 10:49	E1L	FGS SEA
Total/NA	Prep	3546			378451	01/15/22 16:21	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378495	01/16/22 21:16	JCM	FGS SEA

Client Sample ID: HT-E17.5-7-8

Lab Sample ID: 580-109327-10

Date Collected: 01/13/22 13:00

Matrix: Solid

Date Received: 01/15/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	378477	01/16/22 09:46	RJL	FGS SEA

Client Sample ID: HT-E17.5-7-8

Lab Sample ID: 580-109327-10

Date Collected: 01/13/22 13:00

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 70.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378452	01/15/22 16:57	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378464	01/16/22 07:01	CJ	FGS SEA

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Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-E17.5-7-8

Lab Sample ID: 580-109327-10

Date Collected: 01/13/22 13:00

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 70.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378453	01/15/22 17:17	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378592	01/17/22 19:42	JSM	FGS SEA
Total/NA	Prep	3546			378465	01/15/22 18:03	BJM	FGS SEA
Total/NA	Analysis	8270E SIM		1	378516	01/17/22 18:36	CJ	FGS SEA
Total/NA	Prep	3546			378451	01/15/22 16:21	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378495	01/16/22 21:37	JCM	FGS SEA

Client Sample ID: HT-N25-14-15

Lab Sample ID: 580-109327-11

Date Collected: 01/13/22 14:01

Matrix: Solid

Date Received: 01/15/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	378477	01/16/22 09:46	RJL	FGS SEA

Client Sample ID: HT-N25-14-15

Lab Sample ID: 580-109327-11

Date Collected: 01/13/22 14:01

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 64.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378452	01/15/22 16:57	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378464	01/16/22 07:24	CJ	FGS SEA
Total/NA	Prep	5035			378453	01/15/22 17:17	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378592	01/17/22 20:04	JSM	FGS SEA
Total/NA	Prep	3546			378465	01/15/22 18:03	BJM	FGS SEA
Total/NA	Analysis	8270E SIM		1	378516	01/17/22 19:00	CJ	FGS SEA
Total/NA	Prep	3546			378451	01/15/22 16:21	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378495	01/16/22 21:57	JCM	FGS SEA

Client Sample ID: HT-N25-14-15 DUPLICATE

Lab Sample ID: 580-109327-12

Date Collected: 01/13/22 14:20

Matrix: Solid

Date Received: 01/15/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	378477	01/16/22 09:46	RJL	FGS SEA

Client Sample ID: HT-N25-14-15 DUPLICATE

Lab Sample ID: 580-109327-12

Date Collected: 01/13/22 14:20

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 65.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378452	01/15/22 16:57	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378464	01/16/22 07:47	CJ	FGS SEA
Total/NA	Prep	5035			378453	01/15/22 17:17	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378592	01/17/22 20:27	JSM	FGS SEA
Total/NA	Prep	3546			378465	01/15/22 18:03	BJM	FGS SEA
Total/NA	Analysis	8270E SIM		1	378516	01/17/22 19:25	CJ	FGS SEA

Eurofins Seattle

Lab Chronicle

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-N25-14-15 DUPLICATE

Lab Sample ID: 580-109327-12

Date Collected: 01/13/22 14:20

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 65.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			378451	01/15/22 16:21	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378495	01/16/22 22:17	JCM	FGS SEA

Client Sample ID: HT-E10-21-22

Lab Sample ID: 580-109327-13

Date Collected: 01/13/22 12:00

Matrix: Solid

Date Received: 01/15/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	378477	01/16/22 09:46	RJL	FGS SEA

Client Sample ID: HT-E10-21-22

Lab Sample ID: 580-109327-13

Date Collected: 01/13/22 12:00

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 61.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378452	01/15/22 16:57	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378464	01/16/22 08:10	CJ	FGS SEA
Total/NA	Prep	5035			378453	01/15/22 17:17	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378592	01/17/22 20:50	JSM	FGS SEA
Total/NA	Prep	3546			378465	01/15/22 18:03	BJM	FGS SEA
Total/NA	Analysis	8270E SIM		1	378516	01/17/22 19:49	CJ	FGS SEA
Total/NA	Prep	3546			378451	01/15/22 16:21	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378495	01/16/22 22:37	JCM	FGS SEA

Client Sample ID: HT-N25-10-11

Lab Sample ID: 580-109327-14

Date Collected: 01/13/22 14:15

Matrix: Solid

Date Received: 01/15/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	378477	01/16/22 09:46	RJL	FGS SEA

Client Sample ID: HT-N25-10-11

Lab Sample ID: 580-109327-14

Date Collected: 01/13/22 14:15

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 75.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378452	01/15/22 16:57	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378543	01/17/22 10:39	JSM	FGS SEA
Total/NA	Prep	5035			378453	01/15/22 17:17	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378592	01/17/22 21:13	JSM	FGS SEA
Total/NA	Prep	3546			378465	01/15/22 18:03	BJM	FGS SEA
Total/NA	Analysis	8270E SIM		1	378516	01/17/22 20:14	CJ	FGS SEA
Total/NA	Prep	3546			378451	01/15/22 16:21	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378495	01/16/22 22:57	JCM	FGS SEA

Lab Chronicle

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-S25-14-15

Lab Sample ID: 580-109327-15

Date Collected: 01/13/22 11:55

Matrix: Solid

Date Received: 01/15/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	378477	01/16/22 09:46	RJL	FGS SEA

Client Sample ID: HT-S25-14-15

Lab Sample ID: 580-109327-15

Date Collected: 01/13/22 11:55

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 68.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378452	01/15/22 16:57	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378543	01/17/22 11:03	JSM	FGS SEA
Total/NA	Prep	5035			378453	01/15/22 17:17	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378592	01/17/22 21:36	JSM	FGS SEA
Total/NA	Prep	3546			378465	01/15/22 18:03	BJM	FGS SEA
Total/NA	Analysis	8270E SIM		1	378516	01/17/22 20:38	CJ	FGS SEA
Total/NA	Prep	3546			378451	01/15/22 16:21	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378495	01/16/22 23:17	JCM	FGS SEA

Client Sample ID: HT-S25-8-9

Lab Sample ID: 580-109327-16

Date Collected: 01/13/22 11:50

Matrix: Solid

Date Received: 01/15/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	378477	01/16/22 09:46	RJL	FGS SEA

Client Sample ID: HT-S25-8-9

Lab Sample ID: 580-109327-16

Date Collected: 01/13/22 11:50

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 92.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			378452	01/15/22 16:57	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	378543	01/17/22 11:26	JSM	FGS SEA
Total/NA	Prep	5035			378453	01/15/22 17:17	JBT	FGS SEA
Total/NA	Analysis	8260D		1	378597	01/18/22 08:10	JSM	FGS SEA
Total/NA	Prep	3546			378465	01/15/22 18:03	BJM	FGS SEA
Total/NA	Analysis	8270E SIM		1	378516	01/17/22 21:02	CJ	FGS SEA
Total/NA	Prep	3546			378451	01/15/22 16:21	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378495	01/16/22 23:37	JCM	FGS SEA

Client Sample ID: LT-SEDIMENT

Lab Sample ID: 580-109327-17

Date Collected: 01/13/22 13:50

Matrix: Solid

Date Received: 01/15/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	378477	01/16/22 09:46	RJL	FGS SEA

Lab Chronicle

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: LT-SEDIMENT

Lab Sample ID: 580-109327-17

Date Collected: 01/13/22 13:50

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 66.7

<u>Prep Type</u>	<u>Batch Type</u>	<u>Batch Method</u>	<u>Run</u>	<u>Dilution Factor</u>	<u>Batch Number</u>	<u>Prepared or Analyzed</u>	<u>Analyst</u>	<u>Lab</u>
Total/NA	Prep	3546			378465	01/15/22 18:03	BJM	FGS SEA
Total/NA	Analysis	8270E SIM		1	378516	01/17/22 21:27	CJ	FGS SEA
Total/NA	Prep	3546	DL		378465	01/15/22 18:03	BJM	FGS SEA
Total/NA	Analysis	8270E SIM	DL	10	378609	01/18/22 11:13	E1L	FGS SEA
Total/NA	Prep	3546			378451	01/15/22 16:21	BJM	FGS SEA
Total/NA	Analysis	8015D DRO		1	378495	01/17/22 00:17	JCM	FGS SEA

Laboratory References:

FGS SEA = Eurofins Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Laboratory: Eurofins Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2236	01-19-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
2540G		Solid	Percent Moisture
2540G		Solid	Percent Solids
8015D DRO	3510C	Water	C10-C24
8015D DRO	3546	Solid	C10-C24



Sample Summary

Client: AECOM

Job ID: 580-109327-1

Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

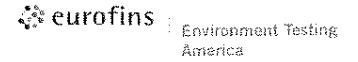
Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-109327-1	EB	Water	01/13/22 16:15	01/15/22 11:00
580-109327-2	HT-E25-7-8	Solid	01/13/22 12:35	01/15/22 11:00
580-109327-3	HT-E17.5-14-15	Solid	01/13/22 13:15	01/15/22 11:00
580-109327-4	HT-S17.5-8-9	Solid	01/13/22 12:20	01/15/22 11:00
580-109327-5	HT-E10-23-24	Solid	01/13/22 11:22	01/15/22 11:00
580-109327-6	HT-S10-17-18	Solid	01/13/22 11:35	01/15/22 11:00
580-109327-7	HT-N25-10-11 DUPLICATE	Solid	01/13/22 14:25	01/15/22 11:00
580-109327-8	HT-E25-14-15	Solid	01/13/22 12:45	01/15/22 11:00
580-109327-9	HT-S10-15-16	Solid	01/13/22 11:40	01/15/22 11:00
580-109327-10	HT-E17.5-7-8	Solid	01/13/22 13:00	01/15/22 11:00
580-109327-11	HT-N25-14-15	Solid	01/13/22 14:01	01/15/22 11:00
580-109327-12	HT-N25-14-15 DUPLICATE	Solid	01/13/22 14:20	01/15/22 11:00
580-109327-13	HT-E10-21-22	Solid	01/13/22 12:00	01/15/22 11:00
580-109327-14	HT-N25-10-11	Solid	01/13/22 14:15	01/15/22 11:00
580-109327-15	HT-S25-14-15	Solid	01/13/22 11:55	01/15/22 11:00
580-109327-16	HT-S25-8-9	Solid	01/13/22 11:50	01/15/22 11:00
580-109327-17	LT-SEDIMENT	Solid	01/13/22 13:50	01/15/22 11:00

Eurofins FGS, Seattle

5755 8th Street East
Tacoma, WA 98424

Chain of Custody Form

Therm ID: SCA3 Cor: 1/4 Unc: 1/4
Cooler Desc: large blue
Packing: BIW FedEx: priority
Cust. Seal: Yes No UPS:
Lab Cour: Other: _____(s):



Client Information		Sampler: Dominic Mariano		Lab Ela:	COC No: 202201-07 Soil																		
Client Contact: Aieletha Ramos (alternate: Margie Pascua)		Phone: 310-625-1283		E-Mail: M.Elaine.Walker@EurofinsET.com	Page: Page 3 of 4																		
Company: AECOM		PWSID:		Analysis Requested		Job #:																	
Address: 1001 Bishop St. Suite 1600		Due Date Requested: see subcontract		<table border="1"> <tr> <th>Field Filtered Sample (Yes or No)</th> <th>Perform MS/MSD (Yes or No)</th> <th>EPA 8260 BTEX+Naph</th> <th>EPA 8260 TPH-G (C6-C10)</th> <th>EPA 8015 TPH-DJO (C10-C24, C24-C40)</th> <th>EPA 8015 TPH-DJO (C10-C24, C24-C40) w/ silica gel cleanup</th> <th>EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)</th> <th>Total Number of containers</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>		Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 8260 BTEX+Naph	EPA 8260 TPH-G (C6-C10)	EPA 8015 TPH-DJO (C10-C24, C24-C40)	EPA 8015 TPH-DJO (C10-C24, C24-C40) w/ silica gel cleanup	EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)	Total Number of containers									Preservation Codes:	
Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 8260 BTEX+Naph	EPA 8260 TPH-G (C6-C10)			EPA 8015 TPH-DJO (C10-C24, C24-C40)	EPA 8015 TPH-DJO (C10-C24, C24-C40) w/ silica gel cleanup	EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)	Total Number of containers														
City: Honolulu		TAT Requested (days): 3 working days				A - HCL		M - Hexane															
State, Zip: Hawaii 96813		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No				B - NaOH		N - None															
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)		PO #: Note to AECOM before printing COC: put in PO# w		C - Zn Acetate		O - AsNaO2																	
Email: aieletha.ramos@aecom.com (alternate: margie.pascua@aecom.com)		WO #: Note to AECOM before printing COC: put in subk#		D - Nitric Acid		P - Na2O4S																	
Project Name: CV22F0106		Project #: 60674414		E - NaHSO4		Q - Na2SO3																	
Site: RH				F - MeOH		R - Na2S2O3																	
				G - Amchlor		S - H2SO4																	
				H - Ascorbic Acid		T - TSP Dodecahydrate																	
				I - Ice		U - Acetone																	
				J - DI Water		V - MCAA																	
				K - EDTA		W - pH 4-5																	
				L - EDA		Z - other (specify)																	
						Other:																	

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)							Total Number of containers	Special Instructions/Note:	
					X	X	M.F.A.	J.F.A.	S	I	S			
EB	1/13/22	1615	G	SW	N	N	X	X					3	
HT-E25-7-8	1/13/22	1235	G	S	N	N	X	X					3	
HT-E17.5-14-15	1/13/22	1315	G	S	N	N	X	X					3	
HT-S17.5-8-9	1/13/22	1220	G	S	N	N	X	X					3	
HT-E10-23-24	1/13/22	1122	G	S	N	N	X	X					3	
HT-S10-17-18	1/13/22	1135	G	S	N	N	X	X					3	
HT-N25-10-11 Duplicate	1/13/22	1425	G	S	N	N	X	X					3	
HT-E25-14-15	1/13/22	1245	G	S	N	N	X	X					3	
HT-S10-15-16	1/13/22	1140	G	S	N	N	X	X					3	
HT-E17.5-7-8	1/13/22	1300	G	S	N	N	X	X					3	
HT-N25-14-15	1/13/22	1401	G	S	N	N	X	X					3	



Possible Hazard Identification
 Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client Disposal By Lab Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify) _____ Prelim data (Level 1 or 2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQUS FDD. Special Instructions/QC Requirements: DOD QSM project.

Empty Kit Relinquished by: _____ Date: _____ Time: _____ Method of Shipment: _____

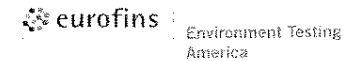
Relinquished by: Matthew Yim	Date/Time: 1/14/22 1530	Company: AECOM	Received by: Tracy Sutton	Date/Time: 1/5/22 1100	Company: EFGS
Relinquished by: _____	Date/Time: _____	Company: _____	Received by: _____	Date/Time: _____	Company: _____
Relinquished by: _____	Date/Time: _____	Company: _____	Received by: _____	Date/Time: _____	Company: _____

Custody Seals Intact: Yes No Custody Seal No.: _____ Cooler Temperature(s) °C and Other Remarks: _____

Eurofins FGS, Seattle

5755 8th Street East
Tacoma, WA 98424

Chain of Custody Record



Client Information			Sampler:			Lab PM:			Carrier Tracking No(s):			COC No:		
Client Contact: Alethea Ramos (alternate: Margie Pascua)			Dominic Mariano			Elaine Walker			FedEx			202201-08 Soil		
Company: AECOM			PWSID:						Analysis Requested			Page: Page 4 of 4		
Address: 1001 Bishop St. Suite 1600			Due Date Requested: see subcontract									Job #:		
City: Honolulu			TAT Requested (days): 3 working days									Preservation Codes:		
State, Zip: Hawaii 96813			Compliance Project: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No									A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA		
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)			PO #: Note to AECOM before printing COC: put in PO# w									M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)		
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)			WO #:									Other:		
Project Name: CV22F0106			Project #: 60674414											
Site: RH			SSOW #: Note to AECOM before printing COC: put in subk#											
Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 8260 BTEX+Naph	EPA 8260 TPH-G (C6-C10)	EPA 8015 TPH-DJO (C10-C24, C24-C40)	EPA 8015 TPH-DJO (C10-C24, C24-C40) w/ silica gel cleanup	EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)	Total Number of containers	Special Instructions/Note:	
HT-N25-14-15 Duplicate	1/13/22	1420	G	S	N	N	X	X				3		
HT-E10-21-22	1/13/22	1200	G	S	N	N	X	X				3		
HT-N25-10-11	1/13/22	1415	G	S	N	N	X	X				3		
HT-S25-14-15	1/13/22	1155	G	S	N	N	X	X				3		
HT-S25-8-9	1/13/22	1150	G	S	N	N	X	X				3		
MY 1/14/22														
Possible Hazard Identification						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)								
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological						<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months								
Deliverable Requested: I, II, III, IV, Other (specify)				Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQUIS FDD.				Special Instructions/QC Requirements: DOD QSM project.						
Empty Kit Relinquished by:			Date:			Time:			Method of Shipment:					
Relinquished by: Matthew Yim <i>Matthew Yim</i>			Date/Time: 1/14/22 1530			Company: AECOM			Received by: <i>Stacy Sutton</i>			Date/Time: 1/5/22 1100		
Relinquished by:			Date/Time:			Company:			Received by:			Date/Time:		
Relinquished by:			Date/Time:			Company:			Received by:			Date/Time:		
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:										

Eurofins FGS, Seattle

5755 8th Street East
Tacoma, WA 98424

Chain of Cust

Therm. ID: SCA3 Cor: 015 Unc: 0.5
Cooler Dsc: large blue FedEx: priority
Packing: BW UPS:
Cust. Seal: Yes No
Blue Ice, Wet, Dry, None Lab Cour:
Other: _____



Environment Testing
America

Client Information		Sampler: Dominic Mariano		Tracking No(s): .x		COC No: 202201-05 Soil																																					
Client Contact: Alethea Ramos (alternate: Margie Pascua)		Phone: 310-625-1283		E-Mail: M.Elaine.Walker@EurofinsET.com		State of Origin: Hawaii																																					
Company: AECOM		PWSID:		Analysis Requested				Page: Page 1 of 4																																			
Address: 1001 Bishop St. Suite 1600		Due Date Requested: see subcontract		<table border="1"> <tr> <td rowspan="5">Field Filtered Sample (Yes or No)</td> <td rowspan="5">Perform MS/MSD (Yes or No)</td> <td rowspan="5">EPA 8260 BTEX+Naph</td> <td rowspan="5">EPA 8260 TPH-G (C6-C10)</td> <td rowspan="5">EPA 8015 TPH-D/O (C10-C24, C24-C40)</td> <td rowspan="5">EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup</td> <td rowspan="5">EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)</td> <td rowspan="5">Total Number of Containers</td> <td colspan="2">Preservation Codes:</td> </tr> <tr> <td>A - HCL</td> <td>M - Hexane</td> </tr> <tr> <td>B - NaOH</td> <td>N - None</td> </tr> <tr> <td>C - Zn Acetate</td> <td>O - AsNaO2</td> </tr> <tr> <td>D - Nitric Acid</td> <td>P - Na2O4S</td> </tr> <tr> <td>E - NaHSO4</td> <td>Q - Na2SO3</td> </tr> <tr> <td>F - MeOH</td> <td>R - Na2S2O3</td> </tr> <tr> <td>G - Amchlor</td> <td>S - H2SO4</td> </tr> <tr> <td>H - Ascorbic Acid</td> <td>T - TSP Dodecahydrate</td> </tr> <tr> <td>I - Ice</td> <td>U - Acetone</td> </tr> <tr> <td>J - DI Water</td> <td>V - MCAA</td> </tr> <tr> <td>K - EDTA</td> <td>W - pH 4-5</td> </tr> <tr> <td>L - EDA</td> <td>Z - other (specify)</td> </tr> </table>				Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 8260 BTEX+Naph	EPA 8260 TPH-G (C6-C10)	EPA 8015 TPH-D/O (C10-C24, C24-C40)	EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup	EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)	Total Number of Containers	Preservation Codes:		A - HCL	M - Hexane	B - NaOH	N - None	C - Zn Acetate	O - AsNaO2	D - Nitric Acid	P - Na2O4S	E - NaHSO4	Q - Na2SO3	F - MeOH	R - Na2S2O3	G - Amchlor	S - H2SO4	H - Ascorbic Acid	T - TSP Dodecahydrate	I - Ice	U - Acetone	J - DI Water	V - MCAA	K - EDTA	W - pH 4-5	L - EDA	Z - other (specify)	Job #:	
Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 8260 BTEX+Naph	EPA 8260 TPH-G (C6-C10)													EPA 8015 TPH-D/O (C10-C24, C24-C40)	EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup	EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)	Total Number of Containers	Preservation Codes:																							
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City: Honolulu		TAT Requested (days): 3 working days																																									
State, Zip: Hawaii 96813		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No																																									
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)		PO #: Note to AECOM before printing COC: put in PO# w																																									
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)		WO #:																																									
Project Name: CV22F0106		Project #: 60674414																																									
Site: RH		SSOW#: Note to AECOM before printing COC: put in subk#																																									
Sample Identification		Sample Date		Sample Time		Sample Type (C=Comp, G=grab)		Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)																																			
								Special Instructions/Note:																																			
EB		1/13/22		1615		G ^{VI} ₁₂ ^W																																					
LT-Sediment		1/13/22		1350		G S																																					
HT-E25-7-8		1/13/22		1235		G S																																					
HT-E17.5-14-15		1/13/22		1315		G S																																					
HT-S17.5-8-9		1/13/22		1220		G S																																					
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HT-S10-17-18		1/13/22		1135		G S																																					
HT-N25-10-11 Duplicate		1/13/22		1425		G S																																					
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HT-S10-15-16		1/13/22		1140		G S																																					
HT-E17.5-7-8		1/13/22		1300		G S																																					
Possible Hazard Identification					Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)																																						
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological					<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months																																						
Deliverable Requested: I, II, III, IV, Other (specify)					Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQUS FDD.																																						
Special Instructions/QC Requirements: DOD QSM project.																																											
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:																																					
Relinquished by: Matthew Yim <i>Matthew Yim</i>		Date/Time: 1/14/22 1530		Company: AECOM		Received by: Tracy Antton <i>Tracy Antton</i>		Date/Time: 1/15/22 1100																																			
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:																																			
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:																																			
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:																																							

Chain of Custody Record

Client Information			Sampler: Dominic Mariano			Lab PM: Elaine Walker			Carrier Tracking No(s): FedEx			COC No: 202201-06 Soil																										
Client Contact: Alethea Ramos (alternate: Margie Pascua)			Phone: 310-625-1283			E-Mail: M.Elaine.Walker@EurofinsET.com			State of Origin: Hawaii			Page: Page 2 of 4																										
Company: AECOM			PWSID:			Analysis Requested						Job #:																										
Address: 1001 Bishop St. Suite 1600			Due Date Requested: see subcontract			<table border="1" style="width:100%; border-collapse: collapse; font-size: 8px;"> <tr> <td style="text-align: center;">Field Filtered Sample (Yes or No)</td> <td style="text-align: center;">Perform MS/MSD (Yes or No)</td> <td style="text-align: center;">EPA 8260 BTEX+Naph</td> <td style="text-align: center;">EPA 8260 TPH-G (C6-C10)</td> <td style="text-align: center;">EPA 8015 TPH-DIO (C10-C24, C24-C40)</td> <td style="text-align: center;">EPA 8015 TPH-DIO (C10-C24, C24-C40) w/ silica gel cleanup</td> <td style="text-align: center;">EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)</td> <td colspan="2">Total Number of Containers</td> </tr> <tr> <td style="text-align: center;">X</td> <td style="text-align: center;">X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>												Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 8260 BTEX+Naph	EPA 8260 TPH-G (C6-C10)	EPA 8015 TPH-DIO (C10-C24, C24-C40)	EPA 8015 TPH-DIO (C10-C24, C24-C40) w/ silica gel cleanup	EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)	Total Number of Containers		X	X								Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify)		
Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 8260 BTEX+Naph	EPA 8260 TPH-G (C6-C10)	EPA 8015 TPH-DIO (C10-C24, C24-C40)	EPA 8015 TPH-DIO (C10-C24, C24-C40) w/ silica gel cleanup													EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)	Total Number of Containers																			
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Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)			PO #: Note to AECOM before printing COC: put in PO# w																																			
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HT-N25-14-15			1/13/22		1401		G S		S		N N			X X X			1		MY 1/14/22																			
HT-N25-14-15 Duplicate			1/13/22		1420		G S		S		N N			X X X			1																					
HT-E10-21-22			1/13/22		1200		G S		S		N N			X X X			1																					
HT-N25-10-11			1/13/22		1415		G S		S		N N			X X X			1																					
HT-S25-14-15			1/13/22		1155		G S		S		N N			X X X			1																					
HT-S25-8-9			1/13/22		1150		G S		S		N N			X X X			1																					
Possible Hazard Identification <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological																																						
Deliverable Requested: I, II, III, IV, Other (specify) Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQUIS EDD.																																						
Empty Kit Relinquished by: Relinquished by: Matthew Yim			Date: 1/14/22 1530			Company: AECOM			Received by: Tracy Sutton			Date/Time: 1/15/22 1100			Company: EFGS																							
Relinquished by:			Date/Time:			Company:			Received by:			Date/Time:			Company:																							
Relinquished by:			Date/Time:			Company:			Received by:			Date/Time:			Company:																							
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No			Custody Seal No.:			Cooler Temperature(s) °C and Other Remarks:																																

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-109327-1

Login Number: 109327

List Number: 1

Creator: Vallelunga, Diana L

List Source: Eurofins Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Appendix C.2 – Groundwater Analytical Data
[provided on DVD-ROM]

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Appendix D – Level IV Sample Delivery Group Reports
[provided on DVD-ROM]

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***Appendix B – Initial and Phase 2 Holding Tank and Leach Tank Field
Boring Logs***

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Boring No.	Field Log of Boring										Sheet <u>1</u> of <u>1</u>		
LT-W10													
Project Name		Project Number			Elevation and Datum			Location					
Red Hill Site Characterization		60574414			117' above mean sea level			10' West of Adit 3 Leach Tank					
Drilling Company		Driller			Date and Time Started			Date and Time Completed					
Geotek Hawaii		Jon Shjegstad and Chad Nix			1-11-22 13:15			1-11-22 13:45					
Drilling Equipment		Drilling Method			Completion Depth			Total No of Samples (to laboratory)					
Geoprobe 6620-DT		Direct Push Technology			20'			2					
Size and Type of Bit		Hole Diameter			No. Samples	Bulk	SS	Drive	Pitcher				
3" macro-core		2"			0	0	0	5	0				
Drilling Fluid		Drilling Angle			First	After			Hours				
--		90			Water Level	NA			NA				
Sample Hammer				Geologist		Date		Checked by		Date			
Type		Drive Wt		Drop		Ethan House		2022-01-11		Belinda Turran 2022-04-15			
Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description			USCS Symbol	Estimated Percent of			Comments
Well-graded gravel	2	X		36%	NM	Light gray (10YR 7/1), dry, very stiff, non-plastic, small angular pieces, trace of coral and clayey silt (brown, 10YR 3/3).			GW	90	0	10	Hand cleared to 2'.
	4	X											
	6	X	0.0			Brown (10YR 3/3), dry, firm, moderate to high plasticity, 5% basalt, dry at 5-7.3'.							
	8	X	191.8	100%	NM	Damp at 7.3 to 10'							
	10	X	65.8										
	12	X	222.3										Soil sample: LT-W10-11-12
Silty Clay	14	X	270.8	100%	NM	Very dark brown (7.5YR 2.5/2), moist, soft, moderate plasticity, 10% saprolite at 14-15'.			ML	0-10	0	90-100	
	16	X	129.4										
	18	X	55.2										
	20	X	85.9										
			44.3	100%	NM								
			21.4										
			69.9										Soil sample: LT-W10-19-20
			51.7	90%	NM								Terminate boring at 20' due to refusal.

Comments:

Boring No.		Field Log of Boring										Sheet <u>1</u> of <u>1</u>						
LT-W25		Project Name					Elevation and Datum					Location						
Red Hill Site Characterization		60574414					116' above mean sea level					25' West of Adit 3 Leach Tank						
Drilling Company		Driller					Date and Time Started					Date and Time Completed						
Geotek Hawaii		Jon Shjegstad and Chad Nix					1-11-22 14:20					1-11-22 15:00						
Drilling Equipment		Drilling Method					Completion Depth					Total No of Samples						
Geoprobe 6620-DT		Direct Push Technology					16'					1						
Size and Type of Bit		Hole Diameter					No. Samples		Bulk		SS		Drive	Pitcher				
3" macro-core		2"					0		0		3		0					
Drilling Fluid		Drilling Angle					First		After _____ Hours									
--		90					Water Level		NA									
Sample Hammer		Geologist					Date		Checked by		Date							
Type		Drive Wt					Drop		Ethan House		2022-01-11		Cindy Brownson		2022-04-20			
Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description	USCS Symbol	Estimated Percent of			Comments							
								GR	SA	FI								
Silty clay	2	X	NM	50%	NM	Dark brown (7.5YR 3/3), dry, firm, moderate to high plasticity, mix of roots, basalt and silty clay.	ML	5	0	95	Hand cleared to 1'.							
	4	X				Light gray (7.5YR 7/1), small angular fragments of basalt												
Well-graded gravel	6	X	100%	100%	NM	Stiff, trace of basalt.	GW	70	0	30								
	8	X				Light gray (7.5YR 7/1) dry, very stiff, no plasticity.												
	10	X				Dark brown (7.5YR 3/2), dry, very stiff, moderate plasticity, trace of basalt.												
	12	X																
Silty clay	14	X	100%	100%	NM		ML	5-15	0	85-95	Soil sample: LT-W25-14-15							
	16																	

Comments:

Boring No.	Field Log of Boring												Sheet 1 of 1	
LT-W40														
Project Name	Project Number				Elevation and Datum				Location					
Red Hill Site Characterization	60574414				113' above mean sea level				40' West of Adit 3 Leach Tank					
Drilling Company	Driller				Date and Time Started				Date and Time Completed					
Geotek Hawaii	Jon Shjegstad and Chad Nix				1-11-22 14:45				1-11-22 16:00					
Drilling Equipment	Drilling Method				Completion Depth				Total No of Samples					
Geoprobe 6620-DT	Direct Push Technology				9.5'				1					
Size and Type of Bit	Hole Diameter				No. Samples		Bulk		SS		Drive		Pitcher	
3" macro-core	2"				0		0		2		0			
Drilling Fluid	Drilling Angle				First		After		Hours					
-	90				Water Level		NA		NA					
Sample Hammer					Geologist			Date		Checked by		Date		
Type		Drive Wt			Drop			Dominic Mariano		2022-01-11		Cindy Brownson		2022-04-20
Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description			USCS Symbol	Estimated Percent of			Comments	
Clayey Silt	2	X	NM	100%	NM	Clayey Silt with gravel, dark brown (10YR 3/3), brown (10YR 4/3), dry, very stiff, friable Basalt boulder, crushed, gray (10YR 5/1), no plasticity			ML	10-20	0	80-90	Hand cleared to 1'	
	4	X											0	
	6	X											0.1	
	8	X											0.3	
	10	X	0.2	70%	NM	Becomes dark brown (10YR 3/3), moist, medium stiff, less gravel Clayey Silt, dark brown (7.5YR 3/3), damp, very stiff, low plasticity, trace of angular gray basalt Refusal at 9.5 ft bgs			0-10	0	90-100	Soil sample: LT-W40-9-10		
														Terminate boring at 9.5' due to refusal.
Comments:														

Boring No.		Field Log of Boring										Sheet 1 of 1										
LT-S10		Project Number				Elevation and Datum (estimated)				Location												
Red Hill Site Characterization		60574414				118' above mean sea level				10' South of Adit 3 Leach Tank												
Drilling Company		Driller				Date and Time Started				Date and Time Completed												
Geotek Hawaii		Jon Shjegstad and Chad Nix				1-12-22 8:00				1-12-22 8:30												
Drilling Equipment		Drilling Method				Completion Depth				Total No of Samples												
Geoprobe 6620-DT		Direct Push Technology				24'				2												
Size and Type of Bit		Hole Diameter				No. Samples		Bulk		SS		Drive		Pitcher								
3" macro-core		2"				0		0		5		0										
Drilling Fluid		Drilling Angle				First		After Hours														
--		90				Water Level		NA														
Sample Hammer		Geologist				Date		Checked by		Date												
Type		Drive Wt				Drop		Ethan House		2022-01-12		Cindy Brownson		2022-04-20								
--		--				--																
Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description	USCS Symbol	Estimated Percent of			Comments											
								GR	SA	FI												
Silty gravel	2	X	NM	32%	NM	Basalt, various colors, medium grays (7.5YR 6/1) to dark red (10R 3/6), dry, no plasticity, small angular pieces of basalt	GM	80	0	20	Hand cleared to 1'.											
		X																				
	4	X																				
		X																				
	6	X	NM	28%	NM							Wet at 5'.	GM	80	0	20	Unable to collect PID readings at every 1' interval due to low recovery.					
		X																				
	8	X																				
		X																				
10	X	NM	26%	NM	Dark brown(7.5YR 3/3), moist, soft, low plasticity, trace of basalt	ML	5-10	0	90-95	Soil sample: LT-S10-17-18												
	X																					
12	X																					
	X																					
14	X	NM	100%	NM							Black (7.5YR 2.5/1), wet, firm.	ML	5-10	0	90-95	Soil sample: LT-S10-17-18						
	X																					
16	X																					
	X																					
18	X	NM	100%	NM	Moist.	ML	5-10	0	90-95	Soil sample: LT-S10-23-24												
	X																					
20	X																					
	X																					
22	X	NM	100%	NM							Moist.	ML	5-10	0	90-95	Soil sample: LT-S10-23-24						
	X																					
24	X																Terminate boring at 24' due to refusal.	ML	5-10	0	90-95	Soil sample: LT-S10-23-24
Comments:																						

Field Log of Boring

Project Name		Project Number		Elevation and Datum		Location	
Red Hill Site Characterization		60574414		114' above mean sea level		10' East of Adit 3 Leach Tank	
Drilling Company		Driller		Date and Time Started		Date and Time Completed	
Geotek Hawaii		Jon Shjegstad and Chad Nix		1-12-22 9:00		1-12-22 9:30	
Drilling Equipment		Drilling Method		Completion Depth		Total No of Samples	
Geoprobe 6620-DT		Direct Push Technology		8'		1	
Size and Type of Bit		Hole Diameter		No. Samples		Bulk	SS
3" macro-core		2"				0	0
Drilling Fluid		Drilling Angle		Water Level		After _____ Hours	
--		90		NA		NA	

Sample Hammer		Geologist		Date		Checked by		Date	
Type --		Drive Wt --		Drop --		Ethan House		2022-01-12	
						Cindy Brownson		2022-04-20	

Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description	USCS Symbol	Estimated Percent of			Comments
								GR	SA	FI	
Clayey silt	2	X	NM	80%	NM	Dark brown (7.5YR 3/2), damp, stiff, moderate plasticity, trace of gravel, fill material.	ML	0-10	0-10	90	Hand cleared to 1'.
		X									
	4	X									
		X									
	6	X	0.3	50%	NM	Dark brown (7.5YR 3/3), firm, 10% basalt 50% basalt					
		X									
	X	0.6									
8	X	0.7			Red (10R 4/6), soft.	Soil sample: LT -E10-7-8					
											Terminate boring at 8' due to refusal.

Comments:

Boring No.		Field Log of Boring										Sheet 1 of 1					
LT-N25		Project Name				Project Number				Elevation and Datum				Location			
Red Hill Site Characterization		60574414				117' above mean sea level				25' North of Adit 3 Leach Tank							
Drilling Company		Driller				Date and Time Started				Date and Time Completed							
Geotek Hawaii		Jon Shjegstad and Chad Nix				1-12-22 13:20				1-12-22 13:40							
Drilling Equipment		Drilling Method				Completion Depth				Total No of Samples							
Geoprobe 6620-DT		Direct Push Technology				27.5'				2							
Size and Type of Bit		Hole Diameter				No. Samples		Bulk		SS		Drive		Pitcher			
3" macro-core		2"				0		0		6		0					
Drilling Fluid		Drilling Angle				Water Level		First		After		Hours					
--		90				NA		NA		NA		NA					
Sample Hammer		Drive Wt				Drop				Geologist		Date		Checked by		Date	
--		--				--				Dominic Mariano		2022-01-12		Cindy Brownson		2022-04-20	
Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description	USCS Symbol	Estimated Percent of			Comments						
								GR	SA	FI							
--	2			--	--	Hand cleared	--	--	--	--	Hand cleared to 2'.						
Sandy Silt	4	X		100%	NM	Dark grayish brown (10YR 4/2), damp, loose, low plasticity, fill material, crushed coral.											
	6	X	3.2	60%	NM	Crushed rocks as gravel.	ML	10-20	20	60-70							
	8	X	3.9														
	10	X	2.9														
		X	7.2														
	Silty Sand	12	X	1.8	100%	NM	Saprolite - reddish brown (5YR 4/3), and dark gray (5YR 4/1), moist, no plasticity Very dark gray (10YR 3/1)	SM	0	70	30						
		14	X	7.2													
		X	423.9														
16		X	17.5	100%	NM	Crushed gravel. Banded staining at 19.5'.											
18		X	113.1														
20		X	18.3														
22		X	4.5	100%	NM	Banded staining at 24.5'.											
24		X	9.3														
		X	30.1														
Silty Clay	26	X	74.9	100%	NM	Very dark gray (10YR 3/1), moist, soft, low plasticity.	CL	0	0	100							
Silty Sand	28	X	2.6			Dark grayish brown (10YR 4/2), moist, no plasticity	SM	0	70	30	Soil sample: LT-N25-17-17.5						
											Terminate boring at 27.5' bgs						
						Saprolite, same as above, dark gray (10YR 3/1), moist,											

Comments:

Boring No.		Field Log of Boring										
LT-S25		Project Number		Elevation and Datum (estimated)				Location				
Red Hill Site Characterization		60574414		117' above mean sea level				25' South of Adit 3 Leach Tank				
Drilling Company		Driller		Date and Time Started				Date and Time Completed				
Geotek Hawaii		Jon Shjegstad and Chad Nix		1-12-22 9:00				1-12-22 9:30				
Drilling Equipment		Drilling Method		Completion Depth				Total No of Samples				
Geoprobe 6620-DT		Direct Push Technology		15'				2				
Size and Type of Bit		Hole Diameter		No. Samples		Bulk		SS		Drive		Pitcher
3" macro-core		2"		0		0		3		0		
Drilling Fluid		Drilling Angle		First		After _____ Hours						
--		90		Water Level		NA						
Sample Hammer		Geologist		Date		Checked by		Date				
Type		Drive Wt		Drop		Ethan House		2022-01-12		Cindy Brownson		2022-04-21
--		--		--								
Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description	USCS Symbol	Estimated Percent of			Comments	
								GR	SA	FI		
Silty, clayey gravel	2	X		100%	NM	Various coloring, dry, very stiff, no plasticity, fill material/basalt	GM-GC	80	0	20	Head cleared to 1'.	
		X										
	4	X										
Silty clay	6	X		70%	NM	Silty Clay - Dark brown (7.5YR 3/3), dry, firm, moderate plasticity, 30% basalt at 5'. Crushed basalt lense at 8.5-9.2'.	CL	0-30	0	70-100	Soil sample: LT-S25-7-8	
		X	0.3									
	8	X	0.0									
Clayey silt	10	X	0.0			Dark brown (7.5YR 3/4), dry, friable, no plasticity.	ML	20	0	80		
		X	0.2									
Silty, clayey gravel	12	X	0.0	92%	NM	Gravel with clayey silt - Dark brown (7.5YR 4/3), dry, no plasticity, small angular fragments	ML	80	0	20		
		X	0.0									
	14	X	0.0				ML	10	0	90		
		X	0.0									
	16										Terminate boring at 15'.	

Comments:

Boring No.		Field Log of Boring											Sheet <u>1</u> of <u>1</u>			
LT-W17.5		Project Number					Elevation and Datum (estimated)				Location					
Red Hill Site Characterization		60574414					116' above mean sea level				17.5' West of Adit 3 Leach Tank					
Drilling Company		Driller					Date and Time Started				Date and Time Completed					
Geotek Hawaii		Jon Shjegstad and Chad Nix					1-12-22 10:00				1-12-22 10:30					
Drilling Equipment		Drilling Method					Completion Depth				Total No of Samples					
Geoprobe 6620-DT		Direct Push Technology					15'				2					
Size and Type of Bit		Hole Diameter					No. Samples		Bulk		SS		Drive		Pitcher	
3" macro-core		2"					0		0		3		0			
Drilling Fluid		Drilling Angle					First		After				Hours			
--		90					Water Level		NA				NA			
Sample Hammer		Geologist					Date		Checked by		Date					
Type		Drive Wt					Drop		Ethan House		2022-01-12		Cindy Brownson		2022-04-21	
--		--					--									
Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description	USCS Symbol	Estimated Percent of			Comments					
								GR	SA	FI						
Silty, clayey gravel	2	X		100%	NM	Dusky red (2.5Y 3/2), dry, loose, no plasticity, fill material/basalt.	GM-GC	50	0	50	Head cleared to 1'.					
		X														
Clay	4	X		92%	NM	Dark reddish brown (2.5Y 3/3), dry, firm, high plasticity.	CH	10	0	90						
		X														
Silty Clay	6	X	0.0	92%	NM	Brown (7.5YR 5/4), dry, very stiff, friable, no plasticity, alluvial, silty clay, small gravel.	CL	5-30	0	70-90						
		X	0.0													
		X	0.0													
	10	X	0.0	92%	NM	Basalt at 8.2-8.5', light gray (7.5YR 7/1). Same as above.	CL	5-30	0	70-90						
		X	1.6													
		X	38.6													
		X	246.5													
14	X	31.2	92%	NM	5% crushed basalt at 12.5-15', light gray (7.5YR 7/1), dry, friable, low plasticity.	CL	5-30	0	70-90	Soil sample: LT-W-17.5-12-13						
	X	5.1														
16											Terminate boring at 15'.					

Comments:

Boring No.		Field Log of Boring											Sheet 1 of 1	
LT-N40		Project Name		Project Number				Elevation and Datum (estimated)				Location		
Red Hill Site Characterization		60574414		117' above mean sea level				40' North of Adit 3 Leach Tank						
Drilling Company		Driller				Date and Time Started				Date and Time Completed				
Geotek Hawaii		Jon Shjegstad and Chad Nix				1-12-22 13:45				1-12-22 14:15				
Drilling Equipment		Drilling Method				Completion Depth				Total No of Samples				
Geoprobe 6620-DT		Direct Push Technology				8				1				
Size and Type of Bit		Hole Diameter				No. Samples		Bulk		SS		Drive		Pitcher
3" macro-core		2"				0		0		2		0		
Drilling Fluid		Drilling Angle				First		After		Hours				
-		90				Water Level		NA		NA				
Sample Hammer		Geologist				Date		Checked by		Date				
Type		Drive Wt				Drop		Dominic Mariano		2022-01-12		Cindy Brownson		2022-04-21
-		-				-								
Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description	USCS Symbol	Estimated Percent of			Comments			
								GR	SA	FI				
Fill	2			-	-	-	-	-	-	-	Hand cleared to 2'.			
	4	X		100%	NM	Brown (10YR 4/4), dry, stiff, no plasticity, silt with sand, gravel and clay.	ML	0-10	0-10	80-100	Soil sample: LT-N40-7-8			
Silt	6	X	1.7	83%	NM	Broken boulder at 3'.								
	7	X	1.5			Black banded staining at 7.5', no odor noted.								
	8	X	0.5											
											Terminate boring at 8' due to refusal. Next 3 attempts also refused.			

Comments:

Boring No.

Field Log of Boring

HT-N10																	
Project Name		Project Number				Elevation and Datum (estimated)				Location							
Red Hill Site Characterization		60574414				117' above mean sea level				10' North of Adit 3 Holding Tank							
Drilling Company		Driller				Date and Time Started				Date and Time Completed							
Geotek Hawaii		Jon Shjegstad and Chad Nix				1-12-22 13:45				1-12-22 14:20							
Drilling Equipment		Drilling Method				Completion Depth				Total No of Samples							
Geoprobe 6620-DT		Direct Push Technology				25'				2							
Size and Type of Bit		Hole Diameter				No. Samples		Bulk		SS		Drive		Pitcher			
3" macro-core		2"				0		0		5		0					
Drilling Fluid		Drilling Angle				First		After				Hours					
--		90				Water Level		NA				NA					
Sample Hammer						Geologist				Date		Checked by		Date			
Type		Drive Wt				Drop				Ethan House		2022-01-12		Cindy Brownson		2022-04-21	
--		--				--											
Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description	USCS Symbol	Estimated Percent of			Comments						
								GR	SA	FI							
Fill/Basalt	2	X		80%	NM	Fill - Organic matter, roots, coral, basalt	--	--	--	--	Hand cleared to 1'.						
		X															
Clayey silt	4	X		60%	NM	Dark brown (7.5YR 3/3), damp, firm, moderate plasticity, silty clay with 15% basalt	ML	15-50	0	50-85							
		X															
	6	X															
		X															
	8	X	0.0														
		X	0.0														
Silty, clayey gravel	10	X	0.0	40%	NM	Increases in basalt, no plasticity, basalt is small, angular pieces	ML	15-50	0	50-85							
		X															
	12	X															
		X															
	14	X	0.3														
		X	0.0														
Silty, clayey gravel	16	X		60%	NM	Dark brown (7.5YR 3/1), moist, friable, no plasticity, small fragments of crushed basalt present, saprolite.	GM-GC	90	0	5	Soil sample: HT-N10-19-20						
		X															
	18	X	3.1														
		X	65.5														
	20	X	171.5														
		X	0														
Silty, clayey gravel	22	X	3.5	100%	NM						Soil sample: HT-N10-24-25						
		X	39.7														
	24	X	94.7														
		X	3.5														
	26										Terminate boring at 25' due to refusal.						
Comments:																	

Boring No.	Field Log of Boring																
HT-W10	Project Name					Project Number				Elevation and Datum (estimated)				Location			
Red Hill Site Characterization						60574414				117' above mean sea level				10' West of Adit 3 Holding Tank			
Drilling Company	Driller					Date and Time Started				Date and Time Completed							
Geotek Hawaii	Jon Shjegstad and Chad Nix					1-12-22 15:17				1-12-22 15:45							
Drilling Equipment	Drilling Method					Completion Depth				Total No of Samples							
Geoprobe 6620-DT	Direct Push Technology					23'				2							
Size and Type of Bit	Hole Diameter					No. Samples		Bulk		SS		Drive		Pitcher			
3" macro-core	2"					0		0		5		0					
Drilling Fluid	Drilling Angle					First		After		Hours							
-	90					Water Level		NA		NA							
Sample Hammer					Geologist				Date		Checked by		Date				
Type	Drive Wt	Drop	Ethan House	2022-01-12	Cindy Brownson	2022-04-21											
Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description	USCS Symbol	Estimated Percent of			Comments						
								GR	SA	FI							
Fill/Basalt	2	X		80%	NM	Fill - Organic matter, basalt fragments and silty clay	-	-	-	-	Hand cleared to 1'.						
		X															
Clayey silt	4	X		80%	NM	Dark brown (7.5YR 3/2), damp, firm, no plasticity, loose, basalt fragments.	ML	30	0	70							
		X															
Well-graded gravel	6	X		60%	NM	Dark brown (7.5YR 3/2), damp, firm, no plasticity, saprolite, loose basalt fragments.	GW	90	0	10							
		X	0.2														
		X	0.6														
		X	0.4														
Well-graded gravel	8	X		90%	NM	Very dark gray (7.5YR 3/1), damp, firm, low plasticity.	ML	0	0	100							
		X	0.4														
		X	0.4														
		X	0.5														
Clayey Silt	14	X	33.2	100%	NM	Saprolite - dark brown (7.5YR 3/2), moist, firm, no plasticity, loose, basalt fragments	GW	100	0	0	Soil sample: HT-W10-18-19						
		X	0.5														
Well-graded gravel	16	X	1.1	100%	NM	Clayey silt - Very dark gray (7.5YR3/1),damp, firm, low plasticity, trace saprolite	ML	5	0	95	Soil sample: HT-W10-22-23						
		X	4.9														
		X	194.3														
		X	66.5														
Clayey Silt	22	X	24.5	100%	NM	Saprolite - dark brown (7.5YR 3/2), moist, firm, no plasticity, loose, basalt fragments	GW	100	0	0	Soil sample: HT-W10-18-19						
		X	0.7														
	24										Terminate boring at 15' due to refusal.						

Comments:

Boring No.		Field Log of Boring										Sheet 1 of 1			
HT-E10		Project Name				Project Number				Elevation and Datum (estimated)				Location	
Red Hill Site Characterization		60574414				118' above mean sea level				10' East of Adit 3 Holding Tank					
Drilling Company		Driller				Date and Time Started				Date and Time Completed					
Geotek Hawaii		Jon Shjegstad and Chad Nix				1-13-22 9:00				1-13-22 9:30					
Drilling Equipment		Drilling Method				Completion Depth				Total No of Samples					
Geoprobe 6620-DT		Direct Push Technology				24'				2					
Size and Type of Bit		Hole Diameter				No. Samples		Bulk		SS		Drive		Pitcher	
3" macro-core		2"				0		0		5		0			
Drilling Fluid		Drilling Angle				First		After				Hours			
--		90				Water Level		NA				NA			
Sample Hammer		Geologist				Date		Checked by		Date					
Type		Drive Wt				Drop		Ethan House		2022-01-12		Cindy Brownson		2022-04-21	
--		--				--									
Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description	USCS Symbol	Estimated Percent of			Comments				
								GR	SA	FI					
Gravelly silt		X		100%	NM	Fill - Organic matter, basalt fragments and silty clay	--	--	--	--	Hand cleared to 1'.				
	2	X				Dark brown (7.5Y 3/2), brown (10YR 4/4), gray (7.5YR 5/5), damp, dense, none to low plasticity, gravelly silt with sand and clay fill material.	ML	20	10	70					
	4	X				Crushed boulder at 5'.									
	6	X				Brown (10YR 4/3), moist, firm, low plasticity.									
Clay	8	X	0.2	80%	NM	Crushed boulders present, light gray (10YR 7/1) to yellowish brown (10YR 5/8).	CL	0	0	100					
	10	X	0.4												
	12	X	0.4			Very dark brown (10YR 2/2), moist, medium stiff, no plasticity, saprolite weathered to silt with clay.	ML	0	0	100					
Clayey silt	14	X	0.5	90%	NM	Very dark brown (10YR 2/2), moist, dense, low plasticity. Fine angular sand layer at 13', pale brown (10YR 7/4), saprolite weathered to clayey sand.	SC	0	70	30					
Clayey silt	16	X	0.5					ML	0	0	100				
Clayey sand	18	X	1.1	100%	NM	Very dark gray (10YR 3/1), medium stiff, no plasticity, saprolite weathered to silt with clay.	SC	0	70	30					
	20	X	4.9												
	22	X	194.3												
	24	X	66.5	100%	NM	Very dark gray (10YR 3/1), moist, dense, low plasticity, saprolite weathered to clayey sand, fine angular sand. Becomes very dark grayish brown (10YR 3/2) at 18'. Banded staining at 21', GLEY1 (6/10 GY).					Soil sample: HT-E10-21-22				
	26	X	1.1									Soil sample: HT-E10-23-24			
	28	X	0.7												
30	X	24.5													
32											Terminate boring at 24' due to refusal.				

Comments:

Boring No.		Field Log of Boring													
HT-E17.5		Project Number				Elevation and Datum (estimated)				Location					
Red Hill Site Characterization		60574414				118' above mean sea level				17.5' East of Adit 3 Holding Tank					
Drilling Company		Driller				Date and Time Started				Date and Time Completed					
Geotek Hawaii		Jon Shjegstad and Chad Nix				1-13-22 11:00				1-13-22 11:30					
Drilling Equipment		Drilling Method				Completion Depth				Total No of Samples					
Geoprobe 6620-DT		Direct Push Technology				15'				2					
Size and Type of Bit		Hole Diameter				No. Samples		Bulk		SS		Drive		Pitcher	
3" macro-core		2"				0		0		3		0			
Drilling Fluid		Drilling Angle				First		After				Hours			
--		90				Water Level		NA				NA			
Sample Hammer		Geologist				Date		Checked by		Date					
Type		Drive Wt				Drop		Dominic Mariano		2022-01-13		Cindy Brownson		2022-04-21	
Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description	USCS Symbol	Estimated Percent of			Comments				
								GR	SA	FI					
-			-	-	-	-	-	-	-	-	Hand cleared to 1'.				
Sandy silt	2	X		100%	NM	Dark grayish brown (10YR 4/2) to white (10YR 8/1), dry loose, no plasticity, gravelly sandy silt, coral gravel.	ML	10-30	10	60-70					
		X													
	4	X													
		X													
	6	X	0.5	80%	NM	Crushed boulder at 5.5' bgs									
		X	0.2												
	8	X	0.5												
		X	0.2												
Silty sand	10	X	0.3	100%	NM	Crushed boulder at 7.5' bgs Dark yellowish brown (10YR 3/10), dry, very dense, low plasticity. Crushed boulder 9.5'-10.5' bgs									
		X	0.1												
	12	X	0.2												
		X	0.2												
	14	X	0.1												
		X	0.2												
	16														

Comments:

Boring No.		Field Log of Boring									
HT-N25		Project Number		Elevation and Datum (estimated)				Location			
Red Hill Site Characterization		60574414		118' above mean sea level				25' North of Adit 3 Holding Tank			
Drilling Company		Driller		Date and Time Started				Date and Time Completed			
Geotek Hawaii		Jon Shjegstad and Chad Nix		1-13-22 11:40				1-13-22 12:30			
Drilling Equipment		Drilling Method		Completion Depth				Total No of Samples			
Geoprobe 6620-DT		Direct Push Technology		15'				4			
Size and Type of Bit		Hole Diameter		No. Samples		Bulk		SS		Pitcher	
3" macro-core		2"				0		0		3	
Drilling Fluid		Drilling Angle		Water Level		First		After Hours			
--		90		NA		NA		NA			
Sample Hammer		Geologist		Date		Checked by		Date			
Type		Drive Wt		Drop		Dominic Mariano		2022-01-13		Cindy Brownson	
--		--		--						2022-04-21	
Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description	USCS Symbol	Estimated Percent of			Comments
								GR	SA	FI	
Fill/Basalt		X		-	-	--	--	--	--	Hand cleared to 1'.	
	2	X		100%	NM	Dark gray (10YR 4/1), dry, loose, no plasticity, gravelly silt, crushed basalt boulder at 3'.					
Sandy silt	4	X	0.0	80%	NM	Dark yellowish brown (10YR 5/4), moist, stiff, low plasticity, clayey silt.	ML	0-30	0-10	60-100	
	6	X	0.0								
	8	X	0.2								
	10	X	5.2								
Silt	12	X	0.0	100%	NM	Dark yellowish brown (10YR 4/4), dry, friable, no plasticity, gravelly silt.				Soil sample: HT-N25-10-11 + DUP	
	14	X	0.0								
Silty sand	14	X	0.5			Very dark gray (10YR 3/1), moist, dense, no plasticity, silty sand.	SM	0	70	30	Soil sample: HT-N25-14-15 + DUP
	16										Terminate boring at 15'.

Comments:

Boring No.		Field Log of Boring										Sheet 1 of 1	
HT-S10													
Project Name		Project Number			Elevation and Datum (estimated)				Location				
Red Hill Site Characterization		60574414			118' above mean sea level				10' South of Adit 3 Holding Tank				
Drilling Company		Driller			Date and Time Started				Date and Time Completed				
Geotek Hawaii		Jon Shjegstad and Chad Nix			1-13-22 9:00				1-13-22 9:18				
Drilling Equipment		Drilling Method			Completion Depth				Total No of Samples				
Geoprobe 6620-DT		Direct Push Technology			18'				2				
Size and Type of Bit		Hole Diameter			No. Samples		Bulk	SS	Drive	Pitcher			
3" macro-core		2"					0	0	4	0			
Drilling Fluid		Drilling Angle			Water Level				After _____ Hours				
--		90			NA				NA				
Sample Hammer				Geologist		Date		Checked by		Date			
Type		Drive Wt		Drop		Ethan House		2022-01-13		Cindy Brownson	2022-04-21		
--		--		--									
Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description	USCS Symbol	Estimated Percent of			Comments		
								GR	SA	FI			
Fill/Basalt	2	X				--	--	--	--	Hand cleared to 1'.			
Silty clay		X		100%	NM	Dark brown (7.5YR 3/2), damp, stiff, trace basalt and coral, silty clay.	CL	10	0	90			
	4	X											
Well-graded gravel	6	X	0.0			Dark brown (7.5YR 3/2), damp, stiff, friable, no plasticity, saprolite, course grained.							
	8	X	0.0	100%	NM								
	10	X	88.3			Dark gray (5YR 4/1), dry, stiff, loose, small angular fragments, basalt.	GW	90-95	0	5-10			
	12	X	2.3										
Clayey silt	14	X	0.4	90%	NM	Dusky red (2.5YR 3/2), damp, soft, low plasticity							
	16	X	18.3				ML	5	0	95	Soil sample: HT-S10-15-16		
	18	X	308.7	100%	NM	Dark brown (7.5YR 3/2), wet, stiff, friable, no plasticity, medium to course grained, saprolite.					Soil sample: HT-S10-17-18		
				33.8				GW	90	0	10		
											Terminate boring at 18' due to refusal.		
Comments:													

Boring No. HT-S25							Field Log of Boring				Sheet 1 of 1									
Project Name		Project Number			Elevation and Datum (estimated)			Location												
Red Hill Site Characterization		60574414			118' above mean sea level			25' South of Adit 3 Holding Tank												
Drilling Company		Driller			Date and Time Started			Date and Time Completed												
Geotek Hawaii		Jon Shjegstad and Chad Nix			1-13-22 9:50			1-13-22 10:30												
Drilling Equipment		Drilling Method			Completion Depth			Total No of Samples												
Geoprobe 6620-DT		Direct Push Technology			15'			2												
Size and Type of Bit		Hole Diameter			No. Samples	Bulk		SS		Pitcher										
3" macro-core		2"				0	0		3		0									
Drilling Fluid		Drilling Angle			Water Level	First			After											
--		90				NA	Hours			Hours										
Sample Hammer					Geologist			Date		Checked by		Date								
Type		Drive Wt			Drop		Ethan House		2022-01-13		Cindy Brownson		2022-04-21							
Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description	USCS Symbol	Estimated Percent of			Comments									
								GR	SA	FI										
--				--		--	--	--	--		Hand cleared to 1'.									
Silty clay	2	X		100%	NM	Fill - mix of basalt, soil, coral and organic material, dry	CL	5	0	95										
		X																		
Clayey silt	4	X									100%	NM	Dark brown (7.5YR 3/2), damp, stiff, moderate plasticity, trace of basalt	ML	5-20	0	80-95			
		X	1.7																	
	6	X	1.8																	
		X	1.1																	
Well-graded gravel	8	X	0.6	100%	NM	Increase in basalt at 5-8'.	GW	90	0	10	Soil sample: HT-S25-8-9									
			X								1.0									
		Silty Clay	10								X	0.2	100%	NM	Basalt - Pink (5YR 7/4), small angular fragments, dry, stiff, loose	ML	5	0	95	Soil sample: HT-S25-14-15
											X	0.1								
Well-graded grave	14	X	0.4	100%	NM	Silty clay - Dark brown (7.5YR 3/2), damp, stiff, trace of basalt	GW	90	0	10										
		X	0.0																	
	16	X	0.3								100%	NM	Dark brown (7.5YR 3/2), dry, stiff, friable, course grained	GW	90	0	10			
Comments:																				

Boring No.		Field Log of Boring										Sheet 1 of 2			
HT-E00.0		Project Name				Project Number				Elevation and Datum (estimated)				Location	
Red Hill Site Characterization		60574414				117' above mean sea level				East of Adit 3 Holding Tank					
Drilling Company		Driller				Date and Time Started				Date and Time Completed					
Geotek Hawaii		Jon Shjegstad and Zach Tullis				3-9-22 9:50				3-10-22 14:00					
Drilling Equipment		Drilling Method				Completion Depth				Total No of Samples (to laboratory)					
Geoprobe 6620-DT		Direct Push Technology / Hollow-Stem Auger				33'				4					
Size and Type of Bit		Hole Diameter				No. Samples		Bulk		SS		Drive		Pitcher	
2" split-spoon		2"				0		20		0		0			
Drilling Fluid		Drilling Angle				First		After		Hours					
--		90				Water Level		NA		31.95' bgs					
Sample Hammer		Geologist				Date				Checked by		Date			
Type		Drive Wt				Drop				Ethan House		2022-03-09		Belinda Turran	
--		--				--								2022-04-18	
Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description	USCS Symbol	Estimated Percent of			Comments				
								GR	SA	FI					
Silty clay	2	X				Asphalt and gravel at 0-3".					Utilities cleared to 2'.				
		X	NM	100%	NM	Dark brown (10YR 3/3), dry, very stiff, moderate plasticity.									
	4	X													
		X	NM	100%	NM										
	6	X													
		X	0.4	100%	NM		ML	5-30	0	70-95					
	8	X				Stiff, increase in basalt.									
	X	0.2	100%	NM											
	10	X				Slightly friable at 10.8'.									
		X	0.1	100%	NM										
Silty, clayey gravel	12	X				Dark brown (10YR 3/3), dry, loose, no plasticity, saprolite, medium-grained, friable.									
		X	0.4	90%	NM										
	14	X				Dark gray (10YR 4/1), dry, firm, low plasticity, saprolite - trace of silty clay.									
		X	55.9	100%	NM										
	16	X				Damp.									
		X	16.4	90%	NM										
	18	X				Grayish brown (10YR 5/2), slightly damp, firm, low plasticity.									
		X	4.2	90%	NM										
	20	X				No plasticity, small fragments of basalt 19.4-19.8'.	GC-GM	25-70	0-5	20-30					
		X	64.7	100%	NM	Friable					Soil sample and field duplicate at 19-21': HT-E00.0-SOFD01-19-21 HT-E00.0-SON01-19-21				
	22	X													
		X	7	80%	NM										
	24	X				Dry, very stiff, no plasticity, staining at 24.4' and 24.75'.									
		X	44.5	100%	NM										
	26	X				Staining at 26.85'.									
		X	21.5	100%	NM										
	28	X				Staining at 29.4'.									
		X	2.1	100%	NM										
Silty Clay	30	X					ML	0	0	100					
		X	4.3	100%	30-70-22/6"	Dark grayish brown (10YR 4/2), damp, stiff, high plasticity.									
Silty, clayey gravel	32	X				Dark grayish brown (10YR 4/2), dry, stiff, no plasticity, friable.					End drilling on 3/9/21. Resume on 3/10/21.				
		X	4.1	100%	28-100/6"										
	34	X					GC-GM	25-40	0	60-75	Soil sample: HT-E00.0-SON01-33-35				
		X	6.3	100%	12-23-22-23										
	36	X				Damp, low plasticity.									
		X	0.5	100%	17-18-12-11	Mix of fragmented basalt and silty clay.									
	38	X				Wet at 37-38.5'. Dry at 38.5-39'.									
Comments:															

Boring No.		Field Log of Boring										Sheet 1 of 2			
LT-E00.0		Project Name				Project Number				Elevation and Datum (estimated)				Location	
Red Hill Site Characterization		60574414				117' above mean sea level				East of Adit 3 Leach Tank					
Drilling Company		Driller				Date and Time Started				Date and Time Completed					
Geotek Hawaii		Jon Shjegstad and Zach Tullis				3-10-22 14:30				3-11-22 16:30					
Drilling Equipment		Drilling Method				Completion Depth				Total No of Samples (to laboratory)					
Geoprobe 6620-DT		Direct Push Technology / Hollow-Stem Auger				45'				3					
Size and Type of Bit		Hole Diameter				No. Samples		Bulk		SS		Drive		Pitcher	
2" split-spoon		2"				0		20		0		0			
Drilling Fluid		Drilling Angle				First		After Hours							
--		90				Water Level		43' bgs				31.65' bgs			
Sample Hammer		Geologist				Date		Checked by		Date					
Type		Drive Wt				Drop		Ethan House		2022-03-10		Belinda Turran		2022-04-21	
--		--				--		--		--		--		--	
Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description	USCS Symbol	Estimated Percent of			Comments				
								GR	SA	FI					
Well-graded gravel	2					Hollow-stem auger and hand auger. Fill material.	--	--	--	--	Utility cleared to 1'.				
	4														
	6	X	0.5	25%	2-3	Gray (10YR 6/1), dry, loose, low plasticity, fill material.	GW	50	25	25					
	8	X	2	58%	5-7-16-19	Medium brown (10YR 4/3) to gray (10YR 6/1), dry, firm, low plasticity. Basalt fragments at 7.8-8'.	ML	70	0	30					
	10	X	436	75%	39-11-6-7	Soft.									
	12	X	451	80%	4-6-8-12	Dark brown (10YR 3/3), damp, soft, no plasticity, staining at 10.6', friable, saprolite.									
	14	X	448	80%	4-7-8-12	Brownish gray (10YR 4/2) Staining at 12-13'.									
	16	X	484	100%	6-6-7-7	Trace staining at 15.8'.									
	18	X	222	100%	4-7-8-10	Stiff.									
	20	X	458	100%	7-9-11-10	Damp.	GC-GM	80	0	20					
22	X	480	100%	4-7-11-14											
Silty, clayey gravel	24	X	379	65%	12-17-24-25	Trace of silty clay.									
	26	X	165	95%	13-19-24-22										
	28	X	527	100%	17-28-34-54	Very stiff. Multiple zones of tan staining, friable, dry. Staining at 26.3', 26.5', 26.6', 27.2', 27.5', and 27.8'.									
	30	X	12.8	65%	32-66-66/6"	Dark gray (10YR 4/1).									
	32	X	--	0%	--	Dark gray (10YR 4/1), dry, stiff, no plasticity.	--	--	--	--	SPT refusal. Advance hollow-stem auger only.				
	34	X	1.3	100%	19-44-96-41	Same as 28-30'. Trace of basalt.	GC-GM	80	0	20					
	36	X	4.3		8-9-12-14	Dark brown (10YR 3/3), low plasticity, wet at 35.2-35.6'									
	38	X	10.2	60%	8-12	Dark brown (10YR 3/3), damp, firm, moderate plasticity	ML	10	0	90					

Comments:

Field Log of Boring

LT-E00.0

Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description	USCS Symbol	Estimated Percent of			Comments
								GR	SA	FI	
Silty clay	40	X	2.8	100%	8-8-8-8	Dark brown (10YR 3/3), moist, soft, moderate plasticity, increase in saprolite 39.5'. No recovery.	ML	10	0	90	
--	42	X									
Silty, clayey gravel	44	X	1.3	95%	18-21-21-24	Orangish brown (7.5YR 6/8), saturated, soft, no plasticity, friable.	GC-GM	70	0	30	Terminate boring at 45'.
	46	X									
	48										
	50										
	52										
	54										
	56										
	58										
	60										
	62										
	64										
	66										
	68										
	70										
	72										
	74										
	76										
	78										
	80										
	82										
	84										

Comments:

Boring No.		Field Log of Boring										Sheet 1 of 1			
LT-W50		Project Name				Project Number				Elevation and Datum (estimated)				Location	
Red Hill Site Characterization		60574414				117' above mean sea level				50' West of Adit 3 Leach Tank					
Drilling Company		Driller				Date and Time Started				Date and Time Completed					
Geotek Hawaii		Jon Shjegstad and Zach Tullis				3-14-22 9:10				3-14-22 14:25					
Drilling Equipment		Drilling Method				Completion Depth				Total No of Samples (to laboratory)					
Geoprobe 6620-DT		Direct Push Technology / Hollow-Stem Auger				18'				0					
Size and Type of Bit		Hole Diameter				No. Samples		Bulk		SS		Drive		Pitcher	
2" split-spoon		2"				0		3		0		0			
Drilling Fluid		Drilling Angle				First		After _____ Hours							
--		90				Water Level		NA							
Sample Hammer		Geologist				Date		Checked by		Date					
Type		Drive Wt				Drop		Ethan House		2022-03-14		Belinda Turran		2022-04-21	
--		--				--									
Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description	USCS Symbol	Estimated Percent of			Comments				
								GR	SA	FI					
--	2		--	--	--	Hollow-stem auger (HSA) only.	--	--	--	--					
--	4														
--	6	X	--	0%	12-14-12-9	Gray (10YR 6/1), dry, loose, low plasticity, fill material.	--	--	--	--					
--	8	X				HSA only.	--	--	--	--					
Silty clay	10														
	12	X	0.0	50%	8-33-17-10	Medium brown (10YR 5/3), dry, stiff, moderate plasticity.	ML	0	0	100					
--	14		--	--	--	Brownish gray (10YR 4/2)	--	--	--	--					
Silty clay	16	X	0.0	35%	8-100/2"	Same as 10-12'.	ML	0	0	100	Refusal SPT at 15.7'. Stepped out 5'. Augered to 16'.				
--	18		--	--	--	HSA only.	--	--	--	--					
	20										Terminate boring at 18' due to refusal.				
	22														
	24														
	26														
	28														
	30														
	32														
	34														
	36														
	38														

Comments:

Boring No.		Field Log of Boring										Sheet 1 of 1			
LT-W35		Project Name				Project Number				Elevation and Datum (estimated)				Location	
Red Hill Site Characterization		60574414				116' above mean sea level				35' West of Adit 3 Leach Tank					
Drilling Company		Driller				Date and Time Started				Date and Time Completed					
Geotek Hawaii		Jon Shjegstad and Zach Tullis				3-14-22 15:00				3-15-22 11:40					
Drilling Equipment		Drilling Method				Completion Depth				Total No of Samples (to laboratory)					
Geoprobe 6620-DT		Direct Push Technology / Hollow-Stem Auger				18'				2					
Size and Type of Bit		Hole Diameter				No. Samples		Bulk		SS		Drive		Pitcher	
2" split-spoon		2"				0		4		0		0			
Drilling Fluid		Drilling Angle				First		After _____ Hours							
--		90				Water Level		34' bgs		28.90' bgs					
Sample Hammer		Geologist				Date		Checked by		Date					
Type		Drive Wt				Drop		Ethan House		2022-03-14		Belinda Turran		2022-04-21	
Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description	USCS Symbol	Estimated Percent of			Comments				
								GR	SA	FI					
-	2					Hollow-stem auger (HSA) only. No SPT sampling.	-	-	-	-					
	4														
	6														
	8														
	10														
	12														
	14														
	16														
	18														
	20														
Silty clay	22	X	0.4	100%	4-12-18-27	Medium brown (10YR 5/3), dry, firm, low plasticity, crushed basalt at 21-21.6'.	ML	20	0	80					
	24	X	0.5	50%	8-50-63-33							Crushed basalt at 23.4-24'.			
--	26		--	--	--	HSA only. No SPT sampling.	--	--	--	--					
	28														
Silty clay	30	X	0.6	100%	6-10-10-15	Dark grayish brown (10YR 4/2), dry, firm, moderate plasticity, trace saprolite and basalt.	ML	10	0	90	Soil sample: LT-W35.0-SON01-29-31				
	32		--	--	--							Dark gray (10YR 4/1), dry, stiff, no plasticity.			
Silty clay	34	X	2.9	100%	6-7-8-7	Same as 29-31'.	ML	10	0	90	Soil sample: LT-W35.0-SON01-34-36				
	36	X										Terminate boring at 36'.			
	38														

Comments:

Boring No.	Field Log of Boring													Sheet 1 of 1			
LT-S15																	
Project Name		Project Number				Elevation and Datum (estimated)				Location							
Red Hill Site Characterization		60574414				114' above mean sea level				15' South of Adit 3 Leach Tank							
Drilling Company		Driller				Date and Time Started				Date and Time Completed							
Geotek Hawaii		Jon Shjegstad and Zach Tullis				3-15-22 13:50				3-15-22 16:45							
Drilling Equipment		Drilling Method				Completion Depth				Total No of Samples (to laboratory)							
Geoprobe 6620-DT		Direct Push Technology / Hollow-Stem Auger				31'				2							
Size and Type of Bit		Hole Diameter				No. Samples		Bulk		SS		Drive		Pitcher			
2" split-spoon		2"				0		11		0		0		0			
Drilling Fluid		Drilling Angle				Water Level		First		After		Hours					
--		90				NA		NA		NA		NA					
Sample Hammer		Drive Wt				Drop				Geologist		Date		Checked by		Date	
Type		--				--				Ethan House		2022-03-15		Belinda Turran		2022-04-21	
Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description	USCS Symbol	Estimated Percent of			Comments						
								GR	SA	FI							
--	2		0.2	--	NM	Hand auger/ Hollow-stem auger (HSA)	--	--	--	--							
	4																
Silty clay	6	X	0.7	100%	4-12-15-19	Gray (10YR 6/1), dry, loose, low plasticity, fill material.	ML	10-25	0	75-90							
		X															
	8	X	0.9	50%	29-24-40-18	Medium brown (10YR 5/3), no plasticity, friable.											
		X															
	10	X	1.0	75%	5-7-7-6	Saprolite lense at 10.8'.											
		X															
Silty, clayey gravel	12	X	0.4	100%	3-5-7-10	Dark brown (10YR 3/3), dry, firm, no plasticity, friable, trace of tan lense at 11.5', 11.6', 11.8'.	GC-GM	80	0	20							
		X															
	14	X	0.4	100%	12-12-13-15												
		X															
	16	X	0.6	100%	7-8-9-10												
		X															
	18	X	0.4	55%	6-5-8-10												
		X															
	20	X	77.1	100%	11-12-13-14												
		X															
	22	X	169.4	80%	5-7-10-10												
		X															
	24	X	226.6	100%	14-19-23-22												
		X															
--	26					HSA only.											
	28		--	--	--		--	--	--	--							
	30																
Silty clay		X	7.9	50%	32-60/6"	Dark gray (10YR 4/1), dry, stiff, no plasticity.	ML	80	0	20	Soil sample: LT-S15.0-SON01-30-31						
											Terminate boring at 31'.						
	32																
	34																
	36																
	38																
Comments:																	

Boring No.		Field Log of Boring										Sheet 1 of 1			
HT-W35		Project Number				Elevation and Datum (estimated)				Location					
Red Hill Site Characterization		60574414				117' above mean sea level				35' West of Adit 3 Holding Tank					
Drilling Company		Driller				Date and Time Started				Date and Time Completed					
Geotek Hawaii		Jon Shjegstad and Zach Tullis				3-17-22 10:05				3-17-22 11:20					
Drilling Equipment		Drilling Method				Completion Depth				Total No of Samples (to laboratory)					
Geoprobe 6620-DT		Direct Push Technology / Hollow-Stem Auger				19.5'				0					
Size and Type of Bit		Hole Diameter				No. Samples		Bulk		SS		Drive		Pitcher	
2" split-spoon		2"						0		2		0		0	
Drilling Fluid		Drilling Angle						First		After _____ Hours					
--		90						Water Level		NA		NA			
Sample Hammer		Geologist				Date		Checked by		Date					
Type		Drive Wt		Drop		Ethan House		2022-03-17		Belinda Turran		2022-04-22			
Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description	USCS Symbol	Estimated Percent of			Comments				
								GR	SA	FI					
-	2					Hollow-stem auger (HSA) only. Appears to be fill.	-	-	-	-					
	4														
	6														
	8														
	10														
-	12					Void - rods dropped.	-	-	-	-					
	14			0%											
	16														
Silty, clayey gravel	18	X	0.0	25%	1-2-1-50+	Medium brownish gray (10YR 5/2), dry, loose, no plasticity, friable.	GM-GC	80	0	20					
--	20			0%	1-2-3-50+	No recovery.	--	--	--	--	Terminate boring at 19.5' due to refusal.				
	22										Stepped out, see boring HT-W35-ALT				
	24														
	26														
	28														
	30														
	32														
	34														
	36														
	38														
Comments:															

Boring No.		Field Log of Boring										Sheet 1 of _____			
LT-N35		Project Number				Elevation and Datum (estimated)				Location					
Red Hill Site Characterization		60574414				117' above mean sea level				35' North of Adit 3 Leach Tank					
Drilling Company		Driller				Date and Time Started				Date and Time Completed					
Geotek Hawaii		Jon Shjegstad and Zach Tullis				3-17-22 9:05				3-17-22 10:00					
Drilling Equipment		Drilling Method				Completion Depth				Total No of Samples (to laboratory)					
Geoprobe 6620-DT		Direct Push Technology / Hollow-Stem Auger				19.5'				2					
Size and Type of Bit		Hole Diameter				No. Samples		Bulk		SS		Drive		Pitcher	
2" split-spoon		2"						0		5		0		0	
Drilling Fluid		Drilling Angle						First		After _____ Hours					
--		90						Water Level		NA		NA			
Sample Hammer		Geologist				Date		Checked by		Date					
Type		Drive Wt		Drop		Ethan House		2022-03-17		Belinda Turran		2022-04-22			
Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description	USCS Symbol	Estimated Percent of			Comments				
								GR	SA	FI					
-	2		0.1	100%	-	Hollow-stem auger (HSA) only. Appears to be fill.	-	-	-	-	Utility cleared to 2', then refusal.				
	4														
	6														
	8														
	10														
	12	X													
Clayey, silty gravel	12	X	0.1	70%	3-3-2-3	Brown (7.5YR 5/2), dry, firm, no plasticity, friable, saprolite and gravel.	GC-GM	80	0	20	Soil sample: LTN35.0-SON01-016.0				
	14	X	0.1	60%	4-3-3-2										
	16	X	0.1	60%	1-1										
	18	X	53.3	45%	1-2-1-50+										
	20	X	4.2	30%	1-2-3-50+										
	22														
	24														
	26														
	30														
	32														
	34														
	36														
	38														
Comments:															

Boring No.		Field Log of Boring										Sheet 1 of 1	
HT-W35-ALT		Project Name		Project Number		Elevation and Datum (estimated)		Location					
Red Hill Site Characterization		60574414		117' above mean sea level		35' West of Adit 3 Holding Tank							
Drilling Company		Driller		Date and Time Started		Date and Time Completed							
Geotek Hawaii		Jon Shjegstad and Zach Tullis		3-17-22 11:20		3-17-22 12:34							
Drilling Equipment		Drilling Method		Completion Depth		Total No of Samples (to laboratory)							
Geoprobe 6620-DT		Direct Push Technology / Hollow-Stem Auger		19.5'		2							
Size and Type of Bit		Hole Diameter		No. Samples		Bulk	SS	Drive	Pitcher				
2" split-spoon		2"		0		5	0	0					
Drilling Fluid		Drilling Angle		Water Level		NA							
--		90		NA		NA							
Sample Hammer		Geologist		Date		Checked by		Date					
Type		Drive Wt		Drop		Ethan House		2022-03-17		Belinda Turran		2022-04-22	
Lithology	Depth	Samples	PID (ppm)	Recovery	Blow Count	Description	USCS Symbol	Estimated Percent of			Comments		
								GR	SA	FI			
--	2		--	--	--	Hollow-stem auger (HSA) only. Appears to be fill.	--	--	--	--			
	4												
	6												
	8												
	10												
Silty, clayey gravel	12	X	0.1	40%	1-1-1-1	Brown (7.5YR 5/2), dry, firm, no plasticity, friable, saprolite, fill material.	GM-GC	50	0	50			
	14	X	0.1	30%	1-1-1-1								
	16	X	0.1	30%	1-2-4-5						Soil sample: HTW35.0-SON01-014.0		
	18	X	0.3	30%	1-3-2-5						Soil sample: HTW35.0-SON01-016.0		
Well-graded gravel	20	X	--	5%	82/6"	Light gray (7.5YR 7/1), dry, loose, no plasticity, pulverized small fragments of basalt.	GW	100	0	0	Terminate boring at 19' due to refusal.		
	22												
	24												
	26												
	28												
	30												
	32												
	34												
	36												
	38												
Comments:													

***Appendix C – Initial and Phase 2 Holding Tank and Leach Tank
Level II Laboratory Reports***

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ANALYTICAL REPORT

Eurofins Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-109299-1

Client Project/Site: Red Hill JBPHH N62742-17-D-1800
CV18F0126

Revision: 4

For:

AECOM
1001 Bishop Street
Honolulu, Hawaii 96813

Attn: Jeff Hart

M. Elaine Walker

Authorized for release by:

8/24/2022 5:17:52 PM

Elaine Walker, Project Manager II
(253)248-4972

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Case Narrative

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Job ID: 580-109299-1

Laboratory: Eurofins Seattle

Narrative

CASE NARRATIVE

Client: AECOM

Project: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Report Number: 580-109299-1

REVISION 4: AUGUST 24, 2022

Report revised to change the GRO carbon range to C6-C10.

REVISION 3: May 25, 2022

This revision is to moisture correct the 8260 and GRO results for samples LT-N40-7-8 (580-109299-8), which was missed in revision 1 and LT-N10-7-8-Dup (580-109299-23), which used the moisture from its duplicate (LT-N10-7-8 (580-109299-11)) per client request.

REVISION 2: May 11, 2022

This revision is to moisture correct the 8260 and GRO results (except sample LT-N10-7-8-Dup (580-109299-23) as they were inadvertently not moisture corrected in the original report.

REVISION 1: APRIL 7, 2022

This revision is to correct the client ID as follows: sample 580-109299-7 has been updated from LT-N25-16-17 to HT-N25-16-17 per client email. It should be noted that the sample chromatograms and quantitation reports are unable to be updated as they are processed outside of the LIMS. All other forms have been corrected.

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

Following DoD QSM guidelines, manual integrations were performed only when necessary and are in compliance with the laboratory's standard operating procedure, Acceptable Manual Integration Practices, SOP No.: Q-S-002. The reason(s) for manual integration have been documented on the affected chromatogram(s), which is/are provided in the raw data package. The raw data also includes the original chromatogram(s) prior to any manual integration being performed. Manual integrations are detailed in the manual integration summary forms following this narrative.

It should be noted that samples with elevated Limits of Quantitation (LOQs) resulting from a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the LOQs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes within the calibration range of the instrument or that reduces the interferences thereby enabling the quantification of target analytes.

LT-N25-16-17

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 01/14/2022 and 01/14/2022; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.7 C.

Receipt Exceptions

One or more containers for the following samples were received broken: TB01 (580-109299-24). This trip blank was unable to be salvaged since it had completely frozen and burst the container's bottom.

The cooler containing all of the VOA vials did not arrive by FedEx with the other containers. They were picked up from the FedEx Facility and arrived at the lab 1620 1/14/22.

Insufficient sample volume was provided for the following samples for the Moisture analysis: LT-N10-7-8-Dup (580-109299-23). There is no bulk soil for this field duplicate sample and cannot be corrected for Dry Weight.

Case Narrative

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Job ID: 580-109299-1 (Continued)

Laboratory: Eurofins Seattle (Continued)

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples LT-W17.5-12-13 (580-109299-1), LT-N10-21-22 (580-109299-2), LT-E10-7-8 (580-109299-3), LT-S25-7-8 (580-109299-4), LT-W10-11-12 (580-109299-5), LT-W10-19-20 (580-109299-6), HT-N10-19-20 (580-109299-7), LT-N40-7-8 (580-109299-8), LT-N25-16-17 (580-109299-9), LT-S10-17-18 (580-109299-10), LT-N10-7-8 (580-109299-11), HT-N10-24-25 (580-109299-12), HT-W10-18-19 (580-109299-13), HT-W10-22-23 (580-109299-14), LT-S17.5-5-6 (580-109299-15), LT-W55-17-18 (580-109299-16), LT-W19.5-14-15 (580-109299-17), LT-S10-23-24 (580-109299-18), LT-W40-9-10 (580-109299-19), LT-N25-27-27.5 (580-109299-20), LT-S25-14-15 (580-109299-21), LT-W25-14-15 (580-109299-22) and LT-N10-7-8-Dup (580-109299-23) were analyzed for volatile organic compounds (GC-MS) in accordance with 8260D_DOD5. The samples were prepared on 01/15/2022 and analyzed on 01/16/2022 and 01/17/2022.

Sample LT-W17.5-12-13 (580-109299-1) which was used for the MS/MSD was non detect when run at dilution. It was reanalyzed at a lesser dilution. Both sets of data are reported due to this sample being used as the MS/MSD in the initial batch. LT-W17.5-12-13 (580-109299-1), (580-109299-D-1-B MS) and (580-109299-D-1-C MSD)

Surrogate recovery was outside drift limits for the CCVIS but within surrogate recovery limits for 1,2-Dichloroethane-d4 (Surr): (CCVIS 580-378538/3). Recovery limit 71%, CCVIS recovered at 75%. All samples are within recovery limits.

The following samples were analyzed at reduced volume due to high concentrations of target analytes: LT-W17.5-12-13 (580-109299-1), LT-W10-11-12 (580-109299-5), LT-W10-19-20 (580-109299-6), LT-N25-16-17 (580-109299-9), (580-109299-D-1-B MS) and (580-109299-D-1-C MSD). The calculation was performed using an initial volume adjustment rather than a dilution factor. The reporting limits have been elevated by the appropriate factor.

The following sample was analyzed at reduced volume due to high concentrations of target analytes: LT-N10-7-8-Dup (580-109299-23). The calculation was performed using an initial volume adjustment rather than a dilution factor. The reporting limits have been elevated by the appropriate factor.

Surrogate recovery for the following sample was outside control limits: LT-N10-7-8-Dup (580-109299-23). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

VOA Prep

Method 5035: The following samples was provided to the laboratory with a significantly different initial weight than that required by the reference method: LT-W17.5-12-13 (580-109299-1), LT-S25-7-8 (580-109299-4), HT-N10-19-20 (580-109299-7), LT-N40-7-8 (580-109299-8), LT-N25-16-17 (580-109299-9), HT-N10-24-25 (580-109299-12), HT-W10-18-19 (580-109299-13), HT-W10-22-23 (580-109299-14), LT-S17.5-5-6 (580-109299-15), LT-W19.5-14-15 (580-109299-17), LT-N25-27-27.5 (580-109299-20), (580-109299-D-1 MS) and (580-109299-D-1 MSD). Deviations in the weight by more than 20% may affect reporting limits and potentially method performance. The method specifies 10g. The amount provided was below this range.

Method 5035: The following samples were provided to the laboratory with a significantly different initial weight than that required by the reference method: LT-S25-14-15 (580-109299-21), LT-W25-14-15 (580-109299-22) and LT-N10-7-8-Dup (580-109299-23). Deviations in the weight by more than 20% may affect reporting limits and potentially method performance. The method specifies 10g. The amount provided was below this range.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SEMIVOLATILE ORGANIC COMPOUNDS - SELECTED ION MODE (SIM)

Samples LT-W17.5-12-13 (580-109299-1), LT-N10-21-22 (580-109299-2), LT-E10-7-8 (580-109299-3), LT-S25-7-8 (580-109299-4), LT-W10-11-12 (580-109299-5), LT-W10-19-20 (580-109299-6), HT-N10-19-20 (580-109299-7), LT-N40-7-8 (580-109299-8), LT-N25-16-17 (580-109299-9), LT-S10-17-18 (580-109299-10), LT-N10-7-8 (580-109299-11), HT-N10-24-25 (580-109299-12), HT-W10-18-19 (580-109299-13), HT-W10-22-23 (580-109299-14), LT-S17.5-5-6 (580-109299-15), LT-W55-17-18 (580-109299-16), LT-W19.5-14-15

Case Narrative

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Job ID: 580-109299-1 (Continued)

Laboratory: Eurofins Seattle (Continued)

(580-109299-17), LT-S10-23-24 (580-109299-18), LT-W40-9-10 (580-109299-19), LT-N25-27-27.5 (580-109299-20), LT-S25-14-15 (580-109299-21) and LT-W25-14-15 (580-109299-22) were analyzed for semivolatile organic compounds - Selected Ion Mode (SIM) in accordance with 8270E SIM. The samples were prepared on 01/14/2022 and analyzed on 01/15/2022.

The following samples was diluted due to the black color and odor of the sample: LT-N40-7-8 (580-109299-8). Elevated reporting limits (RL) are provided.

1-Methylnaphthalene, 2-Methylnaphthalene and Naphthalene failed the recovery criteria high for the MS of sample LT-W17.5-12-13MS (580-109299-1) in batch 580-378418. 1-Methylnaphthalene and 2-Methylnaphthalene failed the recovery criteria low for the MSD. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits. In addition, 1-Methylnaphthalene, 2-Methylnaphthalene and Naphthalene exceeded the RPD limit.

The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GASOLINE RANGE ORGANICS (GRO)

Samples LT-W17.5-12-13 (580-109299-1), LT-N10-21-22 (580-109299-2), LT-E10-7-8 (580-109299-3), LT-S25-7-8 (580-109299-4), LT-W10-11-12 (580-109299-5), LT-W10-19-20 (580-109299-6), HT-N10-19-20 (580-109299-7), LT-N40-7-8 (580-109299-8), LT-N25-16-17 (580-109299-9), LT-S10-17-18 (580-109299-10), LT-N10-7-8 (580-109299-11), HT-N10-24-25 (580-109299-12), HT-W10-18-19 (580-109299-13), HT-W10-22-23 (580-109299-14), LT-S17.5-5-6 (580-109299-15), LT-W55-17-18 (580-109299-16), LT-W19.5-14-15 (580-109299-17), LT-S10-23-24 (580-109299-18), LT-W40-9-10 (580-109299-19), LT-N25-27-27.5 (580-109299-20), LT-S25-14-15 (580-109299-21), LT-W25-14-15 (580-109299-22) and LT-N10-7-8-Dup (580-109299-23) were analyzed for gasoline range organics (GRO) in accordance with 8260B CALUFT. The samples were prepared on 01/15/2022 and analyzed on 01/15/2022, 01/16/2022 and 01/17/2022.

The following samples were analyzed at reduced volume due to high concentrations of target analytes: LT-W17.5-12-13 (580-109299-1), LT-W10-11-12 (580-109299-5) and LT-N25-16-17 (580-109299-9). The calculation was performed using an initial volume adjustment rather than a dilution factor. The reporting limits have been elevated by the appropriate factor.

Surrogate recovery for the following samples was outside control limits high for 4-Bromofluorobenzene (Surr): LT-W10-19-20 (580-109299-6) and LT-N10-7-8 (580-109299-11). Evidence of matrix interference is present; therefore, re-analysis was not performed.

The following sample was analyzed at reduced volume due to high concentrations of target analytes: LT-N10-7-8-Dup (580-109299-23). The calculation was performed using an initial volume adjustment rather than a dilution factor. The reporting limits have been elevated by the appropriate factor.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DIESEL RANGE ORGANICS

Samples LT-W17.5-12-13 (580-109299-1), LT-N10-21-22 (580-109299-2), LT-E10-7-8 (580-109299-3), LT-S25-7-8 (580-109299-4), LT-W10-11-12 (580-109299-5), LT-W10-19-20 (580-109299-6), HT-N10-19-20 (580-109299-7), LT-N40-7-8 (580-109299-8), LT-N25-16-17 (580-109299-9), LT-S10-17-18 (580-109299-10), LT-N10-7-8 (580-109299-11), HT-N10-24-25 (580-109299-12), HT-W10-18-19 (580-109299-13), HT-W10-22-23 (580-109299-14), LT-S17.5-5-6 (580-109299-15), LT-W55-17-18 (580-109299-16), LT-W19.5-14-15 (580-109299-17), LT-S10-23-24 (580-109299-18), LT-W40-9-10 (580-109299-19), LT-N25-27-27.5 (580-109299-20), LT-S25-14-15 (580-109299-21) and LT-W25-14-15 (580-109299-22) were analyzed for diesel range organics in accordance with 8015DRO. The samples were prepared on 01/14/2022 and analyzed on 01/15/2022 and 01/16/2022.

Sample LT-N40-7-8 (580-109299-8)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

C10-C24 failed the recovery criteria high for the MS/MSD of sample LT-W17.5-12-13 (580-109299-1) in batch 580-378473. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample / laboratory sample control duplicate (LCS/LCSD) precision was within acceptance limits.

Case Narrative

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Job ID: 580-109299-1 (Continued)

Laboratory: Eurofins Seattle (Continued)

The peak profile present in this sample LT-S17.5-5-6 (580-109299-15) and LT-W19.5-14-15 (580-109299-17) is atypical of a hydrocarbon pattern and consists of discrete peaks.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PERCENT SOLIDS

Samples LT-W17.5-12-13 (580-109299-1), LT-N10-21-22 (580-109299-2), LT-E10-7-8 (580-109299-3), LT-S25-7-8 (580-109299-4), LT-W10-11-12 (580-109299-5), LT-W10-19-20 (580-109299-6), HT-N10-19-20 (580-109299-7), LT-N40-7-8 (580-109299-8), LT-N25-16-17 (580-109299-9), LT-S10-17-18 (580-109299-10), LT-N10-7-8 (580-109299-11), HT-N10-24-25 (580-109299-12), HT-W10-18-19 (580-109299-13), HT-W10-22-23 (580-109299-14), LT-S17.5-5-6 (580-109299-15), LT-W55-17-18 (580-109299-16), LT-W19.5-14-15 (580-109299-17), LT-S10-23-24 (580-109299-18), LT-W40-9-10 (580-109299-19), LT-N25-27-27.5 (580-109299-20), LT-S25-14-15 (580-109299-21) and LT-W25-14-15 (580-109299-22) were analyzed for percent solids in accordance with ASTM D2216. The samples were analyzed on 01/14/2022.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: AECOM

Job ID: 580-109299-1

Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

GC/MS Semi VOA

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

GC Semi VOA

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
D	The reported value is from a dilution.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)

Eurofins Seattle

Definitions/Glossary

Client: AECOM

Job ID: 580-109299-1

Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

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Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W17.5-12-13

Lab Sample ID: 580-109299-1

Date Collected: 01/12/22 15:05

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 57.1

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	3300		1800	600	mg/Kg	☼	01/15/22 11:51	01/15/22 14:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	96		67 - 134				01/15/22 11:51	01/15/22 14:45	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	6.9	U	9.2	1.7	mg/Kg	☼	01/15/22 11:14	01/16/22 14:56	1
Toluene	14	U	28	6.2	mg/Kg	☼	01/15/22 11:14	01/16/22 14:56	1
Ethylbenzene	14	U	18	4.2	mg/Kg	☼	01/15/22 11:14	01/16/22 14:56	1
m-Xylene & p-Xylene	6.9	U	18	3.3	mg/Kg	☼	01/15/22 11:14	01/16/22 14:56	1
o-Xylene	6.9	U	18	2.3	mg/Kg	☼	01/15/22 11:14	01/16/22 14:56	1
Xylenes, Total	6.9	U	18	3.3	mg/Kg	☼	01/15/22 11:14	01/16/22 14:56	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	97		85 - 116				01/15/22 11:14	01/16/22 14:56	1
4-Bromofluorobenzene (Surr)	101		79 - 119				01/15/22 11:14	01/16/22 14:56	1
Dibromofluoromethane (Surr)	101		78 - 119				01/15/22 11:14	01/16/22 14:56	1
1,2-Dichloroethane-d4 (Surr)	99	M	71 - 136				01/15/22 11:14	01/16/22 14:56	1

Method: 8260D - Volatile Organic Compounds (GC/MS) - RA

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.69	U	0.92	0.17	mg/Kg	☼	01/15/22 11:14	01/17/22 12:25	1
Toluene	1.4	U	2.8	0.62	mg/Kg	☼	01/15/22 11:14	01/17/22 12:25	1
Ethylbenzene	1.4	U	1.8	0.42	mg/Kg	☼	01/15/22 11:14	01/17/22 12:25	1
m-Xylene & p-Xylene	1.7	J	1.8	0.33	mg/Kg	☼	01/15/22 11:14	01/17/22 12:25	1
o-Xylene	3.6		1.8	0.23	mg/Kg	☼	01/15/22 11:14	01/17/22 12:25	1
Xylenes, Total	5.3		1.8	0.33	mg/Kg	☼	01/15/22 11:14	01/17/22 12:25	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	100		85 - 116				01/15/22 11:14	01/17/22 12:25	1
4-Bromofluorobenzene (Surr)	100		79 - 119				01/15/22 11:14	01/17/22 12:25	1
Dibromofluoromethane (Surr)	94		78 - 119				01/15/22 11:14	01/17/22 12:25	1
1,2-Dichloroethane-d4 (Surr)	84	Q	71 - 136				01/15/22 11:14	01/17/22 12:25	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	9.1	J1	0.0084	0.0011	mg/Kg	☼	01/14/22 16:26	01/15/22 00:57	1
2-Methylnaphthalene	13	J1	0.0084	0.0035	mg/Kg	☼	01/14/22 16:26	01/15/22 00:57	1
Naphthalene	4.1	J1	0.0084	0.0027	mg/Kg	☼	01/14/22 16:26	01/15/22 00:57	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	32		28 - 143				01/14/22 16:26	01/15/22 00:57	1
2-methylnaphthalene-d10	63		40 - 140				01/14/22 16:26	01/15/22 00:57	1
Fluoranthene-d10 (Surr)	79		40 - 140				01/14/22 16:26	01/15/22 00:57	1
Terphenyl-d14	95		58 - 132				01/14/22 16:26	01/15/22 00:57	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	4700	J1	77	15	mg/Kg	☼	01/14/22 16:25	01/15/22 21:42	1
Motor Oil Range Organics (C24-C40)	46	U	77	31	mg/Kg	☼	01/14/22 16:25	01/15/22 21:42	1

Eurofins Seattle

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W17.5-12-13

Lab Sample ID: 580-109299-1

Date Collected: 01/12/22 15:05

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 57.1

Surrogate	%Recovery	Qualifier	Limits		Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	90		45 - 130		01/14/22 16:25	01/15/22 21:42	1

General Chemistry									
Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	57.1		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	42.9		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-N10-21-22

Lab Sample ID: 580-109299-2

Date Collected: 01/12/22 10:58

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 67.3

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	3.4	J	7.2	2.3	mg/Kg	☼	01/15/22 11:51	01/15/22 15:09	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	92		67 - 134				01/15/22 11:51	01/15/22 15:09	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.027	U	0.036	0.0068	mg/Kg	☼	01/15/22 11:14	01/16/22 16:05	1
Toluene	0.054	U	0.11	0.024	mg/Kg	☼	01/15/22 11:14	01/16/22 16:05	1
Ethylbenzene	0.054	U	0.072	0.016	mg/Kg	☼	01/15/22 11:14	01/16/22 16:05	1
m-Xylene & p-Xylene	0.027	U	0.072	0.013	mg/Kg	☼	01/15/22 11:14	01/16/22 16:05	1
o-Xylene	0.027	U	0.072	0.0090	mg/Kg	☼	01/15/22 11:14	01/16/22 16:05	1
Xylenes, Total	0.027	U	0.072	0.013	mg/Kg	☼	01/15/22 11:14	01/16/22 16:05	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	99		85 - 116				01/15/22 11:14	01/16/22 16:05	1
4-Bromofluorobenzene (Surr)	99		79 - 119				01/15/22 11:14	01/16/22 16:05	1
Dibromofluoromethane (Surr)	95	M	78 - 119				01/15/22 11:14	01/16/22 16:05	1
1,2-Dichloroethane-d4 (Surr)	96	M	71 - 136				01/15/22 11:14	01/16/22 16:05	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.039		0.0065	0.00081	mg/Kg	☼	01/14/22 16:26	01/15/22 02:09	1
2-Methylnaphthalene	0.053		0.0065	0.0026	mg/Kg	☼	01/14/22 16:26	01/15/22 02:09	1
Naphthalene	0.011	M	0.0065	0.0021	mg/Kg	☼	01/14/22 16:26	01/15/22 02:09	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	64		28 - 143				01/14/22 16:26	01/15/22 02:09	1
2-methylnaphthalene-d10	71		40 - 140				01/14/22 16:26	01/15/22 02:09	1
Fluoranthene-d10 (Surr)	88		40 - 140				01/14/22 16:26	01/15/22 02:09	1
Terphenyl-d14	91		58 - 132				01/14/22 16:26	01/15/22 02:09	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	42	J	69	14	mg/Kg	☼	01/14/22 16:25	01/15/22 22:40	1
Motor Oil Range Organics (C24-C40)	42	U	69	28	mg/Kg	☼	01/14/22 16:25	01/15/22 22:40	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	83		45 - 130				01/14/22 16:25	01/15/22 22:40	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	67.3		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	32.7		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-E10-7-8

Lab Sample ID: 580-109299-3

Date Collected: 01/12/22 13:25

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 70.6

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	5.0	U	6.6	2.2	mg/Kg	☼	01/15/22 11:51	01/15/22 15:32	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	85		67 - 134				01/15/22 11:51	01/15/22 15:32	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.025	U	0.033	0.0063	mg/Kg	☼	01/15/22 11:14	01/16/22 16:28	1
Toluene	0.050	U	0.10	0.022	mg/Kg	☼	01/15/22 11:14	01/16/22 16:28	1
Ethylbenzene	0.050	U	0.066	0.015	mg/Kg	☼	01/15/22 11:14	01/16/22 16:28	1
m-Xylene & p-Xylene	0.025	U	0.066	0.012	mg/Kg	☼	01/15/22 11:14	01/16/22 16:28	1
o-Xylene	0.025	U	0.066	0.0083	mg/Kg	☼	01/15/22 11:14	01/16/22 16:28	1
Xylenes, Total	0.025	U	0.066	0.012	mg/Kg	☼	01/15/22 11:14	01/16/22 16:28	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	99		85 - 116				01/15/22 11:14	01/16/22 16:28	1
4-Bromofluorobenzene (Surr)	97		79 - 119				01/15/22 11:14	01/16/22 16:28	1
Dibromofluoromethane (Surr)	95		78 - 119				01/15/22 11:14	01/16/22 16:28	1
1,2-Dichloroethane-d4 (Surr)	94		71 - 136				01/15/22 11:14	01/16/22 16:28	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0017	U	0.0057	0.00072	mg/Kg	☼	01/14/22 16:26	01/15/22 02:33	1
2-Methylnaphthalene	0.0034	U	0.0057	0.0023	mg/Kg	☼	01/14/22 16:26	01/15/22 02:33	1
Naphthalene	0.0046	U	0.0057	0.0019	mg/Kg	☼	01/14/22 16:26	01/15/22 02:33	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	69		28 - 143				01/14/22 16:26	01/15/22 02:33	1
2-methylnaphthalene-d10	68		40 - 140				01/14/22 16:26	01/15/22 02:33	1
Fluoranthene-d10 (Surr)	79		40 - 140				01/14/22 16:26	01/15/22 02:33	1
Terphenyl-d14	89		58 - 132				01/14/22 16:26	01/15/22 02:33	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	31	U	52	10	mg/Kg	☼	01/14/22 16:25	01/15/22 22:59	1
Motor Oil Range Organics (C24-C40)	25	J	52	21	mg/Kg	☼	01/14/22 16:25	01/15/22 22:59	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	81		45 - 130				01/14/22 16:25	01/15/22 22:59	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	70.6		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	29.4		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-S25-7-8

Lab Sample ID: 580-109299-4

Date Collected: 01/12/22 14:22

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 78.0

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	8.6	U	12	3.7	mg/Kg	☼	01/15/22 11:51	01/15/22 13:36	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	82		67 - 134				01/15/22 11:51	01/15/22 13:36	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.043	U	0.058	0.011	mg/Kg	☼	01/15/22 11:14	01/16/22 16:51	1
Toluene	0.086	U	0.17	0.039	mg/Kg	☼	01/15/22 11:14	01/16/22 16:51	1
Ethylbenzene	0.086	U	0.12	0.026	mg/Kg	☼	01/15/22 11:14	01/16/22 16:51	1
m-Xylene & p-Xylene	0.043	U	0.12	0.020	mg/Kg	☼	01/15/22 11:14	01/16/22 16:51	1
o-Xylene	0.043	U	0.12	0.014	mg/Kg	☼	01/15/22 11:14	01/16/22 16:51	1
Xylenes, Total	0.043	U	0.12	0.020	mg/Kg	☼	01/15/22 11:14	01/16/22 16:51	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	98		85 - 116				01/15/22 11:14	01/16/22 16:51	1
4-Bromofluorobenzene (Surr)	93		79 - 119				01/15/22 11:14	01/16/22 16:51	1
Dibromofluoromethane (Surr)	92		78 - 119				01/15/22 11:14	01/16/22 16:51	1
1,2-Dichloroethane-d4 (Surr)	94		71 - 136				01/15/22 11:14	01/16/22 16:51	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0019	U	0.0063	0.00080	mg/Kg	☼	01/14/22 16:26	01/15/22 02:57	1
2-Methylnaphthalene	0.0038	U	0.0063	0.0026	mg/Kg	☼	01/14/22 16:26	01/15/22 02:57	1
Naphthalene	0.0051	U	0.0063	0.0020	mg/Kg	☼	01/14/22 16:26	01/15/22 02:57	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	69		28 - 143				01/14/22 16:26	01/15/22 02:57	1
2-methylnaphthalene-d10	77		40 - 140				01/14/22 16:26	01/15/22 02:57	1
Fluoranthene-d10 (Surr)	95		40 - 140				01/14/22 16:26	01/15/22 02:57	1
Terphenyl-d14	114		58 - 132				01/14/22 16:26	01/15/22 02:57	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	33	U	55	11	mg/Kg	☼	01/14/22 16:25	01/15/22 23:18	1
Motor Oil Range Organics (C24-C40)	33	U	55	22	mg/Kg	☼	01/14/22 16:25	01/15/22 23:18	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	84		45 - 130				01/14/22 16:25	01/15/22 23:18	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	78.0		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	22.0		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W10-11-12

Lab Sample ID: 580-109299-5

Date Collected: 01/11/22 15:20

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 77.9

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	250	J	630	200	mg/Kg	☼	01/15/22 11:51	01/15/22 15:55	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	90		67 - 134				01/15/22 11:51	01/15/22 15:55	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.047	U	0.063	0.012	mg/Kg	☼	01/15/22 11:14	01/17/22 13:35	1
Toluene	0.094	U	0.19	0.042	mg/Kg	☼	01/15/22 11:14	01/17/22 13:35	1
Ethylbenzene	0.094	U	0.13	0.028	mg/Kg	☼	01/15/22 11:14	01/17/22 13:35	1
m-Xylene & p-Xylene	0.59		0.13	0.022	mg/Kg	☼	01/15/22 11:14	01/17/22 13:35	1
o-Xylene	2.0		0.13	0.016	mg/Kg	☼	01/15/22 11:14	01/17/22 13:35	1
Xylenes, Total	2.6		0.13	0.022	mg/Kg	☼	01/15/22 11:14	01/17/22 13:35	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	111		85 - 116				01/15/22 11:14	01/17/22 13:35	1
4-Bromofluorobenzene (Surr)	92		79 - 119				01/15/22 11:14	01/17/22 13:35	1
Dibromofluoromethane (Surr)	82		78 - 119				01/15/22 11:14	01/17/22 13:35	1
1,2-Dichloroethane-d4 (Surr)	78	Q	71 - 136				01/15/22 11:14	01/17/22 13:35	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	1.7		0.0058	0.00073	mg/Kg	☼	01/14/22 16:26	01/15/22 03:20	1
2-Methylnaphthalene	2.6		0.0058	0.0024	mg/Kg	☼	01/14/22 16:26	01/15/22 03:20	1
Naphthalene	0.61		0.0058	0.0019	mg/Kg	☼	01/14/22 16:26	01/15/22 03:20	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	52		28 - 143				01/14/22 16:26	01/15/22 03:20	1
2-methylnaphthalene-d10	73		40 - 140				01/14/22 16:26	01/15/22 03:20	1
Fluoranthene-d10 (Surr)	87		40 - 140				01/14/22 16:26	01/15/22 03:20	1
Terphenyl-d14	103		58 - 132				01/14/22 16:26	01/15/22 03:20	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	370		58	11	mg/Kg	☼	01/14/22 16:25	01/15/22 23:38	1
Motor Oil Range Organics (C24-C40)	140		58	23	mg/Kg	☼	01/14/22 16:25	01/15/22 23:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	83		45 - 130				01/14/22 16:25	01/15/22 23:38	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	77.9		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	22.1		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W10-19-20

Lab Sample ID: 580-109299-6

Date Collected: 01/11/22 16:02

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 66.2

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	140		7.5	2.4	mg/Kg	☆	01/15/22 11:51	01/15/22 16:41	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	140	Q	67 - 134				01/15/22 11:51	01/15/22 16:41	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.060	U	0.080	0.015	mg/Kg	☆	01/15/22 11:14	01/17/22 13:58	1
Toluene	0.12	U	0.24	0.054	mg/Kg	☆	01/15/22 11:14	01/17/22 13:58	1
Ethylbenzene	0.12	U	0.16	0.037	mg/Kg	☆	01/15/22 11:14	01/17/22 13:58	1
m-Xylene & p-Xylene	0.48	M	0.16	0.028	mg/Kg	☆	01/15/22 11:14	01/17/22 13:58	1
o-Xylene	0.88		0.16	0.020	mg/Kg	☆	01/15/22 11:14	01/17/22 13:58	1
Xylenes, Total	1.4		0.16	0.028	mg/Kg	☆	01/15/22 11:14	01/17/22 13:58	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	104		85 - 116				01/15/22 11:14	01/17/22 13:58	1
4-Bromofluorobenzene (Surr)	94		79 - 119				01/15/22 11:14	01/17/22 13:58	1
Dibromofluoromethane (Surr)	80		78 - 119				01/15/22 11:14	01/17/22 13:58	1
1,2-Dichloroethane-d4 (Surr)	74	Q	71 - 136				01/15/22 11:14	01/17/22 13:58	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	1.1		0.0072	0.00091	mg/Kg	☆	01/14/22 16:26	01/15/22 03:44	1
2-Methylnaphthalene	1.6		0.0072	0.0029	mg/Kg	☆	01/14/22 16:26	01/15/22 03:44	1
Naphthalene	0.36		0.0072	0.0023	mg/Kg	☆	01/14/22 16:26	01/15/22 03:44	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	62		28 - 143				01/14/22 16:26	01/15/22 03:44	1
2-methylnaphthalene-d10	73		40 - 140				01/14/22 16:26	01/15/22 03:44	1
Fluoranthene-d10 (Surr)	83		40 - 140				01/14/22 16:26	01/15/22 03:44	1
Terphenyl-d14	104		58 - 132				01/14/22 16:26	01/15/22 03:44	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	510		54	11	mg/Kg	☆	01/14/22 16:25	01/16/22 00:16	1
Motor Oil Range Organics (C24-C40)	29	J	54	22	mg/Kg	☆	01/14/22 16:25	01/16/22 00:16	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	81		45 - 130				01/14/22 16:25	01/16/22 00:16	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	66.2		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	33.8		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: HT-N10-19-20

Lab Sample ID: 580-109299-7

Date Collected: 01/12/22 16:08

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 66.8

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	160		16	5.1	mg/Kg	☼	01/15/22 11:51	01/15/22 17:04	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	113		67 - 134				01/15/22 11:51	01/15/22 17:04	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.058	U	0.078	0.015	mg/Kg	☼	01/15/22 11:14	01/16/22 18:00	1
Toluene	0.12	U	0.23	0.053	mg/Kg	☼	01/15/22 11:14	01/16/22 18:00	1
Ethylbenzene	0.12	U	0.16	0.035	mg/Kg	☼	01/15/22 11:14	01/16/22 18:00	1
m-Xylene & p-Xylene	0.058	U	0.16	0.028	mg/Kg	☼	01/15/22 11:14	01/16/22 18:00	1
o-Xylene	0.23		0.16	0.019	mg/Kg	☼	01/15/22 11:14	01/16/22 18:00	1
Xylenes, Total	0.23		0.16	0.028	mg/Kg	☼	01/15/22 11:14	01/16/22 18:00	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	103		85 - 116				01/15/22 11:14	01/16/22 18:00	1
4-Bromofluorobenzene (Surr)	105		79 - 119				01/15/22 11:14	01/16/22 18:00	1
Dibromofluoromethane (Surr)	101		78 - 119				01/15/22 11:14	01/16/22 18:00	1
1,2-Dichloroethane-d4 (Surr)	96		71 - 136				01/15/22 11:14	01/16/22 18:00	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	1.2		0.0071	0.00089	mg/Kg	☼	01/14/22 16:26	01/15/22 04:08	1
2-Methylnaphthalene	1.7		0.0071	0.0029	mg/Kg	☼	01/14/22 16:26	01/15/22 04:08	1
Naphthalene	0.40		0.0071	0.0023	mg/Kg	☼	01/14/22 16:26	01/15/22 04:08	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	51		28 - 143				01/14/22 16:26	01/15/22 04:08	1
2-methylnaphthalene-d10	65		40 - 140				01/14/22 16:26	01/15/22 04:08	1
Fluoranthene-d10 (Surr)	73		40 - 140				01/14/22 16:26	01/15/22 04:08	1
Terphenyl-d14	90		58 - 132				01/14/22 16:26	01/15/22 04:08	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	1200		62	12	mg/Kg	☼	01/14/22 16:25	01/16/22 00:35	1
Motor Oil Range Organics (C24-C40)	37	U	62	25	mg/Kg	☼	01/14/22 16:25	01/16/22 00:35	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	88		45 - 130				01/14/22 16:25	01/16/22 00:35	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	66.8		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	33.2		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-N40-7-8

Lab Sample ID: 580-109299-8

Date Collected: 01/12/22 15:42

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 79.7

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	42		11	3.7	mg/Kg	✱	01/15/22 11:51	01/15/22 17:28	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	105		67 - 134				01/15/22 11:51	01/15/22 17:28	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.042	U	0.056	0.011	mg/Kg	✱	01/15/22 11:14	01/16/22 18:23	1
Toluene	0.085	U	0.17	0.038	mg/Kg	✱	01/15/22 11:14	01/16/22 18:23	1
Ethylbenzene	0.085	U	0.11	0.026	mg/Kg	✱	01/15/22 11:14	01/16/22 18:23	1
m-Xylene & p-Xylene	0.042	U	0.11	0.020	mg/Kg	✱	01/15/22 11:14	01/16/22 18:23	1
o-Xylene	0.042	U	0.11	0.014	mg/Kg	✱	01/15/22 11:14	01/16/22 18:23	1
Xylenes, Total	0.042	U	0.11	0.020	mg/Kg	✱	01/15/22 11:14	01/16/22 18:23	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	98		85 - 116				01/15/22 11:14	01/16/22 18:23	1
4-Bromofluorobenzene (Surr)	94		79 - 119				01/15/22 11:14	01/16/22 18:23	1
Dibromofluoromethane (Surr)	92		78 - 119				01/15/22 11:14	01/16/22 18:23	1
1,2-Dichloroethane-d4 (Surr)	93		71 - 136				01/15/22 11:14	01/16/22 18:23	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0026	J M	0.0050	0.00063	mg/Kg	✱	01/14/22 16:26	01/15/22 19:29	1
2-Methylnaphthalene	0.0056	M	0.0050	0.0020	mg/Kg	✱	01/14/22 16:26	01/15/22 19:29	1
Naphthalene	0.0040	U M	0.0050	0.0016	mg/Kg	✱	01/14/22 16:26	01/15/22 19:29	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	60		28 - 143				01/14/22 16:26	01/15/22 19:29	1
2-methylnaphthalene-d10	78		40 - 140				01/14/22 16:26	01/15/22 19:29	1
Fluoranthene-d10 (Surr)	62		40 - 140				01/14/22 16:26	01/15/22 19:29	1
Terphenyl-d14	77		58 - 132				01/14/22 16:26	01/15/22 19:29	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	370	U	610	120	mg/Kg	✱	01/14/22 16:25	01/16/22 16:17	10
Motor Oil Range Organics (C24-C40)	640	D	610	240	mg/Kg	✱	01/14/22 16:25	01/16/22 16:17	10
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	88		45 - 130				01/14/22 16:25	01/16/22 16:17	10

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	79.7		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	20.3		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-N25-16-17

Lab Sample ID: 580-109299-9

Date Collected: 01/12/22 13:36

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 66.1

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	980	J	1500	480	mg/Kg	☼	01/15/22 11:51	01/15/22 17:51	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		67 - 134				01/15/22 11:51	01/15/22 17:51	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.56	U	0.74	0.14	mg/Kg	☼	01/15/22 11:14	01/17/22 13:12	1
Toluene	1.1	U	2.2	0.50	mg/Kg	☼	01/15/22 11:14	01/17/22 13:12	1
Ethylbenzene	0.37	J	1.5	0.34	mg/Kg	☼	01/15/22 11:14	01/17/22 13:12	1
m-Xylene & p-Xylene	2.6		1.5	0.26	mg/Kg	☼	01/15/22 11:14	01/17/22 13:12	1
o-Xylene	4.6		1.5	0.19	mg/Kg	☼	01/15/22 11:14	01/17/22 13:12	1
Xylenes, Total	7.2		1.5	0.26	mg/Kg	☼	01/15/22 11:14	01/17/22 13:12	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	104		85 - 116				01/15/22 11:14	01/17/22 13:12	1
4-Bromofluorobenzene (Surr)	97		79 - 119				01/15/22 11:14	01/17/22 13:12	1
Dibromofluoromethane (Surr)	91		78 - 119				01/15/22 11:14	01/17/22 13:12	1
1,2-Dichloroethane-d4 (Surr)	83	Q	71 - 136				01/15/22 11:14	01/17/22 13:12	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	6.9		0.0069	0.00087	mg/Kg	☼	01/14/22 16:26	01/15/22 04:56	1
2-Methylnaphthalene	11		0.0069	0.0028	mg/Kg	☼	01/14/22 16:26	01/15/22 04:56	1
Naphthalene	4.2		0.0069	0.0022	mg/Kg	☼	01/14/22 16:26	01/15/22 04:56	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	31		28 - 143				01/14/22 16:26	01/15/22 04:56	1
2-methylnaphthalene-d10	42		40 - 140				01/14/22 16:26	01/15/22 04:56	1
Fluoranthene-d10 (Surr)	76		40 - 140				01/14/22 16:26	01/15/22 04:56	1
Terphenyl-d14	78		58 - 132				01/14/22 16:26	01/15/22 04:56	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	5900		73	15	mg/Kg	☼	01/14/22 16:25	01/16/22 01:14	1
Motor Oil Range Organics (C24-C40)	44	U	73	29	mg/Kg	☼	01/14/22 16:25	01/16/22 01:14	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	85		45 - 130				01/14/22 16:25	01/16/22 01:14	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	66.1		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	33.9		0.1	0.1	%			01/14/22 18:41	1

Eurofins Seattle

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-S10-17-18

Lab Sample ID: 580-109299-10

Date Collected: 01/12/22 10:05

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 64.4

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	55		8.1	2.6	mg/Kg	☆	01/15/22 11:51	01/15/22 18:14	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	120		67 - 134				01/15/22 11:51	01/15/22 18:14	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.030	U	0.040	0.0077	mg/Kg	☆	01/15/22 11:14	01/16/22 19:08	1
Toluene	0.061	U	0.12	0.027	mg/Kg	☆	01/15/22 11:14	01/16/22 19:08	1
Ethylbenzene	0.061	U M	0.081	0.018	mg/Kg	☆	01/15/22 11:14	01/16/22 19:08	1
m-Xylene & p-Xylene	0.072	J M	0.081	0.014	mg/Kg	☆	01/15/22 11:14	01/16/22 19:08	1
o-Xylene	0.064	J	0.081	0.010	mg/Kg	☆	01/15/22 11:14	01/16/22 19:08	1
Xylenes, Total	0.14		0.081	0.014	mg/Kg	☆	01/15/22 11:14	01/16/22 19:08	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	100		85 - 116				01/15/22 11:14	01/16/22 19:08	1
4-Bromofluorobenzene (Surr)	100		79 - 119				01/15/22 11:14	01/16/22 19:08	1
Dibromofluoromethane (Surr)	99	M	78 - 119				01/15/22 11:14	01/16/22 19:08	1
1,2-Dichloroethane-d4 (Surr)	94	M	71 - 136				01/15/22 11:14	01/16/22 19:08	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	1.8		0.0075	0.00095	mg/Kg	☆	01/14/22 16:26	01/15/22 05:20	1
2-Methylnaphthalene	2.6		0.0075	0.0031	mg/Kg	☆	01/14/22 16:26	01/15/22 05:20	1
Naphthalene	0.81		0.0075	0.0024	mg/Kg	☆	01/14/22 16:26	01/15/22 05:20	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	53		28 - 143				01/14/22 16:26	01/15/22 05:20	1
2-methylnaphthalene-d10	73		40 - 140				01/14/22 16:26	01/15/22 05:20	1
Fluoranthene-d10 (Surr)	76		40 - 140				01/14/22 16:26	01/15/22 05:20	1
Terphenyl-d14	94		58 - 132				01/14/22 16:26	01/15/22 05:20	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	420		68	14	mg/Kg	☆	01/14/22 16:25	01/16/22 01:33	1
Motor Oil Range Organics (C24-C40)	41	U	68	27	mg/Kg	☆	01/14/22 16:25	01/16/22 01:33	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	83		45 - 130				01/14/22 16:25	01/16/22 01:33	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	64.4		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	35.6		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-N10-7-8

Lab Sample ID: 580-109299-11

Date Collected: 01/12/22 10:50

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 72.9

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	160		6.3	2.1	mg/Kg	☆	01/15/22 11:51	01/15/22 18:37	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	153	Q	67 - 134				01/15/22 11:51	01/15/22 18:37	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.024	U	0.032	0.0060	mg/Kg	☆	01/15/22 11:14	01/16/22 19:31	1
Toluene	0.047	U	0.095	0.021	mg/Kg	☆	01/15/22 11:14	01/16/22 19:31	1
Ethylbenzene	0.047	U	0.063	0.014	mg/Kg	☆	01/15/22 11:14	01/16/22 19:31	1
m-Xylene & p-Xylene	0.063		0.063	0.011	mg/Kg	☆	01/15/22 11:14	01/16/22 19:31	1
o-Xylene	0.41		0.063	0.0079	mg/Kg	☆	01/15/22 11:14	01/16/22 19:31	1
Xylenes, Total	0.47		0.063	0.011	mg/Kg	☆	01/15/22 11:14	01/16/22 19:31	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	105		85 - 116				01/15/22 11:14	01/16/22 19:31	1
4-Bromofluorobenzene (Surr)	94		79 - 119				01/15/22 11:14	01/16/22 19:31	1
Dibromofluoromethane (Surr)	92	M	78 - 119				01/15/22 11:14	01/16/22 19:31	1
1,2-Dichloroethane-d4 (Surr)	95	M	71 - 136				01/15/22 11:14	01/16/22 19:31	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	2.0		0.0066	0.00084	mg/Kg	☆	01/14/22 16:26	01/15/22 05:44	1
2-Methylnaphthalene	1.5		0.0066	0.0027	mg/Kg	☆	01/14/22 16:26	01/15/22 05:44	1
Naphthalene	0.57		0.0066	0.0022	mg/Kg	☆	01/14/22 16:26	01/15/22 05:44	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	34		28 - 143				01/14/22 16:26	01/15/22 05:44	1
2-methylnaphthalene-d10	85		40 - 140				01/14/22 16:26	01/15/22 05:44	1
Fluoranthene-d10 (Surr)	70		40 - 140				01/14/22 16:26	01/15/22 05:44	1
Terphenyl-d14	90		58 - 132				01/14/22 16:26	01/15/22 05:44	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	3500		65	13	mg/Kg	☆	01/14/22 16:25	01/16/22 01:52	1
Motor Oil Range Organics (C24-C40)	39	U	65	26	mg/Kg	☆	01/14/22 16:25	01/16/22 01:52	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	85		45 - 130				01/14/22 16:25	01/16/22 01:52	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	72.9		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	27.1		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: HT-N10-24-25

Lab Sample ID: 580-109299-12

Date Collected: 01/12/22 16:08

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 68.2

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	170		12	3.8	mg/Kg	☼	01/15/22 11:51	01/15/22 19:01	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	109		67 - 134				01/15/22 11:51	01/15/22 19:01	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.044	U	0.058	0.011	mg/Kg	☼	01/15/22 11:14	01/16/22 19:54	1
Toluene	0.087	U	0.17	0.039	mg/Kg	☼	01/15/22 11:14	01/16/22 19:54	1
Ethylbenzene	0.087	U	0.12	0.026	mg/Kg	☼	01/15/22 11:14	01/16/22 19:54	1
m-Xylene & p-Xylene	0.044	U M	0.12	0.021	mg/Kg	☼	01/15/22 11:14	01/16/22 19:54	1
o-Xylene	0.044	U M	0.12	0.015	mg/Kg	☼	01/15/22 11:14	01/16/22 19:54	1
Xylenes, Total	0.044	U	0.12	0.021	mg/Kg	☼	01/15/22 11:14	01/16/22 19:54	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	100		85 - 116				01/15/22 11:14	01/16/22 19:54	1
4-Bromofluorobenzene (Surr)	97		79 - 119				01/15/22 11:14	01/16/22 19:54	1
Dibromofluoromethane (Surr)	92		78 - 119				01/15/22 11:14	01/16/22 19:54	1
1,2-Dichloroethane-d4 (Surr)	88	M	71 - 136				01/15/22 11:14	01/16/22 19:54	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.039		0.0064	0.00080	mg/Kg	☼	01/14/22 16:26	01/15/22 06:07	1
2-Methylnaphthalene	0.060	M	0.0064	0.0026	mg/Kg	☼	01/14/22 16:26	01/15/22 06:07	1
Naphthalene	0.021	M	0.0064	0.0021	mg/Kg	☼	01/14/22 16:26	01/15/22 06:07	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	55		28 - 143				01/14/22 16:26	01/15/22 06:07	1
2-methylnaphthalene-d10	71		40 - 140				01/14/22 16:26	01/15/22 06:07	1
Fluoranthene-d10 (Surr)	87		40 - 140				01/14/22 16:26	01/15/22 06:07	1
Terphenyl-d14	99		58 - 132				01/14/22 16:26	01/15/22 06:07	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	95		71	14	mg/Kg	☼	01/14/22 16:25	01/16/22 02:11	1
Motor Oil Range Organics (C24-C40)	43	U	71	29	mg/Kg	☼	01/14/22 16:25	01/16/22 02:11	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	82		45 - 130				01/14/22 16:25	01/16/22 02:11	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	68.2		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	31.8		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: HT-W10-18-19

Lab Sample ID: 580-109299-13

Date Collected: 01/12/22 17:29

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 65.7

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	200		14	4.7	mg/Kg	☼	01/15/22 11:51	01/15/22 19:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	124		67 - 134				01/15/22 11:51	01/15/22 19:24	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.054	U	0.072	0.014	mg/Kg	☼	01/15/22 11:14	01/16/22 20:17	1
Toluene	0.11	U	0.22	0.049	mg/Kg	☼	01/15/22 11:14	01/16/22 20:17	1
Ethylbenzene	0.11	U	0.14	0.033	mg/Kg	☼	01/15/22 11:14	01/16/22 20:17	1
m-Xylene & p-Xylene	0.068	J	0.14	0.026	mg/Kg	☼	01/15/22 11:14	01/16/22 20:17	1
o-Xylene	0.56		0.14	0.018	mg/Kg	☼	01/15/22 11:14	01/16/22 20:17	1
Xylenes, Total	0.63		0.14	0.026	mg/Kg	☼	01/15/22 11:14	01/16/22 20:17	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	102		85 - 116				01/15/22 11:14	01/16/22 20:17	1
4-Bromofluorobenzene (Surr)	100		79 - 119				01/15/22 11:14	01/16/22 20:17	1
Dibromofluoromethane (Surr)	98		78 - 119				01/15/22 11:14	01/16/22 20:17	1
1,2-Dichloroethane-d4 (Surr)	93		71 - 136				01/15/22 11:14	01/16/22 20:17	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.76		0.0071	0.00089	mg/Kg	☼	01/14/22 16:26	01/15/22 06:31	1
2-Methylnaphthalene	0.91		0.0071	0.0029	mg/Kg	☼	01/14/22 16:26	01/15/22 06:31	1
Naphthalene	0.25		0.0071	0.0023	mg/Kg	☼	01/14/22 16:26	01/15/22 06:31	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	42		28 - 143				01/14/22 16:26	01/15/22 06:31	1
2-methylnaphthalene-d10	55		40 - 140				01/14/22 16:26	01/15/22 06:31	1
Fluoranthene-d10 (Surr)	62		40 - 140				01/14/22 16:26	01/15/22 06:31	1
Terphenyl-d14	74		58 - 132				01/14/22 16:26	01/15/22 06:31	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	1300		56	11	mg/Kg	☼	01/14/22 16:25	01/16/22 02:30	1
Motor Oil Range Organics (C24-C40)	33	U	56	22	mg/Kg	☼	01/14/22 16:25	01/16/22 02:30	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	88		45 - 130				01/14/22 16:25	01/16/22 02:30	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	65.7		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	34.3		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: HT-W10-22-23

Lab Sample ID: 580-109299-14

Date Collected: 01/12/22 17:23

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 75.3

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	74		13	4.2	mg/Kg	☆	01/15/22 11:51	01/15/22 19:47	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	106		67 - 134				01/15/22 11:51	01/15/22 19:47	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.048	U	0.064	0.012	mg/Kg	☆	01/15/22 11:14	01/16/22 20:40	1
Toluene	0.097	U	0.19	0.044	mg/Kg	☆	01/15/22 11:14	01/16/22 20:40	1
Ethylbenzene	0.097	U	0.13	0.029	mg/Kg	☆	01/15/22 11:14	01/16/22 20:40	1
m-Xylene & p-Xylene	0.048	U	0.13	0.023	mg/Kg	☆	01/15/22 11:14	01/16/22 20:40	1
o-Xylene	0.048	U	0.13	0.016	mg/Kg	☆	01/15/22 11:14	01/16/22 20:40	1
Xylenes, Total	0.048	U	0.13	0.023	mg/Kg	☆	01/15/22 11:14	01/16/22 20:40	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	98		85 - 116				01/15/22 11:14	01/16/22 20:40	1
4-Bromofluorobenzene (Surr)	92		79 - 119				01/15/22 11:14	01/16/22 20:40	1
Dibromofluoromethane (Surr)	90		78 - 119				01/15/22 11:14	01/16/22 20:40	1
1,2-Dichloroethane-d4 (Surr)	90		71 - 136				01/15/22 11:14	01/16/22 20:40	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.13		0.0061	0.00077	mg/Kg	☆	01/14/22 16:26	01/15/22 06:55	1
2-Methylnaphthalene	0.17		0.0061	0.0025	mg/Kg	☆	01/14/22 16:26	01/15/22 06:55	1
Naphthalene	0.038		0.0061	0.0020	mg/Kg	☆	01/14/22 16:26	01/15/22 06:55	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	55		28 - 143				01/14/22 16:26	01/15/22 06:55	1
2-methylnaphthalene-d10	67		40 - 140				01/14/22 16:26	01/15/22 06:55	1
Fluoranthene-d10 (Surr)	71		40 - 140				01/14/22 16:26	01/15/22 06:55	1
Terphenyl-d14	94		58 - 132				01/14/22 16:26	01/15/22 06:55	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	39	J	56	11	mg/Kg	☆	01/14/22 16:25	01/16/22 02:49	1
Motor Oil Range Organics (C24-C40)	33	U	56	22	mg/Kg	☆	01/14/22 16:25	01/16/22 02:49	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	83		45 - 130				01/14/22 16:25	01/16/22 02:49	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	75.3		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	24.7		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-S17.5-5-6

Lab Sample ID: 580-109299-15

Date Collected: 01/12/22 13:43

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 84.0

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	7.2	J	10	3.4	mg/Kg	☆	01/15/22 11:51	01/15/22 20:10	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	100		67 - 134				01/15/22 11:51	01/15/22 20:10	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.039	U	0.052	0.0099	mg/Kg	☆	01/15/22 11:14	01/16/22 21:03	1
Toluene	0.078	U	0.16	0.035	mg/Kg	☆	01/15/22 11:14	01/16/22 21:03	1
Ethylbenzene	0.078	U	0.10	0.024	mg/Kg	☆	01/15/22 11:14	01/16/22 21:03	1
m-Xylene & p-Xylene	0.039	U	0.10	0.018	mg/Kg	☆	01/15/22 11:14	01/16/22 21:03	1
o-Xylene	0.039	U	0.10	0.013	mg/Kg	☆	01/15/22 11:14	01/16/22 21:03	1
Xylenes, Total	0.039	U	0.10	0.018	mg/Kg	☆	01/15/22 11:14	01/16/22 21:03	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	99		85 - 116				01/15/22 11:14	01/16/22 21:03	1
4-Bromofluorobenzene (Surr)	96		79 - 119				01/15/22 11:14	01/16/22 21:03	1
Dibromofluoromethane (Surr)	91		78 - 119				01/15/22 11:14	01/16/22 21:03	1
1,2-Dichloroethane-d4 (Surr)	94		71 - 136				01/15/22 11:14	01/16/22 21:03	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0028	J M	0.0055	0.00069	mg/Kg	☆	01/14/22 16:26	01/15/22 07:19	1
2-Methylnaphthalene	0.0025	J M	0.0055	0.0023	mg/Kg	☆	01/14/22 16:26	01/15/22 07:19	1
Naphthalene	0.0044	U	0.0055	0.0018	mg/Kg	☆	01/14/22 16:26	01/15/22 07:19	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	69		28 - 143				01/14/22 16:26	01/15/22 07:19	1
2-methylnaphthalene-d10	69		40 - 140				01/14/22 16:26	01/15/22 07:19	1
Fluoranthene-d10 (Surr)	77		40 - 140				01/14/22 16:26	01/15/22 07:19	1
Terphenyl-d14	92		58 - 132				01/14/22 16:26	01/15/22 07:19	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	22	J	54	11	mg/Kg	☆	01/14/22 16:25	01/16/22 03:08	1
Motor Oil Range Organics (C24-C40)	110		54	22	mg/Kg	☆	01/14/22 16:25	01/16/22 03:08	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	86		45 - 130				01/14/22 16:25	01/16/22 03:08	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	84.0		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	16.0		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W55-17-18

Lab Sample ID: 580-109299-16

Date Collected: 01/11/22 14:55

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 75.2

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	4.6	U	6.1	2.0	mg/Kg	☼	01/15/22 11:51	01/15/22 20:57	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	91		67 - 134				01/15/22 11:51	01/15/22 20:57	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.023	U	0.031	0.0058	mg/Kg	☼	01/15/22 11:14	01/16/22 21:25	1
Toluene	0.046	U	0.092	0.021	mg/Kg	☼	01/15/22 11:14	01/16/22 21:25	1
Ethylbenzene	0.046	U	0.061	0.014	mg/Kg	☼	01/15/22 11:14	01/16/22 21:25	1
m-Xylene & p-Xylene	0.023	U	0.061	0.011	mg/Kg	☼	01/15/22 11:14	01/16/22 21:25	1
o-Xylene	0.033	J	0.061	0.0077	mg/Kg	☼	01/15/22 11:14	01/16/22 21:25	1
Xylenes, Total	0.033	J	0.061	0.011	mg/Kg	☼	01/15/22 11:14	01/16/22 21:25	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	100		85 - 116				01/15/22 11:14	01/16/22 21:25	1
4-Bromofluorobenzene (Surr)	98		79 - 119				01/15/22 11:14	01/16/22 21:25	1
Dibromofluoromethane (Surr)	93	M	78 - 119				01/15/22 11:14	01/16/22 21:25	1
1,2-Dichloroethane-d4 (Surr)	92	M	71 - 136				01/15/22 11:14	01/16/22 21:25	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0053	J M	0.0062	0.00078	mg/Kg	☼	01/14/22 16:26	01/15/22 07:43	1
2-Methylnaphthalene	0.0085	M	0.0062	0.0025	mg/Kg	☼	01/14/22 16:26	01/15/22 07:43	1
Naphthalene	0.023	M	0.0062	0.0020	mg/Kg	☼	01/14/22 16:26	01/15/22 07:43	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	69		28 - 143				01/14/22 16:26	01/15/22 07:43	1
2-methylnaphthalene-d10	69		40 - 140				01/14/22 16:26	01/15/22 07:43	1
Fluoranthene-d10 (Surr)	82		40 - 140				01/14/22 16:26	01/15/22 07:43	1
Terphenyl-d14	99		58 - 132				01/14/22 16:26	01/15/22 07:43	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	39	U	65	13	mg/Kg	☼	01/14/22 16:25	01/16/22 03:47	1
Motor Oil Range Organics (C24-C40)	39	U	65	26	mg/Kg	☼	01/14/22 16:25	01/16/22 03:47	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	79		45 - 130				01/14/22 16:25	01/16/22 03:47	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	75.2		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	24.8		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W19.5-14-15

Lab Sample ID: 580-109299-17

Date Collected: 01/12/22 16:08

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 75.7

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	9.9	U	13	4.3	mg/Kg	☼	01/15/22 11:51	01/15/22 21:20	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	90		67 - 134				01/15/22 11:51	01/15/22 21:20	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.050	U	0.066	0.013	mg/Kg	☼	01/15/22 11:14	01/16/22 21:48	1
Toluene	0.099	U	0.20	0.045	mg/Kg	☼	01/15/22 11:14	01/16/22 21:48	1
Ethylbenzene	0.099	U	0.13	0.030	mg/Kg	☼	01/15/22 11:14	01/16/22 21:48	1
m-Xylene & p-Xylene	0.050	U	0.13	0.023	mg/Kg	☼	01/15/22 11:14	01/16/22 21:48	1
o-Xylene	0.050	U	0.13	0.017	mg/Kg	☼	01/15/22 11:14	01/16/22 21:48	1
Xylenes, Total	0.050	U	0.13	0.023	mg/Kg	☼	01/15/22 11:14	01/16/22 21:48	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	99		85 - 116				01/15/22 11:14	01/16/22 21:48	1
4-Bromofluorobenzene (Surr)	99		79 - 119				01/15/22 11:14	01/16/22 21:48	1
Dibromofluoromethane (Surr)	89		78 - 119				01/15/22 11:14	01/16/22 21:48	1
1,2-Dichloroethane-d4 (Surr)	91		71 - 136				01/15/22 11:14	01/16/22 21:48	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0061	M	0.0059	0.00075	mg/Kg	☼	01/14/22 16:26	01/15/22 08:07	1
2-Methylnaphthalene	0.0079	M	0.0059	0.0024	mg/Kg	☼	01/14/22 16:26	01/15/22 08:07	1
Naphthalene	0.0040	J M	0.0059	0.0019	mg/Kg	☼	01/14/22 16:26	01/15/22 08:07	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	58		28 - 143				01/14/22 16:26	01/15/22 08:07	1
2-methylnaphthalene-d10	62		40 - 140				01/14/22 16:26	01/15/22 08:07	1
Fluoranthene-d10 (Surr)	75		40 - 140				01/14/22 16:26	01/15/22 08:07	1
Terphenyl-d14	91		58 - 132				01/14/22 16:26	01/15/22 08:07	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	90		59	12	mg/Kg	☼	01/14/22 16:25	01/16/22 04:06	1
Motor Oil Range Organics (C24-C40)	110		59	24	mg/Kg	☼	01/14/22 16:25	01/16/22 04:06	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	78		45 - 130				01/14/22 16:25	01/16/22 04:06	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	75.7		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	24.3		0.1	0.1	%			01/14/22 18:41	1

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Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-S10-23-24

Lab Sample ID: 580-109299-18

Date Collected: 01/12/22 10:10

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 67.7

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	5.7	U	7.6	2.5	mg/Kg	☼	01/15/22 11:51	01/15/22 21:43	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	91		67 - 134				01/15/22 11:51	01/15/22 21:43	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.028	U	0.038	0.0072	mg/Kg	☼	01/15/22 11:14	01/16/22 22:11	1
Toluene	0.057	U	0.11	0.026	mg/Kg	☼	01/15/22 11:14	01/16/22 22:11	1
Ethylbenzene	0.057	U	0.076	0.017	mg/Kg	☼	01/15/22 11:14	01/16/22 22:11	1
m-Xylene & p-Xylene	0.028	U	0.076	0.013	mg/Kg	☼	01/15/22 11:14	01/16/22 22:11	1
o-Xylene	0.028	U	0.076	0.0095	mg/Kg	☼	01/15/22 11:14	01/16/22 22:11	1
Xylenes, Total	0.028	U	0.076	0.013	mg/Kg	☼	01/15/22 11:14	01/16/22 22:11	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	100		85 - 116				01/15/22 11:14	01/16/22 22:11	1
4-Bromofluorobenzene (Surr)	100		79 - 119				01/15/22 11:14	01/16/22 22:11	1
Dibromofluoromethane (Surr)	91	M	78 - 119				01/15/22 11:14	01/16/22 22:11	1
1,2-Dichloroethane-d4 (Surr)	93		71 - 136				01/15/22 11:14	01/16/22 22:11	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.027		0.0059	0.00075	mg/Kg	☼	01/14/22 16:26	01/15/22 08:31	1
2-Methylnaphthalene	0.021		0.0059	0.0024	mg/Kg	☼	01/14/22 16:26	01/15/22 08:31	1
Naphthalene	0.017	M	0.0059	0.0019	mg/Kg	☼	01/14/22 16:26	01/15/22 08:31	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	61		28 - 143				01/14/22 16:26	01/15/22 08:31	1
2-methylnaphthalene-d10	69		40 - 140				01/14/22 16:26	01/15/22 08:31	1
Fluoranthene-d10 (Surr)	79		40 - 140				01/14/22 16:26	01/15/22 08:31	1
Terphenyl-d14	93		58 - 132				01/14/22 16:26	01/15/22 08:31	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	13	J	65	13	mg/Kg	☼	01/14/22 16:25	01/16/22 04:25	1
Motor Oil Range Organics (C24-C40)	39	U	65	26	mg/Kg	☼	01/14/22 16:25	01/16/22 04:25	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	84		45 - 130				01/14/22 16:25	01/16/22 04:25	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	67.7		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	32.3		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W40-9-10

Lab Sample ID: 580-109299-19

Date Collected: 01/11/22 16:51

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 78.4

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	5.2	U	6.9	2.2	mg/Kg	☼	01/15/22 11:51	01/15/22 22:06	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	89		67 - 134				01/15/22 11:51	01/15/22 22:06	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.026	U	0.035	0.0066	mg/Kg	☼	01/15/22 11:14	01/16/22 22:34	1
Toluene	0.052	U	0.10	0.023	mg/Kg	☼	01/15/22 11:14	01/16/22 22:34	1
Ethylbenzene	0.052	U	0.069	0.016	mg/Kg	☼	01/15/22 11:14	01/16/22 22:34	1
m-Xylene & p-Xylene	0.026	U	0.069	0.012	mg/Kg	☼	01/15/22 11:14	01/16/22 22:34	1
o-Xylene	0.026	U	0.069	0.0086	mg/Kg	☼	01/15/22 11:14	01/16/22 22:34	1
Xylenes, Total	0.026	U	0.069	0.012	mg/Kg	☼	01/15/22 11:14	01/16/22 22:34	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	101		85 - 116				01/15/22 11:14	01/16/22 22:34	1
4-Bromofluorobenzene (Surr)	95		79 - 119				01/15/22 11:14	01/16/22 22:34	1
Dibromofluoromethane (Surr)	90		78 - 119				01/15/22 11:14	01/16/22 22:34	1
1,2-Dichloroethane-d4 (Surr)	91		71 - 136				01/15/22 11:14	01/16/22 22:34	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0015	U	0.0050	0.00063	mg/Kg	☼	01/14/22 16:26	01/15/22 08:55	1
2-Methylnaphthalene	0.0030	U	0.0050	0.0020	mg/Kg	☼	01/14/22 16:26	01/15/22 08:55	1
Naphthalene	0.0040	U	0.0050	0.0016	mg/Kg	☼	01/14/22 16:26	01/15/22 08:55	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	57		28 - 143				01/14/22 16:26	01/15/22 08:55	1
2-methylnaphthalene-d10	62		40 - 140				01/14/22 16:26	01/15/22 08:55	1
Fluoranthene-d10 (Surr)	84		40 - 140				01/14/22 16:26	01/15/22 08:55	1
Terphenyl-d14	98		58 - 132				01/14/22 16:26	01/15/22 08:55	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	38	U	63	12	mg/Kg	☼	01/14/22 16:25	01/16/22 04:44	1
Motor Oil Range Organics (C24-C40)	38	U	63	25	mg/Kg	☼	01/14/22 16:25	01/16/22 04:44	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	76		45 - 130				01/14/22 16:25	01/16/22 04:44	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	78.4		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	21.6		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-N25-27-27.5

Lab Sample ID: 580-109299-20

Date Collected: 01/12/22 13:36

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 68.4

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	9.3	U	12	4.0	mg/Kg	☼	01/15/22 11:51	01/15/22 22:29	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	89		67 - 134				01/15/22 11:51	01/15/22 22:29	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.046	U	0.062	0.012	mg/Kg	☼	01/15/22 11:14	01/16/22 22:57	1
Toluene	0.093	U	0.19	0.042	mg/Kg	☼	01/15/22 11:14	01/16/22 22:57	1
Ethylbenzene	0.093	U	0.12	0.028	mg/Kg	☼	01/15/22 11:14	01/16/22 22:57	1
m-Xylene & p-Xylene	0.046	U	0.12	0.022	mg/Kg	☼	01/15/22 11:14	01/16/22 22:57	1
o-Xylene	0.046	U	0.12	0.015	mg/Kg	☼	01/15/22 11:14	01/16/22 22:57	1
Xylenes, Total	0.046	U	0.12	0.022	mg/Kg	☼	01/15/22 11:14	01/16/22 22:57	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	103		85 - 116				01/15/22 11:14	01/16/22 22:57	1
4-Bromofluorobenzene (Surr)	98		79 - 119				01/15/22 11:14	01/16/22 22:57	1
Dibromofluoromethane (Surr)	90	M	78 - 119				01/15/22 11:14	01/16/22 22:57	1
1,2-Dichloroethane-d4 (Surr)	90		71 - 136				01/15/22 11:14	01/16/22 22:57	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0020	U	0.0067	0.00085	mg/Kg	☼	01/14/22 16:26	01/15/22 09:18	1
2-Methylnaphthalene	0.0040	U	0.0067	0.0028	mg/Kg	☼	01/14/22 16:26	01/15/22 09:18	1
Naphthalene	0.0054	U	0.0067	0.0022	mg/Kg	☼	01/14/22 16:26	01/15/22 09:18	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	59		28 - 143				01/14/22 16:26	01/15/22 09:18	1
2-methylnaphthalene-d10	69		40 - 140				01/14/22 16:26	01/15/22 09:18	1
Fluoranthene-d10 (Surr)	83		40 - 140				01/14/22 16:26	01/15/22 09:18	1
Terphenyl-d14	91		58 - 132				01/14/22 16:26	01/15/22 09:18	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	16	J	67	13	mg/Kg	☼	01/14/22 16:25	01/16/22 05:03	1
Motor Oil Range Organics (C24-C40)	40	U	67	27	mg/Kg	☼	01/14/22 16:25	01/16/22 05:03	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	87		45 - 130				01/14/22 16:25	01/16/22 05:03	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	68.4		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	31.6		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-S25-14-15

Lab Sample ID: 580-109299-21

Date Collected: 01/12/22 14:30

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 72.0

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	13	U	17	5.6	mg/Kg	☼	01/15/22 16:57	01/16/22 02:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	88		67 - 134				01/15/22 16:57	01/16/22 02:45	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.064	U	0.086	0.016	mg/Kg	☼	01/15/22 17:17	01/17/22 01:59	1
Toluene	0.13	U	0.26	0.058	mg/Kg	☼	01/15/22 17:17	01/17/22 01:59	1
Ethylbenzene	0.13	U	0.17	0.039	mg/Kg	☼	01/15/22 17:17	01/17/22 01:59	1
m-Xylene & p-Xylene	0.064	U	0.17	0.030	mg/Kg	☼	01/15/22 17:17	01/17/22 01:59	1
o-Xylene	0.064	U	0.17	0.021	mg/Kg	☼	01/15/22 17:17	01/17/22 01:59	1
Xylenes, Total	0.064	U	0.17	0.030	mg/Kg	☼	01/15/22 17:17	01/17/22 01:59	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	101		85 - 116				01/15/22 17:17	01/17/22 01:59	1
4-Bromofluorobenzene (Surr)	97		79 - 119				01/15/22 17:17	01/17/22 01:59	1
Dibromofluoromethane (Surr)	86		78 - 119				01/15/22 17:17	01/17/22 01:59	1
1,2-Dichloroethane-d4 (Surr)	89	M	71 - 136				01/15/22 17:17	01/17/22 01:59	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0043	J M	0.0058	0.00073	mg/Kg	☼	01/14/22 17:22	01/15/22 17:53	1
2-Methylnaphthalene	0.0034	J M	0.0058	0.0024	mg/Kg	☼	01/14/22 17:22	01/15/22 17:53	1
Naphthalene	0.010	M	0.0058	0.0019	mg/Kg	☼	01/14/22 17:22	01/15/22 17:53	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	59	M	28 - 143				01/14/22 17:22	01/15/22 17:53	1
2-methylnaphthalene-d10	68		40 - 140				01/14/22 17:22	01/15/22 17:53	1
Fluoranthene-d10 (Surr)	77		40 - 140				01/14/22 17:22	01/15/22 17:53	1
Terphenyl-d14	90		58 - 132				01/14/22 17:22	01/15/22 17:53	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	40	U	66	13	mg/Kg	☼	01/14/22 18:32	01/16/22 06:20	1
Motor Oil Range Organics (C24-C40)	40	U	66	26	mg/Kg	☼	01/14/22 18:32	01/16/22 06:20	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	75		45 - 130				01/14/22 18:32	01/16/22 06:20	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	72.0		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	28.0		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W25-14-15

Lab Sample ID: 580-109299-22

Date Collected: 01/11/22 16:35

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 75.1

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	5.7	U	7.5	2.4	mg/Kg	☼	01/15/22 16:57	01/16/22 03:08	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	92		67 - 134				01/15/22 16:57	01/16/22 03:08	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.028	U	0.038	0.0072	mg/Kg	☼	01/15/22 17:17	01/17/22 08:15	1
Toluene	0.057	U	0.11	0.025	mg/Kg	☼	01/15/22 17:17	01/17/22 08:15	1
Ethylbenzene	0.057	U	0.075	0.017	mg/Kg	☼	01/15/22 17:17	01/17/22 08:15	1
m-Xylene & p-Xylene	0.028	U	0.075	0.013	mg/Kg	☼	01/15/22 17:17	01/17/22 08:15	1
o-Xylene	0.028	U	0.075	0.0094	mg/Kg	☼	01/15/22 17:17	01/17/22 08:15	1
Xylenes, Total	0.028	U	0.075	0.013	mg/Kg	☼	01/15/22 17:17	01/17/22 08:15	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	99		85 - 116				01/15/22 17:17	01/17/22 08:15	1
4-Bromofluorobenzene (Surr)	98		79 - 119				01/15/22 17:17	01/17/22 08:15	1
Dibromofluoromethane (Surr)	101		78 - 119				01/15/22 17:17	01/17/22 08:15	1
1,2-Dichloroethane-d4 (Surr)	131		71 - 136				01/15/22 17:17	01/17/22 08:15	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0019	U	0.0063	0.00080	mg/Kg	☼	01/14/22 17:22	01/15/22 19:05	1
2-Methylnaphthalene	0.0038	U	0.0063	0.0026	mg/Kg	☼	01/14/22 17:22	01/15/22 19:05	1
Naphthalene	0.0024	J M	0.0063	0.0021	mg/Kg	☼	01/14/22 17:22	01/15/22 19:05	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	66		28 - 143				01/14/22 17:22	01/15/22 19:05	1
2-methylnaphthalene-d10	72		40 - 140				01/14/22 17:22	01/15/22 19:05	1
Fluoranthene-d10 (Surr)	99		40 - 140				01/14/22 17:22	01/15/22 19:05	1
Terphenyl-d14	117		58 - 132				01/14/22 17:22	01/15/22 19:05	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	39	U	65	13	mg/Kg	☼	01/14/22 18:32	01/16/22 07:37	1
Motor Oil Range Organics (C24-C40)	39	U	65	26	mg/Kg	☼	01/14/22 18:32	01/16/22 07:37	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	80		45 - 130				01/14/22 18:32	01/16/22 07:37	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	75.1		0.1	0.1	%			01/14/22 18:41	1
Percent Moisture	24.9		0.1	0.1	%			01/14/22 18:41	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-N10-7-8-Dup

Lab Sample ID: 580-109299-23

Date Collected: 01/12/22 10:50

Matrix: Solid

Date Received: 01/14/22 10:30

Percent Solids: 72.9

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	490	U	660	210	mg/Kg	☼	01/15/22 16:57	01/16/22 03:31	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	87		67 - 134				01/15/22 16:57	01/16/22 03:31	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.25	U Q	0.33	0.062	mg/Kg	☼	01/15/22 17:17	01/17/22 09:00	1
Toluene	0.87	J Q	0.98	0.22	mg/Kg	☼	01/15/22 17:17	01/17/22 09:00	1
Ethylbenzene	0.16	J Q	0.66	0.15	mg/Kg	☼	01/15/22 17:17	01/17/22 09:00	1
m-Xylene & p-Xylene	1.1	Q	0.66	0.12	mg/Kg	☼	01/15/22 17:17	01/17/22 09:00	1
o-Xylene	0.85	M Q	0.66	0.082	mg/Kg	☼	01/15/22 17:17	01/17/22 09:00	1
Xylenes, Total	2.0	Q	0.66	0.12	mg/Kg	☼	01/15/22 17:17	01/17/22 09:00	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	117	Q	85 - 116				01/15/22 17:17	01/17/22 09:00	1
4-Bromofluorobenzene (Surr)	96		79 - 119				01/15/22 17:17	01/17/22 09:00	1
Dibromofluoromethane (Surr)	106	M	78 - 119				01/15/22 17:17	01/17/22 09:00	1
1,2-Dichloroethane-d4 (Surr)	140	Q	71 - 136				01/15/22 17:17	01/17/22 09:00	1

QC Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-378434/1-A
Matrix: Solid
Analysis Batch: 378437

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378434

Analyte	MB MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Gasoline Range Organics [C6 - C10]	3.0	U	4.0	1.3	mg/Kg		01/15/22 11:51	01/15/22 12:26	1
Surrogate	MB MB		Limits			Prepared	Analyzed	Dil Fac	
%Recovery	Qualifier								
4-Bromofluorobenzene (Surr)	82		67 - 134			01/15/22 11:51	01/15/22 12:26	1	

Lab Sample ID: LCS 580-378434/2-A
Matrix: Solid
Analysis Batch: 378437

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378434

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Gasoline Range Organics [C6 - C10]	40.0	37.1		mg/Kg		93	79 - 122
Surrogate	LCS LCS		Limits			%Rec	
%Recovery	Qualifier						
4-Bromofluorobenzene (Surr)	97		67 - 134				

Lab Sample ID: LCSD 580-378434/3-A
Matrix: Solid
Analysis Batch: 378437

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378434

Analyte	Spike Added	LCSD LCSD		Unit	D	%Rec	%Rec Limits	RPD	Limit
		Result	Qualifier						
Gasoline Range Organics [C6 - C10]	40.0	36.6		mg/Kg		92	79 - 122	1	30
Surrogate	LCSD LCSD		Limits			%Rec			
%Recovery	Qualifier								
4-Bromofluorobenzene (Surr)	96		67 - 134						

Lab Sample ID: 580-109299-4 MS
Matrix: Solid
Analysis Batch: 378437

Client Sample ID: LT-S25-7-8
Prep Type: Total/NA
Prep Batch: 378434

Analyte	Sample Result	Sample Qualifier	Spike Added	MS MS		Unit	D	%Rec	%Rec Limits
				Result	Qualifier				
Gasoline Range Organics [C6 - C10]	8.6	U	115	116		mg/Kg	✱	101	79 - 122
Surrogate	MS MS		Limits			%Rec			
%Recovery	Qualifier								
4-Bromofluorobenzene (Surr)	100		67 - 134						

Lab Sample ID: 580-109299-4 MSD
Matrix: Solid
Analysis Batch: 378437

Client Sample ID: LT-S25-7-8
Prep Type: Total/NA
Prep Batch: 378434

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD MSD		Unit	D	%Rec	%Rec Limits	RPD	Limit
				Result	Qualifier						
Gasoline Range Organics [C6 - C10]	8.6	U	115	115		mg/Kg	✱	100	79 - 122	1	30
Surrogate	MSD MSD		Limits			%Rec					
%Recovery	Qualifier										
4-Bromofluorobenzene (Surr)	98		67 - 134								

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QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-378452/1-A
Matrix: Solid
Analysis Batch: 378464

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378452

Analyte	MB	MB	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Gasoline Range Organics [C6 - C10]	3.0	U	4.0	1.3	mg/Kg		01/15/22 16:57	01/16/22 00:25	1
Surrogate	MB	MB	Limits			D	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier							
4-Bromofluorobenzene (Surr)	88		67 - 134				01/15/22 16:57	01/16/22 00:25	1

Lab Sample ID: LCS 580-378452/2-A
Matrix: Solid
Analysis Batch: 378464

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378452

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits	
								Gasoline Range Organics [C6 - C10]
Surrogate	LCS	LCS	Limits			D	%Rec	%Rec Limits
	%Recovery	Qualifier						
4-Bromofluorobenzene (Surr)	100		67 - 134					

Lab Sample ID: LCSD 580-378452/3-A
Matrix: Solid
Analysis Batch: 378464

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378452

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit
Surrogate	LCSD	LCSD	Limits			D	%Rec	RPD	Limit
	%Recovery	Qualifier							
4-Bromofluorobenzene (Surr)	99		67 - 134						

Method: 8260D - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 580-378429/1-A
Matrix: Solid
Analysis Batch: 378485

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378429

Analyte	MB	MB	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Benzene	0.015	U	0.020	0.0038	mg/Kg		01/15/22 11:14	01/16/22 13:48	1
Toluene	0.030	U	0.060	0.014	mg/Kg		01/15/22 11:14	01/16/22 13:48	1
Ethylbenzene	0.030	U	0.040	0.0091	mg/Kg		01/15/22 11:14	01/16/22 13:48	1
m-Xylene & p-Xylene	0.015	U	0.040	0.0071	mg/Kg		01/15/22 11:14	01/16/22 13:48	1
o-Xylene	0.015	U	0.040	0.0050	mg/Kg		01/15/22 11:14	01/16/22 13:48	1
Xylenes, Total	0.015	U	0.040	0.0071	mg/Kg		01/15/22 11:14	01/16/22 13:48	1
Surrogate	MB	MB	Limits			D	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier							
Toluene-d8 (Surr)	99		85 - 116				01/15/22 11:14	01/16/22 13:48	1
4-Bromofluorobenzene (Surr)	96		79 - 119				01/15/22 11:14	01/16/22 13:48	1
Dibromofluoromethane (Surr)	96	M	78 - 119				01/15/22 11:14	01/16/22 13:48	1
1,2-Dichloroethane-d4 (Surr)	98	M	71 - 136				01/15/22 11:14	01/16/22 13:48	1

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QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 580-378429/2-A

Matrix: Solid
Analysis Batch: 378485

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378429

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	0.800	0.809		mg/Kg		101	77 - 121
Toluene	0.800	0.814		mg/Kg		102	77 - 121
Ethylbenzene	0.800	0.795		mg/Kg		99	76 - 122
m-Xylene & p-Xylene	0.800	0.783		mg/Kg		98	77 - 124
o-Xylene	0.800	0.778	M	mg/Kg		97	77 - 123
Xylenes, Total	1.60	1.56		mg/Kg		98	78 - 124

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Toluene-d8 (Surr)	101		85 - 116
4-Bromofluorobenzene (Surr)	98		79 - 119
Dibromofluoromethane (Surr)	96		78 - 119
1,2-Dichloroethane-d4 (Surr)	91		71 - 136

Lab Sample ID: LCSD 580-378429/3-A

Matrix: Solid
Analysis Batch: 378485

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378429

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit
Benzene	0.800	0.886		mg/Kg		111	77 - 121	9	20
Toluene	0.800	0.899		mg/Kg		112	77 - 121	10	20
Ethylbenzene	0.800	0.879		mg/Kg		110	76 - 122	10	20
m-Xylene & p-Xylene	0.800	0.864		mg/Kg		108	77 - 124	10	20
o-Xylene	0.800	0.844	M	mg/Kg		105	77 - 123	8	20
Xylenes, Total	1.60	1.71		mg/Kg		107	78 - 124	9	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Toluene-d8 (Surr)	102		85 - 116
4-Bromofluorobenzene (Surr)	100		79 - 119
Dibromofluoromethane (Surr)	96	M	78 - 119
1,2-Dichloroethane-d4 (Surr)	89		71 - 136

Lab Sample ID: 580-109299-1 MS

Matrix: Solid
Analysis Batch: 378485

Client Sample ID: LT-W17.5-12-13
Prep Type: Total/NA
Prep Batch: 378429

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	0.69	U	184	200		mg/Kg	⊛	108	77 - 121
Toluene	1.4	U	184	205		mg/Kg	⊛	111	77 - 121
Ethylbenzene	1.4	U	184	204		mg/Kg	⊛	111	76 - 122
m-Xylene & p-Xylene	1.7	J	184	203		mg/Kg	⊛	110	77 - 124
o-Xylene	3.6		184	200	M	mg/Kg	⊛	107	77 - 123
Xylenes, Total	5.3		368	403		mg/Kg	⊛	108	78 - 124

Surrogate	MS %Recovery	MS Qualifier	Limits
Toluene-d8 (Surr)	100		85 - 116
4-Bromofluorobenzene (Surr)	102		79 - 119
Dibromofluoromethane (Surr)	95		78 - 119

QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 580-109299-1 MS
Matrix: Solid
Analysis Batch: 378485

Client Sample ID: LT-W17.5-12-13
Prep Type: Total/NA
Prep Batch: 378429

Surrogate	MS MS		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	92		71 - 136

Lab Sample ID: 580-109299-1 MSD
Matrix: Solid
Analysis Batch: 378485

Client Sample ID: LT-W17.5-12-13
Prep Type: Total/NA
Prep Batch: 378429

Analyte	Sample		Spike Added	MSD MSD		Unit	D	%Rec	%Rec		RPD	Limit
	Result	Qualifier		Result	Qualifier				Limits	RPD		
Benzene	0.69	U	184	202		mg/Kg	⊛	110	77 - 121	1	20	
Toluene	1.4	U	184	201		mg/Kg	⊛	109	77 - 121	2	20	
Ethylbenzene	1.4	U	184	195		mg/Kg	⊛	106	76 - 122	5	20	
m-Xylene & p-Xylene	1.7	J	184	197		mg/Kg	⊛	106	77 - 124	3	20	
o-Xylene	3.6		184	198	M	mg/Kg	⊛	106	77 - 123	1	20	
Xylenes, Total	5.3		368	395		mg/Kg	⊛	106	78 - 124	2	20	

Surrogate	MSD MSD		Limits
	%Recovery	Qualifier	
Toluene-d8 (Surr)	99		85 - 116
4-Bromofluorobenzene (Surr)	102		79 - 119
Dibromofluoromethane (Surr)	98		78 - 119
1,2-Dichloroethane-d4 (Surr)	94		71 - 136

Lab Sample ID: MB 580-378453/1-A
Matrix: Solid
Analysis Batch: 378460

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378453

Analyte	MB MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Benzene	0.015	U	0.020	0.0038	mg/Kg		01/15/22 17:17	01/17/22 00:51	1
Toluene	0.030	U	0.060	0.014	mg/Kg		01/15/22 17:17	01/17/22 00:51	1
Ethylbenzene	0.030	U	0.040	0.0091	mg/Kg		01/15/22 17:17	01/17/22 00:51	1
m-Xylene & p-Xylene	0.015	U	0.040	0.0071	mg/Kg		01/15/22 17:17	01/17/22 00:51	1
o-Xylene	0.015	U	0.040	0.0050	mg/Kg		01/15/22 17:17	01/17/22 00:51	1
Xylenes, Total	0.015	U	0.040	0.0071	mg/Kg		01/15/22 17:17	01/17/22 00:51	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
Toluene-d8 (Surr)	99		85 - 116	01/15/22 17:17	01/17/22 00:51	1
4-Bromofluorobenzene (Surr)	97		79 - 119	01/15/22 17:17	01/17/22 00:51	1
Dibromofluoromethane (Surr)	96	M	78 - 119	01/15/22 17:17	01/17/22 00:51	1
1,2-Dichloroethane-d4 (Surr)	95	M	71 - 136	01/15/22 17:17	01/17/22 00:51	1

Lab Sample ID: LCS 580-378453/2-A
Matrix: Solid
Analysis Batch: 378460

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378453

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec	
		Result	Qualifier				Limits	RPD
Benzene	0.800	0.885		mg/Kg		111	77 - 121	
Toluene	0.800	0.922		mg/Kg		115	77 - 121	
Ethylbenzene	0.800	0.894		mg/Kg		112	76 - 122	
m-Xylene & p-Xylene	0.800	0.889		mg/Kg		111	77 - 124	
o-Xylene	0.800	0.871	M	mg/Kg		109	77 - 123	

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QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 580-378453/2-A
Matrix: Solid
Analysis Batch: 378460

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378453

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Xylenes, Total	1.60	1.76		mg/Kg		110	78 - 124

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Toluene-d8 (Surr)	99		85 - 116
4-Bromofluorobenzene (Surr)	98		79 - 119
Dibromofluoromethane (Surr)	90	M	78 - 119
1,2-Dichloroethane-d4 (Surr)	87		71 - 136

Lab Sample ID: LCSD 580-378453/3-A
Matrix: Solid
Analysis Batch: 378460

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378453

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit
Benzene	0.800	0.782		mg/Kg		98	77 - 121	12	20
Toluene	0.800	0.783		mg/Kg		98	77 - 121	16	20
Ethylbenzene	0.800	0.761		mg/Kg		95	76 - 122	16	20
m-Xylene & p-Xylene	0.800	0.763		mg/Kg		95	77 - 124	15	20
o-Xylene	0.800	0.755	M	mg/Kg		94	77 - 123	14	20
Xylenes, Total	1.60	1.52		mg/Kg		95	78 - 124	15	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Toluene-d8 (Surr)	97		85 - 116
4-Bromofluorobenzene (Surr)	98		79 - 119
Dibromofluoromethane (Surr)	92	M	78 - 119
1,2-Dichloroethane-d4 (Surr)	89	M	71 - 136

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 580-378391/1-A
Matrix: Solid
Analysis Batch: 378418

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378391

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0015	U	0.0050	0.00063	mg/Kg		01/14/22 16:26	01/15/22 00:09	1
2-Methylnaphthalene	0.0030	U	0.0050	0.0021	mg/Kg		01/14/22 16:26	01/15/22 00:09	1
Naphthalene	0.0040	U	0.0050	0.0016	mg/Kg		01/14/22 16:26	01/15/22 00:09	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	63	M	28 - 143	01/14/22 16:26	01/15/22 00:09	1
2-methylnaphthalene-d10	82		40 - 140	01/14/22 16:26	01/15/22 00:09	1
Fluoranthene-d10 (Surr)	82		40 - 140	01/14/22 16:26	01/15/22 00:09	1
Terphenyl-d14	103		58 - 132	01/14/22 16:26	01/15/22 00:09	1

QC Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCS 580-378391/2-A
Matrix: Solid
Analysis Batch: 378418

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378391

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1-Methylnaphthalene	1.00	0.835		mg/Kg		84	43 - 111
2-Methylnaphthalene	1.00	1.05		mg/Kg		105	39 - 114
Naphthalene	1.00	0.950		mg/Kg		95	38 - 111

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2,4,6-Tribromophenol	80		28 - 143
2-methylnaphthalene-d10	115		40 - 140
Fluoranthene-d10 (Surr)	85		40 - 140
Terphenyl-d14	100		58 - 132

Lab Sample ID: 580-109299-1 MS
Matrix: Solid
Analysis Batch: 378418

Client Sample ID: LT-W17.5-12-13
Prep Type: Total/NA
Prep Batch: 378391

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
1-Methylnaphthalene	9.1	J1	1.65	11.6	4	mg/Kg	☼	150	43 - 111
2-Methylnaphthalene	13	J1	1.65	16.4	M 4	mg/Kg	☼	214	39 - 114
Naphthalene	4.1	J1	1.65	6.72	J1	mg/Kg	☼	161	38 - 111

Surrogate	MS %Recovery	MS Qualifier	Limits
2,4,6-Tribromophenol	36		28 - 143
2-methylnaphthalene-d10	94		40 - 140
Fluoranthene-d10 (Surr)	74		40 - 140
Terphenyl-d14	88		58 - 132

Lab Sample ID: 580-109299-1 MSD
Matrix: Solid
Analysis Batch: 378418

Client Sample ID: LT-W17.5-12-13
Prep Type: Total/NA
Prep Batch: 378391

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit
1-Methylnaphthalene	9.1	J1	1.60	8.17	4 J1	mg/Kg	☼	-59	43 - 111	35	20
2-Methylnaphthalene	13	J1	1.60	12.5	4 J1	mg/Kg	☼	-27	39 - 114	27	20
Naphthalene	4.1	J1	1.60	5.07	J1	mg/Kg	☼	63	38 - 111	28	20

Surrogate	MSD %Recovery	MSD Qualifier	Limits
2,4,6-Tribromophenol	32		28 - 143
2-methylnaphthalene-d10	67		40 - 140
Fluoranthene-d10 (Surr)	83		40 - 140
Terphenyl-d14	97		58 - 132

Lab Sample ID: MB 580-378402/1-A
Matrix: Solid
Analysis Batch: 378443

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378402

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0015	U	0.0050	0.00063	mg/Kg		01/14/22 17:22	01/15/22 15:54	1
2-Methylnaphthalene	0.0030	U	0.0050	0.0021	mg/Kg		01/14/22 17:22	01/15/22 15:54	1
Naphthalene	0.0040	U	0.0050	0.0016	mg/Kg		01/14/22 17:22	01/15/22 15:54	1

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QC Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
2,4,6-Tribromophenol	83	M	28 - 143	01/14/22 17:22	01/15/22 15:54	1
2-methylnaphthalene-d10	92		40 - 140	01/14/22 17:22	01/15/22 15:54	1
Fluoranthene-d10 (Surr)	86		40 - 140	01/14/22 17:22	01/15/22 15:54	1
Terphenyl-d14	108		58 - 132	01/14/22 17:22	01/15/22 15:54	1

Lab Sample ID: LCS 580-378402/2-A
Matrix: Solid
Analysis Batch: 378443

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378402

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	Limits
		Result	Qualifier				
1-Methylnaphthalene	1.00	0.834		mg/Kg		83	43 - 111
2-Methylnaphthalene	1.00	1.04		mg/Kg		104	39 - 114
Naphthalene	1.00	0.975		mg/Kg		97	38 - 111

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
2,4,6-Tribromophenol	88		28 - 143
2-methylnaphthalene-d10	120	M	40 - 140
Fluoranthene-d10 (Surr)	88		40 - 140
Terphenyl-d14	112		58 - 132

Lab Sample ID: 580-109299-21 MS
Matrix: Solid
Analysis Batch: 378443

Client Sample ID: LT-S25-14-15
Prep Type: Total/NA
Prep Batch: 378402

Analyte	Sample Result	Sample Qualifier	Spike Added	MS MS		Unit	D	%Rec	Limits
				Result	Qualifier				
1-Methylnaphthalene	0.0043	J M	1.37	1.05		mg/Kg	⊛	76	43 - 111
2-Methylnaphthalene	0.0034	J M	1.37	1.31		mg/Kg	⊛	95	39 - 114
Naphthalene	0.010	M	1.37	1.27		mg/Kg	⊛	92	38 - 111

Surrogate	MS MS		Limits
	%Recovery	Qualifier	
2,4,6-Tribromophenol	77		28 - 143
2-methylnaphthalene-d10	102		40 - 140
Fluoranthene-d10 (Surr)	71		40 - 140
Terphenyl-d14	80		58 - 132

Lab Sample ID: 580-109299-21 MSD
Matrix: Solid
Analysis Batch: 378443

Client Sample ID: LT-S25-14-15
Prep Type: Total/NA
Prep Batch: 378402

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD MSD		Unit	D	%Rec	Limits	RPD	
				Result	Qualifier					RPD	Limit
1-Methylnaphthalene	0.0043	J M	1.36	0.923		mg/Kg	⊛	67	43 - 111	12	20
2-Methylnaphthalene	0.0034	J M	1.36	1.14		mg/Kg	⊛	83	39 - 114	14	20
Naphthalene	0.010	M	1.36	1.21		mg/Kg	⊛	88	38 - 111	5	20

Surrogate	MSD MSD		Limits
	%Recovery	Qualifier	
2,4,6-Tribromophenol	69		28 - 143
2-methylnaphthalene-d10	81		40 - 140
Fluoranthene-d10 (Surr)	80		40 - 140
Terphenyl-d14	98		58 - 132

QC Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 580-378393/1-A
Matrix: Solid
Analysis Batch: 378473

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378393

Analyte	MB	MB	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Diesel Range Organics (C10-C24)	30	U	50	9.9	mg/Kg		01/14/22 16:25	01/15/22 20:44	1
Motor Oil Range Organics (C24-C40)	30	U	50	20	mg/Kg		01/14/22 16:25	01/15/22 20:44	1
Surrogate	MB	MB	Limits			Prepared	Analyzed	Dil Fac	
	%Recovery	Qualifier							
<i>o</i> -Terphenyl	78	M	45 - 130			01/14/22 16:25	01/15/22 20:44	1	

Lab Sample ID: LCS 580-378393/2-A
Matrix: Solid
Analysis Batch: 378473

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378393

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	Limits
		Result	Qualifier				
Diesel Range Organics (C10-C24)	500	461		mg/Kg		92	75 - 125
Motor Oil Range Organics (C24-C40)	500	430		mg/Kg		86	39 - 106
Surrogate	LCS	LCS	Limits				
	%Recovery	Qualifier					
<i>o</i> -Terphenyl	98		45 - 130				

Lab Sample ID: LCSD 580-378393/3-A
Matrix: Solid
Analysis Batch: 378473

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378393

Analyte	Spike Added	LCSD	LCSD	Unit	D	%Rec	Limits	RPD	Limit
		Result	Qualifier						
Diesel Range Organics (C10-C24)	500	506		mg/Kg		101	75 - 125	9	20
Motor Oil Range Organics (C24-C40)	500	462		mg/Kg		92	39 - 106	7	20
Surrogate	LCSD	LCSD	Limits						
	%Recovery	Qualifier							
<i>o</i> -Terphenyl	104		45 - 130						

Lab Sample ID: 580-109299-1 MS
Matrix: Solid
Analysis Batch: 378473

Client Sample ID: LT-W17.5-12-13
Prep Type: Total/NA
Prep Batch: 378393

Analyte	Sample	Sample	Spike Added	MS	MS	Unit	D	%Rec	Limits
	Result	Qualifier		Result	Qualifier				
Diesel Range Organics (C10-C24)	4700	J1	832	6090	4	mg/Kg	⊛	164	75 - 125
Motor Oil Range Organics (C24-C40)	46	U	832	845		mg/Kg	⊛	102	39 - 106
Surrogate	MS	MS	Limits						
	%Recovery	Qualifier							
<i>o</i> -Terphenyl	98		45 - 130						

QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC) (Continued)

Lab Sample ID: 580-109299-1 MSD

Matrix: Solid
Analysis Batch: 378473

Client Sample ID: LT-W17.5-12-13

Prep Type: Total/NA
Prep Batch: 378393

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec	RPD	Limit	
	Result	Qualifier		Result	Qualifier				Limits			
Diesel Range Organics (C10-C24)	4700	J1	853	6630	4	mg/Kg	☼	225	75 - 125	9	20	
Motor Oil Range Organics (C24-C40)	46	U	853	897		mg/Kg	☼	105	39 - 106	6	20	
			MSD	MSD								
Surrogate	%Recovery	Qualifier	Limits									
<i>o</i> -Terphenyl	110		45 - 130									

Lab Sample ID: MB 580-378410/1-A

Matrix: Solid
Analysis Batch: 378473

Client Sample ID: Method Blank

Prep Type: Total/NA
Prep Batch: 378410

Analyte	MB	MB	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Diesel Range Organics (C10-C24)	30	U	50	9.9	mg/Kg		01/14/22 18:32	01/16/22 05:22	1
Motor Oil Range Organics (C24-C40)	30	U	50	20	mg/Kg		01/14/22 18:32	01/16/22 05:22	1
			MB	MB					
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	90		45 - 130				01/14/22 18:32	01/16/22 05:22	1

Lab Sample ID: LCS 580-378410/2-A

Matrix: Solid
Analysis Batch: 378473

Client Sample ID: Lab Control Sample

Prep Type: Total/NA
Prep Batch: 378410

Analyte	Spike	LCS	LCS	Unit	D	%Rec	%Rec
		Result	Qualifier				Limits
Diesel Range Organics (C10-C24)	500	493		mg/Kg		99	75 - 125
Motor Oil Range Organics (C24-C40)	500	528		mg/Kg		106	39 - 106
			LCS	LCS			
Surrogate	%Recovery	Qualifier	Limits				
<i>o</i> -Terphenyl	104		45 - 130				

Lab Sample ID: LCSD 580-378410/3-A

Matrix: Solid
Analysis Batch: 378473

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA
Prep Batch: 378410

Analyte	Spike	LCSD	LCSD	Unit	D	%Rec	%Rec	RPD	Limit
		Result	Qualifier				Limits		
Diesel Range Organics (C10-C24)	500	517		mg/Kg		103	75 - 125	5	20
Motor Oil Range Organics (C24-C40)	500	494		mg/Kg		99	39 - 106	7	20
			LCSD	LCSD					
Surrogate	%Recovery	Qualifier	Limits						
<i>o</i> -Terphenyl	102		45 - 130						

QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC) (Continued)

Lab Sample ID: 580-109299-21 MS
Matrix: Solid
Analysis Batch: 378473

Client Sample ID: LT-S25-14-15
Prep Type: Total/NA
Prep Batch: 378410

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec	Limits
	Result	Qualifier		Result	Qualifier					
Diesel Range Organics (C10-C24)	40	U	652	588		mg/Kg	☼	90		75 - 125
Motor Oil Range Organics (C24-C40)	40	U	652	518		mg/Kg	☼	79		39 - 106
Surrogate	MS MS		Limits	MS	MS	Unit	D	%Rec	%Rec	Limits
	%Recovery	Qualifier								
<i>o</i> -Terphenyl			45 - 130							

Lab Sample ID: 580-109299-21 MSD
Matrix: Solid
Analysis Batch: 378473

Client Sample ID: LT-S25-14-15
Prep Type: Total/NA
Prep Batch: 378410

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec	Limits	RPD	RPD
	Result	Qualifier		Result	Qualifier							
Diesel Range Organics (C10-C24)	40	U	642	562		mg/Kg	☼	87		75 - 125	5	20
Motor Oil Range Organics (C24-C40)	40	U	642	497		mg/Kg	☼	77		39 - 106	4	20
Surrogate	MSD MSD		Limits	MSD	MSD	Unit	D	%Rec	%Rec	Limits	RPD	RPD
	%Recovery	Qualifier										
<i>o</i> -Terphenyl			45 - 130									

Method: 2540G - SM 2540G

Lab Sample ID: 580-109299-1 DU
Matrix: Solid
Analysis Batch: 378411

Client Sample ID: LT-W17.5-12-13
Prep Type: Total/NA

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	RPD
	Result	Qualifier		Result				
Percent Solids	57.1		55.6		%			3
Percent Moisture	42.9		44.4		%			4

Lab Sample ID: 580-109299-19 DU
Matrix: Solid
Analysis Batch: 378411

Client Sample ID: LT-W40-9-10
Prep Type: Total/NA

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	RPD
	Result	Qualifier		Result				
Percent Solids	78.4		79.2		%			1
Percent Moisture	21.6		20.8		%			4

Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W17.5-12-13
Date Collected: 01/12/22 15:05
Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378411	BJM	EET SEA	01/14/22 18:41

Client Sample ID: LT-W17.5-12-13
Date Collected: 01/12/22 15:05
Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-1
Matrix: Solid
Percent Solids: 57.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378434	JBT	EET SEA	01/15/22 11:51
Total/NA	Analysis	8260/CALUFT DOD		1	378437	JBT	EET SEA	01/15/22 14:45
Total/NA	Prep	5035			378429	JBT	EET SEA	01/15/22 11:14
Total/NA	Analysis	8260D		1	378485	JBT	EET SEA	01/16/22 14:56
Total/NA	Prep	5035	RA		378429	JBT	EET SEA	01/15/22 11:14
Total/NA	Analysis	8260D	RA	1	378538	JSM	EET SEA	01/17/22 12:25
Total/NA	Prep	3546			378391	RJL	EET SEA	01/14/22 16:26
Total/NA	Analysis	8270E SIM		1	378418	T1L	EET SEA	01/15/22 00:57
Total/NA	Prep	3546			378393	BJM	EET SEA	01/14/22 16:25
Total/NA	Analysis	8015D DRO		1	378473	JCM	EET SEA	01/15/22 21:42

Client Sample ID: LT-N10-21-22
Date Collected: 01/12/22 10:58
Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378411	BJM	EET SEA	01/14/22 18:41

Client Sample ID: LT-N10-21-22
Date Collected: 01/12/22 10:58
Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-2
Matrix: Solid
Percent Solids: 67.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378434	JBT	EET SEA	01/15/22 11:51
Total/NA	Analysis	8260/CALUFT DOD		1	378437	JBT	EET SEA	01/15/22 15:09
Total/NA	Prep	5035			378429	JBT	EET SEA	01/15/22 11:14
Total/NA	Analysis	8260D		1	378485	JBT	EET SEA	01/16/22 16:05
Total/NA	Prep	3546			378391	RJL	EET SEA	01/14/22 16:26
Total/NA	Analysis	8270E SIM		1	378418	T1L	EET SEA	01/15/22 02:09
Total/NA	Prep	3546			378393	BJM	EET SEA	01/14/22 16:25
Total/NA	Analysis	8015D DRO		1	378473	JCM	EET SEA	01/15/22 22:40

Client Sample ID: LT-E10-7-8
Date Collected: 01/12/22 13:25
Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-3
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378411	BJM	EET SEA	01/14/22 18:41

Lab Chronicle

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-E10-7-8

Lab Sample ID: 580-109299-3

Date Collected: 01/12/22 13:25

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 70.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378434	JBT	EET SEA	01/15/22 11:51
Total/NA	Analysis	8260/CALUFT DOD		1	378437	JBT	EET SEA	01/15/22 15:32
Total/NA	Prep	5035			378429	JBT	EET SEA	01/15/22 11:14
Total/NA	Analysis	8260D		1	378485	JBT	EET SEA	01/16/22 16:28
Total/NA	Prep	3546			378391	RJL	EET SEA	01/14/22 16:26
Total/NA	Analysis	8270E SIM		1	378418	T1L	EET SEA	01/15/22 02:33
Total/NA	Prep	3546			378393	BJM	EET SEA	01/14/22 16:25
Total/NA	Analysis	8015D DRO		1	378473	JCM	EET SEA	01/15/22 22:59

Client Sample ID: LT-S25-7-8

Lab Sample ID: 580-109299-4

Date Collected: 01/12/22 14:22

Matrix: Solid

Date Received: 01/14/22 15:12

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378411	BJM	EET SEA	01/14/22 18:41

Client Sample ID: LT-S25-7-8

Lab Sample ID: 580-109299-4

Date Collected: 01/12/22 14:22

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 78.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378434	JBT	EET SEA	01/15/22 11:51
Total/NA	Analysis	8260/CALUFT DOD		1	378437	JBT	EET SEA	01/15/22 13:36
Total/NA	Prep	5035			378429	JBT	EET SEA	01/15/22 11:14
Total/NA	Analysis	8260D		1	378485	JBT	EET SEA	01/16/22 16:51
Total/NA	Prep	3546			378391	RJL	EET SEA	01/14/22 16:26
Total/NA	Analysis	8270E SIM		1	378418	T1L	EET SEA	01/15/22 02:57
Total/NA	Prep	3546			378393	BJM	EET SEA	01/14/22 16:25
Total/NA	Analysis	8015D DRO		1	378473	JCM	EET SEA	01/15/22 23:18

Client Sample ID: LT-W10-11-12

Lab Sample ID: 580-109299-5

Date Collected: 01/11/22 15:20

Matrix: Solid

Date Received: 01/14/22 15:12

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378411	BJM	EET SEA	01/14/22 18:41

Client Sample ID: LT-W10-11-12

Lab Sample ID: 580-109299-5

Date Collected: 01/11/22 15:20

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 77.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378434	JBT	EET SEA	01/15/22 11:51
Total/NA	Analysis	8260/CALUFT DOD		1	378437	JBT	EET SEA	01/15/22 15:55
Total/NA	Prep	5035			378429	JBT	EET SEA	01/15/22 11:14
Total/NA	Analysis	8260D		1	378538	JSM	EET SEA	01/17/22 13:35

Eurofins Seattle

Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W10-11-12

Lab Sample ID: 580-109299-5

Date Collected: 01/11/22 15:20

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 77.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3546			378391	RJL	EET SEA	01/14/22 16:26
Total/NA	Analysis	8270E SIM		1	378418	T1L	EET SEA	01/15/22 03:20
Total/NA	Prep	3546			378393	BJM	EET SEA	01/14/22 16:25
Total/NA	Analysis	8015D DRO		1	378473	JCM	EET SEA	01/15/22 23:38

Client Sample ID: LT-W10-19-20

Lab Sample ID: 580-109299-6

Date Collected: 01/11/22 16:02

Matrix: Solid

Date Received: 01/14/22 15:12

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378411	BJM	EET SEA	01/14/22 18:41

Client Sample ID: LT-W10-19-20

Lab Sample ID: 580-109299-6

Date Collected: 01/11/22 16:02

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 66.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378434	JBT	EET SEA	01/15/22 11:51
Total/NA	Analysis	8260/CALUFT DOD		1	378437	JBT	EET SEA	01/15/22 16:41
Total/NA	Prep	5035			378429	JBT	EET SEA	01/15/22 11:14
Total/NA	Analysis	8260D		1	378538	JSM	EET SEA	01/17/22 13:58
Total/NA	Prep	3546			378391	RJL	EET SEA	01/14/22 16:26
Total/NA	Analysis	8270E SIM		1	378418	T1L	EET SEA	01/15/22 03:44
Total/NA	Prep	3546			378393	BJM	EET SEA	01/14/22 16:25
Total/NA	Analysis	8015D DRO		1	378473	JCM	EET SEA	01/16/22 00:16

Client Sample ID: HT-N10-19-20

Lab Sample ID: 580-109299-7

Date Collected: 01/12/22 16:08

Matrix: Solid

Date Received: 01/14/22 15:12

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378411	BJM	EET SEA	01/14/22 18:41

Client Sample ID: HT-N10-19-20

Lab Sample ID: 580-109299-7

Date Collected: 01/12/22 16:08

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 66.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378434	JBT	EET SEA	01/15/22 11:51
Total/NA	Analysis	8260/CALUFT DOD		1	378437	JBT	EET SEA	01/15/22 17:04
Total/NA	Prep	5035			378429	JBT	EET SEA	01/15/22 11:14
Total/NA	Analysis	8260D		1	378485	JBT	EET SEA	01/16/22 18:00
Total/NA	Prep	3546			378391	RJL	EET SEA	01/14/22 16:26
Total/NA	Analysis	8270E SIM		1	378418	T1L	EET SEA	01/15/22 04:08
Total/NA	Prep	3546			378393	BJM	EET SEA	01/14/22 16:25
Total/NA	Analysis	8015D DRO		1	378473	JCM	EET SEA	01/16/22 00:35

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Lab Chronicle

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-N40-7-8

Date Collected: 01/12/22 15:42

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-8

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378411	BJM	EET SEA	01/14/22 18:41

Client Sample ID: LT-N40-7-8

Date Collected: 01/12/22 15:42

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-8

Matrix: Solid

Percent Solids: 79.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378434	JBT	EET SEA	01/15/22 11:51
Total/NA	Analysis	8260/CALUFT DOD		1	378437	JBT	EET SEA	01/15/22 17:28
Total/NA	Prep	5035			378429	JBT	EET SEA	01/15/22 11:14
Total/NA	Analysis	8260D		1	378485	JBT	EET SEA	01/16/22 18:23
Total/NA	Prep	3546			378391	RJL	EET SEA	01/14/22 16:26
Total/NA	Analysis	8270E SIM		1	378443	T1L	EET SEA	01/15/22 19:29
Total/NA	Prep	3546			378393	BJM	EET SEA	01/14/22 16:25
Total/NA	Analysis	8015D DRO		10	378473	JCM	EET SEA	01/16/22 16:17

Client Sample ID: LT-N25-16-17

Date Collected: 01/12/22 13:36

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-9

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378411	BJM	EET SEA	01/14/22 18:41

Client Sample ID: LT-N25-16-17

Date Collected: 01/12/22 13:36

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-9

Matrix: Solid

Percent Solids: 66.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378434	JBT	EET SEA	01/15/22 11:51
Total/NA	Analysis	8260/CALUFT DOD		1	378437	JBT	EET SEA	01/15/22 17:51
Total/NA	Prep	5035			378429	JBT	EET SEA	01/15/22 11:14
Total/NA	Analysis	8260D		1	378538	JSM	EET SEA	01/17/22 13:12
Total/NA	Prep	3546			378391	RJL	EET SEA	01/14/22 16:26
Total/NA	Analysis	8270E SIM		1	378418	T1L	EET SEA	01/15/22 04:56
Total/NA	Prep	3546			378393	BJM	EET SEA	01/14/22 16:25
Total/NA	Analysis	8015D DRO		1	378473	JCM	EET SEA	01/16/22 01:14

Client Sample ID: LT-S10-17-18

Date Collected: 01/12/22 10:05

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-10

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378411	BJM	EET SEA	01/14/22 18:41

Lab Chronicle

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-S10-17-18

Lab Sample ID: 580-109299-10

Date Collected: 01/12/22 10:05

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 64.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378434	JBT	EET SEA	01/15/22 11:51
Total/NA	Analysis	8260/CALUFT DOD		1	378437	JBT	EET SEA	01/15/22 18:14
Total/NA	Prep	5035			378429	JBT	EET SEA	01/15/22 11:14
Total/NA	Analysis	8260D		1	378485	JBT	EET SEA	01/16/22 19:08
Total/NA	Prep	3546			378391	RJL	EET SEA	01/14/22 16:26
Total/NA	Analysis	8270E SIM		1	378418	T1L	EET SEA	01/15/22 05:20
Total/NA	Prep	3546			378393	BJM	EET SEA	01/14/22 16:25
Total/NA	Analysis	8015D DRO		1	378473	JCM	EET SEA	01/16/22 01:33

Client Sample ID: LT-N10-7-8

Lab Sample ID: 580-109299-11

Date Collected: 01/12/22 10:50

Matrix: Solid

Date Received: 01/14/22 15:12

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378411	BJM	EET SEA	01/14/22 18:41

Client Sample ID: LT-N10-7-8

Lab Sample ID: 580-109299-11

Date Collected: 01/12/22 10:50

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 72.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378434	JBT	EET SEA	01/15/22 11:51
Total/NA	Analysis	8260/CALUFT DOD		1	378437	JBT	EET SEA	01/15/22 18:37
Total/NA	Prep	5035			378429	JBT	EET SEA	01/15/22 11:14
Total/NA	Analysis	8260D		1	378485	JBT	EET SEA	01/16/22 19:31
Total/NA	Prep	3546			378391	RJL	EET SEA	01/14/22 16:26
Total/NA	Analysis	8270E SIM		1	378418	T1L	EET SEA	01/15/22 05:44
Total/NA	Prep	3546			378393	BJM	EET SEA	01/14/22 16:25
Total/NA	Analysis	8015D DRO		1	378473	JCM	EET SEA	01/16/22 01:52

Client Sample ID: HT-N10-24-25

Lab Sample ID: 580-109299-12

Date Collected: 01/12/22 16:08

Matrix: Solid

Date Received: 01/14/22 15:12

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378411	BJM	EET SEA	01/14/22 18:41

Client Sample ID: HT-N10-24-25

Lab Sample ID: 580-109299-12

Date Collected: 01/12/22 16:08

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 68.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378434	JBT	EET SEA	01/15/22 11:51
Total/NA	Analysis	8260/CALUFT DOD		1	378437	JBT	EET SEA	01/15/22 19:01
Total/NA	Prep	5035			378429	JBT	EET SEA	01/15/22 11:14
Total/NA	Analysis	8260D		1	378485	JBT	EET SEA	01/16/22 19:54

Eurofins Seattle

Lab Chronicle

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: HT-N10-24-25

Date Collected: 01/12/22 16:08

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-12

Matrix: Solid

Percent Solids: 68.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3546			378391	RJL	EET SEA	01/14/22 16:26
Total/NA	Analysis	8270E SIM		1	378418	T1L	EET SEA	01/15/22 06:07
Total/NA	Prep	3546			378393	BJM	EET SEA	01/14/22 16:25
Total/NA	Analysis	8015D DRO		1	378473	JCM	EET SEA	01/16/22 02:11

Client Sample ID: HT-W10-18-19

Date Collected: 01/12/22 17:29

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-13

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378411	BJM	EET SEA	01/14/22 18:41

Client Sample ID: HT-W10-18-19

Date Collected: 01/12/22 17:29

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-13

Matrix: Solid

Percent Solids: 65.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378434	JBT	EET SEA	01/15/22 11:51
Total/NA	Analysis	8260/CALUFT DOD		1	378437	JBT	EET SEA	01/15/22 19:24
Total/NA	Prep	5035			378429	JBT	EET SEA	01/15/22 11:14
Total/NA	Analysis	8260D		1	378485	JBT	EET SEA	01/16/22 20:17
Total/NA	Prep	3546			378391	RJL	EET SEA	01/14/22 16:26
Total/NA	Analysis	8270E SIM		1	378418	T1L	EET SEA	01/15/22 06:31
Total/NA	Prep	3546			378393	BJM	EET SEA	01/14/22 16:25
Total/NA	Analysis	8015D DRO		1	378473	JCM	EET SEA	01/16/22 02:30

Client Sample ID: HT-W10-22-23

Date Collected: 01/12/22 17:23

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-14

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378411	BJM	EET SEA	01/14/22 18:41

Client Sample ID: HT-W10-22-23

Date Collected: 01/12/22 17:23

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-14

Matrix: Solid

Percent Solids: 75.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378434	JBT	EET SEA	01/15/22 11:51
Total/NA	Analysis	8260/CALUFT DOD		1	378437	JBT	EET SEA	01/15/22 19:47
Total/NA	Prep	5035			378429	JBT	EET SEA	01/15/22 11:14
Total/NA	Analysis	8260D		1	378485	JBT	EET SEA	01/16/22 20:40
Total/NA	Prep	3546			378391	RJL	EET SEA	01/14/22 16:26
Total/NA	Analysis	8270E SIM		1	378418	T1L	EET SEA	01/15/22 06:55
Total/NA	Prep	3546			378393	BJM	EET SEA	01/14/22 16:25
Total/NA	Analysis	8015D DRO		1	378473	JCM	EET SEA	01/16/22 02:49

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Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-S17.5-5-6

Date Collected: 01/12/22 13:43

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-15

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378411	BJM	EET SEA	01/14/22 18:41

Client Sample ID: LT-S17.5-5-6

Date Collected: 01/12/22 13:43

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-15

Matrix: Solid

Percent Solids: 84.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378434	JBT	EET SEA	01/15/22 11:51
Total/NA	Analysis	8260/CALUFT DOD		1	378437	JBT	EET SEA	01/15/22 20:10
Total/NA	Prep	5035			378429	JBT	EET SEA	01/15/22 11:14
Total/NA	Analysis	8260D		1	378485	JBT	EET SEA	01/16/22 21:03
Total/NA	Prep	3546			378391	RJL	EET SEA	01/14/22 16:26
Total/NA	Analysis	8270E SIM		1	378418	T1L	EET SEA	01/15/22 07:19
Total/NA	Prep	3546			378393	BJM	EET SEA	01/14/22 16:25
Total/NA	Analysis	8015D DRO		1	378473	JCM	EET SEA	01/16/22 03:08

Client Sample ID: LT-W55-17-18

Date Collected: 01/11/22 14:55

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-16

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378411	BJM	EET SEA	01/14/22 18:41

Client Sample ID: LT-W55-17-18

Date Collected: 01/11/22 14:55

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-16

Matrix: Solid

Percent Solids: 75.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378434	JBT	EET SEA	01/15/22 11:51
Total/NA	Analysis	8260/CALUFT DOD		1	378437	JBT	EET SEA	01/15/22 20:57
Total/NA	Prep	5035			378429	JBT	EET SEA	01/15/22 11:14
Total/NA	Analysis	8260D		1	378485	JBT	EET SEA	01/16/22 21:25
Total/NA	Prep	3546			378391	RJL	EET SEA	01/14/22 16:26
Total/NA	Analysis	8270E SIM		1	378418	T1L	EET SEA	01/15/22 07:43
Total/NA	Prep	3546			378393	BJM	EET SEA	01/14/22 16:25
Total/NA	Analysis	8015D DRO		1	378473	JCM	EET SEA	01/16/22 03:47

Client Sample ID: LT-W19.5-14-15

Date Collected: 01/12/22 16:08

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-17

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378411	BJM	EET SEA	01/14/22 18:41

Lab Chronicle

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W19.5-14-15

Date Collected: 01/12/22 16:08

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-17

Matrix: Solid

Percent Solids: 75.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378434	JBT	EET SEA	01/15/22 11:51
Total/NA	Analysis	8260/CALUFT DOD		1	378437	JBT	EET SEA	01/15/22 21:20
Total/NA	Prep	5035			378429	JBT	EET SEA	01/15/22 11:14
Total/NA	Analysis	8260D		1	378485	JBT	EET SEA	01/16/22 21:48
Total/NA	Prep	3546			378391	RJL	EET SEA	01/14/22 16:26
Total/NA	Analysis	8270E SIM		1	378418	T1L	EET SEA	01/15/22 08:07
Total/NA	Prep	3546			378393	BJM	EET SEA	01/14/22 16:25
Total/NA	Analysis	8015D DRO		1	378473	JCM	EET SEA	01/16/22 04:06

Client Sample ID: LT-S10-23-24

Date Collected: 01/12/22 10:10

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-18

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378411	BJM	EET SEA	01/14/22 18:41

Client Sample ID: LT-S10-23-24

Date Collected: 01/12/22 10:10

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-18

Matrix: Solid

Percent Solids: 67.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378434	JBT	EET SEA	01/15/22 11:51
Total/NA	Analysis	8260/CALUFT DOD		1	378437	JBT	EET SEA	01/15/22 21:43
Total/NA	Prep	5035			378429	JBT	EET SEA	01/15/22 11:14
Total/NA	Analysis	8260D		1	378485	JBT	EET SEA	01/16/22 22:11
Total/NA	Prep	3546			378391	RJL	EET SEA	01/14/22 16:26
Total/NA	Analysis	8270E SIM		1	378418	T1L	EET SEA	01/15/22 08:31
Total/NA	Prep	3546			378393	BJM	EET SEA	01/14/22 16:25
Total/NA	Analysis	8015D DRO		1	378473	JCM	EET SEA	01/16/22 04:25

Client Sample ID: LT-W40-9-10

Date Collected: 01/11/22 16:51

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-19

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378411	BJM	EET SEA	01/14/22 18:41

Client Sample ID: LT-W40-9-10

Date Collected: 01/11/22 16:51

Date Received: 01/14/22 15:12

Lab Sample ID: 580-109299-19

Matrix: Solid

Percent Solids: 78.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378434	JBT	EET SEA	01/15/22 11:51
Total/NA	Analysis	8260/CALUFT DOD		1	378437	JBT	EET SEA	01/15/22 22:06
Total/NA	Prep	5035			378429	JBT	EET SEA	01/15/22 11:14
Total/NA	Analysis	8260D		1	378485	JBT	EET SEA	01/16/22 22:34

Eurofins Seattle

Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W40-9-10

Lab Sample ID: 580-109299-19

Date Collected: 01/11/22 16:51

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 78.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3546			378391	RJL	EET SEA	01/14/22 16:26
Total/NA	Analysis	8270E SIM		1	378418	T1L	EET SEA	01/15/22 08:55
Total/NA	Prep	3546			378393	BJM	EET SEA	01/14/22 16:25
Total/NA	Analysis	8015D DRO		1	378473	JCM	EET SEA	01/16/22 04:44

Client Sample ID: LT-N25-27-27.5

Lab Sample ID: 580-109299-20

Date Collected: 01/12/22 13:36

Matrix: Solid

Date Received: 01/14/22 15:12

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378411	BJM	EET SEA	01/14/22 18:41

Client Sample ID: LT-N25-27-27.5

Lab Sample ID: 580-109299-20

Date Collected: 01/12/22 13:36

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 68.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378434	JBT	EET SEA	01/15/22 11:51
Total/NA	Analysis	8260/CALUFT DOD		1	378437	JBT	EET SEA	01/15/22 22:29
Total/NA	Prep	5035			378429	JBT	EET SEA	01/15/22 11:14
Total/NA	Analysis	8260D		1	378485	JBT	EET SEA	01/16/22 22:57
Total/NA	Prep	3546			378391	RJL	EET SEA	01/14/22 16:26
Total/NA	Analysis	8270E SIM		1	378418	T1L	EET SEA	01/15/22 09:18
Total/NA	Prep	3546			378393	BJM	EET SEA	01/14/22 16:25
Total/NA	Analysis	8015D DRO		1	378473	JCM	EET SEA	01/16/22 05:03

Client Sample ID: LT-S25-14-15

Lab Sample ID: 580-109299-21

Date Collected: 01/12/22 14:30

Matrix: Solid

Date Received: 01/14/22 15:12

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378411	BJM	EET SEA	01/14/22 18:41

Client Sample ID: LT-S25-14-15

Lab Sample ID: 580-109299-21

Date Collected: 01/12/22 14:30

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 72.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378452	JBT	EET SEA	01/15/22 16:57
Total/NA	Analysis	8260/CALUFT DOD		1	378464	CJ	EET SEA	01/16/22 02:45
Total/NA	Prep	5035			378453	JBT	EET SEA	01/15/22 17:17
Total/NA	Analysis	8260D		1	378460	JSM	EET SEA	01/17/22 01:59
Total/NA	Prep	3546			378402	RJL	EET SEA	01/14/22 17:22
Total/NA	Analysis	8270E SIM		1	378443	T1L	EET SEA	01/15/22 17:53
Total/NA	Prep	3546			378410	RJL	EET SEA	01/14/22 18:32
Total/NA	Analysis	8015D DRO		1	378473	JCM	EET SEA	01/16/22 06:20

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Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Client Sample ID: LT-W25-14-15

Lab Sample ID: 580-109299-22

Date Collected: 01/11/22 16:35

Matrix: Solid

Date Received: 01/14/22 15:12

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378411	BJM	EET SEA	01/14/22 18:41

Client Sample ID: LT-W25-14-15

Lab Sample ID: 580-109299-22

Date Collected: 01/11/22 16:35

Matrix: Solid

Date Received: 01/14/22 15:12

Percent Solids: 75.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378452	JBT	EET SEA	01/15/22 16:57
Total/NA	Analysis	8260/CALUFT DOD		1	378464	CJ	EET SEA	01/16/22 03:08
Total/NA	Prep	5035			378453	JBT	EET SEA	01/15/22 17:17
Total/NA	Analysis	8260D		1	378460	JSM	EET SEA	01/17/22 08:15
Total/NA	Prep	3546			378402	RJL	EET SEA	01/14/22 17:22
Total/NA	Analysis	8270E SIM		1	378443	T1L	EET SEA	01/15/22 19:05
Total/NA	Prep	3546			378410	RJL	EET SEA	01/14/22 18:32
Total/NA	Analysis	8015D DRO		1	378473	JCM	EET SEA	01/16/22 07:37

Client Sample ID: LT-N10-7-8-Dup

Lab Sample ID: 580-109299-23

Date Collected: 01/12/22 10:50

Matrix: Solid

Date Received: 01/14/22 10:30

Percent Solids: 72.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378452	JBT	EET SEA	01/15/22 16:57
Total/NA	Analysis	8260/CALUFT DOD		1	378464	CJ	EET SEA	01/16/22 03:31
Total/NA	Prep	5035			378453	JBT	EET SEA	01/15/22 17:17
Total/NA	Analysis	8260D		1	378460	JSM	EET SEA	01/17/22 09:00

Laboratory References:

EET SEA = Eurofins Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

Job ID: 580-109299-1

Laboratory: Eurofins Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2236	01-18-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
2540G		Solid	Percent Moisture
2540G		Solid	Percent Solids
8015D DRO	3546	Solid	Diesel Range Organics (C10-C24)
8260/CALUFT DOD	5035	Solid	Gasoline Range Organics [C6 - C10]

Sample Summary

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800 CV18F0126

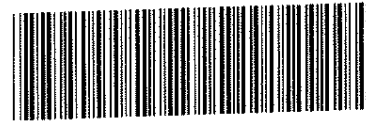
Job ID: 580-109299-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-109299-1	LT-W17.5-12-13	Solid	01/12/22 15:05	01/14/22 15:12
580-109299-2	LT-N10-21-22	Solid	01/12/22 10:58	01/14/22 15:12
580-109299-3	LT-E10-7-8	Solid	01/12/22 13:25	01/14/22 15:12
580-109299-4	LT-S25-7-8	Solid	01/12/22 14:22	01/14/22 15:12
580-109299-5	LT-W10-11-12	Solid	01/11/22 15:20	01/14/22 15:12
580-109299-6	LT-W10-19-20	Solid	01/11/22 16:02	01/14/22 15:12
580-109299-7	HT-N10-19-20	Solid	01/12/22 16:08	01/14/22 15:12
580-109299-8	LT-N40-7-8	Solid	01/12/22 15:42	01/14/22 15:12
580-109299-9	LT-N25-16-17	Solid	01/12/22 13:36	01/14/22 15:12
580-109299-10	LT-S10-17-18	Solid	01/12/22 10:05	01/14/22 15:12
580-109299-11	LT-N10-7-8	Solid	01/12/22 10:50	01/14/22 15:12
580-109299-12	HT-N10-24-25	Solid	01/12/22 16:08	01/14/22 15:12
580-109299-13	HT-W10-18-19	Solid	01/12/22 17:29	01/14/22 15:12
580-109299-14	HT-W10-22-23	Solid	01/12/22 17:23	01/14/22 15:12
580-109299-15	LT-S17.5-5-6	Solid	01/12/22 13:43	01/14/22 15:12
580-109299-16	LT-W55-17-18	Solid	01/11/22 14:55	01/14/22 15:12
580-109299-17	LT-W19.5-14-15	Solid	01/12/22 16:08	01/14/22 15:12
580-109299-18	LT-S10-23-24	Solid	01/12/22 10:10	01/14/22 15:12
580-109299-19	LT-W40-9-10	Solid	01/11/22 16:51	01/14/22 15:12
580-109299-20	LT-N25-27-27.5	Solid	01/12/22 13:36	01/14/22 15:12
580-109299-21	LT-S25-14-15	Solid	01/12/22 14:30	01/14/22 15:12
580-109299-22	LT-W25-14-15	Solid	01/11/22 16:35	01/14/22 15:12
580-109299-23	LT-N10-7-8-Dup	Solid	01/12/22 10:50	01/14/22 10:30

Eurofins FGS, Seattle

5755 8th Street East
Tacoma, WA 98424

Chain of Custody Record



580-109299 Chain of Custody

eurofins Environment Testing
America

Client Information		Sampler: Dominic Mariano		Lab PM: Elaine Walker		COC No: 202201-01 Soil									
Client Contact: Alethea Ramos (alternate: Margie Pascua)		Phone: 310-625-1283		E-Mail: M.Elaine.Walker@EurofinsET.com		State of Origin: Hawaii									
Company: AECOM		FWSID:		Analysis Requested		Page: Page 1 of 4									
Address: 1001 Bishop St. Suite 1600		Due Date Requested: see subcontract		Field Filtered Sample (Yes or No) Perform MS/MSD (Yes or No) EPA 8260 BTEX+Naph EPA 8260 TPH-G (C6-C10) EPA 8015 TPH-D/O (C10-C24, C24-C40) EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)		Job #: 109299									
City: Honolulu		TAT Requested (days): 3 working days				Preservation Codes:									
State, Zip: Hawaii 96813		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No				A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA		M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)							
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)		PO #: Note to AECOM before printing COC: put in PO# w				Total Number of containers		Other:							
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)		WO #:													
Project Name: CV18F0126		Project #: 60674414													
Site: RH		SSOW#: Note to AECOM before printing COC: put in subk#													
Sample Identification		Sample Date		Sample Time		Sample Type (C=comp, G=grab)		Matrix (W=water, S=solid, O=soil, BT=tissue, A=air)		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		Special Instructions/Note:	
-1 LT-W17.5-12-13		1/12/22		1505		G S		S		N N		X X X		1	
LT-N10-21-22		1/12/22		1058		G S		S		N N		X X X		1	
-3 LT-E10-7-8		1/12/22		1325		G S		S		N N		X X X		1	
LT-S25-7-8		1/12/22		1422		G S		S		N N		X X X		1	
-5 LT-W10-11-12		1/11/22		1520		G S		S		N N		X X X		1	
LT-W10-19-20		1/11/22		1602		G S		S		N N		X X X		1	
-7 HT-N10-19-20		1/12/22		1608		G S		S		N N		X X X		1	
LT-N40-7-8		1/12/22		1542		G S		S		N N		X X X		1	
-9 LT-N25-16-17		1/12/22		1336		G S		S		N N		X X X		1	
LT-S10-17-18		1/12/22		1005		G S		S		N N		X X X		1	
-11 LT-N10-7-8		1/12/22		1050		G S		S		N N		X X X		1	
Possible Hazard Identification						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)									
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological						<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months									
Deliverable Requested: I, II, III, IV, Other (specify)						Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQUS EDD.									
Empty Kit Relinquished by:						Date:									
Relinquished by: Matthew Yim <i>Matthew Yim</i>						Date/Time: 1/13/22 1530									
Relinquished by:						Date/Time:									
Relinquished by:						Date/Time:									
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No						Custody Seal No.:									

Therm. ID: 329 Cor: 27° Unc: 2.2°
 Cooler Dsc: RO FedEx: RO
 Packing: Bubs UPS:
 Cust. Seal: Yes No
 Blue Ice, Dry, None Other: _____

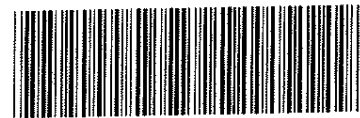
Chain of Custody Record

Client Information		Sampler: Dominic Mariano		Lab PM: Elaine Walker		Carrier Tracking No(s): FedEx		COC No: 202201-01 Sol					
Client Contact: Alethea Ramos (alternate: Margie Pascua)		Phone: 310-625-1283		E-Mail: M.Elaine.Walker@EurofinsET.com		State of Origin: Hawaii		Page: Page 1 of 4					
Company: AECOM		PWSID:		Analysis Requested		Preservation Codes:		Job #:					
Address: 1001 Bishop St. Suite 1600		Due Date Requested: see subcontract											
City: Honolulu		TAT Requested (days): 3 working days											
State, Zip: Hawaii 96813		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No											
Phone: 808-521-3051 (direct: 808-528-7283) (alternate: 808-356-5373)		PO #:		EPA 8260 BTEX + Naph EPA 8280 TPH-G (C8-C10) EPA 8015 TPH-D/D (C10-C24, C24-C40) EPA 8015 TPH-E/E (C10-C24, C24-C40) EPA 8270 SIM PAHs (benz[a]anthracene, 1-methylpyrene, 2-methylanthracene)		A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA M - Hexane N - None O - AcNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)		Do not do silica gel cleanup on soil					
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)		Note to AECOM before printing COC: put in PO# w											
Project Name: CV18F0126		Project #: 60674414											
Site: RH		SSOW#: Note to AECOM before printing COC: put in subk#		Field Filtered Samples (Yes or No) Performance Based (Yes or No)		Total Number of Containers		Other:					
Sample Identification		Sample Date		Sample Time		Sample Type (C=Comp, G=grab)		Matrix (W=water, S=solid, G=grab, etc.)		Preservation Code:		Special Instructions/Note:	
LT-W17.5-12-13		1/12/22		1505		G		S		N N		PID = 39 ppmv	
LT-N10-21-22		1/12/22		1058		G		S		N N		= 621 ppmv	
LT-E10-7-8		1/12/22		1325		G		S		N N		= 0.7	
LT-S25-7-8		1/12/22		1422		G		S		N N		= 0.0	
LT-W10-11-12		1/11/22		1520		G		S		N N		= 440	
LT-W10-19-20		1/11/22		1602		G		S		N N		= 70	
HT-N10-19-20		1/12/22		1608		G		S		N N		= 70	
LT-N40-7-8		1/12/22		1542		G		S		N N		= 0.5	
LT-N25-16-17		1/12/22		1336		G		S		N N		= 50	
LT-S10-17-18		1/12/22		1005		G		S		N N		= 470	
LT-N10-7-8		1/12/22		1050		G		S		N N		= 662 ^{4/1/22} _{(P) Predict}	
Possible Hazard Identification						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)							
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological						<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months							
Deliverable Requested: I, II, III, IV, Other (specify)						Prelim data (Level 1 or 2)=see TAT above. DoD Stage 4 report standard TAT. AECOM, EQUS, EDD.							
Special instructions/QC Requirements: DOD QSM project.													
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:							
Relinquished by: Matthew Yim <i>Matthew Yim</i>		Date/Time: 1/13/22 1530		Company: AECOM		Received by:		Date/Time:		Company:			
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:			
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:			
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Hart, Jeff		Cooler Temperature:		Therm ID: _____ Cor: _____ ° Unc: _____ °		Cooler Desc: _____ FedEx: _____			
								Packing: _____ UPS: _____		Cust. Seal: Yes ___ No ___ Lab Cour: _____			
								Blue Ice, Wet, Dry, None		Other: _____			

Chain of Custody Record

Client Information		Sampler: Dominic Mariano		Lab PM: Elaine Walker		Carrier Tracking No(s): FedEx		COC No: 202201-02 Soil			
Client Contact: Alethea Ramos (alternate: Margie Pascua)		Phone: 310-625-1283		E-Mail: M.Elaine.Walker@EurofinsET.com		State of Origin: Hawaii		Page: Page 2 of 4			
Company: AECOM		PWSD:		Analysis Requested						Job #:	
Address: 1001 Bishop St. Suite 1600		Due Date Requested: see subcontract		Field Filtered Sample (Yes or No) Particulate Matter (Yes or No) EPA 8200 BTEX+Naph EPA 8260 TPH-G (CS-C10) EPA 8016 TPH-DIO (C10-C24, C24-C40) EPA 8218 TPH-DAP (C10-C24, C24-C40) w/ silica gel sheet up EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)		Total Number of Containers		Preservation Codes:			
City: Honolulu		TAT Requested (days): 3 working days						A - HCL		M - Hexane	
State, Zip: Hawaii 96813		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No						B - NaOH		N - None	
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)		PO #: Note to AECOM before printing COC: put in PO# w						C - Zn Acetate		O - AsNaO2	
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)		WO #:						D - Nitric Acid		P - Na2O4S	
Project Name: CV18FD126		Project #: G0674414		E - NaHSO4		Q - Na2SO3		F - MeOH		R - Na2S2O3	
Site: RH		SSOW#: Note to AECOM before printing COC: put in subk#		G - Amchlor		S - H2SO4		H - Ascorbic Acid		T - TSP Dodecahydrate	
				I - tea		U - Acetone		J - DI Water		V - MCAA	
				K - EDTA		W - pH 4-5		L - EDA		Z - other (specify)	
										Other:	
										Do not do Silica gel cleanup on soil	
										Special Instructions/Note:	
Sample Identification		Sample Date		Sample Time		Sample Type (C=Comp, G=grab)		Matrix (Water, Sediment, Dredge/Silt, BT=Trilobe, AA=Air)			
HT-N10-24-25		1/12/22		1608		G S		N N		297 ppmv	
HT-W10-18-19		1/12/22		1729		G S		N N		580	
HT-W10-22-23		1/12/22		1723		G S		N N		25	
LT-S17.5-5-6		1/12/22		1343		G S		N N		0	
LT-W55-17-18		1/11/22		1455		G S		N N		0	
LT-W19.5-14-15		1/12/22		1608		G S		N N		247	
LT-S10-23-24		1/12/22		1010		G S		N N		414	
LT-W40-9-10		1/11/22		1651		G S		N N		0.1	
LT-N25-27-27.5		1/12/22		1336		G S		N N		30	
LT-S25-14-15		1/12/22		1430		G S		N N		0	
LT-W25-14-15		1/11/22		1635		G S		N N		0	
Possible Hazard Identification						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)					
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological						<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months					
Deliverable Requested: I, II, III, IV, Other (specify)						Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQUS EDD.					
Special Instructions/QC Requirements: DOD QSM project.											
Empty Kit Relinquished by:			Date:			Time:			Method of Shipment:		
Relinquished by: Matthew Yun <i>Matthew Yun</i>			Date/Time: 1/13/22 1530			Company: AECOM			Received by:		
Relinquished by:			Date/Time:			Company:			Received by:		
Relinquished by:			Date/Time:			Company:			Received by:		
Custody Seals Intact:		Custody Seal No.:		Digitally signed by Hart, Jeff DN: cn=Hart, Jeff, ou=USHNL1, email=Jeff.Hart@aecom.com Date: 2022.01.14 12:40:37 - 1000				Cooler Temperature(s) °C and Other Remarks:			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				Hart, Jeff							

Chain of Custody Record



580-109299 Chain of Custody

Client Information		Sampler: Dominic Mariano		Lab PM: Elaine Walker		COC No: 202201-01 Soil								
Client Contact: Alethea Ramos (alternate: Margie Pascua)		Phone: 310-625-1283		E-Mail: M.Elaine.Walker@EurofinsET.com		Page: Page 1 of 4								
Company: AECOM		PWSID:		Analysis Requested		Job #: 109299								
Address: 1001 Bishop St. Suite 1600		Due Date Requested: see subcontract		<table border="1"> <tr><td>Field Filtered Sample (Yes or No)</td></tr> <tr><td>Perform MS/MSD (Yes or No)</td></tr> <tr><td>EPA 8260 BTEX+Naph</td></tr> <tr><td>EPA 8260 TPH-G (C6-C10)</td></tr> <tr><td>EPA 8015 TPH-D/O (C10-C24, C24-C40)</td></tr> <tr><td>EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup</td></tr> <tr><td>EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)</td></tr> </table>		Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 8260 BTEX+Naph	EPA 8260 TPH-G (C6-C10)	EPA 8015 TPH-D/O (C10-C24, C24-C40)	EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup	EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)	Preservation Codes:	
Field Filtered Sample (Yes or No)														
Perform MS/MSD (Yes or No)														
EPA 8260 BTEX+Naph														
EPA 8260 TPH-G (C6-C10)														
EPA 8015 TPH-D/O (C10-C24, C24-C40)														
EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup														
EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)														
City: Honolulu		TAT Requested (days): 3 working days		A - HCL		M - Hexane								
State, Zip: Hawaii 96813		Compliance Project: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		EPA 8260 BTEX+Naph		N - None								
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)		PO #:		EPA 8260 TPH-G (C6-C10)		O - AsNaO2								
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)		WO #:		EPA 8015 TPH-D/O (C10-C24, C24-C40)		P - Na2O4S								
Project Name: CV18F0126		Project #: 60674414		EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup		Q - Na2SO3								
Site: RH		SSOW#: Note to AECOM before printing COC: put in subk#		EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)		R - Na2SO3								
Sample Identification		Sample Date		Sample Time		Sample Type (C=comp, G=grab)		Matrix (Water, Seawater, Oil, Tissue, Air)		Total Number of containers		Special Instructions/Note:		
-1 LT-W17.5-12-13		1/12/22		1505		G S		S		1				
LT-N10-21-22		1/12/22		1058		G S		S		1				
-3 LT-E10-7-8		1/12/22		1325		G S		S		1				
LT-S25-7-8		1/12/22		1422		G S		S		1				
-5 LT-W10-11-12		1/11/22		1520		G S		S		1				
LT-W10-19-20		1/11/22		1602		G S		S		1				
-7 HT-N10-19-20		1/12/22		1608		G S		S		1				
LT-N40-7-8		1/12/22		1542		G S		S		1				
-9 LT-N25-16-17		1/12/22		1336		G S		S		1				
LT-S10-17-18		1/12/22		1005		G S		S		1				
-11 LT-N10-7-8		1/12/22		1050		G S		S		1				
Possible Hazard Identification						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)								
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological						<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months								
Deliverable Requested: I, II, III, IV, Other (specify)			Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQUIS FDD.			Special Instructions/QC Requirements: DOD QSM project.								
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:								
Relinquished by: Matthew Yim <i>Matthew Yim</i>		Date/Time: 1/13/22 1530		Company: AECOM		Received by: <i>[Signature]</i>		Date/Time: 1/14/22 1030		Company: EFGS				
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:				
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:				
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature:		Therm. ID: <u>IL9</u> Cor: <u>2.7°</u> Unc: <u>2.2°</u>								
						Cooler Dsc: <u>RG</u> FedEx: <u>RG</u>								
						Packing: <u>Bubs</u> UPS: _____								
						Cust. Seal: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Lab Cour: _____								
						Blue Ice, <u>Wet</u> , Dry, None Other: _____								

Chain of Custody Record

Client Information		Sampler: Dominic Mariano			Lab PM: Elaine Walker			Carrier Tracking Note: FedEx			COC No: 202201-01 Soil				
Client Contact: Althea Ramos (alternate: Margie Pascua)		Phone: 310-625-1283			E-Mail: M.Elaine.Walker@EurofinsET.com			State of Origin: Hawaii			Page: Page 1 of 4				
Company: AECOM		PWSID:			Analysis Requested							Job #:			
Address: 1001 Bishop St. Suite 1600		Due Date Requested: see subcontract			Field Filtered Sample (Yes or No) <input type="checkbox"/> Perform MS/MSD (Yes or No) <input type="checkbox"/> EPA 8260 BTEX+Naph <input type="checkbox"/> EPA 8260 TPH-G (C5-C10) <input type="checkbox"/> EPA 816 TPH-DIO (C10-C24, C24-C40) <input type="checkbox"/> EPA 8146 TPH-EPE-99-694-GM-949) w/ silica gel cleanup <input type="checkbox"/> EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene) <input type="checkbox"/>							Preservation Codes:			
City: Honolulu		TAT Requested (days): 3 working days										A - HCL		M - Hexane	
State, Zip: Hawaii 96813		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No										B - NaOH		N - None	
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)		PO #:										C - Zn Acetate		O - AsNaO2	
Email: althea.ramos@aecom.com (alternate: margie.pascua@aecom.com)		WO #:										D - Nitric Acid		F - Na2O4S	
Project Name: CV18F0126		Project #: 60674414			E - NaHSO4		Q - Na2SO3								
Site: RH		SSOW#: Note to AECOM before printing COC: put in subk#			G - MeOH		R - Na2SO3								
					H - Ascorbic Acid		T - TSP Dodecahydrate								
					I - Ice		U - Acetone								
					J - DI Water		V - MCAA								
					K - EDTA		W - pH 4-5								
					L - EDA		Z - other (specify)								
					Other:										
					Do not do silica gel cleanup on soil										
Sample Identification					Special Instructions/Note:										
LT-W17.5-12-13		1/12/22 1505 G S N N			1 PID = 39 ppmv										
LT-N10-21-22		1/12/22 1058 G S N N			1 = 621 ppmv										
LT-E10-7-8		1/12/22 1325 G S N N			1 = 0.7										
LT-S25-7-8		1/12/22 1422 G S N N			1 = 0.0										
LT-W10-11-12		1/11/22 1520 G S N N			1 = 440										
LT-W10-19-20		1/11/22 1602 G S N N			1 = 70										
HT-N10-19-20		1/12/22 1608 G S N N			1 = 70										
LT-N40-7-8		1/12/22 1542 G S N N			1 = 0.5										
LT-N25-16-17		1/12/22 1336 G S N N			1 = 50										
LT-S10-17-18		1/12/22 1005 G S N N			1 = 470										
LT-N10-7-8		1/12/22 1050 G S N N			1 = 662										
					/ 1/14/22 (P) Participant										
Possible Hazard Identification					Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)										
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological					<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months										
Deliverable Requested: I, II, III, IV, Other (specify)					Prelim data (Level 1or2)—see TAT above. DoD Stage 4 report standard TAT. AECOM EQHS EDD.										
Special Instructions/QC Requirements: DOD QSM project.															
Empty Kit Relinquished by:					Date:			Time:			Method of Shipment:				
Relinquished by: Matthew Yim <i>Matthew Yim</i>					Date/Time: 1/13/22 1530			Company: AECOM			Received by:				
Date/Time:					Company:			Received by:			Company:				
Date/Time:					Company:			Received by:			Company:				
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:			Hart, Jeff			Digital signed by Hart, Jeff DN: cn=Hart, Jeff, ou=USHNL1, email=Jeff.Hart@aecom.com Date: 2022.01.14 12:39:00			Cooler Temperature:				
					Therm. ID: _____ Cor: _____ ° Unc: _____ °			Cooler Disc: _____			FedEx: _____				
					Packg: _____			UPS: _____			Lab Cour: _____				
					Cust. Seal: Yes <input type="checkbox"/> No <input type="checkbox"/>			Other: _____							

Eurofins FGS, Seattle
5755 8th Street East
Tacoma, WA 98424

Chain of Custody Record

eurofins Environment Testing
America

Client Information		Sampler:		Lab PM:		Carrier Tracking No(s):		COC No:	
Client Contact: Alethea Ramos (alternate: Margie Pascua)		Dominic Mariano		Elaine Walker		FedEx		202201-02 Soil	
Company: AECOM		Phone: 310-625-1283		E-Mail: M.Elaine.Walker@EurofinsET.com		State of Origin: Hawaii		Page: Page 2 of 4	
Address: 1001 Bishop St. Suite 1600		Due Date Requested: see subcontract		Analysis Requested		Job #:		Preservation Codes:	
City: Honolulu		TAT Requested (days): 3 working days		Field Filtered Sample (Yes or No)		Total Number of Containers		A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA	
State, Zip: Hawaii 96813		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No		PO #: Note to AECOM before printing COC: put in PO# w		EPA 8260 BTEX+Naph		M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2SO3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)	
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)		Project #: 60674414		WO #:		EPA 8260 TPH-G (C6-C10)		Other:	
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)		SSOW #: Note to AECOM before printing COC: put in subk#		Matrix (Water, Soils, Organics, etc.)		EPA 8015 TPH-DIO (C10-C24, C24-C40)		Do not do Silica gel cleanup on soil	
Project Name: CV18F0126		Sample Identification		Special Instructions/Note:		EPA 8016 TPH-DIO (C10-C24, C24-C40)			
Site: RH		Sample Date		Sample Time		EPA 8016 TPH-DIO (C10-C24, C24-C40)			
		Sample Type (C=Comp, G=grab)		Matrix		EPA 8016 TPH-DIO (C10-C24, C24-C40)			
		Preservation Code:				EPA 8016 TPH-DIO (C10-C24, C24-C40)			
HT-N10-24-25		1/12/22		1608		G S		N N	
HT-W10-18-19		1/12/22		1729		G S		N N	
HT-W10-22-23		1/12/22		1723		G S		N N	
LT-S17.5-5-6		1/12/22		1343		G S		N N	
LT-W55-17-18		1/11/22		1455		G S		N N	
LT-W19.5-14-15		1/12/22		1608		G S		N N	
LT-S10-23-24		1/12/22		1010		G S		N N	
LT-W40-9-10		1/11/22		1651		G S		N N	
LT-N25-27-27.5		1/12/22		1336		G S		N N	
LT-S25-14-15		1/12/22		1430		G S		N N	
LT-W25-14-15		1/11/22		1635		G S		N N	
Possible Hazard Identification		Sample Disposal		Sample Disposal		Sample Disposal		Sample Disposal	
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months		Special Instructions/QC Requirements: DOD QSM project.		Special Instructions/QC Requirements: DOD QSM project.		Special Instructions/QC Requirements: DOD QSM project.	
Deliverable Requested: I, II, III, IV, Other (specify)		Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQUIS EDD.		Special Instructions/QC Requirements: DOD QSM project.		Special Instructions/QC Requirements: DOD QSM project.		Special Instructions/QC Requirements: DOD QSM project.	
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:			
Relinquished by: Matthew Yim <i>Matthew Yim</i>		Date/Time: 1/13/22 1530		Company: AECOM		Received by:		Date/Time:	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Digitally signed by Hart, Jeff DN: cn=Hart, Jeff, ou=USHNL1, email=Jeff.Hart@aecom.com Date: 2022.01.14 12:40:37 -1000		Cooler Temperature(s) °C and Other Remarks:			

Hart, Jeff

Chain of Custody Record

Client Information		Sampler: Dominic Mariano		Lab PM: Elaine Walker		Carrier Tracking No(s): FedEx		COC No: 202201-03 Soil																			
Client Contact: Alethea Ramos (alternate: Margie Pascua)		Phone: 310-625-1283		E-Mail: M.Elaine.Walker@EurofinsET.com		State of Origin: Hawaii		Page: Page 3 of 4																			
Company: AECOM				PWSID:				Analysis Requested																			
Address: 1001 Bishop St. Suite 1600		Due Date Requested: see subcontract		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		EPA 8260 BTEX+Naph		EPA 8260 TPH-G (C6-C10)		EPA 8015 TPH-D/O (C10-C24, C24-C40)		EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup		EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)		Total Number of containers		Preservation Codes:							
City: Honolulu		TAT Requested (days): 3 working days																		A - HCL				M - Hexane			
State, Zip: Hawaii 96813		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No																		B - NaOH				N - None			
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)		PO #:																		C - Zn Acetate				O - AsNaO2			
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)		WO #:																		D - Nitric Acid				P - Na2O4S			
Project Name: CV18F0126		Project #: 60674414		E - NaHSO4				Q - Na2SO3																			
Site: RH		Note to AECOM before printing COC: put in subk#		F - MeOH				R - Na2S2O3																			
				G - Amchlor				S - H2SO4																			
				H - Ascorbic Acid				T - TSP Dodecahydrate																			
				I - Ice				U - Acetone																			
				J - DI Water				V - MCAA																			
				K - EDTA				W - pH 4-5																			
				L - EDA				Z - other (specify)																			
				Other:																							
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, An=Air)	Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		EPA 8260 BTEX+Naph		EPA 8260 TPH-G (C6-C10)		EPA 8015 TPH-D/O (C10-C24, C24-C40)		EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup		EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)		Total Number of containers	Special Instructions/Note:						
-1	LT-W17.5-12-13	1/12/22	1505	G	S	N	N	X	X												3						
	LT-N10-21-22	1/12/22	1058	G	S	N	N	X	X													3					
-3	LT-E10-7-8	1/12/22	1325	G	S	N	N	X	X													3					
	LT-S25-7-8	1/12/22	1422	G	S	N	N	X	X													3					
-5	LT-W10-11-12	1/11/22	1520	G	S	N	N	X	X													3					
	LT-W10-19-20	1/11/22	1602	G	S	N	N	X	X													3					
-7	HT-N10-19-20	1/12/22	1608	G	S	N	N	X	X													3					
	LT-N40-7-8	1/12/22	1542	G	S	N	N	X	X													3					
-9	LT-N25-16-17	1/12/22	1336	G	S	N	N	X	X													3					
	LT-S10-17-18	1/12/22	1005	G	S	N	N	X	X													3					
-11	LT-N10-7-8	1/12/22	1050	G	S	N	N	X	X													3					
Possible Hazard Identification						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)																					
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological						<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposa						Therm. ID: <u>A3</u> Cor: <u>D6</u> ° Unc: <u>D6</u> °															
Deliverable Requested: I, II, III, IV, Other (specify)						Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQHS EDD						Special Instructions/QC Requirements: DC															
Empty Kit Relinquished by:				Date:		Time:		M.		Packing: <u>1</u> FedEx: <u>PO</u>																	
Relinquished by: Matthew Yim <i>Matthew Yim</i>				Date/Time: 1/13/22 1530		Company: AECOM		Received by:		Cust. Seal: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Blue Ice: <u>Wet, Dry, None</u> Lab Cour: <u>ETG</u>																	
Relinquished by:				Date/Time:		Company:		Received by:		Other:																	
Relinquished by:				Date/Time:		Company:		Received by: <i>M. Pas</i>		Date/Time: <u>1/14/22 1615</u>		Company: <u>ETG</u>															
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:																							

Chain of Custody Record

Client Information		Sampler: Dominic Mariano		Lab PM: Elaine Walker		Carrier Tracking No(s): FedEx		COC No: 202201-04 Soil																															
Client Contact: Alethea Ramos (alternate: Margie Pascua)		Phone: 310-625-1283		E-Mail: M.Elaine.Walker@EurofinsET.com		State of Origin: Hawaii		Page: Page 4 of 4																															
Company: AECOM				PWSID:		Analysis Requested																																	
Address: 1001 Bishop St. Suite 1600		Due Date Requested: See subcontract		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; text-align:center;">Field Filtered Sample (Yes or No)</td> <td style="width:50%; text-align:center;">Perform MS/MSD (Yes or No)</td> </tr> <tr> <td style="text-align:center;">EPA 8260 BTEX+Naph</td> <td style="text-align:center;">EPA 8260 TPH-G (CS-C10)</td> </tr> <tr> <td style="text-align:center;">EPA 8015 TPH-D/D (C10-C24, C24-C40)</td> <td style="text-align:center;">EPA 8015 TPH-D/D (C10-C24, C24-C40) w/ silica gel cleanup</td> </tr> <tr> <td style="text-align:center;">EPA 8270 SIM PAHs</td> <td style="text-align:center;">(naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)</td> </tr> <tr> <td style="text-align:center;"></td> <td style="text-align:center;"></td> </tr> </table>				Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 8260 BTEX+Naph	EPA 8260 TPH-G (CS-C10)	EPA 8015 TPH-D/D (C10-C24, C24-C40)	EPA 8015 TPH-D/D (C10-C24, C24-C40) w/ silica gel cleanup	EPA 8270 SIM PAHs	(naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)			Job #:																					
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EPA 8270 SIM PAHs	(naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)																																						
City: Honolulu		TAT Requested (days): 3 working days		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; text-align:center;">Preservation Codes:</td> <td style="width:50%;"></td> </tr> <tr> <td style="vertical-align: top;"> A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA </td> <td style="vertical-align: top;"> M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify) </td> </tr> <tr> <td colspan="2">Other:</td> </tr> </table>				Preservation Codes:		A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA	M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)	Other:		Preservation Codes:																									
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Other:																																							
State, Zip: Hawaii 96813		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Sample Identification</th> <th>Sample Date</th> <th>Sample Time</th> <th>Sample Type (C=comp, G=grab)</th> <th>Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)</th> <th>Field Filtered Sample (Yes or No)</th> <th>Perform MS/MSD (Yes or No)</th> <th>EPA 8260 BTEX+Naph</th> <th>EPA 8260 TPH-G (CS-C10)</th> <th>EPA 8015 TPH-D/D (C10-C24, C24-C40)</th> <th>EPA 8015 TPH-D/D (C10-C24, C24-C40) w/ silica gel cleanup</th> <th>EPA 8270 SIM PAHs</th> <th>(naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)</th> <th>Total Number of containers</th> <th>Special Instructions/Note:</th> </tr> <tr> <td colspan="15" style="text-align:center;">Preservation Code:</td> </tr> </table>				Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 8260 BTEX+Naph	EPA 8260 TPH-G (CS-C10)	EPA 8015 TPH-D/D (C10-C24, C24-C40)	EPA 8015 TPH-D/D (C10-C24, C24-C40) w/ silica gel cleanup	EPA 8270 SIM PAHs	(naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)	Total Number of containers	Special Instructions/Note:	Preservation Code:															Note to AECOM before printing COC: put in PO# v	
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Preservation Code:																																							
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)		PO #:		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td colspan="15" style="text-align:center;">Preservation Code:</td> </tr> </table>				Preservation Code:															Note to AECOM before printing COC: put in subk#																
Preservation Code:																																							
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)		WO #:		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td colspan="15" style="text-align:center;">Preservation Code:</td> </tr> </table>															Preservation Code:																				
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Project Name: CV18F0126		Project #: 60674414		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td colspan="15" style="text-align:center;">Preservation Code:</td> </tr> </table>															Preservation Code:																				
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Possible Hazard Identification				Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)									
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological				<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months									
Deliverable Requested: I, II, III, IV, Other (specify)				Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT, AECOM EQUIS EDD.		Special Instructions/QC Requirements: DOD QSM project.							
Empty Kit Relinquished by:				Date:		Time:		Method of Shipment:					
Relinquished by: Matthew Yim <i>Matthew Yim</i>				Date/Time: 1/13/22 1530		Company: AECOM		Received by:		Date/Time:		Company:	
Relinquished by:				Date/Time:		Company:		Received by:		Date/Time:		Company:	
Relinquished by:				Date/Time:		Company:		Received by: <i>[Signature]</i>		Date/Time: 1/14/22 1605		Company: FGS	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:									



Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-109299-1

Login Number: 109299

List Source: Eurofins Seattle

List Number: 1

Creator: Holdener, Heather D

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	False	Refer to Job Narrative for details.
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ANALYTICAL REPORT

Eurofins Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-109327-1

Client Project/Site: Red Hill JBPHH N62742-17-D-1800-
CV22F0106

Revision: 2

For:

AECOM
1001 Bishop Street
Honolulu, Hawaii 96813

Attn: Jeff Hart



Authorized for release by:

9/8/2022 5:46:24 PM

Elaine Walker, Project Manager II
(253)248-4972

M.Elaine.Walker@et.eurofinsus.com

LINKS

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results through



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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Sample Summary	41
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Case Narrative

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Job ID: 580-109327-1

Laboratory: Eurofins Seattle

Narrative

CASE NARRATIVE
Client: AECOM
Project: Red Hill JBPHH N62742-17-D-1800-CV22F0106
Report Number: 580-109327-1

REVISION 2 August 30, 2022

Report revised to change the reported carbon range for GRO to C6-C10.

REVISION 1 July 29, 2022

Report has been revised for 8260B CALUFT results. Chromatographic integrations have been adjusted to forced baseline-baseline integration per Method and SOP.

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

Following DoD QSM guidelines, manual integrations were performed only when necessary and are in compliance with the laboratory's standard operating procedure, Acceptable Manual Integration Practices, SOP No.: Q-S-002. The reason(s) for manual integration have been documented on the affected chromatogram(s), which is/are provided in the raw data package. The raw data also includes the original chromatogram(s) prior to any manual integration being performed. Manual integrations are detailed in the manual integration summary forms following this narrative.

It should be noted that samples with elevated Limits of Quantitation (LOQs) resulting from a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the LOQs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes within the calibration range of the instrument or that reduces the interferences thereby enabling the quantification of target analytes.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

Seventeen samples were received on 1/15/2022 11:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.5° C and 1.4° C.

Receipt Exceptions

109327-1: Three 40 ml VOA Vials were submitted for analysis and there are only two listed on the COC.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

GASOLINE RANGE ORGANICS (GRO)

Samples HT-E25-7-8 (580-109327-2), HT-E17.5-14-15 (580-109327-3), HT-S17.5-8-9 (580-109327-4), HT-E10-23-24 (580-109327-5), HT-S10-17-18 (580-109327-6), HT-N25-10-11 DUPLICATE (580-109327-7), HT-E25-14-15 (580-109327-8), HT-S10-15-16 (580-109327-9), HT-E17.5-7-8 (580-109327-10), HT-N25-14-15 (580-109327-11), HT-N25-14-15 DUPLICATE (580-109327-12), HT-E10-21-22

Case Narrative

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Job ID: 580-109327-1 (Continued)

Laboratory: Eurofins Seattle (Continued)

(580-109327-13), HT-N25-10-11 (580-109327-14), HT-S25-14-15 (580-109327-15) and HT-S25-8-9 (580-109327-16) were analyzed for gasoline range organics (GRO) in accordance with 8260B CALUFT. The samples were prepared on 01/15/2022 and analyzed on 01/16/2022 and 01/17/2022.

The following samples were analyzed at reduced volume due to high concentrations of target analytes: HT-S10-17-18 (580-109327-6) and HT-S10-15-16 (580-109327-9). The calculation was performed using an initial volume adjustment rather than a dilution factor. The reporting limits have been elevated by the appropriate factor.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GASOLINE RANGE ORGANICS (GRO) - EB

Sample EB (580-109327-1) was analyzed for gasoline range organics (GRO) in accordance with 8260B CALUFT. The sample was analyzed on 01/17/2022.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples HT-E25-7-8 (580-109327-2), HT-E17.5-14-15 (580-109327-3), HT-S17.5-8-9 (580-109327-4), HT-E10-23-24 (580-109327-5), HT-S10-17-18 (580-109327-6), HT-N25-10-11 DUPLICATE (580-109327-7), HT-E25-14-15 (580-109327-8), HT-S10-15-16 (580-109327-9), HT-E17.5-7-8 (580-109327-10), HT-N25-14-15 (580-109327-11), HT-N25-14-15 DUPLICATE (580-109327-12), HT-E10-21-22 (580-109327-13), HT-N25-10-11 (580-109327-14), HT-S25-14-15 (580-109327-15) and HT-S25-8-9 (580-109327-16) were analyzed for volatile organic compounds (GC-MS) in accordance with 8260D_DOD5. The samples were prepared on 01/15/2022 and analyzed on 01/17/2022 and 01/18/2022.

The continuing calibration verification (CCV) associated with batch 580-378597 recovered above the upper control limit for Benzene and Toluene. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated samples are impacted: HT-S10-17-18 (580-109327-6), HT-S10-15-16 (580-109327-9), HT-S25-8-9 (580-109327-16) and (CCVIS 580-378597/3).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOLATILE ORGANIC COMPOUNDS (GC-MS) - EB

Sample EB (580-109327-1) was analyzed for volatile organic compounds (GC-MS) in accordance with 8260D_DOD5. The sample was analyzed on 01/17/2022.

The continuing calibration verification (CCV) associated with batch 580-378553 recovered above the upper control limit for m-Xylene & p-Xylene and Toluene. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated samples are impacted: EB (580-109327-1) and (CCVIS 580-378553/2).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SEMIVOLATILE ORGANIC COMPOUNDS - SELECTED ION MODE (SIM)

Samples HT-E25-7-8 (580-109327-2), HT-E17.5-14-15 (580-109327-3), HT-S17.5-8-9 (580-109327-4), HT-E10-23-24 (580-109327-5), HT-S10-17-18 (580-109327-6), HT-N25-10-11 DUPLICATE (580-109327-7), HT-E25-14-15 (580-109327-8), HT-S10-15-16 (580-109327-9), HT-E17.5-7-8 (580-109327-10), HT-N25-14-15 (580-109327-11), HT-N25-14-15 DUPLICATE (580-109327-12), HT-E10-21-22 (580-109327-13), HT-N25-10-11 (580-109327-14), HT-S25-14-15 (580-109327-15), HT-S25-8-9 (580-109327-16) and LT-SEDIMENT (580-109327-17) were analyzed for semivolatile organic compounds - Selected Ion Mode (SIM) in accordance with 8270E SIM. The samples were prepared on 01/15/2022 and analyzed on 01/17/2022 and 01/18/2022.

The following samples was diluted to bring the concentration of target analytes within the calibration range: HT-S10-15-16 (580-109327-9) and LT-SEDIMENT (580-109327-17). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SEMIVOLATILE ORGANIC COMPOUNDS - SELECTED ION MODE (SIM) - EB

Case Narrative

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Job ID: 580-109327-1 (Continued)

Laboratory: Eurofins Seattle (Continued)

Sample EB (580-109327-1) was analyzed for semivolatile organic compounds - Selected Ion Mode (SIM) in accordance with 8270E SIM. The sample was prepared on 01/16/2022 and analyzed on 01/17/2022.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DIESEL RANGE ORGANICS

Samples HT-E25-7-8 (580-109327-2), HT-E17.5-14-15 (580-109327-3), HT-S17.5-8-9 (580-109327-4), HT-E10-23-24 (580-109327-5), HT-S10-17-18 (580-109327-6), HT-N25-10-11 DUPLICATE (580-109327-7), HT-E25-14-15 (580-109327-8), HT-S10-15-16 (580-109327-9), HT-E17.5-7-8 (580-109327-10), HT-N25-14-15 (580-109327-11), HT-N25-14-15 DUPLICATE (580-109327-12), HT-E10-21-22 (580-109327-13), HT-N25-10-11 (580-109327-14), HT-S25-14-15 (580-109327-15), HT-S25-8-9 (580-109327-16) and LT-SEDIMENT (580-109327-17) were analyzed for diesel range organics in accordance with 8015DRO. The samples were prepared on 01/15/2022 and analyzed on 01/16/2022 and 01/17/2022.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DIESEL RANGE ORGANICS - EB

Sample EB (580-109327-1) was analyzed for Diesel Range Organics in accordance with 8015D DRO. The sample was prepared and analyzed on 01/16/2022.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PERCENT SOLIDS

Samples HT-E25-7-8 (580-109327-2), HT-E17.5-14-15 (580-109327-3), HT-S17.5-8-9 (580-109327-4), HT-E10-23-24 (580-109327-5), HT-S10-17-18 (580-109327-6), HT-N25-10-11 DUPLICATE (580-109327-7), HT-E25-14-15 (580-109327-8), HT-S10-15-16 (580-109327-9), HT-E17.5-7-8 (580-109327-10), HT-N25-14-15 (580-109327-11), HT-N25-14-15 DUPLICATE (580-109327-12), HT-E10-21-22 (580-109327-13), HT-N25-10-11 (580-109327-14), HT-S25-14-15 (580-109327-15), HT-S25-8-9 (580-109327-16) and LT-SEDIMENT (580-109327-17) were analyzed for percent solids in accordance with ASTM D2216. The samples were analyzed on 01/16/2022.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: AECOM

Job ID: 580-109327-1

Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

GC/MS Semi VOA

Qualifier	Qualifier Description
D	The reported value is from a dilution.
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

GC Semi VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: EB
Date Collected: 01/13/22 16:15
Date Received: 01/15/22 11:00

Lab Sample ID: 580-109327-1
Matrix: Water

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	80	U	100	31	ug/L			01/17/22 21:28	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	96		69 - 133					01/17/22 21:28	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.50	U	1.0	0.24	ug/L			01/17/22 21:28	1
Toluene	0.80	U Q	1.0	0.39	ug/L			01/17/22 21:28	1
Ethylbenzene	0.80	U	1.0	0.50	ug/L			01/17/22 21:28	1
m-Xylene & p-Xylene	0.80	U Q	2.0	0.53	ug/L			01/17/22 21:28	1
o-Xylene	0.80	U	1.0	0.39	ug/L			01/17/22 21:28	1
Xylenes, Total	0.80	U	2.0	0.53	ug/L			01/17/22 21:28	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	96		85 - 114					01/17/22 21:28	1
Toluene-d8 (Surr)	97		89 - 112					01/17/22 21:28	1
Dibromofluoromethane (Surr)	90		80 - 119					01/17/22 21:28	1
1,2-Dichloroethane-d4 (Surr)	88		81 - 118					01/17/22 21:28	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	0.079	U M	0.099	0.031	ug/L		01/16/22 11:03	01/17/22 13:25	1
2-Methylnaphthalene	0.079	U M	0.20	0.039	ug/L		01/16/22 11:03	01/17/22 13:25	1
1-Methylnaphthalene	0.032	U M	0.099	0.019	ug/L		01/16/22 11:03	01/17/22 13:25	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Terphenyl-d14	93		58 - 132				01/16/22 11:03	01/17/22 13:25	1
2-methylnaphthalene-d10	63		40 - 140				01/16/22 11:03	01/17/22 13:25	1
Fluoranthene-d10 (Surr)	87		40 - 140				01/16/22 11:03	01/17/22 13:25	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	97	U	110	63	ug/L		01/16/22 11:08	01/16/22 22:45	1
Motor Oil Range Organics (C24-C40)	290	U	340	170	ug/L		01/16/22 11:08	01/16/22 22:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	84		56 - 125				01/16/22 11:08	01/16/22 22:45	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-E25-7-8

Lab Sample ID: 580-109327-2

Date Collected: 01/13/22 12:35

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 73.9

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	5.1	U	6.8	2.2	mg/Kg	✱	01/15/22 16:57	01/16/22 03:55	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	90		67 - 134				01/15/22 16:57	01/16/22 03:55	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.026	U	0.034	0.0065	mg/Kg	✱	01/15/22 17:17	01/17/22 15:52	1
Toluene	0.051	U	0.10	0.023	mg/Kg	✱	01/15/22 17:17	01/17/22 15:52	1
Ethylbenzene	0.051	U	0.068	0.016	mg/Kg	✱	01/15/22 17:17	01/17/22 15:52	1
m-Xylene & p-Xylene	0.026	U	0.068	0.012	mg/Kg	✱	01/15/22 17:17	01/17/22 15:52	1
o-Xylene	0.026	U	0.068	0.0085	mg/Kg	✱	01/15/22 17:17	01/17/22 15:52	1
Xylenes, Total	0.026	U	0.068	0.012	mg/Kg	✱	01/15/22 17:17	01/17/22 15:52	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	106		85 - 116				01/15/22 17:17	01/17/22 15:52	1
4-Bromofluorobenzene (Surr)	93		79 - 119				01/15/22 17:17	01/17/22 15:52	1
Dibromofluoromethane (Surr)	83		78 - 119				01/15/22 17:17	01/17/22 15:52	1
1,2-Dichloroethane-d4 (Surr)	81		71 - 136				01/15/22 17:17	01/17/22 15:52	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0019	U	0.0063	0.00080	mg/Kg	✱	01/15/22 18:03	01/17/22 14:32	1
2-Methylnaphthalene	0.0038	U	0.0063	0.0026	mg/Kg	✱	01/15/22 18:03	01/17/22 14:32	1
Naphthalene	0.0051	U	0.0063	0.0021	mg/Kg	✱	01/15/22 18:03	01/17/22 14:32	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	89		40 - 140				01/15/22 18:03	01/17/22 14:32	1
Fluoranthene-d10 (Surr)	104		40 - 140				01/15/22 18:03	01/17/22 14:32	1
Terphenyl-d14	114		58 - 132				01/15/22 18:03	01/17/22 14:32	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	13	J	61	12	mg/Kg	✱	01/15/22 16:21	01/16/22 17:55	1
Motor Oil Range Organics (C24-C40)	36	U	61	24	mg/Kg	✱	01/15/22 16:21	01/16/22 17:55	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	98		45 - 130				01/15/22 16:21	01/16/22 17:55	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	73.9		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	26.1		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-E17.5-14-15

Lab Sample ID: 580-109327-3

Date Collected: 01/13/22 13:15

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 65.0

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	10	U	13	4.3	mg/Kg	☼	01/15/22 16:57	01/16/22 01:35	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	88		67 - 134				01/15/22 16:57	01/16/22 01:35	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.050	U	0.067	0.013	mg/Kg	☼	01/15/22 17:17	01/17/22 16:15	1
Toluene	0.10	U	0.20	0.045	mg/Kg	☼	01/15/22 17:17	01/17/22 16:15	1
Ethylbenzene	0.10	U	0.13	0.030	mg/Kg	☼	01/15/22 17:17	01/17/22 16:15	1
m-Xylene & p-Xylene	0.050	U	0.13	0.024	mg/Kg	☼	01/15/22 17:17	01/17/22 16:15	1
o-Xylene	0.050	U	0.13	0.017	mg/Kg	☼	01/15/22 17:17	01/17/22 16:15	1
Xylenes, Total	0.050	U	0.13	0.024	mg/Kg	☼	01/15/22 17:17	01/17/22 16:15	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	106		85 - 116				01/15/22 17:17	01/17/22 16:15	1
4-Bromofluorobenzene (Surr)	94		79 - 119				01/15/22 17:17	01/17/22 16:15	1
Dibromofluoromethane (Surr)	83	M	78 - 119				01/15/22 17:17	01/17/22 16:15	1
1,2-Dichloroethane-d4 (Surr)	80		71 - 136				01/15/22 17:17	01/17/22 16:15	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0022	U	0.0072	0.00091	mg/Kg	☼	01/15/22 18:03	01/17/22 15:45	1
2-Methylnaphthalene	0.0043	U	0.0072	0.0030	mg/Kg	☼	01/15/22 18:03	01/17/22 15:45	1
Naphthalene	0.0058	U	0.0072	0.0023	mg/Kg	☼	01/15/22 18:03	01/17/22 15:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	89		40 - 140				01/15/22 18:03	01/17/22 15:45	1
Fluoranthene-d10 (Surr)	108		40 - 140				01/15/22 18:03	01/17/22 15:45	1
Terphenyl-d14	117		58 - 132				01/15/22 18:03	01/17/22 15:45	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	15	J	72	14	mg/Kg	☼	01/15/22 16:21	01/16/22 18:55	1
Motor Oil Range Organics (C24-C40)	43	U	72	29	mg/Kg	☼	01/15/22 16:21	01/16/22 18:55	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	101		45 - 130				01/15/22 16:21	01/16/22 18:55	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	65.0		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	35.0		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-S17.5-8-9

Lab Sample ID: 580-109327-4

Date Collected: 01/13/22 12:20

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 75.9

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	10	U	14	4.4	mg/Kg	☼	01/15/22 16:57	01/16/22 04:41	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	88		67 - 134				01/15/22 16:57	01/16/22 04:41	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.051	U	0.068	0.013	mg/Kg	☼	01/15/22 17:17	01/17/22 16:38	1
Toluene	0.10	U	0.20	0.046	mg/Kg	☼	01/15/22 17:17	01/17/22 16:38	1
Ethylbenzene	0.10	U	0.14	0.031	mg/Kg	☼	01/15/22 17:17	01/17/22 16:38	1
m-Xylene & p-Xylene	0.051	U	0.14	0.024	mg/Kg	☼	01/15/22 17:17	01/17/22 16:38	1
o-Xylene	0.051	U	0.14	0.017	mg/Kg	☼	01/15/22 17:17	01/17/22 16:38	1
Xylenes, Total	0.051	U	0.14	0.024	mg/Kg	☼	01/15/22 17:17	01/17/22 16:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	97		85 - 116				01/15/22 17:17	01/17/22 16:38	1
4-Bromofluorobenzene (Surr)	98		79 - 119				01/15/22 17:17	01/17/22 16:38	1
Dibromofluoromethane (Surr)	86		78 - 119				01/15/22 17:17	01/17/22 16:38	1
1,2-Dichloroethane-d4 (Surr)	75		71 - 136				01/15/22 17:17	01/17/22 16:38	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0019	U	0.0065	0.00082	mg/Kg	☼	01/15/22 18:03	01/17/22 16:10	1
2-Methylnaphthalene	0.0039	U	0.0065	0.0027	mg/Kg	☼	01/15/22 18:03	01/17/22 16:10	1
Naphthalene	0.0052	U	0.0065	0.0021	mg/Kg	☼	01/15/22 18:03	01/17/22 16:10	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	88		40 - 140				01/15/22 18:03	01/17/22 16:10	1
Fluoranthene-d10 (Surr)	109		40 - 140				01/15/22 18:03	01/17/22 16:10	1
Terphenyl-d14	117		58 - 132				01/15/22 18:03	01/17/22 16:10	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	39	U	66	13	mg/Kg	☼	01/15/22 16:21	01/16/22 19:15	1
Motor Oil Range Organics (C24-C40)	39	U	66	26	mg/Kg	☼	01/15/22 16:21	01/16/22 19:15	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	97		45 - 130				01/15/22 16:21	01/16/22 19:15	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	75.9		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	24.1		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-E10-23-24

Lab Sample ID: 580-109327-5

Date Collected: 01/13/22 11:22

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 64.3

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	11	U	14	4.7	mg/Kg	☼	01/15/22 16:57	01/16/22 05:04	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	94		67 - 134				01/15/22 16:57	01/16/22 05:04	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.054	U	0.072	0.014	mg/Kg	☼	01/15/22 17:17	01/17/22 17:01	1
Toluene	0.11	U	0.22	0.049	mg/Kg	☼	01/15/22 17:17	01/17/22 17:01	1
Ethylbenzene	0.11	U	0.14	0.033	mg/Kg	☼	01/15/22 17:17	01/17/22 17:01	1
m-Xylene & p-Xylene	0.054	U	0.14	0.026	mg/Kg	☼	01/15/22 17:17	01/17/22 17:01	1
o-Xylene	0.054	U	0.14	0.018	mg/Kg	☼	01/15/22 17:17	01/17/22 17:01	1
Xylenes, Total	0.054	U	0.14	0.026	mg/Kg	☼	01/15/22 17:17	01/17/22 17:01	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	106		85 - 116				01/15/22 17:17	01/17/22 17:01	1
4-Bromofluorobenzene (Surr)	96		79 - 119				01/15/22 17:17	01/17/22 17:01	1
Dibromofluoromethane (Surr)	85		78 - 119				01/15/22 17:17	01/17/22 17:01	1
1,2-Dichloroethane-d4 (Surr)	83		71 - 136				01/15/22 17:17	01/17/22 17:01	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.024	M	0.0073	0.00092	mg/Kg	☼	01/15/22 18:03	01/17/22 16:34	1
2-Methylnaphthalene	0.038	M	0.0073	0.0030	mg/Kg	☼	01/15/22 18:03	01/17/22 16:34	1
Naphthalene	0.0059	U	0.0073	0.0024	mg/Kg	☼	01/15/22 18:03	01/17/22 16:34	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	86		40 - 140				01/15/22 18:03	01/17/22 16:34	1
Fluoranthene-d10 (Surr)	108		40 - 140				01/15/22 18:03	01/17/22 16:34	1
Terphenyl-d14	114		58 - 132				01/15/22 18:03	01/17/22 16:34	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	130		68	14	mg/Kg	☼	01/15/22 16:21	01/16/22 19:36	1
Motor Oil Range Organics (C24-C40)	41	U	68	27	mg/Kg	☼	01/15/22 16:21	01/16/22 19:36	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	98		45 - 130				01/15/22 16:21	01/16/22 19:36	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	64.3		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	35.7		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-S10-17-18

Lab Sample ID: 580-109327-6

Date Collected: 01/13/22 11:35

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 65.9

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	370		140	46	mg/Kg	☼	01/15/22 16:57	01/16/22 05:28	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	108		67 - 134				01/15/22 16:57	01/16/22 05:28	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.11	U Q	0.14	0.027	mg/Kg	☼	01/15/22 17:17	01/18/22 08:33	1
Toluene	0.21	U Q	0.43	0.096	mg/Kg	☼	01/15/22 17:17	01/18/22 08:33	1
Ethylbenzene	0.21	U	0.28	0.065	mg/Kg	☼	01/15/22 17:17	01/18/22 08:33	1
m-Xylene & p-Xylene	0.69		0.28	0.050	mg/Kg	☼	01/15/22 17:17	01/18/22 08:33	1
o-Xylene	1.6		0.28	0.035	mg/Kg	☼	01/15/22 17:17	01/18/22 08:33	1
Xylenes, Total	2.3		0.28	0.050	mg/Kg	☼	01/15/22 17:17	01/18/22 08:33	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	109		85 - 116				01/15/22 17:17	01/18/22 08:33	1
4-Bromofluorobenzene (Surr)	93		79 - 119				01/15/22 17:17	01/18/22 08:33	1
Dibromofluoromethane (Surr)	83		78 - 119				01/15/22 17:17	01/18/22 08:33	1
1,2-Dichloroethane-d4 (Surr)	80		71 - 136				01/15/22 17:17	01/18/22 08:33	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	4.4		0.0060	0.00075	mg/Kg	☼	01/15/22 18:03	01/17/22 16:59	1
2-Methylnaphthalene	6.5		0.0060	0.0024	mg/Kg	☼	01/15/22 18:03	01/17/22 16:59	1
Naphthalene	1.4	M	0.0060	0.0019	mg/Kg	☼	01/15/22 18:03	01/17/22 16:59	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	119		40 - 140				01/15/22 18:03	01/17/22 16:59	1
Fluoranthene-d10 (Surr)	100		40 - 140				01/15/22 18:03	01/17/22 16:59	1
Terphenyl-d14	111		58 - 132				01/15/22 18:03	01/17/22 16:59	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	2600		63	12	mg/Kg	☼	01/15/22 16:21	01/16/22 19:56	1
Motor Oil Range Organics (C24-C40)	38	U	63	25	mg/Kg	☼	01/15/22 16:21	01/16/22 19:56	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	97		45 - 130				01/15/22 16:21	01/16/22 19:56	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	65.9		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	34.1		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-N25-10-11 DUPLICATE

Lab Sample ID: 580-109327-7

Date Collected: 01/13/22 14:25

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 74.6

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	12	J	13	4.3	mg/Kg	☆	01/15/22 16:57	01/16/22 05:51	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	98		67 - 134				01/15/22 16:57	01/16/22 05:51	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.049	U	0.066	0.012	mg/Kg	☆	01/15/22 17:17	01/17/22 18:32	1
Toluene	0.099	U	0.20	0.044	mg/Kg	☆	01/15/22 17:17	01/17/22 18:32	1
Ethylbenzene	0.099	U	0.13	0.030	mg/Kg	☆	01/15/22 17:17	01/17/22 18:32	1
m-Xylene & p-Xylene	0.049	U	0.13	0.023	mg/Kg	☆	01/15/22 17:17	01/17/22 18:32	1
o-Xylene	0.049	U	0.13	0.016	mg/Kg	☆	01/15/22 17:17	01/17/22 18:32	1
Xylenes, Total	0.049	U	0.13	0.023	mg/Kg	☆	01/15/22 17:17	01/17/22 18:32	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	107		85 - 116				01/15/22 17:17	01/17/22 18:32	1
4-Bromofluorobenzene (Surr)	96		79 - 119				01/15/22 17:17	01/17/22 18:32	1
Dibromofluoromethane (Surr)	81		78 - 119				01/15/22 17:17	01/17/22 18:32	1
1,2-Dichloroethane-d4 (Surr)	79		71 - 136				01/15/22 17:17	01/17/22 18:32	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.013	M	0.0056	0.00070	mg/Kg	☆	01/15/22 18:03	01/17/22 17:23	1
2-Methylnaphthalene	0.019	M	0.0056	0.0023	mg/Kg	☆	01/15/22 18:03	01/17/22 17:23	1
Naphthalene	0.0045	U	0.0056	0.0018	mg/Kg	☆	01/15/22 18:03	01/17/22 17:23	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	97		40 - 140				01/15/22 18:03	01/17/22 17:23	1
Fluoranthene-d10 (Surr)	110		40 - 140				01/15/22 18:03	01/17/22 17:23	1
Terphenyl-d14	120		58 - 132				01/15/22 18:03	01/17/22 17:23	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	18	J	60	12	mg/Kg	☆	01/15/22 16:21	01/16/22 20:36	1
Motor Oil Range Organics (C24-C40)	40	J	60	24	mg/Kg	☆	01/15/22 16:21	01/16/22 20:36	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	102		45 - 130				01/15/22 16:21	01/16/22 20:36	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	74.6		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	25.4		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-E25-14-15

Lab Sample ID: 580-109327-8

Date Collected: 01/13/22 12:45

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 65.6

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	11	U	15	4.7	mg/Kg	☼	01/15/22 16:57	01/16/22 06:14	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	88		67 - 134				01/15/22 16:57	01/16/22 06:14	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.055	U	0.073	0.014	mg/Kg	☼	01/15/22 17:17	01/17/22 18:55	1
Toluene	0.11	U	0.22	0.049	mg/Kg	☼	01/15/22 17:17	01/17/22 18:55	1
Ethylbenzene	0.11	U	0.15	0.033	mg/Kg	☼	01/15/22 17:17	01/17/22 18:55	1
m-Xylene & p-Xylene	0.055	U	0.15	0.026	mg/Kg	☼	01/15/22 17:17	01/17/22 18:55	1
o-Xylene	0.055	U	0.15	0.018	mg/Kg	☼	01/15/22 17:17	01/17/22 18:55	1
Xylenes, Total	0.055	U	0.15	0.026	mg/Kg	☼	01/15/22 17:17	01/17/22 18:55	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	106		85 - 116				01/15/22 17:17	01/17/22 18:55	1
4-Bromofluorobenzene (Surr)	97		79 - 119				01/15/22 17:17	01/17/22 18:55	1
Dibromofluoromethane (Surr)	84		78 - 119				01/15/22 17:17	01/17/22 18:55	1
1,2-Dichloroethane-d4 (Surr)	81		71 - 136				01/15/22 17:17	01/17/22 18:55	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0018	U	0.0059	0.00075	mg/Kg	☼	01/15/22 18:03	01/17/22 17:47	1
2-Methylnaphthalene	0.0036	U	0.0059	0.0024	mg/Kg	☼	01/15/22 18:03	01/17/22 17:47	1
Naphthalene	0.0048	U	0.0059	0.0019	mg/Kg	☼	01/15/22 18:03	01/17/22 17:47	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	89		40 - 140				01/15/22 18:03	01/17/22 17:47	1
Fluoranthene-d10 (Surr)	107		40 - 140				01/15/22 18:03	01/17/22 17:47	1
Terphenyl-d14	114		58 - 132				01/15/22 18:03	01/17/22 17:47	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	16	J	74	15	mg/Kg	☼	01/15/22 16:21	01/16/22 20:56	1
Motor Oil Range Organics (C24-C40)	44	U	74	30	mg/Kg	☼	01/15/22 16:21	01/16/22 20:56	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	101		45 - 130				01/15/22 16:21	01/16/22 20:56	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	65.6		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	34.4		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-S10-15-16

Lab Sample ID: 580-109327-9

Date Collected: 01/13/22 11:40

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 67.8

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	1000	U	1400	450	mg/Kg	☼	01/15/22 16:57	01/16/22 06:37	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	97		67 - 134				01/15/22 16:57	01/16/22 06:37	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.10	U Q	0.14	0.026	mg/Kg	☼	01/15/22 17:17	01/18/22 08:57	1
Toluene	0.21	U Q	0.42	0.094	mg/Kg	☼	01/15/22 17:17	01/18/22 08:57	1
Ethylbenzene	0.29		0.28	0.063	mg/Kg	☼	01/15/22 17:17	01/18/22 08:57	1
m-Xylene & p-Xylene	1.9		0.28	0.050	mg/Kg	☼	01/15/22 17:17	01/18/22 08:57	1
o-Xylene	6.1		0.28	0.035	mg/Kg	☼	01/15/22 17:17	01/18/22 08:57	1
Xylenes, Total	8.0		0.28	0.050	mg/Kg	☼	01/15/22 17:17	01/18/22 08:57	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	110		85 - 116				01/15/22 17:17	01/18/22 08:57	1
4-Bromofluorobenzene (Surr)	93		79 - 119				01/15/22 17:17	01/18/22 08:57	1
Dibromofluoromethane (Surr)	85		78 - 119				01/15/22 17:17	01/18/22 08:57	1
1,2-Dichloroethane-d4 (Surr)	82		71 - 136				01/15/22 17:17	01/18/22 08:57	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	8.9		0.0067	0.0022	mg/Kg	☼	01/15/22 18:03	01/17/22 18:11	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	82	M	40 - 140				01/15/22 18:03	01/17/22 18:11	1
Fluoranthene-d10 (Surr)	105		40 - 140				01/15/22 18:03	01/17/22 18:11	1
Terphenyl-d14	111		58 - 132				01/15/22 18:03	01/17/22 18:11	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	29	D	0.067	0.0085	mg/Kg	☼	01/15/22 18:03	01/18/22 10:49	10
2-Methylnaphthalene	45	D	0.067	0.028	mg/Kg	☼	01/15/22 18:03	01/18/22 10:49	10
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	127	M	40 - 140				01/15/22 18:03	01/18/22 10:49	10
Fluoranthene-d10 (Surr)	102		40 - 140				01/15/22 18:03	01/18/22 10:49	10
Terphenyl-d14	116		58 - 132				01/15/22 18:03	01/18/22 10:49	10

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	3200		55	11	mg/Kg	☼	01/15/22 16:21	01/16/22 21:16	1
Motor Oil Range Organics (C24-C40)	61		55	22	mg/Kg	☼	01/15/22 16:21	01/16/22 21:16	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	89		45 - 130				01/15/22 16:21	01/16/22 21:16	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	67.8		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	32.2		0.1	0.1	%			01/16/22 09:46	1

Eurofins Seattle

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-E17.5-7-8

Lab Sample ID: 580-109327-10

Date Collected: 01/13/22 13:00

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 70.1

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	12	U	16	5.3	mg/Kg	☼	01/15/22 16:57	01/16/22 07:01	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	91		67 - 134				01/15/22 16:57	01/16/22 07:01	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.061	U	0.081	0.015	mg/Kg	☼	01/15/22 17:17	01/17/22 19:42	1
Toluene	0.12	U	0.24	0.055	mg/Kg	☼	01/15/22 17:17	01/17/22 19:42	1
Ethylbenzene	0.12	U	0.16	0.037	mg/Kg	☼	01/15/22 17:17	01/17/22 19:42	1
m-Xylene & p-Xylene	0.061	U	0.16	0.029	mg/Kg	☼	01/15/22 17:17	01/17/22 19:42	1
o-Xylene	0.061	U	0.16	0.020	mg/Kg	☼	01/15/22 17:17	01/17/22 19:42	1
Xylenes, Total	0.061	U	0.16	0.029	mg/Kg	☼	01/15/22 17:17	01/17/22 19:42	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	105		85 - 116				01/15/22 17:17	01/17/22 19:42	1
4-Bromofluorobenzene (Surr)	92		79 - 119				01/15/22 17:17	01/17/22 19:42	1
Dibromofluoromethane (Surr)	83		78 - 119				01/15/22 17:17	01/17/22 19:42	1
1,2-Dichloroethane-d4 (Surr)	79		71 - 136				01/15/22 17:17	01/17/22 19:42	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0020	U	0.0068	0.00086	mg/Kg	☼	01/15/22 18:03	01/17/22 18:36	1
2-Methylnaphthalene	0.0041	U	0.0068	0.0028	mg/Kg	☼	01/15/22 18:03	01/17/22 18:36	1
Naphthalene	0.0054	U	0.0068	0.0022	mg/Kg	☼	01/15/22 18:03	01/17/22 18:36	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	92		40 - 140				01/15/22 18:03	01/17/22 18:36	1
Fluoranthene-d10 (Surr)	106		40 - 140				01/15/22 18:03	01/17/22 18:36	1
Terphenyl-d14	112		58 - 132				01/15/22 18:03	01/17/22 18:36	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	23	J	67	13	mg/Kg	☼	01/15/22 16:21	01/16/22 21:37	1
Motor Oil Range Organics (C24-C40)	72		67	27	mg/Kg	☼	01/15/22 16:21	01/16/22 21:37	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	101		45 - 130				01/15/22 16:21	01/16/22 21:37	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	70.1		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	29.9		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-N25-14-15

Lab Sample ID: 580-109327-11

Date Collected: 01/13/22 14:01

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 64.8

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	9.8	U	13	4.2	mg/Kg	☼	01/15/22 16:57	01/16/22 07:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	86		67 - 134				01/15/22 16:57	01/16/22 07:24	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.049	U	0.065	0.012	mg/Kg	☼	01/15/22 17:17	01/17/22 20:04	1
Toluene	0.098	U	0.20	0.044	mg/Kg	☼	01/15/22 17:17	01/17/22 20:04	1
Ethylbenzene	0.098	U	0.13	0.030	mg/Kg	☼	01/15/22 17:17	01/17/22 20:04	1
m-Xylene & p-Xylene	0.049	U	0.13	0.023	mg/Kg	☼	01/15/22 17:17	01/17/22 20:04	1
o-Xylene	0.049	U	0.13	0.016	mg/Kg	☼	01/15/22 17:17	01/17/22 20:04	1
Xylenes, Total	0.049	U	0.13	0.023	mg/Kg	☼	01/15/22 17:17	01/17/22 20:04	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	106		85 - 116				01/15/22 17:17	01/17/22 20:04	1
4-Bromofluorobenzene (Surr)	93		79 - 119				01/15/22 17:17	01/17/22 20:04	1
Dibromofluoromethane (Surr)	85		78 - 119				01/15/22 17:17	01/17/22 20:04	1
1,2-Dichloroethane-d4 (Surr)	80		71 - 136				01/15/22 17:17	01/17/22 20:04	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0023	U	0.0076	0.00096	mg/Kg	☼	01/15/22 18:03	01/17/22 19:00	1
2-Methylnaphthalene	0.0046	U	0.0076	0.0031	mg/Kg	☼	01/15/22 18:03	01/17/22 19:00	1
Naphthalene	0.0061	U	0.0076	0.0025	mg/Kg	☼	01/15/22 18:03	01/17/22 19:00	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	88		40 - 140				01/15/22 18:03	01/17/22 19:00	1
Fluoranthene-d10 (Surr)	105		40 - 140				01/15/22 18:03	01/17/22 19:00	1
Terphenyl-d14	118		58 - 132				01/15/22 18:03	01/17/22 19:00	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	20	J	77	15	mg/Kg	☼	01/15/22 16:21	01/16/22 21:57	1
Motor Oil Range Organics (C24-C40)	46	U	77	31	mg/Kg	☼	01/15/22 16:21	01/16/22 21:57	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	103		45 - 130				01/15/22 16:21	01/16/22 21:57	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	64.8		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	35.2		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-N25-14-15 DUPLICATE

Lab Sample ID: 580-109327-12

Date Collected: 01/13/22 14:20

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 65.4

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	12	U	15	5.0	mg/Kg	☼	01/15/22 16:57	01/16/22 07:47	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	89		67 - 134				01/15/22 16:57	01/16/22 07:47	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.058	U	0.077	0.015	mg/Kg	☼	01/15/22 17:17	01/17/22 20:27	1
Toluene	0.12	U	0.23	0.052	mg/Kg	☼	01/15/22 17:17	01/17/22 20:27	1
Ethylbenzene	0.12	U	0.15	0.035	mg/Kg	☼	01/15/22 17:17	01/17/22 20:27	1
m-Xylene & p-Xylene	0.058	U	0.15	0.027	mg/Kg	☼	01/15/22 17:17	01/17/22 20:27	1
o-Xylene	0.058	U	0.15	0.019	mg/Kg	☼	01/15/22 17:17	01/17/22 20:27	1
Xylenes, Total	0.058	U	0.15	0.027	mg/Kg	☼	01/15/22 17:17	01/17/22 20:27	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	106		85 - 116				01/15/22 17:17	01/17/22 20:27	1
4-Bromofluorobenzene (Surr)	91		79 - 119				01/15/22 17:17	01/17/22 20:27	1
Dibromofluoromethane (Surr)	85		78 - 119				01/15/22 17:17	01/17/22 20:27	1
1,2-Dichloroethane-d4 (Surr)	82		71 - 136				01/15/22 17:17	01/17/22 20:27	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0021	U	0.0069	0.00087	mg/Kg	☼	01/15/22 18:03	01/17/22 19:25	1
2-Methylnaphthalene	0.0042	U	0.0069	0.0028	mg/Kg	☼	01/15/22 18:03	01/17/22 19:25	1
Naphthalene	0.0055	U	0.0069	0.0022	mg/Kg	☼	01/15/22 18:03	01/17/22 19:25	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	94		40 - 140				01/15/22 18:03	01/17/22 19:25	1
Fluoranthene-d10 (Surr)	109		40 - 140				01/15/22 18:03	01/17/22 19:25	1
Terphenyl-d14	121		58 - 132				01/15/22 18:03	01/17/22 19:25	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	25	J	67	13	mg/Kg	☼	01/15/22 16:21	01/16/22 22:17	1
Motor Oil Range Organics (C24-C40)	40	U	67	27	mg/Kg	☼	01/15/22 16:21	01/16/22 22:17	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	98		45 - 130				01/15/22 16:21	01/16/22 22:17	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	65.4		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	34.6		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-E10-21-22

Lab Sample ID: 580-109327-13

Date Collected: 01/13/22 12:00

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 61.8

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	51		14	4.6	mg/Kg	☼	01/15/22 16:57	01/16/22 08:10	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	112		67 - 134				01/15/22 16:57	01/16/22 08:10	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.053	U	0.071	0.014	mg/Kg	☼	01/15/22 17:17	01/17/22 20:50	1
Toluene	0.11	U	0.21	0.048	mg/Kg	☼	01/15/22 17:17	01/17/22 20:50	1
Ethylbenzene	0.11	U	0.14	0.032	mg/Kg	☼	01/15/22 17:17	01/17/22 20:50	1
m-Xylene & p-Xylene	0.053	U	0.14	0.025	mg/Kg	☼	01/15/22 17:17	01/17/22 20:50	1
o-Xylene	0.053	U	0.14	0.018	mg/Kg	☼	01/15/22 17:17	01/17/22 20:50	1
Xylenes, Total	0.053	U	0.14	0.025	mg/Kg	☼	01/15/22 17:17	01/17/22 20:50	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	104		85 - 116				01/15/22 17:17	01/17/22 20:50	1
4-Bromofluorobenzene (Surr)	95		79 - 119				01/15/22 17:17	01/17/22 20:50	1
Dibromofluoromethane (Surr)	84		78 - 119				01/15/22 17:17	01/17/22 20:50	1
1,2-Dichloroethane-d4 (Surr)	82		71 - 136				01/15/22 17:17	01/17/22 20:50	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.73		0.0078	0.00098	mg/Kg	☼	01/15/22 18:03	01/17/22 19:49	1
2-Methylnaphthalene	0.85		0.0078	0.0032	mg/Kg	☼	01/15/22 18:03	01/17/22 19:49	1
Naphthalene	0.34		0.0078	0.0025	mg/Kg	☼	01/15/22 18:03	01/17/22 19:49	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	84		40 - 140				01/15/22 18:03	01/17/22 19:49	1
Fluoranthene-d10 (Surr)	99		40 - 140				01/15/22 18:03	01/17/22 19:49	1
Terphenyl-d14	108		58 - 132				01/15/22 18:03	01/17/22 19:49	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	430		67	13	mg/Kg	☼	01/15/22 16:21	01/16/22 22:37	1
Motor Oil Range Organics (C24-C40)	40	U	67	27	mg/Kg	☼	01/15/22 16:21	01/16/22 22:37	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	93		45 - 130				01/15/22 16:21	01/16/22 22:37	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	61.8		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	38.2		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-N25-10-11

Lab Sample ID: 580-109327-14

Date Collected: 01/13/22 14:15

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 75.6

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	4.5	J	12	4.0	mg/Kg	☆	01/15/22 16:57	01/17/22 10:39	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	79		67 - 134				01/15/22 16:57	01/17/22 10:39	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.046	U	0.061	0.012	mg/Kg	☆	01/15/22 17:17	01/17/22 21:13	1
Toluene	0.091	U	0.18	0.041	mg/Kg	☆	01/15/22 17:17	01/17/22 21:13	1
Ethylbenzene	0.091	U	0.12	0.028	mg/Kg	☆	01/15/22 17:17	01/17/22 21:13	1
m-Xylene & p-Xylene	0.046	U	0.12	0.022	mg/Kg	☆	01/15/22 17:17	01/17/22 21:13	1
o-Xylene	0.046	U	0.12	0.015	mg/Kg	☆	01/15/22 17:17	01/17/22 21:13	1
Xylenes, Total	0.046	U	0.12	0.022	mg/Kg	☆	01/15/22 17:17	01/17/22 21:13	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	108		85 - 116				01/15/22 17:17	01/17/22 21:13	1
4-Bromofluorobenzene (Surr)	97		79 - 119				01/15/22 17:17	01/17/22 21:13	1
Dibromofluoromethane (Surr)	82		78 - 119				01/15/22 17:17	01/17/22 21:13	1
1,2-Dichloroethane-d4 (Surr)	77		71 - 136				01/15/22 17:17	01/17/22 21:13	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0016	U	0.0054	0.00068	mg/Kg	☆	01/15/22 18:03	01/17/22 20:14	1
2-Methylnaphthalene	0.0032	U	0.0054	0.0022	mg/Kg	☆	01/15/22 18:03	01/17/22 20:14	1
Naphthalene	0.0043	U	0.0054	0.0017	mg/Kg	☆	01/15/22 18:03	01/17/22 20:14	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	91		40 - 140				01/15/22 18:03	01/17/22 20:14	1
Fluoranthene-d10 (Surr)	103		40 - 140				01/15/22 18:03	01/17/22 20:14	1
Terphenyl-d14	115		58 - 132				01/15/22 18:03	01/17/22 20:14	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	21	J	61	12	mg/Kg	☆	01/15/22 16:21	01/16/22 22:57	1
Motor Oil Range Organics (C24-C40)	36	U	61	24	mg/Kg	☆	01/15/22 16:21	01/16/22 22:57	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	94		45 - 130				01/15/22 16:21	01/16/22 22:57	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	75.6		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	24.4		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-S25-14-15

Lab Sample ID: 580-109327-15

Date Collected: 01/13/22 11:55

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 68.1

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	7.0	J	14	4.6	mg/Kg	☼	01/15/22 16:57	01/17/22 11:03	1
<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
4-Bromofluorobenzene (Surr)	82		67 - 134				01/15/22 16:57	01/17/22 11:03	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.053	U	0.070	0.013	mg/Kg	☼	01/15/22 17:17	01/17/22 21:36	1
Toluene	0.11	U	0.21	0.047	mg/Kg	☼	01/15/22 17:17	01/17/22 21:36	1
Ethylbenzene	0.11	U	0.14	0.032	mg/Kg	☼	01/15/22 17:17	01/17/22 21:36	1
m-Xylene & p-Xylene	0.053	U	0.14	0.025	mg/Kg	☼	01/15/22 17:17	01/17/22 21:36	1
o-Xylene	0.053	U	0.14	0.018	mg/Kg	☼	01/15/22 17:17	01/17/22 21:36	1
Xylenes, Total	0.053	U	0.14	0.025	mg/Kg	☼	01/15/22 17:17	01/17/22 21:36	1
<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
Toluene-d8 (Surr)	108		85 - 116				01/15/22 17:17	01/17/22 21:36	1
4-Bromofluorobenzene (Surr)	93		79 - 119				01/15/22 17:17	01/17/22 21:36	1
Dibromofluoromethane (Surr)	85		78 - 119				01/15/22 17:17	01/17/22 21:36	1
1,2-Dichloroethane-d4 (Surr)	83		71 - 136				01/15/22 17:17	01/17/22 21:36	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0020	U	0.0067	0.00084	mg/Kg	☼	01/15/22 18:03	01/17/22 20:38	1
2-Methylnaphthalene	0.0040	U	0.0067	0.0027	mg/Kg	☼	01/15/22 18:03	01/17/22 20:38	1
Naphthalene	0.0053	U	0.0067	0.0022	mg/Kg	☼	01/15/22 18:03	01/17/22 20:38	1
<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
2-methylnaphthalene-d10	90		40 - 140				01/15/22 18:03	01/17/22 20:38	1
Fluoranthene-d10 (Surr)	105		40 - 140				01/15/22 18:03	01/17/22 20:38	1
Terphenyl-d14	113		58 - 132				01/15/22 18:03	01/17/22 20:38	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	38	U	64	13	mg/Kg	☼	01/15/22 16:21	01/16/22 23:17	1
Motor Oil Range Organics (C24-C40)	38	U	64	25	mg/Kg	☼	01/15/22 16:21	01/16/22 23:17	1
<i>Surrogate</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
o-Terphenyl	87		45 - 130				01/15/22 16:21	01/16/22 23:17	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	68.1		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	31.9		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-S25-8-9

Lab Sample ID: 580-109327-16

Date Collected: 01/13/22 11:50

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 92.8

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	4.3	J	11	3.5	mg/Kg	☆	01/15/22 16:57	01/17/22 11:26	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	86		67 - 134				01/15/22 16:57	01/17/22 11:26	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.040	U Q	0.054	0.010	mg/Kg	☆	01/15/22 17:17	01/18/22 08:10	1
Toluene	0.081	U Q	0.16	0.036	mg/Kg	☆	01/15/22 17:17	01/18/22 08:10	1
Ethylbenzene	0.081	U	0.11	0.024	mg/Kg	☆	01/15/22 17:17	01/18/22 08:10	1
m-Xylene & p-Xylene	0.040	U	0.11	0.019	mg/Kg	☆	01/15/22 17:17	01/18/22 08:10	1
o-Xylene	0.040	U	0.11	0.013	mg/Kg	☆	01/15/22 17:17	01/18/22 08:10	1
Xylenes, Total	0.040	U	0.11	0.019	mg/Kg	☆	01/15/22 17:17	01/18/22 08:10	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	104		85 - 116				01/15/22 17:17	01/18/22 08:10	1
4-Bromofluorobenzene (Surr)	93		79 - 119				01/15/22 17:17	01/18/22 08:10	1
Dibromofluoromethane (Surr)	87		78 - 119				01/15/22 17:17	01/18/22 08:10	1
1,2-Dichloroethane-d4 (Surr)	80		71 - 136				01/15/22 17:17	01/18/22 08:10	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0016	U	0.0053	0.00067	mg/Kg	☆	01/15/22 18:03	01/17/22 21:02	1
2-Methylnaphthalene	0.0032	U	0.0053	0.0022	mg/Kg	☆	01/15/22 18:03	01/17/22 21:02	1
Naphthalene	0.0042	U	0.0053	0.0017	mg/Kg	☆	01/15/22 18:03	01/17/22 21:02	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	93		40 - 140				01/15/22 18:03	01/17/22 21:02	1
Fluoranthene-d10 (Surr)	114		40 - 140				01/15/22 18:03	01/17/22 21:02	1
Terphenyl-d14	120		58 - 132				01/15/22 18:03	01/17/22 21:02	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	12	J	50	9.8	mg/Kg	☆	01/15/22 16:21	01/16/22 23:37	1
Motor Oil Range Organics (C24-C40)	30	U	50	20	mg/Kg	☆	01/15/22 16:21	01/16/22 23:37	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	96		45 - 130				01/15/22 16:21	01/16/22 23:37	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	92.8		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	7.2		0.1	0.1	%			01/16/22 09:46	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: LT-SEDIMENT

Lab Sample ID: 580-109327-17

Date Collected: 01/13/22 13:50

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 66.7

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	7.2		0.0073	0.0024	mg/Kg	☼	01/15/22 18:03	01/17/22 21:27	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	71	M	40 - 140				01/15/22 18:03	01/17/22 21:27	1
Fluoranthene-d10 (Surr)	94		40 - 140				01/15/22 18:03	01/17/22 21:27	1
Terphenyl-d14	98		58 - 132				01/15/22 18:03	01/17/22 21:27	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	52	D	0.073	0.0092	mg/Kg	☼	01/15/22 18:03	01/18/22 11:13	10
2-Methylnaphthalene	74	D	0.073	0.030	mg/Kg	☼	01/15/22 18:03	01/18/22 11:13	10
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	131	M	40 - 140				01/15/22 18:03	01/18/22 11:13	10
Fluoranthene-d10 (Surr)	96		40 - 140				01/15/22 18:03	01/18/22 11:13	10
Terphenyl-d14	104		58 - 132				01/15/22 18:03	01/18/22 11:13	10

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	13000		70	14	mg/Kg	☼	01/15/22 16:21	01/17/22 00:17	1
Motor Oil Range Organics (C24-C40)	250		70	28	mg/Kg	☼	01/15/22 16:21	01/17/22 00:17	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	92		45 - 130				01/15/22 16:21	01/17/22 00:17	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	66.7		0.1	0.1	%			01/16/22 09:46	1
Percent Moisture	33.3		0.1	0.1	%			01/16/22 09:46	1

QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-378452/1-A
Matrix: Solid
Analysis Batch: 378464

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378452

Analyte	MB MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Gasoline Range Organics [C6 - C10]	3.0	U	4.0	1.3	mg/Kg		01/15/22 16:57	01/16/22 00:25	1
Surrogate	MB MB		Limits			D	Prepared	Analyzed	Dil Fac
%Recovery	Qualifier								
4-Bromofluorobenzene (Surr)	88		67 - 134				01/15/22 16:57	01/16/22 00:25	1

Lab Sample ID: LCS 580-378452/2-A
Matrix: Solid
Analysis Batch: 378464

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378452

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Surrogate	LCS LCS		Limits				
%Recovery	Qualifier						
4-Bromofluorobenzene (Surr)	100		67 - 134				

Lab Sample ID: LCSD 580-378452/3-A
Matrix: Solid
Analysis Batch: 378464

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378452

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit
Surrogate	LCSD LCSD		Limits						
%Recovery	Qualifier								
4-Bromofluorobenzene (Surr)	99		67 - 134						

Lab Sample ID: 580-109327-3 MS
Matrix: Solid
Analysis Batch: 378464

Client Sample ID: HT-E17.5-14-15
Prep Type: Total/NA
Prep Batch: 378452

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Surrogate	MS MS		Limits						
%Recovery	Qualifier								
4-Bromofluorobenzene (Surr)	97		67 - 134						

Lab Sample ID: 580-109327-3 MSD
Matrix: Solid
Analysis Batch: 378464

Client Sample ID: HT-E17.5-14-15
Prep Type: Total/NA
Prep Batch: 378452

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit
Surrogate	MSD MSD		Limits								
%Recovery	Qualifier										
4-Bromofluorobenzene (Surr)	100		67 - 134								

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QC Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-378552/4
Matrix: Water
Analysis Batch: 378552

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	80	U	100	31	ug/L			01/17/22 18:41	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	92		69 - 133					01/17/22 18:41	1

Lab Sample ID: LCS 580-378552/7
Matrix: Water
Analysis Batch: 378552

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Gasoline Range Organics [C6 - C10]	1000	1000		ug/L		100	78 - 122		
Surrogate	LCS %Recovery	LCS Qualifier	Limits						
4-Bromofluorobenzene (Surr)	100		69 - 133						

Lab Sample ID: LCSD 580-378552/8
Matrix: Water
Analysis Batch: 378552

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Gasoline Range Organics [C6 - C10]	1000	995		ug/L		100	78 - 122	1	30
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
4-Bromofluorobenzene (Surr)	97		69 - 133						

Method: 8260D - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 580-378453/1-A
Matrix: Solid
Analysis Batch: 378460

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378453

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.015	U	0.020	0.0038	mg/Kg		01/15/22 17:17	01/17/22 00:51	1
Toluene	0.030	U	0.060	0.014	mg/Kg		01/15/22 17:17	01/17/22 00:51	1
Ethylbenzene	0.030	U	0.040	0.0091	mg/Kg		01/15/22 17:17	01/17/22 00:51	1
m-Xylene & p-Xylene	0.015	U	0.040	0.0071	mg/Kg		01/15/22 17:17	01/17/22 00:51	1
o-Xylene	0.015	U	0.040	0.0050	mg/Kg		01/15/22 17:17	01/17/22 00:51	1
Xylenes, Total	0.015	U	0.040	0.0071	mg/Kg		01/15/22 17:17	01/17/22 00:51	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	97		79 - 119				01/15/22 17:17	01/17/22 00:51	1
Toluene-d8 (Surr)	99		85 - 116				01/15/22 17:17	01/17/22 00:51	1
Dibromofluoromethane (Surr)	96	M	78 - 119				01/15/22 17:17	01/17/22 00:51	1
1,2-Dichloroethane-d4 (Surr)	95	M	71 - 136				01/15/22 17:17	01/17/22 00:51	1

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QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 580-378453/2-A
Matrix: Solid
Analysis Batch: 378460

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378453

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits	
							Lower	Upper
Benzene	0.800	0.885		mg/Kg		111	77	121
Toluene	0.800	0.922		mg/Kg		115	77	121
Ethylbenzene	0.800	0.894		mg/Kg		112	76	122
m-Xylene & p-Xylene	0.800	0.889		mg/Kg		111	77	124
o-Xylene	0.800	0.871	M	mg/Kg		109	77	123
Xylenes, Total	1.60	1.76		mg/Kg		110	78	124

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	98		79 - 119
Toluene-d8 (Surr)	99		85 - 116
Dibromofluoromethane (Surr)	90	M	78 - 119
1,2-Dichloroethane-d4 (Surr)	87		71 - 136

Lab Sample ID: LCSD 580-378453/3-A
Matrix: Solid
Analysis Batch: 378460

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378453

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits		RPD Limit	
							Lower	Upper	RPD	Limit
Benzene	0.800	0.782		mg/Kg		98	77	121	12	20
Toluene	0.800	0.783		mg/Kg		98	77	121	16	20
Ethylbenzene	0.800	0.761		mg/Kg		95	76	122	16	20
m-Xylene & p-Xylene	0.800	0.763		mg/Kg		95	77	124	15	20
o-Xylene	0.800	0.755	M	mg/Kg		94	77	123	14	20
Xylenes, Total	1.60	1.52		mg/Kg		95	78	124	15	20

Surrogate	LCSD LCSD		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	98		79 - 119
Toluene-d8 (Surr)	97		85 - 116
Dibromofluoromethane (Surr)	92	M	78 - 119
1,2-Dichloroethane-d4 (Surr)	89	M	71 - 136

Lab Sample ID: MB 580-378553/4
Matrix: Water
Analysis Batch: 378553

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Benzene	0.50	U	1.0	0.24	ug/L		01/17/22 18:41	1	
Toluene	0.80	U	1.0	0.39	ug/L		01/17/22 18:41	1	
Ethylbenzene	0.80	U	1.0	0.50	ug/L		01/17/22 18:41	1	
m-Xylene & p-Xylene	0.80	U	2.0	0.53	ug/L		01/17/22 18:41	1	
o-Xylene	0.80	U	1.0	0.39	ug/L		01/17/22 18:41	1	
Xylenes, Total	0.80	U	2.0	0.53	ug/L		01/17/22 18:41	1	

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
4-Bromofluorobenzene (Surr)	92		85 - 114		01/17/22 18:41	1
Toluene-d8 (Surr)	98		89 - 112		01/17/22 18:41	1
Dibromofluoromethane (Surr)	88		80 - 119		01/17/22 18:41	1

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QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 580-378553/4
Matrix: Water
Analysis Batch: 378553

Client Sample ID: Method Blank
Prep Type: Total/NA

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
1,2-Dichloroethane-d4 (Surr)	86	M	81 - 118		01/17/22 18:41	1

Lab Sample ID: LCS 580-378553/5
Matrix: Water
Analysis Batch: 378553

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Benzene	10.0	10.7		ug/L		107	79 - 120
Toluene	10.0	10.3		ug/L		103	80 - 121
Ethylbenzene	10.0	10.6		ug/L		106	79 - 121
m-Xylene & p-Xylene	10.0	10.1		ug/L		101	80 - 121
o-Xylene	10.0	10.2		ug/L		102	78 - 122
Xylenes, Total	20.0	20.3		ug/L		102	79 - 121

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	96		85 - 114
Toluene-d8 (Surr)	99		89 - 112
Dibromofluoromethane (Surr)	90		80 - 119
1,2-Dichloroethane-d4 (Surr)	87		81 - 118

Lab Sample ID: LCSD 580-378553/6
Matrix: Water
Analysis Batch: 378553

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD LCSD		Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
		Result	Qualifier						
Benzene	10.0	10.7		ug/L		107	79 - 120	0	20
Toluene	10.0	10.1		ug/L		101	80 - 121	2	20
Ethylbenzene	10.0	10.4		ug/L		104	79 - 121	1	20
m-Xylene & p-Xylene	10.0	10.2		ug/L		102	80 - 121	1	20
o-Xylene	10.0	10.1		ug/L		101	78 - 122	1	20
Xylenes, Total	20.0	20.3		ug/L		102	79 - 121	0	20

Surrogate	LCSD LCSD		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	98		85 - 114
Toluene-d8 (Surr)	98		89 - 112
Dibromofluoromethane (Surr)	92		80 - 119
1,2-Dichloroethane-d4 (Surr)	89		81 - 118

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 580-378465/1-A
Matrix: Solid
Analysis Batch: 378516

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378465

Analyte	MB MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
2-Methylnaphthalene	0.0030	U	0.0050	0.0021	mg/Kg		01/15/22 18:03	01/17/22 13:44	1
1-Methylnaphthalene	0.0015	U	0.0050	0.00063	mg/Kg		01/15/22 18:03	01/17/22 13:44	1
Naphthalene	0.0040	U	0.0050	0.0016	mg/Kg		01/15/22 18:03	01/17/22 13:44	1

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QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: MB 580-378465/1-A
Matrix: Solid
Analysis Batch: 378516

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378465

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
2-methylnaphthalene-d10	91		40 - 140	01/15/22 18:03	01/17/22 13:44	1
Fluoranthene-d10 (Surr)	111		40 - 140	01/15/22 18:03	01/17/22 13:44	1
Terphenyl-d14	123		58 - 132	01/15/22 18:03	01/17/22 13:44	1

Lab Sample ID: LCS 580-378465/2-A
Matrix: Solid
Analysis Batch: 378516

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378465

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
2-Methylnaphthalene	1.00	1.11		mg/Kg		111	39 - 114
1-Methylnaphthalene	1.00	0.887		mg/Kg		89	43 - 111
Naphthalene	1.00	1.01		mg/Kg		101	38 - 111

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
2-methylnaphthalene-d10	137		40 - 140
Fluoranthene-d10 (Surr)	96		40 - 140
Terphenyl-d14	104		58 - 132

Lab Sample ID: 580-109327-2 MS
Matrix: Solid
Analysis Batch: 378516

Client Sample ID: HT-E25-7-8
Prep Type: Total/NA
Prep Batch: 378465

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
2-Methylnaphthalene	0.0038	U	1.27	1.35	M	mg/Kg	⊛	106	39 - 114
1-Methylnaphthalene	0.0019	U	1.27	1.13	M	mg/Kg	⊛	89	43 - 111
Naphthalene	0.0051	U	1.27	1.35		mg/Kg	⊛	106	38 - 111

Surrogate	MS MS		Limits
	%Recovery	Qualifier	
2-methylnaphthalene-d10	105		40 - 140
Fluoranthene-d10 (Surr)	103		40 - 140
Terphenyl-d14	109		58 - 132

Lab Sample ID: 580-109327-2 MSD
Matrix: Solid
Analysis Batch: 378516

Client Sample ID: HT-E25-7-8
Prep Type: Total/NA
Prep Batch: 378465

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
2-Methylnaphthalene	0.0038	U	1.30	1.34	M	mg/Kg	⊛	103	39 - 114	1	20
1-Methylnaphthalene	0.0019	U	1.30	1.12	M	mg/Kg	⊛	86	43 - 111	1	20
Naphthalene	0.0051	U	1.30	1.33		mg/Kg	⊛	103	38 - 111	1	20

Surrogate	MSD MSD		Limits
	%Recovery	Qualifier	
2-methylnaphthalene-d10	105		40 - 140
Fluoranthene-d10 (Surr)	101		40 - 140
Terphenyl-d14	106		58 - 132

QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: MB 580-378478/1-A
Matrix: Water
Analysis Batch: 378522

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378478

Analyte	MB MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
2-Methylnaphthalene	0.080	U M	0.20	0.039	ug/L		01/16/22 11:03	01/17/22 12:28	1
1-Methylnaphthalene	0.032	U M	0.10	0.019	ug/L		01/16/22 11:03	01/17/22 12:28	1
Naphthalene	0.080	U M	0.10	0.031	ug/L		01/16/22 11:03	01/17/22 12:28	1
Surrogate	MB MB		Limits			D	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier		Prepared	Analyzed				
2-methylnaphthalene-d10	70		40 - 140				01/16/22 11:03	01/17/22 12:28	1
Fluoranthene-d10 (Surr)	87		40 - 140				01/16/22 11:03	01/17/22 12:28	1
Terphenyl-d14	93		58 - 132				01/16/22 11:03	01/17/22 12:28	1

Lab Sample ID: LCS 580-378478/2-A
Matrix: Water
Analysis Batch: 378522

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378478

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	Limits	RPD	
		Result	Qualifier						
2-Methylnaphthalene	2.00	1.54		ug/L		77	39 - 114		
1-Methylnaphthalene	2.00	1.54		ug/L		77	41 - 115		
Naphthalene	2.00	1.53		ug/L		77	43 - 114		
Surrogate	LCS LCS		Limits			D	%Rec	Limits	RPD
	%Recovery	Qualifier		Prepared	Analyzed				
2-methylnaphthalene-d10	70		40 - 140						
Fluoranthene-d10 (Surr)	75		40 - 140						
Terphenyl-d14	85		58 - 132						

Lab Sample ID: LCSD 580-378478/3-A
Matrix: Water
Analysis Batch: 378522

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378478

Analyte	Spike Added	LCSD LCSD		Unit	D	%Rec	Limits	RPD	Limit
		Result	Qualifier						
2-Methylnaphthalene	2.00	1.57		ug/L		79	39 - 114	2	20
1-Methylnaphthalene	2.00	1.57		ug/L		79	41 - 115	2	20
Naphthalene	2.00	1.57		ug/L		79	43 - 114	2	20
Surrogate	LCSD LCSD		Limits			D	%Rec	Limits	RPD
	%Recovery	Qualifier		Prepared	Analyzed				
2-methylnaphthalene-d10	72		40 - 140						
Fluoranthene-d10 (Surr)	81		40 - 140						
Terphenyl-d14	90		58 - 132						

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 580-378451/1-A
Matrix: Solid
Analysis Batch: 378495

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378451

Analyte	MB MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Diesel Range Organics (C10-C24)	30	U	50	9.9	mg/Kg		01/15/22 16:21	01/16/22 16:55	1
Motor Oil Range Organics (C24-C40)	30	U	50	20	mg/Kg		01/15/22 16:21	01/16/22 16:55	1

QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC) (Continued)

Lab Sample ID: MB 580-378451/1-A
Matrix: Solid
Analysis Batch: 378495

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378451

Surrogate	MB MB	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
<i>o-Terphenyl</i>		103		45 - 130	01/15/22 16:21	01/16/22 16:55	1

Lab Sample ID: LCS 580-378451/2-A
Matrix: Solid
Analysis Batch: 378495

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378451

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Diesel Range Organics (C10-C24)	500	501		mg/Kg		100	75 - 125
Motor Oil Range Organics (C24-C40)	500	464		mg/Kg		93	39 - 106

Surrogate	LCS LCS	%Recovery	Qualifier	Limits
<i>o-Terphenyl</i>		95		45 - 130

Lab Sample ID: LCSD 580-378451/3-A
Matrix: Solid
Analysis Batch: 378495

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378451

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Diesel Range Organics (C10-C24)	500	505		mg/Kg		101	75 - 125	1	20
Motor Oil Range Organics (C24-C40)	500	490		mg/Kg		98	39 - 106	5	20

Surrogate	LCSD LCSD	%Recovery	Qualifier	Limits
<i>o-Terphenyl</i>		92		45 - 130

Lab Sample ID: 580-109327-2 MS
Matrix: Solid
Analysis Batch: 378495

Client Sample ID: HT-E25-7-8
Prep Type: Total/NA
Prep Batch: 378451

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Diesel Range Organics (C10-C24)	13	J	646	617		mg/Kg	✱	93	75 - 125
Motor Oil Range Organics (C24-C40)	36	U	646	603		mg/Kg	✱	93	39 - 106

Surrogate	MS MS	%Recovery	Qualifier	Limits
<i>o-Terphenyl</i>		86		45 - 130

Lab Sample ID: 580-109327-2 MSD
Matrix: Solid
Analysis Batch: 378495

Client Sample ID: HT-E25-7-8
Prep Type: Total/NA
Prep Batch: 378451

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Diesel Range Organics (C10-C24)	13	J	624	606		mg/Kg	✱	95	75 - 125	2	20
Motor Oil Range Organics (C24-C40)	36	U	624	604		mg/Kg	✱	97	39 - 106	0	20

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QC Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC) (Continued)

Surrogate	MSD %Recovery	MSD Qualifier	Limits
o-Terphenyl	89		45 - 130

Lab Sample ID: MB 580-378479/1-A
Matrix: Water
Analysis Batch: 378500

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378479

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	100	U	110	65	ug/L		01/16/22 11:08	01/16/22 21:47	1
Motor Oil Range Organics (C24-C40)	300	U	350	180	ug/L		01/16/22 11:08	01/16/22 21:47	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	74		56 - 125	01/16/22 11:08	01/16/22 21:47	1

Lab Sample ID: LCS 580-378479/2-A
Matrix: Water
Analysis Batch: 378500

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378479

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Diesel Range Organics (C10-C24)	500	408		ug/L		82	36 - 132
Motor Oil Range Organics (C24-C40)	500	495		ug/L		99	41 - 113

Surrogate	LCS %Recovery	LCS Qualifier	Limits
o-Terphenyl	89		56 - 125

Lab Sample ID: LCSD 580-378479/3-A
Matrix: Water
Analysis Batch: 378500

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378479

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Diesel Range Organics (C10-C24)	500	385		ug/L		77	36 - 132	6	20
Motor Oil Range Organics (C24-C40)	500	496		ug/L		99	41 - 113	0	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
o-Terphenyl	91		56 - 125

Method: 2540G - SM 2540G

Lab Sample ID: 580-109327-2 DU
Matrix: Solid
Analysis Batch: 378477

Client Sample ID: HT-E25-7-8
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Solids	73.9		74.2		%		0.4	20
Percent Solids	73.9		74.2		%		0.4	20
Percent Moisture	26.1		25.8		%		1	20
Percent Moisture	26.1		25.8		%		1	20

Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: EB
Date Collected: 01/13/22 16:15
Date Received: 01/15/22 11:00

Lab Sample ID: 580-109327-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260/CALUFT DOD		1	378552	JSM	EET SEA	01/17/22 21:28
Total/NA	Analysis	8260D		1	378553	JSM	EET SEA	01/17/22 21:28
Total/NA	Prep	3510C			378478	JHR	EET SEA	01/16/22 11:03
Total/NA	Analysis	8270E SIM		1	378522	W1T	EET SEA	01/17/22 13:25
Total/NA	Prep	3510C			378479	JHR	EET SEA	01/16/22 11:08
Total/NA	Analysis	8015D DRO		1	378500	JCM	EET SEA	01/16/22 22:45

Client Sample ID: HT-E25-7-8
Date Collected: 01/13/22 12:35
Date Received: 01/15/22 11:00

Lab Sample ID: 580-109327-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378477	RJL	EET SEA	01/16/22 09:46

Client Sample ID: HT-E25-7-8
Date Collected: 01/13/22 12:35
Date Received: 01/15/22 11:00

Lab Sample ID: 580-109327-2
Matrix: Solid
Percent Solids: 73.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378452	JBT	EET SEA	01/15/22 16:57
Total/NA	Analysis	8260/CALUFT DOD		1	378464	CJ	EET SEA	01/16/22 03:55
Total/NA	Prep	5035			378453	JBT	EET SEA	01/15/22 17:17
Total/NA	Analysis	8260D		1	378592	JSM	EET SEA	01/17/22 15:52
Total/NA	Prep	3546			378465	BJM	EET SEA	01/15/22 18:03
Total/NA	Analysis	8270E SIM		1	378516	CJ	EET SEA	01/17/22 14:32
Total/NA	Prep	3546			378451	BJM	EET SEA	01/15/22 16:21
Total/NA	Analysis	8015D DRO		1	378495	JCM	EET SEA	01/16/22 17:55

Client Sample ID: HT-E17.5-14-15
Date Collected: 01/13/22 13:15
Date Received: 01/15/22 11:00

Lab Sample ID: 580-109327-3
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378477	RJL	EET SEA	01/16/22 09:46

Client Sample ID: HT-E17.5-14-15
Date Collected: 01/13/22 13:15
Date Received: 01/15/22 11:00

Lab Sample ID: 580-109327-3
Matrix: Solid
Percent Solids: 65.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378452	JBT	EET SEA	01/15/22 16:57
Total/NA	Analysis	8260/CALUFT DOD		1	378464	CJ	EET SEA	01/16/22 01:35
Total/NA	Prep	5035			378453	JBT	EET SEA	01/15/22 17:17
Total/NA	Analysis	8260D		1	378592	JSM	EET SEA	01/17/22 16:15

Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-E17.5-14-15

Lab Sample ID: 580-109327-3

Date Collected: 01/13/22 13:15

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 65.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3546			378465	BJM	EET SEA	01/15/22 18:03
Total/NA	Analysis	8270E SIM		1	378516	CJ	EET SEA	01/17/22 15:45
Total/NA	Prep	3546			378451	BJM	EET SEA	01/15/22 16:21
Total/NA	Analysis	8015D DRO		1	378495	JCM	EET SEA	01/16/22 18:55

Client Sample ID: HT-S17.5-8-9

Lab Sample ID: 580-109327-4

Date Collected: 01/13/22 12:20

Matrix: Solid

Date Received: 01/15/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378477	RJL	EET SEA	01/16/22 09:46

Client Sample ID: HT-S17.5-8-9

Lab Sample ID: 580-109327-4

Date Collected: 01/13/22 12:20

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 75.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378452	JBT	EET SEA	01/15/22 16:57
Total/NA	Analysis	8260/CALUFT DOD		1	378464	CJ	EET SEA	01/16/22 04:41
Total/NA	Prep	5035			378453	JBT	EET SEA	01/15/22 17:17
Total/NA	Analysis	8260D		1	378592	JSM	EET SEA	01/17/22 16:38
Total/NA	Prep	3546			378465	BJM	EET SEA	01/15/22 18:03
Total/NA	Analysis	8270E SIM		1	378516	CJ	EET SEA	01/17/22 16:10
Total/NA	Prep	3546			378451	BJM	EET SEA	01/15/22 16:21
Total/NA	Analysis	8015D DRO		1	378495	JCM	EET SEA	01/16/22 19:15

Client Sample ID: HT-E10-23-24

Lab Sample ID: 580-109327-5

Date Collected: 01/13/22 11:22

Matrix: Solid

Date Received: 01/15/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378477	RJL	EET SEA	01/16/22 09:46

Client Sample ID: HT-E10-23-24

Lab Sample ID: 580-109327-5

Date Collected: 01/13/22 11:22

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 64.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378452	JBT	EET SEA	01/15/22 16:57
Total/NA	Analysis	8260/CALUFT DOD		1	378464	CJ	EET SEA	01/16/22 05:04
Total/NA	Prep	5035			378453	JBT	EET SEA	01/15/22 17:17
Total/NA	Analysis	8260D		1	378592	JSM	EET SEA	01/17/22 17:01
Total/NA	Prep	3546			378465	BJM	EET SEA	01/15/22 18:03
Total/NA	Analysis	8270E SIM		1	378516	CJ	EET SEA	01/17/22 16:34
Total/NA	Prep	3546			378451	BJM	EET SEA	01/15/22 16:21
Total/NA	Analysis	8015D DRO		1	378495	JCM	EET SEA	01/16/22 19:36

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Lab Chronicle

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-S10-17-18

Lab Sample ID: 580-109327-6

Date Collected: 01/13/22 11:35

Matrix: Solid

Date Received: 01/15/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378477	RJL	EET SEA	01/16/22 09:46

Client Sample ID: HT-S10-17-18

Lab Sample ID: 580-109327-6

Date Collected: 01/13/22 11:35

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 65.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378452	JBT	EET SEA	01/15/22 16:57
Total/NA	Analysis	8260/CALUFT DOD		1	378464	CJ	EET SEA	01/16/22 05:28
Total/NA	Prep	5035			378453	JBT	EET SEA	01/15/22 17:17
Total/NA	Analysis	8260D		1	378597	JSM	EET SEA	01/18/22 08:33
Total/NA	Prep	3546			378465	BJM	EET SEA	01/15/22 18:03
Total/NA	Analysis	8270E SIM		1	378516	CJ	EET SEA	01/17/22 16:59
Total/NA	Prep	3546			378451	BJM	EET SEA	01/15/22 16:21
Total/NA	Analysis	8015D DRO		1	378495	JCM	EET SEA	01/16/22 19:56

Client Sample ID: HT-N25-10-11 DUPLICATE

Lab Sample ID: 580-109327-7

Date Collected: 01/13/22 14:25

Matrix: Solid

Date Received: 01/15/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378477	RJL	EET SEA	01/16/22 09:46

Client Sample ID: HT-N25-10-11 DUPLICATE

Lab Sample ID: 580-109327-7

Date Collected: 01/13/22 14:25

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 74.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378452	JBT	EET SEA	01/15/22 16:57
Total/NA	Analysis	8260/CALUFT DOD		1	378464	CJ	EET SEA	01/16/22 05:51
Total/NA	Prep	5035			378453	JBT	EET SEA	01/15/22 17:17
Total/NA	Analysis	8260D		1	378592	JSM	EET SEA	01/17/22 18:32
Total/NA	Prep	3546			378465	BJM	EET SEA	01/15/22 18:03
Total/NA	Analysis	8270E SIM		1	378516	CJ	EET SEA	01/17/22 17:23
Total/NA	Prep	3546			378451	BJM	EET SEA	01/15/22 16:21
Total/NA	Analysis	8015D DRO		1	378495	JCM	EET SEA	01/16/22 20:36

Client Sample ID: HT-E25-14-15

Lab Sample ID: 580-109327-8

Date Collected: 01/13/22 12:45

Matrix: Solid

Date Received: 01/15/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378477	RJL	EET SEA	01/16/22 09:46

Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-E25-14-15

Lab Sample ID: 580-109327-8

Date Collected: 01/13/22 12:45

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 65.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378452	JBT	EET SEA	01/15/22 16:57
Total/NA	Analysis	8260/CALUFT DOD		1	378464	CJ	EET SEA	01/16/22 06:14
Total/NA	Prep	5035			378453	JBT	EET SEA	01/15/22 17:17
Total/NA	Analysis	8260D		1	378592	JSM	EET SEA	01/17/22 18:55
Total/NA	Prep	3546			378465	BJM	EET SEA	01/15/22 18:03
Total/NA	Analysis	8270E SIM		1	378516	CJ	EET SEA	01/17/22 17:47
Total/NA	Prep	3546			378451	BJM	EET SEA	01/15/22 16:21
Total/NA	Analysis	8015D DRO		1	378495	JCM	EET SEA	01/16/22 20:56

Client Sample ID: HT-S10-15-16

Lab Sample ID: 580-109327-9

Date Collected: 01/13/22 11:40

Matrix: Solid

Date Received: 01/15/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378477	RJL	EET SEA	01/16/22 09:46

Client Sample ID: HT-S10-15-16

Lab Sample ID: 580-109327-9

Date Collected: 01/13/22 11:40

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 67.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378452	JBT	EET SEA	01/15/22 16:57
Total/NA	Analysis	8260/CALUFT DOD		1	378464	CJ	EET SEA	01/16/22 06:37
Total/NA	Prep	5035			378453	JBT	EET SEA	01/15/22 17:17
Total/NA	Analysis	8260D		1	378597	JSM	EET SEA	01/18/22 08:57
Total/NA	Prep	3546			378465	BJM	EET SEA	01/15/22 18:03
Total/NA	Analysis	8270E SIM		1	378516	CJ	EET SEA	01/17/22 18:11
Total/NA	Prep	3546	DL		378465	BJM	EET SEA	01/15/22 18:03
Total/NA	Analysis	8270E SIM	DL	10	378609	E1L	EET SEA	01/18/22 10:49
Total/NA	Prep	3546			378451	BJM	EET SEA	01/15/22 16:21
Total/NA	Analysis	8015D DRO		1	378495	JCM	EET SEA	01/16/22 21:16

Client Sample ID: HT-E17.5-7-8

Lab Sample ID: 580-109327-10

Date Collected: 01/13/22 13:00

Matrix: Solid

Date Received: 01/15/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378477	RJL	EET SEA	01/16/22 09:46

Client Sample ID: HT-E17.5-7-8

Lab Sample ID: 580-109327-10

Date Collected: 01/13/22 13:00

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 70.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378452	JBT	EET SEA	01/15/22 16:57
Total/NA	Analysis	8260/CALUFT DOD		1	378464	CJ	EET SEA	01/16/22 07:01

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Lab Chronicle

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-E17.5-7-8

Lab Sample ID: 580-109327-10

Date Collected: 01/13/22 13:00

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 70.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378453	JBT	EET SEA	01/15/22 17:17
Total/NA	Analysis	8260D		1	378592	JSM	EET SEA	01/17/22 19:42
Total/NA	Prep	3546			378465	BJM	EET SEA	01/15/22 18:03
Total/NA	Analysis	8270E SIM		1	378516	CJ	EET SEA	01/17/22 18:36
Total/NA	Prep	3546			378451	BJM	EET SEA	01/15/22 16:21
Total/NA	Analysis	8015D DRO		1	378495	JCM	EET SEA	01/16/22 21:37

Client Sample ID: HT-N25-14-15

Lab Sample ID: 580-109327-11

Date Collected: 01/13/22 14:01

Matrix: Solid

Date Received: 01/15/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378477	RJL	EET SEA	01/16/22 09:46

Client Sample ID: HT-N25-14-15

Lab Sample ID: 580-109327-11

Date Collected: 01/13/22 14:01

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 64.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378452	JBT	EET SEA	01/15/22 16:57
Total/NA	Analysis	8260/CALUFT DOD		1	378464	CJ	EET SEA	01/16/22 07:24
Total/NA	Prep	5035			378453	JBT	EET SEA	01/15/22 17:17
Total/NA	Analysis	8260D		1	378592	JSM	EET SEA	01/17/22 20:04
Total/NA	Prep	3546			378465	BJM	EET SEA	01/15/22 18:03
Total/NA	Analysis	8270E SIM		1	378516	CJ	EET SEA	01/17/22 19:00
Total/NA	Prep	3546			378451	BJM	EET SEA	01/15/22 16:21
Total/NA	Analysis	8015D DRO		1	378495	JCM	EET SEA	01/16/22 21:57

Client Sample ID: HT-N25-14-15 DUPLICATE

Lab Sample ID: 580-109327-12

Date Collected: 01/13/22 14:20

Matrix: Solid

Date Received: 01/15/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378477	RJL	EET SEA	01/16/22 09:46

Client Sample ID: HT-N25-14-15 DUPLICATE

Lab Sample ID: 580-109327-12

Date Collected: 01/13/22 14:20

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 65.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378452	JBT	EET SEA	01/15/22 16:57
Total/NA	Analysis	8260/CALUFT DOD		1	378464	CJ	EET SEA	01/16/22 07:47
Total/NA	Prep	5035			378453	JBT	EET SEA	01/15/22 17:17
Total/NA	Analysis	8260D		1	378592	JSM	EET SEA	01/17/22 20:27
Total/NA	Prep	3546			378465	BJM	EET SEA	01/15/22 18:03
Total/NA	Analysis	8270E SIM		1	378516	CJ	EET SEA	01/17/22 19:25

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Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-N25-14-15 DUPLICATE

Lab Sample ID: 580-109327-12

Date Collected: 01/13/22 14:20

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 65.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3546			378451	BJM	EET SEA	01/15/22 16:21
Total/NA	Analysis	8015D DRO		1	378495	JCM	EET SEA	01/16/22 22:17

Client Sample ID: HT-E10-21-22

Lab Sample ID: 580-109327-13

Date Collected: 01/13/22 12:00

Matrix: Solid

Date Received: 01/15/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378477	RJL	EET SEA	01/16/22 09:46

Client Sample ID: HT-E10-21-22

Lab Sample ID: 580-109327-13

Date Collected: 01/13/22 12:00

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 61.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378452	JBT	EET SEA	01/15/22 16:57
Total/NA	Analysis	8260/CALUFT DOD		1	378464	CJ	EET SEA	01/16/22 08:10
Total/NA	Prep	5035			378453	JBT	EET SEA	01/15/22 17:17
Total/NA	Analysis	8260D		1	378592	JSM	EET SEA	01/17/22 20:50
Total/NA	Prep	3546			378465	BJM	EET SEA	01/15/22 18:03
Total/NA	Analysis	8270E SIM		1	378516	CJ	EET SEA	01/17/22 19:49
Total/NA	Prep	3546			378451	BJM	EET SEA	01/15/22 16:21
Total/NA	Analysis	8015D DRO		1	378495	JCM	EET SEA	01/16/22 22:37

Client Sample ID: HT-N25-10-11

Lab Sample ID: 580-109327-14

Date Collected: 01/13/22 14:15

Matrix: Solid

Date Received: 01/15/22 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378477	RJL	EET SEA	01/16/22 09:46

Client Sample ID: HT-N25-10-11

Lab Sample ID: 580-109327-14

Date Collected: 01/13/22 14:15

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 75.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378452	JBT	EET SEA	01/15/22 16:57
Total/NA	Analysis	8260/CALUFT DOD		1	378543	JSM	EET SEA	01/17/22 10:39
Total/NA	Prep	5035			378453	JBT	EET SEA	01/15/22 17:17
Total/NA	Analysis	8260D		1	378592	JSM	EET SEA	01/17/22 21:13
Total/NA	Prep	3546			378465	BJM	EET SEA	01/15/22 18:03
Total/NA	Analysis	8270E SIM		1	378516	CJ	EET SEA	01/17/22 20:14
Total/NA	Prep	3546			378451	BJM	EET SEA	01/15/22 16:21
Total/NA	Analysis	8015D DRO		1	378495	JCM	EET SEA	01/16/22 22:57

Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Client Sample ID: HT-S25-14-15

Date Collected: 01/13/22 11:55

Date Received: 01/15/22 11:00

Lab Sample ID: 580-109327-15

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378477	RJL	EET SEA	01/16/22 09:46

Client Sample ID: HT-S25-14-15

Date Collected: 01/13/22 11:55

Date Received: 01/15/22 11:00

Lab Sample ID: 580-109327-15

Matrix: Solid

Percent Solids: 68.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378452	JBT	EET SEA	01/15/22 16:57
Total/NA	Analysis	8260/CALUFT DOD		1	378543	JSM	EET SEA	01/17/22 11:03
Total/NA	Prep	5035			378453	JBT	EET SEA	01/15/22 17:17
Total/NA	Analysis	8260D		1	378592	JSM	EET SEA	01/17/22 21:36
Total/NA	Prep	3546			378465	BJM	EET SEA	01/15/22 18:03
Total/NA	Analysis	8270E SIM		1	378516	CJ	EET SEA	01/17/22 20:38
Total/NA	Prep	3546			378451	BJM	EET SEA	01/15/22 16:21
Total/NA	Analysis	8015D DRO		1	378495	JCM	EET SEA	01/16/22 23:17

Client Sample ID: HT-S25-8-9

Date Collected: 01/13/22 11:50

Date Received: 01/15/22 11:00

Lab Sample ID: 580-109327-16

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378477	RJL	EET SEA	01/16/22 09:46

Client Sample ID: HT-S25-8-9

Date Collected: 01/13/22 11:50

Date Received: 01/15/22 11:00

Lab Sample ID: 580-109327-16

Matrix: Solid

Percent Solids: 92.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			378452	JBT	EET SEA	01/15/22 16:57
Total/NA	Analysis	8260/CALUFT DOD		1	378543	JSM	EET SEA	01/17/22 11:26
Total/NA	Prep	5035			378453	JBT	EET SEA	01/15/22 17:17
Total/NA	Analysis	8260D		1	378597	JSM	EET SEA	01/18/22 08:10
Total/NA	Prep	3546			378465	BJM	EET SEA	01/15/22 18:03
Total/NA	Analysis	8270E SIM		1	378516	CJ	EET SEA	01/17/22 21:02
Total/NA	Prep	3546			378451	BJM	EET SEA	01/15/22 16:21
Total/NA	Analysis	8015D DRO		1	378495	JCM	EET SEA	01/16/22 23:37

Client Sample ID: LT-SEDIMENT

Date Collected: 01/13/22 13:50

Date Received: 01/15/22 11:00

Lab Sample ID: 580-109327-17

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	378477	RJL	EET SEA	01/16/22 09:46

Lab Chronicle

Client: AECOM

Job ID: 580-109327-1

Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Client Sample ID: LT-SEDIMENT

Lab Sample ID: 580-109327-17

Date Collected: 01/13/22 13:50

Matrix: Solid

Date Received: 01/15/22 11:00

Percent Solids: 66.7

<u>Prep Type</u>	<u>Batch Type</u>	<u>Batch Method</u>	<u>Run</u>	<u>Dilution Factor</u>	<u>Batch Number</u>	<u>Analyst</u>	<u>Lab</u>	<u>Prepared or Analyzed</u>
Total/NA	Prep	3546			378465	BJM	EET SEA	01/15/22 18:03
Total/NA	Analysis	8270E SIM		1	378516	CJ	EET SEA	01/17/22 21:27
Total/NA	Prep	3546	DL		378465	BJM	EET SEA	01/15/22 18:03
Total/NA	Analysis	8270E SIM	DL	10	378609	E1L	EET SEA	01/18/22 11:13
Total/NA	Prep	3546			378451	BJM	EET SEA	01/15/22 16:21
Total/NA	Analysis	8015D DRO		1	378495	JCM	EET SEA	01/17/22 00:17

Laboratory References:

EET SEA = Eurofins Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

Job ID: 580-109327-1

Laboratory: Eurofins Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2236	01-18-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
2540G		Solid	Percent Moisture
2540G		Solid	Percent Solids
8015D DRO	3510C	Water	Diesel Range Organics (C10-C24)
8015D DRO	3546	Solid	Diesel Range Organics (C10-C24)
8260/CALUFT DOD		Water	Gasoline Range Organics [C6 - C10]
8260/CALUFT DOD	5035	Solid	Gasoline Range Organics [C6 - C10]

Sample Summary

Client: AECOM

Job ID: 580-109327-1

Project/Site: Red Hill JBPHH N62742-17-D-1800-CV22F0106

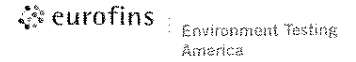
Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-109327-1	EB	Water	01/13/22 16:15	01/15/22 11:00
580-109327-2	HT-E25-7-8	Solid	01/13/22 12:35	01/15/22 11:00
580-109327-3	HT-E17.5-14-15	Solid	01/13/22 13:15	01/15/22 11:00
580-109327-4	HT-S17.5-8-9	Solid	01/13/22 12:20	01/15/22 11:00
580-109327-5	HT-E10-23-24	Solid	01/13/22 11:22	01/15/22 11:00
580-109327-6	HT-S10-17-18	Solid	01/13/22 11:35	01/15/22 11:00
580-109327-7	HT-N25-10-11 DUPLICATE	Solid	01/13/22 14:25	01/15/22 11:00
580-109327-8	HT-E25-14-15	Solid	01/13/22 12:45	01/15/22 11:00
580-109327-9	HT-S10-15-16	Solid	01/13/22 11:40	01/15/22 11:00
580-109327-10	HT-E17.5-7-8	Solid	01/13/22 13:00	01/15/22 11:00
580-109327-11	HT-N25-14-15	Solid	01/13/22 14:01	01/15/22 11:00
580-109327-12	HT-N25-14-15 DUPLICATE	Solid	01/13/22 14:20	01/15/22 11:00
580-109327-13	HT-E10-21-22	Solid	01/13/22 12:00	01/15/22 11:00
580-109327-14	HT-N25-10-11	Solid	01/13/22 14:15	01/15/22 11:00
580-109327-15	HT-S25-14-15	Solid	01/13/22 11:55	01/15/22 11:00
580-109327-16	HT-S25-8-9	Solid	01/13/22 11:50	01/15/22 11:00
580-109327-17	LT-SEDIMENT	Solid	01/13/22 13:50	01/15/22 11:00

Eurofins FGS, Seattle

5755 8th Street East
Tacoma, WA 98424

Chain of Custody Form

Therm ID: SCA3 Cor: 104 Unc: 104
Cooler Desc: large blue
Packing: BIW FedEx: priority
Cust. Seal: Yes No
Blue Ice, Ver Dry, None
Other: _____ (s): _____
Lab Ela: _____
E-Mail: M.Elaine.Walker@EurofinsET.com State or Origin: Hawaii
Lab Cour: _____
UPS: _____



Client Information		Sampler: <u>Dominic Mariano</u>		Lab Ela: _____	COC No: <u>202201-07 Soil</u>																																					
Client Contact: <u>Alethea Ramos (alternate: Margie Pascua)</u>		Phone: <u>310-625-1283</u>		E-Mail: <u>M.Elaine.Walker@EurofinsET.com</u>	Page: <u>Page 3 of 4</u>																																					
Company: <u>AECOM</u>		PWSID: _____		Analysis Requested																																						
Address: <u>1001 Bishop St. Suite 1600</u>		Due Date Requested: <u>see subcontract</u>		<table border="1"> <tr> <td>Field Filtered Sample (Yes or No)</td> <td>Perform MS/MSD (Yes or No)</td> <td>EPA 8260 BTEX+Naph</td> <td>EPA 8260 TPH-G (C6-C10)</td> <td>EPA 8015 TPH-DJO (C10-C24, C24-C40)</td> <td>EPA 8015 TPH-DJO (C10-C24, C24-C40) w/ silica gel cleanup</td> <td>EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)</td> <td rowspan="5">Total Number of containers</td> </tr> <tr> <td>City: <u>Honolulu</u></td> <td>TAT Requested (days): <u>3 working days</u></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>State, Zip: <u>Hawaii 96813</u></td> <td>Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Phone: <u>808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)</u></td> <td>PO #: _____</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Email: <u>alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)</u></td> <td>WO #: _____</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>			Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 8260 BTEX+Naph	EPA 8260 TPH-G (C6-C10)	EPA 8015 TPH-DJO (C10-C24, C24-C40)	EPA 8015 TPH-DJO (C10-C24, C24-C40) w/ silica gel cleanup	EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)	Total Number of containers	City: <u>Honolulu</u>	TAT Requested (days): <u>3 working days</u>						State, Zip: <u>Hawaii 96813</u>	Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No						Phone: <u>808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)</u>	PO #: _____						Email: <u>alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)</u>	WO #: _____					
Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 8260 BTEX+Naph	EPA 8260 TPH-G (C6-C10)				EPA 8015 TPH-DJO (C10-C24, C24-C40)	EPA 8015 TPH-DJO (C10-C24, C24-C40) w/ silica gel cleanup	EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)	Total Number of containers																																
City: <u>Honolulu</u>	TAT Requested (days): <u>3 working days</u>																																									
State, Zip: <u>Hawaii 96813</u>	Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No																																									
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Email: <u>alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)</u>	WO #: _____																																									
Project Name: <u>CV22F0106</u>		Project #: <u>60674414</u>		Preservation Codes:																																						
Site: <u>RH</u>		SSOW#: _____		A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)																																						
Other: _____		Note to AECOM before printing COC: put in subk#		Job #: _____																																						
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Preservation Code:	Special Instructions/Note:																																			
EB	1/13/22	1615	G	S	N	N																																				
HT-E25-7-8	1/13/22	1235	G	S	N	N																																				
HT-E17.5-14-15	1/13/22	1315	G	S	N	N																																				
HT-S17.5-8-9	1/13/22	1220	G	S	N	N																																				
HT-E10-23-24	1/13/22	1122	G	S	N	N																																				
HT-S10-17-18	1/13/22	1135	G	S	N	N																																				
HT-N25-10-11 Duplicate	1/13/22	1425	G	S	N	N																																				
HT-E25-14-15	1/13/22	1245	G	S	N	N																																				
HT-S10-15-16	1/13/22	1140	G	S	N	N																																				
HT-E17.5-7-8	1/13/22	1300	G	S	N	N																																				
HT-N25-14-15	1/13/22	1401	G	S	N	N																																				



Possible Hazard Identification
 Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client Disposal By Lab Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify) _____ Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQ/IS FDD. Special Instructions/QC Requirements: DOD QSM project.

Empty Kit Relinquished by: _____ Date: _____ Time: _____ Method of Shipment: _____

Relinquished by: <u>Matthew Yim</u>	Date/Time: <u>1/14/22 1530</u>	Company: <u>AECOM</u>	Received by: <u>Tracy Sutton</u>	Date/Time: <u>1/5/22 1100</u>	Company: <u>EP65</u>
Relinquished by: _____	Date/Time: _____	Company: _____	Received by: _____	Date/Time: _____	Company: _____
Relinquished by: _____	Date/Time: _____	Company: _____	Received by: _____	Date/Time: _____	Company: _____

Custody Seals Intact: Yes No Custody Seal No.: _____ Cooler Temperature(s) °C and Other Remarks: _____

Client Information					Sampler: Dominic Mariano		Lab PM: Elaine Walker		Carrier Tracking No(s): FedEx			COC No: 202201-08 Soil																																																																													
Client Contact: Alethea Ramos (alternate: Margie Pascua)					Phone: 310-625-1283		E-Mail: M.Elaine.Walker@EurofinsET.com		State of Origin: Hawaii			Page: Page 4 of 4																																																																													
Company: AECOM				PWSID:				Analysis Requested					Job #:																																																																												
Address: 1001 Bishop St. Suite 1600				Due Date Requested: see subcontract				<table border="1" style="width:100%; border-collapse: collapse;"> <tr><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td></tr> <tr><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td></tr> <tr><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td></tr> <tr><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td></tr> <tr><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td><td style="width:10%;"></td></tr> </table>																																																																																Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify)	
City: Honolulu				TAT Requested (days): 3 working days				Total Number of containers:																																																																																	
State, Zip: Hawaii 96813				Compliance Project: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				Special Instructions/Note:																																																																																	
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)				PO #: Note to AECOM before printing COC: put in PO# w				Other:																																																																																	
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)				WO #:																																																																																					
Project Name: CV22F0106				Project #: 60674414																																																																																					
Site: RH				SSOW #: Note to AECOM before printing COC: put in subk#																																																																																					
					Field Filtered Samples (Yes or No)																																																																																				
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					EPA 8260 TPH-G (C6-C10)																																																																																				
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					EPA 8015 TPH-DIO (C10-C24, C24-C40) w/ silica gel cleanup																																																																																				
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Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, AA=Air)	Field Filtered Samples (Yes or No)	Perform MS/MSD (Yes or No)	EPA 8260 BTEX+Naph	EPA 8260 TPH-G (C6-C10)	EPA 8015 TPH-DIO (C10-C24, C24-C40)	EPA 8015 TPH-DIO (C10-C24, C24-C40) w/ silica gel cleanup	EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)	Total Number of containers	Special Instructions/Note																																																																												
HT-N25-14-15 Duplicate	1/13/22	1420	G	S	N	N	X	X				3																																																																													
HT-E10-21-22	1/13/22	1200	G	S	N	N	X	X				3																																																																													
HT-N25-10-11	1/13/22	1415	G	S	N	N	X	X				3																																																																													
HT-S25-14-15	1/13/22	1155	G	S	N	N	X	X				3																																																																													
HT-S25-8-9	1/13/22	1150	G	S	N	N	X	X				3																																																																													
<i>MY 1/14/22</i>																																																																																									
Possible Hazard Identification					Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)																																																																																				
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological					<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months																																																																																				
Deliverable Requested: I, II, III, IV, Other (specify)				Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQuIS FDD.				Special Instructions/QC Requirements: DOD QSM project.																																																																																	
Empty Kit Relinquished by:				Date:				Time:				Method of Shipment:																																																																													
Relinquished by: Matthew Yim <i>Matthew Yim</i>				Date/Time: 1/14/22 1530				Company: AECOM				Received by: <i>Stacy Arthur</i>		Date/Time: 1/5/22 1100		Company: EFGS																																																																									
Relinquished by:				Date/Time:				Company:				Received by:		Date/Time:		Company:																																																																									
Relinquished by:				Date/Time:				Company:				Received by:		Date/Time:		Company:																																																																									
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:																																																																																					

Eurofins FGS, Seattle

5755 8th Street East
Tacoma, WA 98424

Chain of Cust

Therm. ID: SCA3 Cor: 015 Unc: 0.5
Cooler Dsc: large blue FedEx: priority
Packing: BW UPS:
Cust. Seal: Yes No
Blue Ice, Wet, Dry, None Lab Cour:
Other: _____



Environment Testing
America

Client Information		Sampler: Dominic Mariano		Tracking No(s): .x		COC No: 202201-05 Soil																			
Client Contact: Alethea Ramos (alternate: Margie Pascua)		Phone: 310-625-1283		E-Mail: M.Elaine.Walker@EurofinsET.com		State of Origin: Hawaii																			
Company: AECOM		PWSID:		Analysis Requested				Page: Page 1 of 4																	
Address: 1001 Bishop St. Suite 1600		Due Date Requested: see subcontract		<table border="1"> <tr> <th>Field Filtered Sample (Yes or No)</th> <th>Perform MS/MSD (Yes or No)</th> <th>EPA 8260 BTEX+Naph</th> <th>EPA 8260 TPH-G (C6-C10)</th> <th>EPA 8015 TPH-D/O (C10-C24, C24-C40)</th> <th>EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup</th> <th>EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)</th> <th>Total Number of containers</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>				Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 8260 BTEX+Naph	EPA 8260 TPH-G (C6-C10)	EPA 8015 TPH-D/O (C10-C24, C24-C40)	EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup	EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)	Total Number of containers									Job #:	
Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 8260 BTEX+Naph	EPA 8260 TPH-G (C6-C10)					EPA 8015 TPH-D/O (C10-C24, C24-C40)	EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup	EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)	Total Number of containers														
City: Honolulu		TAT Requested (days): 3 working days						Preservation Codes:		A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA		M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)													
State, Zip: Hawaii 96813		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No						Other:																	
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)		PO #: Note to AECOM before printing COC: put in PO# w		Project #: 60674414		SSOW#: Note to AECOM before printing COC: put in subk#																			
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)		WO #:		Sample Identification		Sample Date		Sample Time																	
Project Name: CV22F0106		Project #: 60674414		Sample Type (C=Comp, G=grab)		Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)		Preservation Code:																	
Site: RH		SSOW#: Note to AECOM before printing COC: put in subk#		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		EPA 8260 BTEX+Naph																	
				EPA 8260 TPH-G (C6-C10)		EPA 8015 TPH-D/O (C10-C24, C24-C40)		EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup																	
				EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)		Total Number of containers		Special Instructions/Note:																	
				EB		1/13/22		1615																	
				LT-Sediment		1/13/22		1350																	
				HT-E25-7-8		1/13/22		1235																	
				HT-E17.5-14-15		1/13/22		1315																	
				HT-S17.5-8-9		1/13/22		1220																	
				HT-E10-23-24		1/13/22		1122																	
				HT-S10-17-18		1/13/22		1135																	
				HT-N25-10-11 Duplicate		1/13/22		1425																	
				HT-E25-14-15		1/13/22		1245																	
				HT-S10-15-16		1/13/22		1140																	
				HT-E17.5-7-8		1/13/22		1300																	
Possible Hazard Identification					Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)																				
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological					<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months																				
Deliverable Requested: I, II, III, IV, Other (specify)					Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQUS FDD.																				
Special Instructions/QC Requirements: DOD QSM project.																									
Empty Kit Relinquished by:			Date:		Time:		Method of Shipment:																		
Relinquished by: Matthew Yim <i>Matthew Yim</i>			Date/Time: 1/14/22 1530		Company: AECOM		Received by: Tracy Antton <i>Tracy Antton</i>																		
Relinquished by:			Date/Time:		Company:		Date/Time: 1/15/22 1100																		
Relinquished by:			Date/Time:		Company:		Date/Time:																		
Custody Seals Intact:		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:																					
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																									

Chain of Custody Record

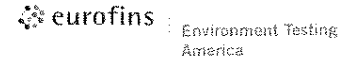
Client Information		Sampler: Dominic Mariano		Lab PM: Elaine Walker		Carrier Tracking No(s): FedEx		COC No: 202201-06 Soil													
Client Contact: Alethea Ramos (alternate: Margie Pascua)		Phone: 310-625-1283		E-Mail: M.Elaine.Walker@EurofinsET.com		State of Origin: Hawaii		Page: Page 2 of 4													
Company: AECOM		PWSID:		Analysis Requested						Job #:											
Address: 1001 Bishop St. Suite 1600		Due Date Requested: see subcontract		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		EPA 8260 BTEX+Naph		EPA 8260 TPH-G (C6-C10)		EPA 8015 TPH-D/O (C10-C24, C24-C40)		EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup		EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)		Total Number of Containers		Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify)	
City: Honolulu		TAT Requested (days): 3 working days																			
State, Zip: Hawaii 96813		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No																			
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)		PO #: Note to AECOM before printing COC: put in PO# w																			
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)		WO #:		Project #: 60674414		SSOW#:		Note to AECOM before printing COC: put in subk#		Other: _____		Special Instructions/Note: _____									
Project Name: CV22F0106		Site: RH																			
Sample Identification		Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 8260 BTEX+Naph	EPA 8260 TPH-G (C6-C10)	EPA 8015 TPH-D/O (C10-C24, C24-C40)	EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup	EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)	Total Number of Containers	Special Instructions/Note:							
HT-N25-14-15		1/13/22	1401	G	S	N	N			X	X	X	1	MY 1/14/22							
HT-N25-14-15 Duplicate		1/13/22	1420	G	S	N	N			X	X	X	1								
HT-E10-21-22		1/13/22	1200	G	S	N	N			X	X	X	1								
HT-N25-10-11		1/13/22	1415	G	S	N	N			X	X	X	1								
HT-S25-14-15		1/13/22	1155	G	S	N	N			X	X	X	1								
HT-S25-8-9		1/13/22	1150	G	S	N	N			X	X	X	1								
														MY 1/14/22							
Possible Hazard Identification						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)															
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological						<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months															
Deliverable Requested: I, II, III, IV, Other (specify)						Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQUIS EDD.															
Empty Kit Relinquished by:						Method of Shipment:															
Relinquished by: Matthew Yim		Date/Time: 1/14/22 1530		Company: AECOM		Received by: <i>Tracy Sutton</i>		Date/Time: 1/15/22 1100		Company: EFGS											
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:											
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:											
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:																	

Eurofins FGS, Seattle

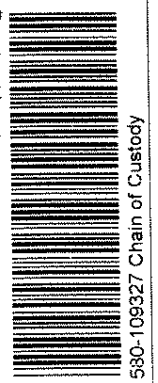
5755 8th Street East
Tacoma, WA 98424

Chain of Custody Form

Therm ID: SCAB Cor: 104 Unc: 104
Cooler Desc: large blue
Packing: BIW FedEx: priority
Cust. Seal: Yes No
Blue Ice, Dry, None
Other: _____ (s): _____
Lab Ela: _____
E-Mail: M.Elaine.Walker@EurofinsET.com State or Origin: Hawaii
Lab Cour: _____
UPS: _____



Client Information		Sampler: Dominic Mariano		Lab Ela:		COC No: 202201-07 Soil	
Client Contact: Alethea Ramos (alternate: Margie Pascua)		Phone: 310-625-1283		E-Mail: M.Elaine.Walker@EurofinsET.com		Page: Page 3 of 4	
Company: AECOM		PWSID:		Analysis Requested		Job #:	
Address: 1001 Bishop St. Suite 1600		Due Date Requested: see subcontract				Preservation Codes:	
City: Honolulu		TAT Requested (days): 3 working days		Field Filtered Sample (Yes or No) Perform MS/MSD (Yes or No) EPA 8260 BTEX+Naph EPA 8260 TPH-G (C6-C10) EPA 8015 TPH-DJO (C10-C24, C24-C40) EPA 8015 TPH-DJO (C10-C24, C24-C40) w/ silica gel cleanup EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)		A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA	
State, Zip: Hawaii 96813		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No				M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)	
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)		PO #: Note to AECOM before printing COC: put in PO# w		Total Number of containers		Other:	
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)		WO #:					
Project Name: CV22F0106		Project #: 60674414		Special Instructions/Note:			
Site: RH		SSOW#: Note to AECOM before printing COC: put in subk#					
Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	
EB	1/13/22	1615	G	S	N	N	X X
HT-E25-7-8	1/13/22	1235	G	S	N	N	X X
HT-E17.5-14-15	1/13/22	1315	G	S	N	N	X X
HT-S17.5-8-9	1/13/22	1220	G	S	N	N	X X
HT-E10-23-24	1/13/22	1122	G	S	N	N	X X
HT-S10-17-18	1/13/22	1135	G	S	N	N	X X
HT-N25-10-11 Duplicate	1/13/22	1425	G	S	N	N	X X
HT-E25-14-15	1/13/22	1245	G	S	N	N	X X
HT-S10-15-16	1/13/22	1140	G	S	N	N	X X
HT-E17.5-7-8	1/13/22	1300	G	S	N	N	X X
HT-N25-14-15	1/13/22	1401	G	S	N	N	X X
Possible Hazard Identification				Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)			
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological				<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months			
Deliverable Requested: I, II, III, IV, Other (specify)		Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQ/IS FDD.		Special Instructions/QC Requirements: DOD QSM project.			
Empty Kit Relinquished by:		Date:	Time:		Method of Shipment:		
Relinquished by: Matthew Yim <i>Matthew Yim</i>		Date/Time: 1/14/22 1530	Company: AECOM		Received by: Tracy Sutton <i>Tracy Sutton</i>		Date/Time: 1/5/22 11 00
Relinquished by:		Date/Time:	Company:		Received by:		Date/Time:
Relinquished by:		Date/Time:	Company:		Received by:		Date/Time:
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:					



Chain of Custody Record

Client Information			Sampler: Dominic Mariano		Lab PM: Elaine Walker		Carrier Tracking No(s): FedEx		COC No: 202201-08 Soil								
Client Contact: Alethea Ramos (alternate: Margie Pascua)			Phone: 310-625-1283		E-Mail: M.Elaine.Walker@EurofinsET.com		State of Origin: Hawaii		Page: Page 4 of 4								
Company: AECOM			PWSID:		Analysis Requested			Preservation Codes:									
Address: 1001 Bishop St. Suite 1600			Due Date Requested: see subcontract														
City: Honolulu			TAT Requested (days): 3 working days														
State, Zip: Hawaii 96813			Compliance Project: Δ Yes Δ No														
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)			PO #: Note to AECOM before printing COC: put in PO# w		Field Filtered Samples (Yes or No) Perform MS/MSD (Yes or No)			Total Number of containers									
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)			WO #:														
Project Name: CV22F0106			Project #: 60674414														
Site: RH			SSOW #: Note to AECOM before printing COC: put in subk#		Special Instructions/Note:												
Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix <small>(W=water, S=solid, O=soil/oil, BT=Tissue, A=Air)</small>	N	N	X	X	I	I	S	S	I	I	S	S	
HT-N25-14-15 Duplicate	1/13/22	1420	G	S	N	N	X	X									3
HT-E10-21-22	1/13/22	1200	G	S	N	N	X	X									3
HT-N25-10-11	1/13/22	1415	G	S	N	N	X	X									3
HT-S25-14-15	1/13/22	1155	G	S	N	N	X	X									3
HT-S25-8-9	1/13/22	1150	G	S	N	N	X	X									3
<div style="font-size: 24px; font-weight: bold; color: blue;">MY 1/14/22</div>																	

Possible Hazard Identification

Non-Hazard
 Flammable
 Skin Irritant
 Poison B
 Unknown
 Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Return To Client
 Disposal By Lab
 Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)
 Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQ/US FDD

Special Instructions/QC Requirements: DOD QSM project.

Empty Kit Relinquished by:		Date:	Time:	Method of Shipment:	
Relinquished by: Matthew Yim	Matthew Yim	Date/Time: 1/14/22 1530		Received by: Tracy Suthon	Date/Time: 1/15/22 1103
Relinquished by:		Date/Time:		Received by:	Date/Time:
Relinquished by:		Date/Time:		Received by:	Date/Time:

Custody Seals Intact: Δ Yes Δ No
 Custody Seal No.: _____
 Cooler Temperature(s) °C and Other Remarks: _____

Eurofins FGS, Seattle

5755 8th Street East
Tacoma, WA 98424

Chain of Cust

Therm. ID: SCA3 Cor: 015 Unc: 0.5
Cooler Desc: large blue FedEx: priority
Packing: BW UPS:
Cust. Seal: Yes No
Blue Ice, Wet, Dry, None Lab Cour:
Other: _____



Environment Testing
America

Client Information		Sampler: Dominic Mariano		Tracking No(s): .x		COC No: 202201-05 Soil																			
Client Contact: Alethea Ramos (alternate: Margie Pascua)		Phone: 310-625-1283		E-Mail: M.Elaine.Walker@EurofinsET.com		State of Origin: Hawaii																			
Company: AECOM		PWSID:		Analysis Requested				Page: Page 1 of 4																	
Address: 1001 Bishop St. Suite 1600		Due Date Requested: see subcontract		<table border="1"> <tr> <th>Field Filtered Sample (Yes or No)</th> <th>Perform MS/MSD (Yes or No)</th> <th>EPA 8260 BTEX+Naph</th> <th>EPA 8260 TPH-G (C6-C10)</th> <th>EPA 8015 TPH-D/O (C10-C24, C24-C40)</th> <th>EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup</th> <th>EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)</th> <th>Total Number of Containers</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>				Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 8260 BTEX+Naph	EPA 8260 TPH-G (C6-C10)	EPA 8015 TPH-D/O (C10-C24, C24-C40)	EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup	EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)	Total Number of Containers									Job #:	
Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 8260 BTEX+Naph	EPA 8260 TPH-G (C6-C10)					EPA 8015 TPH-D/O (C10-C24, C24-C40)	EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup	EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)	Total Number of Containers														
City: Honolulu		TAT Requested (days): 3 working days						Preservation Codes:		A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA		M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)													
State, Zip: Hawaii 96813		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No						Other:																	
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)		PO #: Note to AECOM before printing COC: put in PO# w/		WO #:																					
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)		Project #: 60674414		SSOW#: Note to AECOM before printing COC: put in subk#																					
Project Name: CV22F0106		Site: RH																							
Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 8260 BTEX+Naph	EPA 8260 TPH-G (C6-C10)	EPA 8015 TPH-D/O (C10-C24, C24-C40)	EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup	EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)	Total Number of Containers	Special Instructions/Note:												
EB	1/13/22	1615	G	W	N	N			X	X	X	2													
LT-Sediment	1/13/22	1350	G	S	N	N			X	X	X	1													
HT-E25-7-8	1/13/22	1235	G	S	N	N			X	X	X	1													
HT-E17.5-14-15	1/13/22	1315	G	S	N	N			X	X	X	1													
HT-S17.5-8-9	1/13/22	1220	G	S	N	N			X	X	X	1													
HT-E10-23-24	1/13/22	1122	G	S	N	N			X	X	X	1													
HT-S10-17-18	1/13/22	1135	G	S	N	N			X	X	X	1													
HT-N25-10-11 Duplicate	1/13/22	1425	G	S	N	N			X	X	X	1													
HT-E25-14-15	1/13/22	1245	G	S	N	N			X	X	X	1													
HT-S10-15-16	1/13/22	1140	G	S	N	N			X	X	X	1													
HT-E17.5-7-8	1/13/22	1300	G	S	N	N			X	X	X	1													
Possible Hazard Identification					Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)																				
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological					<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months																				
Deliverable Requested: I, II, III, IV, Other (specify)					Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQUS FDD.					Special Instructions/QC Requirements: DOD QSM project.															
Empty Kit Relinquished by:			Date:		Time:			Method of Shipment:																	
Relinquished by: Matthew Yim			Date/Time: 1/14/22 1530		Company: AECOM			Received by: Tracy Dunton		Date/Time: 1/15/22 1100		Company: EFGS													
Relinquished by:			Date/Time:		Company:			Received by:		Date/Time:		Company:													
Relinquished by:			Date/Time:		Company:			Received by:		Date/Time:		Company:													
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:																					

Chain of Custody Record

Client Information		Sampler: Dominic Mariano		Lab PM: Elaine Walker		Carrier Tracking No(s): FedEx		COC No: 202201-06 Soil													
Client Contact: Alethea Ramos (alternate: Margie Pascua)		Phone: 310-625-1283		E-Mail: M.Elaine.Walker@EurofinsET.com		State of Origin: Hawaii		Page: Page 2 of 4													
Company: AECOM		PWSID:		Analysis Requested						Job #:											
Address: 1001 Bishop St. Suite 1600		Due Date Requested: see subcontract		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		EPA 8260 BTEX+Naph		EPA 8260 TPH-G (C6-C10)		EPA 8015 TPH-D/O (C10-C24, C24-C40)		EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup		EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)		Total Number of containers		Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify)	
City: Honolulu		TAT Requested (days): 3 working days																			
State, Zip: Hawaii 96813		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No																			
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)		PO #: Note to AECOM before printing COC: put in PO# w																			
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)		WO #:		Project #: 60674414		SSOW#:		Note to AECOM before printing COC: put in subk#		Special Instructions/Note:											
Project Name: CV22F0106		Site: RH																			
Sample Identification		Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 8260 BTEX+Naph	EPA 8260 TPH-G (C6-C10)	EPA 8015 TPH-D/O (C10-C24, C24-C40)	EPA 8015 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup	EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)	Total Number of containers	Special Instructions/Note:							
HT-N25-14-15		1/13/22	1401	G	S	N	N			X	X	X	1	MY 1/14/22							
HT-N25-14-15 Duplicate		1/13/22	1420	G	S	N	N			X	X	X	1								
HT-E10-21-22		1/13/22	1200	G	S	N	N			X	X	X	1								
HT-N25-10-11		1/13/22	1415	G	S	N	N			X	X	X	1								
HT-S25-14-15		1/13/22	1155	G	S	N	N			X	X	X	1								
HT-S25-8-9		1/13/22	1150	G	S	N	N			X	X	X	1								
														MY 1/14/22							
Possible Hazard Identification						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)															
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological						<input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months															
Deliverable Requested: I, II, III, IV, Other (specify)						Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQUIS EDD.						Special Instructions/QC Requirements: DOD QSM project.									
Empty Kit Relinquished by:			Date:			Time:			Method of Shipment:												
Relinquished by: Matthew Yim			Date/Time: 1/14/22 1530			Company: AECOM			Received by: <i>Tracy Sutton</i>			Date/Time: 1/15/22 1100			Company: EFGS						
Relinquished by:			Date/Time:			Company:			Received by:			Date/Time:			Company:						
Relinquished by:			Date/Time:			Company:			Received by:			Date/Time:			Company:						
Custody Seals Intact:		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:																	
<input type="checkbox"/> Yes <input type="checkbox"/> No																					

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-109327-1

Login Number: 109327

List Number: 1

Creator: Vallelunga, Diana L

List Source: Eurofins Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



ANALYTICAL REPORT

Eurofins Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-109724-1
Client Project/Site: CV22F0106
Revision: 1

For:
AECOM
1001 Bishop Street
Honolulu, Hawaii 96813

Attn: Margie F Pascua

M. Elaine Walker

Authorized for release by:
9/19/2022 4:11:21 PM

Elaine Walker, Project Manager II
(253)248-4972

M.Elaine.Walker@et.eurofinsus.com

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results through



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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Case Narrative

Client: AECOM
Project/Site: CV22F0106

Job ID: 580-109724-1

Job ID: 580-109724-1

Laboratory: Eurofins Seattle

Narrative

CASE NARRATIVE

Client: AECOM

Project: Red Hill NPDES CV22F0106

Report Number: 580-109724-1

REVISION 1: SEPTEMBER 19, 2022

Report has been revised for 8015B/CA LUFT results. Chromatographic integrations have been adjusted to forced baseline-baseline integration per Method and SOP. In addition, the formatter has been updated to report LOD/LOQ/DL per DoD protocol.

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) resulting from a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes within the calibration range of the instrument or that reduces the interferences thereby enabling the quantification of target analytes.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

Two samples were received on 1/28/2022 9:45 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.8° C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

GASOLINE RANGE ORGANICS (GRO)

Samples ERH2495 (580-109724-1) and ERH2494 (580-109724-2) were analyzed for gasoline range organics (GRO) in accordance with CA_LUFT_GRO. The samples were analyzed on 01/29/2022.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples ERH2495 (580-109724-1) and ERH2494 (580-109724-2) were analyzed for volatile organic compounds (GC-MS) in accordance with 8260C. The samples were analyzed on 01/29/2022.

The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for analytical batch 580-379738 recovered outside control limits for the following analytes: Benzene. The LCS and LCSD recoveries were in control.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SEMIVOLATILE ORGANIC COMPOUNDS - SELECTED ION MODE (SIM)

Sample ERH2495 (580-109724-1) was analyzed for semivolatile organic compounds - Selected Ion Mode (SIM) in accordance with 8270E SIM. The samples were prepared on 01/29/2022 and analyzed on 01/30/2022.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Case Narrative

Client: AECOM
Project/Site: CV22F0106

Job ID: 580-109724-1

Job ID: 580-109724-1 (Continued)

Laboratory: Eurofins Seattle (Continued)

DIESEL AND EXTENDED RANGE ORGANICS

Sample ERH2495 (580-109724-1) was analyzed for diesel and extended range organics in accordance with 8015D. The samples were prepared on 01/28/2022 and analyzed on 01/30/2022.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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Definitions/Glossary

Client: AECOM
Project/Site: CV22F0106

Job ID: 580-109724-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

GC/MS Semi VOA

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.

GC Semi VOA

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client Sample Results

Client: AECOM
Project/Site: CV22F0106

Job ID: 580-109724-1

Client Sample ID: ERH2495

Lab Sample ID: 580-109724-1

Date Collected: 01/26/22 16:15

Matrix: Water

Date Received: 01/28/22 09:45

Method: 8260B/CA_LUFTMS - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	80	U	100	31	ug/L			01/29/22 02:57	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	110		78 - 120					01/29/22 02:57	1

Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.50	U Q	1.0	0.24	ug/L			01/29/22 02:57	1
Toluene	0.80	U	1.0	0.39	ug/L			01/29/22 02:57	1
Ethylbenzene	0.80	U	1.0	0.50	ug/L			01/29/22 02:57	1
m-Xylene & p-Xylene	0.80	U	2.0	0.53	ug/L			01/29/22 02:57	1
o-Xylene	0.80	U	1.0	0.39	ug/L			01/29/22 02:57	1
Xylenes, Total	0.80	U	2.0	0.53	ug/L			01/29/22 02:57	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	95		80 - 120					01/29/22 02:57	1
4-Bromofluorobenzene (Surr)	110		80 - 120					01/29/22 02:57	1
Dibromofluoromethane (Surr)	97		80 - 120					01/29/22 02:57	1
1,2-Dichloroethane-d4 (Surr)	99		80 - 120					01/29/22 02:57	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	0.64		0.10	0.032	ug/L		01/29/22 15:26	01/30/22 12:34	1
2-Methylnaphthalene	0.27		0.20	0.040	ug/L		01/29/22 15:26	01/30/22 12:34	1
1-Methylnaphthalene	1.7		0.10	0.019	ug/L		01/29/22 15:26	01/30/22 12:34	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Terphenyl-d14	95		29 - 150				01/29/22 15:26	01/30/22 12:34	1
2-methylnaphthalene-d10	51		35 - 120				01/29/22 15:26	01/30/22 12:34	1
Fluoranthene-d10 (Surr)	85		49 - 129				01/29/22 15:26	01/30/22 12:34	1

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	240		110	67	ug/L		01/28/22 19:12	01/30/22 19:58	1
Motor Oil Range Organics (C24-C40)	310	U	360	180	ug/L		01/28/22 19:12	01/30/22 19:58	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	97		53 - 120				01/28/22 19:12	01/30/22 19:58	1

Client Sample Results

Client: AECOM
Project/Site: CV22F0106

Job ID: 580-109724-1

Client Sample ID: ERH2494

Lab Sample ID: 580-109724-2

Date Collected: 01/26/22 16:10

Matrix: Water

Date Received: 01/28/22 09:45

Method: 8260B/CA_LUFTMS - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	80	U	100	31	ug/L			01/29/22 02:32	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	111		78 - 120					01/29/22 02:32	1

Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.50	U Q	1.0	0.24	ug/L			01/29/22 02:32	1
Toluene	0.80	U	1.0	0.39	ug/L			01/29/22 02:32	1
Ethylbenzene	0.80	U	1.0	0.50	ug/L			01/29/22 02:32	1
m-Xylene & p-Xylene	0.80	U	2.0	0.53	ug/L			01/29/22 02:32	1
o-Xylene	0.80	U	1.0	0.39	ug/L			01/29/22 02:32	1
Xylenes, Total	0.80	U	2.0	0.53	ug/L			01/29/22 02:32	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	100		80 - 120					01/29/22 02:32	1
4-Bromofluorobenzene (Surr)	111		80 - 120					01/29/22 02:32	1
Dibromofluoromethane (Surr)	99		80 - 120					01/29/22 02:32	1
1,2-Dichloroethane-d4 (Surr)	94		80 - 120					01/29/22 02:32	1

QC Sample Results

Client: AECOM
Project/Site: CV22F0106

Job ID: 580-109724-1

Method: 8260B/CA_LUFTMS - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-379734/5
Matrix: Water
Analysis Batch: 379734

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB	MB	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Gasoline Range Organics [C6 - C10]	80	U	100	31	ug/L			01/29/22 00:31	1
Surrogate	MB	MB	Limits			Prepared	Analyzed	Dil Fac	
	%Recovery	Qualifier							
4-Bromofluorobenzene (Surr)	117		78 - 120				01/29/22 00:31	1	

Lab Sample ID: LCS 580-379734/8
Matrix: Water
Analysis Batch: 379734

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Gasoline Range Organics [C6 - C10]	1000	885		ug/L		88	75 - 127
Surrogate	LCS	LCS	Limits				
	%Recovery	Qualifier					
4-Bromofluorobenzene (Surr)	114		78 - 120				

Lab Sample ID: LCSD 580-379734/9
Matrix: Water
Analysis Batch: 379734

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD	LCSD	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
		Result	Qualifier						
Gasoline Range Organics [C6 - C10]	1000	802		ug/L		80	75 - 127	10	13
Surrogate	LCSD	LCSD	Limits						
	%Recovery	Qualifier							
4-Bromofluorobenzene (Surr)	108		78 - 120						

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-379738/5
Matrix: Water
Analysis Batch: 379738

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB	MB	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Benzene	0.50	U	1.0	0.24	ug/L			01/29/22 00:31	1
Toluene	0.80	U	1.0	0.39	ug/L			01/29/22 00:31	1
Ethylbenzene	0.80	U	1.0	0.50	ug/L			01/29/22 00:31	1
m-Xylene & p-Xylene	0.80	U	2.0	0.53	ug/L			01/29/22 00:31	1
o-Xylene	0.80	U	1.0	0.39	ug/L			01/29/22 00:31	1
Xylenes, Total	0.80	U	2.0	0.53	ug/L			01/29/22 00:31	1
Surrogate	MB	MB	Limits			Prepared	Analyzed	Dil Fac	
	%Recovery	Qualifier							
Toluene-d8 (Surr)	100		80 - 120				01/29/22 00:31	1	
4-Bromofluorobenzene (Surr)	117		80 - 120				01/29/22 00:31	1	
Dibromofluoromethane (Surr)	111		80 - 120				01/29/22 00:31	1	
1,2-Dichloroethane-d4 (Surr)	94		80 - 120				01/29/22 00:31	1	

Eurofins Seattle

QC Sample Results

Client: AECOM
Project/Site: CV22F0106

Job ID: 580-109724-1

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 580-379738/6
Matrix: Water
Analysis Batch: 379738

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	10.0	8.36		ug/L		84	80 - 122
Toluene	10.0	8.55		ug/L		85	80 - 120
Ethylbenzene	10.0	9.28		ug/L		93	80 - 120
m-Xylene & p-Xylene	10.0	9.59		ug/L		96	80 - 120
o-Xylene	10.0	8.88		ug/L		89	80 - 120
Xylenes, Total	20.0	18.5		ug/L		92	80 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Toluene-d8 (Surr)	92		80 - 120
4-Bromofluorobenzene (Surr)	108		80 - 120
Dibromofluoromethane (Surr)	97		80 - 120
1,2-Dichloroethane-d4 (Surr)	93		80 - 120

Lab Sample ID: LCSD 580-379738/7
Matrix: Water
Analysis Batch: 379738

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Benzene	10.0	10.3	Q	ug/L		103	80 - 122	21	14
Toluene	10.0	8.85		ug/L		89	80 - 120	4	13
Ethylbenzene	10.0	10.2		ug/L		102	80 - 120	9	14
m-Xylene & p-Xylene	10.0	10.5		ug/L		105	80 - 120	9	14
o-Xylene	10.0	10.4		ug/L		104	80 - 120	16	16
Xylenes, Total	20.0	20.9		ug/L		105	80 - 120	12	16

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Toluene-d8 (Surr)	97		80 - 120
4-Bromofluorobenzene (Surr)	112		80 - 120
Dibromofluoromethane (Surr)	105		80 - 120
1,2-Dichloroethane-d4 (Surr)	93		80 - 120

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 580-379767/1-A
Matrix: Water
Analysis Batch: 379790

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 379767

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	0.080	U	0.10	0.031	ug/L		01/29/22 15:26	01/30/22 11:21	1
2-Methylnaphthalene	0.080	U	0.20	0.039	ug/L		01/29/22 15:26	01/30/22 11:21	1
1-Methylnaphthalene	0.032	U	0.10	0.019	ug/L		01/29/22 15:26	01/30/22 11:21	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Terphenyl-d14	103		29 - 150	01/29/22 15:26	01/30/22 11:21	1
2-methylnaphthalene-d10	76		35 - 120	01/29/22 15:26	01/30/22 11:21	1
Fluoranthene-d10 (Surr)	90		49 - 129	01/29/22 15:26	01/30/22 11:21	1

Eurofins Seattle

QC Sample Results

Client: AECOM
Project/Site: CV22F0106

Job ID: 580-109724-1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCS 580-379767/2-A
Matrix: Water
Analysis Batch: 379790

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 379767

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits	
Naphthalene	4.00	3.59		ug/L		90	34 - 120	
2-Methylnaphthalene	4.00	3.97		ug/L		99	33 - 120	
1-Methylnaphthalene	4.00	3.15		ug/L		79	29 - 120	
LCS LCS								
Surrogate	%Recovery	Qualifier	Limits					
Terphenyl-d14	97		29 - 150					
2-methylnaphthalene-d10	77		35 - 120					
Fluoranthene-d10 (Surr)	90		49 - 129					

Lab Sample ID: LCSD 580-379767/3-A
Matrix: Water
Analysis Batch: 379790

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 379767

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits		RPD Limit	
									RPD	Limit
Naphthalene	4.00	3.70		ug/L		92	34 - 120	3	35	
2-Methylnaphthalene	4.00	4.03		ug/L		101	33 - 120	1	35	
1-Methylnaphthalene	4.00	3.20		ug/L		80	29 - 120	2	35	
LCSD LCSD										
Surrogate	%Recovery	Qualifier	Limits							
Terphenyl-d14	97		29 - 150							
2-methylnaphthalene-d10	75		35 - 120							
Fluoranthene-d10 (Surr)	86		49 - 129							

Method: 8015D - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 580-379706/1-B
Matrix: Water
Analysis Batch: 379789

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 379706

Analyte	MB MB		LOQ	DL	Unit	D	Prepared		Analyzed		Dil Fac
	Result	Qualifier									
Diesel Range Organics (C10-C24)	100	U	110	65	ug/L		01/28/22 19:12	01/30/22 18:57			1
Motor Oil Range Organics (C24-C40)	300	U	350	180	ug/L		01/28/22 19:12	01/30/22 18:57			1
MB MB											
Surrogate	%Recovery	Qualifier	Limits		Prepared		Analyzed		Dil Fac		
o-Terphenyl	96		53 - 120		01/28/22 19:12		01/30/22 18:57		1		

Lab Sample ID: LCS 580-379706/2-B
Matrix: Water
Analysis Batch: 379789

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 379706

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits	
Diesel Range Organics (C10-C24)	2000	1840		ug/L		92	49 - 120	
Motor Oil Range Organics (C24-C40)	2000	1850		ug/L		93	36 - 143	
LCS LCS								
Surrogate	%Recovery	Qualifier	Limits					
o-Terphenyl	84		53 - 120					

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QC Sample Results

Client: AECOM
Project/Site: CV22F0106

Job ID: 580-109724-1

Method: 8015D - Diesel Range Organics (DRO) (GC)

Lab Sample ID: LCSD 580-379706/3-B
Matrix: Water
Analysis Batch: 379789

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 379706

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Diesel Range Organics (C10-C24)	2000	1860		ug/L		93	49 - 120	1	25
Motor Oil Range Organics (C24-C40)	2000	1960		ug/L		98	36 - 143	6	24

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
<i>o</i> -Terphenyl	90		53 - 120



Lab Chronicle

Client: AECOM
Project/Site: CV22F0106

Job ID: 580-109724-1

Client Sample ID: ERH2495

Date Collected: 01/26/22 16:15

Date Received: 01/28/22 09:45

Lab Sample ID: 580-109724-1

Matrix: Water

<u>Prep Type</u>	<u>Batch Type</u>	<u>Batch Method</u>	<u>Run</u>	<u>Dilution Factor</u>	<u>Batch Number</u>	<u>Analyst</u>	<u>Lab</u>	<u>Prepared or Analyzed</u>
Total/NA	Analysis	8260B/CA_LUFTMS		1	379734	BNM	EET SEA	01/29/22 02:57
Total/NA	Analysis	8260D		1	379738	BNM	EET SEA	01/29/22 02:57
Total/NA	Prep	3510C			379767	M1E	EET SEA	01/29/22 15:26
Total/NA	Analysis	8270E SIM		1	379790	W1T	EET SEA	01/30/22 12:34
Total/NA	Prep	3510C			379706	JHR	EET SEA	01/28/22 19:12
Total/NA	Cleanup	3630C			379792	JHR	EET SEA	01/30/22 14:27
Total/NA	Analysis	8015D		1	379789	JAE	EET SEA	01/30/22 19:58

Client Sample ID: ERH2494

Date Collected: 01/26/22 16:10

Date Received: 01/28/22 09:45

Lab Sample ID: 580-109724-2

Matrix: Water

<u>Prep Type</u>	<u>Batch Type</u>	<u>Batch Method</u>	<u>Run</u>	<u>Dilution Factor</u>	<u>Batch Number</u>	<u>Analyst</u>	<u>Lab</u>	<u>Prepared or Analyzed</u>
Total/NA	Analysis	8260B/CA_LUFTMS		1	379734	BNM	EET SEA	01/29/22 02:32
Total/NA	Analysis	8260D		1	379738	BNM	EET SEA	01/29/22 02:32

Laboratory References:

EET SEA = Eurofins Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: AECOM
Project/Site: CV22F0106

Job ID: 580-109724-1

Laboratory: Eurofins Seattle

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2236	01-19-25

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12

Sample Summary

Client: AECOM
Project/Site: CV22F0106

Job ID: 580-109724-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-109724-1	ERH2495	Water	01/26/22 16:15	01/28/22 09:45
580-109724-2	ERH2494	Water	01/26/22 16:10	01/28/22 09:45

1

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12

Chain of Custody Record

Client Information	Sampler: Collin Ferguson AECOM	Lab PM: Elaine Walker	Carrier Tracking No(s): FedEx	COC No: 20220127-OWDFMW06B
Client Contact: Alethea Ramos (alternate: Margie Pascua)	Phone:	E-Mail: M.Elaine.Walker@EurofinsET.com	State of Origin: Hawaii	Page: Page 1 of 1
Company: AECOM	PWSID:			Job #: 109724

Address: 1001 Bishop St. Suite 1600	Dua Date Requested: see subcontract	Analysis Requested		
City: Honolulu	TAT Requested (days): RUSH, ASAP			
State, Zip: Hawaii 96813	Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No			
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)	PO #:			
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)	WO #:	Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify)		
Project Name: CV22F0106	Project #: 60674414			
Site: RH	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=Water, S=Soil, O=Organic, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)										Total Number of Containers	Special Instructions/Notes		
					Perform MS/MSD (Yes or No)	EPA 8260 BTEX	EPA 8260 TPH-G (C6-C10)	EPA 8015 TPH-D/O (C10-C24, C24-C40)	EPA 8016 TPH-D/O (C10-C24, C24-C40) w/ silica gel cleanup	EPA 8270 SIM PAHs (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene)	Other:							
ERH2495 (OWDFMW06B)	1/26/22	1615	G	GW	N	N	x	x									7	
ERH2494 (Trip Blanks)	1/26/22	1610	G	WQ	N	N	x	x									3	
u.k. 01/27/22																		

Possible Hazard Identification <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements: DOD QSM project.

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by: <i>Alexander Edmonds</i>	Date/Time: <i>01/27/22 1330</i>	Company: AECOM	Received by: <i>Tom Blanks</i>
Relinquished by:	Date/Time:	Company:	Received by:
Relinquished by:	Date/Time:	Company:	Received by:

Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: <i>Fed PO Smear/wet/bub</i>	<i>A3 0.8 / 0.8 W/S</i>
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580-109724 Chain of Custody



Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-109724-1

Login Number: 109724

List Number: 1

Creator: Blankinship, Tom X

List Source: Eurofins Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	Refer to Job Narrative for details.
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	False	Narrative to indicate if headspace container used for analysis.
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

09/16/2022

Margie Pascua
AECOM
1001 Bishop Street
Honolulu, HI 96813**RE: Notification of Revised Results**

Dear Margie:

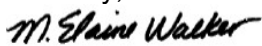
Eurofins Seattle is dedicated to providing its clients with defensible data of the highest quality and producing accurate and useable environmental analytical test results. Testing and data review by the analyst, secondary reviews by expert reviewers, and internal audits are built into our Quality Program. This robust element of our data integrity process checks and prevents errors. Seldom, but on occasion, we determine that erroneous data have been reported to clients. When this occurs, we aggressively correct these errors, perform internal critical reviews, and forthrightly revise the results.

During a recent external data validation, a discrepancy was identified in the integration parameters used for GRO ranges by GCMS analysis by method 8260B/CALUFT. According to similar Method 8015C for GRO/DRO analysis by FID, the integration of the GRO range is via a sum of the area of the individual peaks (i.e., valley to valley integration). However, Method 8015C uses a projected horizontal baseline for DRO range, where a more pronounced hydrocarbon 'hump' is common. The laboratory has determined a forced baseline to baseline integration is a better representation of the GRO quantitation in the GCMS method when a hydrocarbon 'hump' is present in the chromatogram, and this integration technique should be utilized for these types of samples.

As both the calibration and the sample integrations were done similarly, little to no change in quantitation was detected for samples with minimal hydrocarbon contribution. However, samples with a hydrocarbon 'hump' were originally reported with a low bias. The impact on the reported results is dependent on the specific hydrocarbon pattern present in the sample. Samples with no change in value (minimal hydrocarbon hump) have not been revised.

We recognize the need for accurate, consistent laboratory analysis and reporting in regards to meeting project requirements, and we apologize for any difficulty this error may have caused. We look forward to continuing our relationship with you and standing by our promise of providing you with quality data and service. If you have any questions or comments, please feel free to contact me.

Sincerely,

M. Elaine Walker
Senior Project Manager

ANALYTICAL REPORT

Eurofins Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-111500-1

Client Project/Site: Site Char,P2 HT-LT Red Hill Bulk Fuel
Storage

Revision: 2

For:
AECOM
1001 Bishop Street
Honolulu, Hawaii 96813

Attn: Jeff Hart

M. Elaine Walker

Authorized for release by:
9/8/2022 5:52:20 PM

Elaine Walker, Project Manager II
(253)248-4972

M.Elaine.Walker@et.eurofinsus.com

LINKS

Review your project
results through



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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Case Narrative

Client: AECOM
Project/Site: Site Char,P2 HT-LT Red Hill Bulk Fuel Storage

Job ID: 580-111500-1

Job ID: 580-111500-1

Laboratory: Eurofins Seattle

Narrative

CASE NARRATIVE

Client: AECOM

Project: Site Char, P2 HT-LT Red Hill Bulk Fuel Storage

Report Number: 580-111500-1

REVISION 2 September 1, 2022

Report revised to change the carbon range for GRO, add collection times for the trip blanks, and add surrogates for dilution of sample 111502-2.

REVISION 1 July 29, 2022

Report has been revised for 8260B CALUFT results. Chromatographic integrations have been adjusted to forced baseline-baseline integration per Method and SOP.

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

Following DoD QSM guidelines, manual integrations were performed only when necessary and are in compliance with the laboratory's standard operating procedure, Acceptable Manual Integration Practices, SOP No.: Q-S-002. The reason(s) for manual integration have been documented on the affected chromatogram(s), which is/are provided in the raw data package. The raw data also includes the original chromatogram(s) prior to any manual integration being performed. Manual integrations are detailed in the manual integration summary forms following this narrative.

It should be noted that samples with elevated Limits of Quantitation (LOQs) resulting from a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the LOQs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes within the calibration range of the instrument or that reduces the interferences thereby enabling the quantification of target analytes.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 3/17/2022 9:40 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were -0.2° C and -0.1° C.

Receipt Exceptions

The VOA vial container label for the following sample did not match the information listed on the Chain-of-Custody (COC): HTE00.0-WGN01-031.0 (580-111500-2). The container labels list HTE00.0-WGN01-031.0-FD, while the COC lists HTE00.0-WGN01-031.0. Per confirmation from the client, the sample is HTE00.0-WGN01-031.0. In addition, sample HTE00.0-WGFD01-031.0, originally logged in job 580-111502-1, sample 2. Per client request, job 580-111502-1 has been merged with job 580-111500-1 in order to report the parent and field samples together in one report.

The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): TB-02 (580-111500-3). The container labels list TB-01, while the COC lists TB-02. The samples were labeled with the COC ID.

Container labels for the following sample lack sample ID, date or time. TB-01 (580-111502-3)

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required

Case Narrative

Client: AECOM
Project/Site: Site Char,P2 HT-LT Red Hill Bulk Fuel Storage

Job ID: 580-111500-1

Job ID: 580-111500-1 (Continued)

Laboratory: Eurofins Seattle (Continued)

temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

GASOLINE RANGE ORGANICS (GRO)

Samples LTE00.0-WGN01-030.0 (580-111500-1), HTE00.0-WGFD01-031.0 (580-111502-1), HTE00.0-WGN01-031.0 (580-111500-2), LTW35.0-WGN01-028.0 (580-111502-2), TB-02 (580-111500-3) and TB-01 (580-111502-3) were analyzed for gasoline range organics (GRO) in accordance with 8260B CALUFT. The samples were analyzed on 03/23/2022.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples LTE00.0-WGN01-030.0 (580-111500-1), HTE00.0-WGFD01-031.0 (580-111502-1), HTE00.0-WGN01-031.0 (580-111500-2), LTW35.0-WGN01-028.0 (580-111502-2), TB-02 (580-111500-3) and TB-01 (580-111502-3) were analyzed for volatile organic compounds (GC-MS) in accordance with 8260D_DOD5. The samples were analyzed on 03/23/2022.

Surrogate recovery for the following samples were outside the upper control limit: LTE00.0-WGN01-030.0 (580-111500-1), HTE00.0-WGN01-031.0 (580-111500-2), HTE00.0-WGFD01-031.0 (580-111502-1), LTW35.0-WGN01-028.0 (580-111502-2). The surrogate was biased high and the samples were ND; therefore, re-extraction and/or re-analysis was not performed.

The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for analytical batch 580-384852 recovered outside control limits for the following analytes: 1,2-Dichloroethane-d4 (Surr). This surrogate was biased high in the LCS and reported analytes were not detected in the associated samples; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SEMIVOLATILE ORGANIC COMPOUNDS (GC-MS - SIM)

Samples LTE00.0-WGN01-030.0 (580-111500-1), HTE00.0-WGFD01-031.0 (580-111502-1), HTE00.0-WGN01-031.0 (580-111500-2) and LTW35.0-WGN01-028.0 (580-111502-2) were analyzed for semivolatile organic compounds (GC-MS - SIM) in accordance with 8270E SIM. The samples were prepared on 03/23/2022 and analyzed on 03/24/2022 and 03/27/2022.

The following sample was diluted to bring the concentration of target analytes within the calibration range: LTW35.0-WGN01-028.0 (580-111502-2). Elevated reporting limits (RLs) are provided.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DIESEL RANGE ORGANICS

Samples LTE00.0-WGN01-030.0 (580-111500-1), HTE00.0-WGFD01-031.0 (580-111502-1), HTE00.0-WGN01-031.0 (580-111500-2) and LTW35.0-WGN01-028.0 (580-111502-2) were analyzed for Diesel Range Organics in accordance with 8015D DRO. The samples were prepared on 03/22/2022 and 03/25/2022 and analyzed on 03/23/2022 and 03/26/2022.

The following samples were re-prepared outside of preparation holding time due to method blank contamination as well as high LCS/LCSD recoveries in the first extraction. Both sets of data have been reported. LTE00.0-WGN01-030.0 (580-111500-1), HTE00.0-WGN01-031.0 (580-111500-2), HTE00.0-WGFD01-031.0 (580-111502-1), LTW35.0-WGN01-028.0 (580-111502-2), (LCS 580-384606/2-A), (LCS 580-385117/2-A), (LCSD 580-384606/3-A), (LCSD 580-385117/3-A), (MB 580-384606/1-A) and (MB 580-385117/1-A).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: AECOM

Job ID: 580-111500-1

Project/Site: Site Char,P2 HT-LT Red Hill Bulk Fuel Storage

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

GC/MS Semi VOA

Qualifier	Qualifier Description
D	The reported value is from a dilution.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

GC Semi VOA

Qualifier	Qualifier Description
B	Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank.
H	Sample was prepped or analyzed beyond the specified holding time
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
⊞	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)

Definitions/Glossary

Client: AECOM

Job ID: 580-111500-1

Project/Site: Site Char,P2 HT-LT Red Hill Bulk Fuel Storage

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

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Client Sample Results

Client: AECOM
 Project/Site: Site Char,P2 HT-LT Red Hill Bulk Fuel Storage

Job ID: 580-111500-1

Client Sample ID: LTE00.0-WGN01-030.0

Lab Sample ID: 580-111500-1

Date Collected: 03/16/22 09:00

Matrix: Water

Date Received: 03/17/22 09:40

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	80	U	100	31	ug/L			03/23/22 14:09	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	89		69 - 133					03/23/22 14:09	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.50	U Q	1.0	0.24	ug/L			03/23/22 14:09	1
Toluene	0.80	U Q	1.0	0.39	ug/L			03/23/22 14:09	1
Ethylbenzene	0.80	U	1.0	0.50	ug/L			03/23/22 14:09	1
m-Xylene & p-Xylene	0.80	U	2.0	0.53	ug/L			03/23/22 14:09	1
o-Xylene	0.80	U	1.0	0.39	ug/L			03/23/22 14:09	1
Xylenes, Total	0.80	U	2.0	0.53	ug/L			03/23/22 14:09	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	89		85 - 114					03/23/22 14:09	1
Toluene-d8 (Surr)	99		89 - 112					03/23/22 14:09	1
Dibromofluoromethane (Surr)	114		80 - 119					03/23/22 14:09	1
1,2-Dichloroethane-d4 (Surr)	122	Q	81 - 118					03/23/22 14:09	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.37	M	0.10	0.019	ug/L		03/23/22 13:50	03/27/22 18:10	1
2-Methylnaphthalene	0.077	J M	0.20	0.039	ug/L		03/23/22 13:50	03/27/22 18:10	1
Naphthalene	0.15	M	0.10	0.031	ug/L		03/23/22 13:50	03/27/22 18:10	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	62		40 - 140				03/23/22 13:50	03/27/22 18:10	1
Fluoranthene-d10 (Surr)	80		40 - 140				03/23/22 13:50	03/27/22 18:10	1
Terphenyl-d14	88		58 - 132				03/23/22 13:50	03/27/22 18:10	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	500	B	110	65	ug/L		03/22/22 11:42	03/23/22 19:27	1
Diesel Range Organics (C10-C24)	540	H	110	65	ug/L		03/25/22 10:21	03/26/22 11:02	1
Motor Oil Range Organics (C24-C40)	210	J Q B	350	180	ug/L		03/22/22 11:42	03/23/22 19:27	1
Motor Oil Range Organics (C24-C40)	200	J H	350	180	ug/L		03/25/22 10:21	03/26/22 11:02	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	71		56 - 125				03/22/22 11:42	03/23/22 19:27	1
o-Terphenyl	86		56 - 125				03/25/22 10:21	03/26/22 11:02	1

Client Sample Results

Client: AECOM
 Project/Site: Site Char,P2 HT-LT Red Hill Bulk Fuel Storage

Job ID: 580-111500-1

Client Sample ID: HTE00.0-WGN01-031.0

Lab Sample ID: 580-111500-2

Date Collected: 03/16/22 10:30

Matrix: Water

Date Received: 03/17/22 09:40

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	80	U	100	31	ug/L			03/23/22 13:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	89		69 - 133					03/23/22 13:45	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.50	U Q	1.0	0.24	ug/L			03/23/22 13:45	1
Toluene	0.80	U Q	1.0	0.39	ug/L			03/23/22 13:45	1
Ethylbenzene	0.80	U	1.0	0.50	ug/L			03/23/22 13:45	1
m-Xylene & p-Xylene	0.80	U	2.0	0.53	ug/L			03/23/22 13:45	1
o-Xylene	0.80	U	1.0	0.39	ug/L			03/23/22 13:45	1
Xylenes, Total	0.80	U	2.0	0.53	ug/L			03/23/22 13:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	89		85 - 114					03/23/22 13:45	1
Toluene-d8 (Surr)	99		89 - 112					03/23/22 13:45	1
Dibromofluoromethane (Surr)	114		80 - 119					03/23/22 13:45	1
1,2-Dichloroethane-d4 (Surr)	119	M Q	81 - 118					03/23/22 13:45	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.032	U	0.10	0.019	ug/L		03/23/22 13:50	03/24/22 13:08	1
2-Methylnaphthalene	0.080	U	0.20	0.039	ug/L		03/23/22 13:50	03/24/22 13:08	1
Naphthalene	0.080	U	0.10	0.031	ug/L		03/23/22 13:50	03/24/22 13:08	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	72		40 - 140				03/23/22 13:50	03/24/22 13:08	1
Fluoranthene-d10 (Surr)	92		40 - 140				03/23/22 13:50	03/24/22 13:08	1
Terphenyl-d14	97		58 - 132				03/23/22 13:50	03/24/22 13:08	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	310	B	110	65	ug/L		03/22/22 11:42	03/23/22 19:46	1
Diesel Range Organics (C10-C24)	240	H	110	65	ug/L		03/25/22 10:21	03/26/22 11:22	1
Motor Oil Range Organics (C24-C40)	190	J B Q	350	180	ug/L		03/22/22 11:42	03/23/22 19:46	1
Motor Oil Range Organics (C24-C40)	300	U H	350	180	ug/L		03/25/22 10:21	03/26/22 11:22	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	69		56 - 125				03/22/22 11:42	03/23/22 19:46	1
o-Terphenyl	81		56 - 125				03/25/22 10:21	03/26/22 11:22	1

Client Sample Results

Client: AECOM
 Project/Site: Site Char,P2 HT-LT Red Hill Bulk Fuel Storage

Job ID: 580-111500-1

Client Sample ID: TB-02
Date Collected: 03/16/22 12:00
Date Received: 03/17/22 09:40

Lab Sample ID: 580-111500-3
Matrix: Water

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	80	U M	100	31	ug/L			03/23/22 13:21	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	86		69 - 133					03/23/22 13:21	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.50	U	1.0	0.24	ug/L			03/23/22 13:21	1
Toluene	0.80	U	1.0	0.39	ug/L			03/23/22 13:21	1
Ethylbenzene	0.80	U	1.0	0.50	ug/L			03/23/22 13:21	1
m-Xylene & p-Xylene	0.80	U	2.0	0.53	ug/L			03/23/22 13:21	1
o-Xylene	0.80	U	1.0	0.39	ug/L			03/23/22 13:21	1
Xylenes, Total	0.80	U	2.0	0.53	ug/L			03/23/22 13:21	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	86		85 - 114					03/23/22 13:21	1
Toluene-d8 (Surr)	100		89 - 112					03/23/22 13:21	1
Dibromofluoromethane (Surr)	110		80 - 119					03/23/22 13:21	1
1,2-Dichloroethane-d4 (Surr)	117	M	81 - 118					03/23/22 13:21	1

Client Sample Results

Client: AECOM
Project/Site: Site Char,P2 HT-LT Red Hill Bulk Fuel Storage

Job ID: 580-111500-1

Client Sample ID: HTE00.0-WGFD01-031.0

Lab Sample ID: 580-111502-1

Date Collected: 03/16/22 11:00

Matrix: Water

Date Received: 03/17/22 09:40

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	80	U	100	31	ug/L			03/23/22 18:07	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	89		69 - 133					03/23/22 18:07	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.50	U Q	1.0	0.24	ug/L			03/23/22 18:07	1
Toluene	0.80	U Q	1.0	0.39	ug/L			03/23/22 18:07	1
Ethylbenzene	0.80	U	1.0	0.50	ug/L			03/23/22 18:07	1
m-Xylene & p-Xylene	0.80	U	2.0	0.53	ug/L			03/23/22 18:07	1
o-Xylene	0.80	U	1.0	0.39	ug/L			03/23/22 18:07	1
Xylenes, Total	0.80	U	2.0	0.53	ug/L			03/23/22 18:07	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	89		85 - 114					03/23/22 18:07	1
Toluene-d8 (Surr)	100		89 - 112					03/23/22 18:07	1
Dibromofluoromethane (Surr)	114		80 - 119					03/23/22 18:07	1
1,2-Dichloroethane-d4 (Surr)	123	Q	81 - 118					03/23/22 18:07	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.049	J M	0.10	0.019	ug/L		03/23/22 13:50	03/24/22 13:28	1
2-Methylnaphthalene	0.080	U	0.20	0.039	ug/L		03/23/22 13:50	03/24/22 13:28	1
Naphthalene	0.080	U	0.10	0.031	ug/L		03/23/22 13:50	03/24/22 13:28	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	78		40 - 140				03/23/22 13:50	03/24/22 13:28	1
Fluoranthene-d10 (Surr)	93		40 - 140				03/23/22 13:50	03/24/22 13:28	1
Terphenyl-d14	99		58 - 132				03/23/22 13:50	03/24/22 13:28	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	280	B	110	65	ug/L		03/22/22 11:42	03/23/22 20:26	1
Diesel Range Organics (C10-C24)	320	H	110	65	ug/L		03/25/22 10:21	03/26/22 11:42	1
Motor Oil Range Organics (C24-C40)	180	J B Q	350	180	ug/L		03/22/22 11:42	03/23/22 20:26	1
Motor Oil Range Organics (C24-C40)	190	J H	350	180	ug/L		03/25/22 10:21	03/26/22 11:42	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	59		56 - 125				03/22/22 11:42	03/23/22 20:26	1
o-Terphenyl	88		56 - 125				03/25/22 10:21	03/26/22 11:42	1

Client Sample Results

Client: AECOM
Project/Site: Site Char,P2 HT-LT Red Hill Bulk Fuel Storage

Job ID: 580-111500-1

Client Sample ID: LTW35.0-WGN01-028.0

Lab Sample ID: 580-111502-2

Date Collected: 03/16/22 12:00

Matrix: Water

Date Received: 03/17/22 09:40

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	180		100	31	ug/L			03/23/22 18:30	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	95		69 - 133					03/23/22 18:30	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.50	U Q	1.0	0.24	ug/L			03/23/22 18:30	1
Toluene	0.80	U Q	1.0	0.39	ug/L			03/23/22 18:30	1
Ethylbenzene	0.80	U	1.0	0.50	ug/L			03/23/22 18:30	1
m-Xylene & p-Xylene	0.80	U	2.0	0.53	ug/L			03/23/22 18:30	1
o-Xylene	4.8		1.0	0.39	ug/L			03/23/22 18:30	1
Xylenes, Total	4.8		2.0	0.53	ug/L			03/23/22 18:30	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	95		85 - 114					03/23/22 18:30	1
Toluene-d8 (Surr)	94		89 - 112					03/23/22 18:30	1
Dibromofluoromethane (Surr)	118		80 - 119					03/23/22 18:30	1
1,2-Dichloroethane-d4 (Surr)	126	Q	81 - 118					03/23/22 18:30	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
2-Methylnaphthalene	34		0.20	0.039	ug/L		03/23/22 13:50	03/24/22 13:47	1
Naphthalene	24		0.10	0.031	ug/L		03/23/22 13:50	03/24/22 13:47	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	75	M	40 - 140				03/23/22 13:50	03/24/22 13:47	1
Fluoranthene-d10 (Surr)	94		40 - 140				03/23/22 13:50	03/24/22 13:47	1
Terphenyl-d14	101		58 - 132				03/23/22 13:50	03/24/22 13:47	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) - DL

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	75	D	5.0	0.95	ug/L		03/23/22 13:50	03/27/22 18:30	50
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	78		40 - 140				03/23/22 13:50	03/27/22 18:30	50
Fluoranthene-d10 (Surr)	92		40 - 140				03/23/22 13:50	03/27/22 18:30	50
Terphenyl-d14	107		58 - 132				03/23/22 13:50	03/27/22 18:30	50

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	3700	B	110	65	ug/L		03/22/22 11:42	03/23/22 20:45	1
Motor Oil Range Organics (C24-C40)	200	J B Q	350	180	ug/L		03/22/22 11:42	03/23/22 20:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	70	M	56 - 125				03/22/22 11:42	03/23/22 20:45	1
o-Terphenyl	82		56 - 125				03/25/22 10:21	03/26/22 12:03	1

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Client Sample Results

Client: AECOM
 Project/Site: Site Char,P2 HT-LT Red Hill Bulk Fuel Storage

Job ID: 580-111500-1

Client Sample ID: TB-01
Date Collected: 03/16/22 12:00
Date Received: 03/17/22 09:40

Lab Sample ID: 580-111502-3
Matrix: Water

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	80	U M	100	31	ug/L			03/23/22 17:43	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	86		69 - 133					03/23/22 17:43	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.50	U	1.0	0.24	ug/L			03/23/22 17:43	1
Toluene	0.80	U	1.0	0.39	ug/L			03/23/22 17:43	1
Ethylbenzene	0.80	U	1.0	0.50	ug/L			03/23/22 17:43	1
m-Xylene & p-Xylene	0.80	U	2.0	0.53	ug/L			03/23/22 17:43	1
o-Xylene	0.80	U	1.0	0.39	ug/L			03/23/22 17:43	1
Xylenes, Total	0.80	U	2.0	0.53	ug/L			03/23/22 17:43	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	86		85 - 114					03/23/22 17:43	1
Toluene-d8 (Surr)	100		89 - 112					03/23/22 17:43	1
Dibromofluoromethane (Surr)	112		80 - 119					03/23/22 17:43	1
1,2-Dichloroethane-d4 (Surr)	118		81 - 118					03/23/22 17:43	1

QC Sample Results

Client: AECOM
 Project/Site: Site Char,P2 HT-LT Red Hill Bulk Fuel Storage

Job ID: 580-111500-1

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-384857/5
Matrix: Water
Analysis Batch: 384857

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	80	U M	100	31	ug/L			03/23/22 11:23	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	90		69 - 133					03/23/22 11:23	1

Lab Sample ID: LCS 580-384857/8
Matrix: Water
Analysis Batch: 384857

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Gasoline Range Organics [C6 - C10]	1000	986		ug/L		99	78 - 122
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
4-Bromofluorobenzene (Surr)	93		69 - 133				

Lab Sample ID: LCSD 580-384857/9
Matrix: Water
Analysis Batch: 384857

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Gasoline Range Organics [C6 - C10]	1000	959		ug/L		96	78 - 122	3	30
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
4-Bromofluorobenzene (Surr)	99		69 - 133						

Method: 8260D - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 580-384852/5
Matrix: Water
Analysis Batch: 384852

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.50	U	1.0	0.24	ug/L			03/23/22 11:23	1
Toluene	0.80	U	1.0	0.39	ug/L			03/23/22 11:23	1
Ethylbenzene	0.80	U	1.0	0.50	ug/L			03/23/22 11:23	1
m-Xylene & p-Xylene	0.80	U	2.0	0.53	ug/L			03/23/22 11:23	1
o-Xylene	0.80	U	1.0	0.39	ug/L			03/23/22 11:23	1
Xylenes, Total	0.80	U	2.0	0.53	ug/L			03/23/22 11:23	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	90		85 - 114					03/23/22 11:23	1
Toluene-d8 (Surr)	98		89 - 112					03/23/22 11:23	1
Dibromofluoromethane (Surr)	112		80 - 119					03/23/22 11:23	1
1,2-Dichloroethane-d4 (Surr)	117	M	81 - 118					03/23/22 11:23	1

Eurofins Seattle

QC Sample Results

Client: AECOM
 Project/Site: Site Char,P2 HT-LT Red Hill Bulk Fuel Storage

Job ID: 580-111500-1

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 580-384852/6
Matrix: Water
Analysis Batch: 384852

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	10.0	10.6	Q	ug/L		106	79 - 120
Toluene	10.0	11.1	Q	ug/L		111	80 - 121
Ethylbenzene	10.0	11.4		ug/L		114	79 - 121
m-Xylene & p-Xylene	10.0	11.1		ug/L		111	80 - 121
o-Xylene	10.0	11.4		ug/L		114	78 - 122
Xylenes, Total	20.0	22.5		ug/L		113	79 - 121

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	97		85 - 114
Toluene-d8 (Surr)	100		89 - 112
Dibromofluoromethane (Surr)	113		80 - 119
1,2-Dichloroethane-d4 (Surr)	119	M Q	81 - 118

Lab Sample ID: LCSD 580-384852/7
Matrix: Water
Analysis Batch: 384852

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Benzene	10.0	10.6		ug/L		106	79 - 120	0	20
Toluene	10.0	10.9		ug/L		109	80 - 121	1	20
Ethylbenzene	10.0	11.2		ug/L		112	79 - 121	2	20
m-Xylene & p-Xylene	10.0	10.7		ug/L		107	80 - 121	3	20
o-Xylene	10.0	11.1	M	ug/L		111	78 - 122	3	20
Xylenes, Total	20.0	21.8		ug/L		109	79 - 121	3	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	94		85 - 114
Toluene-d8 (Surr)	99		89 - 112
Dibromofluoromethane (Surr)	113		80 - 119
1,2-Dichloroethane-d4 (Surr)	117		81 - 118

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 580-384887/1-A
Matrix: Water
Analysis Batch: 384983

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 384887

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.032	U M	0.10	0.019	ug/L		03/23/22 13:50	03/24/22 11:52	1
1-Methylnaphthalene	0.032	U M	0.10	0.019	ug/L		03/23/22 13:50	03/24/22 11:52	1
2-Methylnaphthalene	0.080	U M	0.20	0.039	ug/L		03/23/22 13:50	03/24/22 11:52	1
2-Methylnaphthalene	0.080	U M	0.20	0.039	ug/L		03/23/22 13:50	03/24/22 11:52	1
Naphthalene	0.080	U M	0.10	0.031	ug/L		03/23/22 13:50	03/24/22 11:52	1
Naphthalene	0.080	U M	0.10	0.031	ug/L		03/23/22 13:50	03/24/22 11:52	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	68		40 - 140	03/23/22 13:50	03/24/22 11:52	1
2-methylnaphthalene-d10	68		40 - 140	03/23/22 13:50	03/24/22 11:52	1

Eurofins Seattle

QC Sample Results

Client: AECOM
 Project/Site: Site Char,P2 HT-LT Red Hill Bulk Fuel Storage

Job ID: 580-111500-1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: MB 580-384887/1-A
Matrix: Water
Analysis Batch: 384983

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 384887

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
Fluoranthene-d10 (Surr)	88		40 - 140	03/23/22 13:50	03/24/22 11:52	1
Fluoranthene-d10 (Surr)	88		40 - 140	03/23/22 13:50	03/24/22 11:52	1
Terphenyl-d14	93		58 - 132	03/23/22 13:50	03/24/22 11:52	1
Terphenyl-d14	93		58 - 132	03/23/22 13:50	03/24/22 11:52	1

Lab Sample ID: LCS 580-384887/2-A
Matrix: Water
Analysis Batch: 384983

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 384887

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1-Methylnaphthalene	4.00	2.55		ug/L		64	41 - 115
2-Methylnaphthalene	4.00	2.41		ug/L		60	39 - 114
2-Methylnaphthalene	4.00	2.41		ug/L		60	39 - 114
Naphthalene	4.00	2.47		ug/L		62	43 - 114
Naphthalene	4.00	2.47		ug/L		62	43 - 114

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
2-methylnaphthalene-d10	73		40 - 140
2-methylnaphthalene-d10	73		40 - 140
Fluoranthene-d10 (Surr)	93		40 - 140
Fluoranthene-d10 (Surr)	93		40 - 140
Terphenyl-d14	98		58 - 132
Terphenyl-d14	98		58 - 132

Lab Sample ID: LCSD 580-384887/3-A
Matrix: Water
Analysis Batch: 384983

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 384887

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	
								RPD	Limit
1-Methylnaphthalene	4.00	2.72		ug/L		68	41 - 115	6	20
1-Methylnaphthalene	4.00	2.72		ug/L		68	41 - 115	6	20
2-Methylnaphthalene	4.00	2.59		ug/L		65	39 - 114	7	20
2-Methylnaphthalene	4.00	2.59		ug/L		65	39 - 114	7	20
Naphthalene	4.00	2.73		ug/L		68	43 - 114	10	20
Naphthalene	4.00	2.73		ug/L		68	43 - 114	10	20

Surrogate	LCSD LCSD		Limits
	%Recovery	Qualifier	
2-methylnaphthalene-d10	73		40 - 140
2-methylnaphthalene-d10	73		40 - 140
Fluoranthene-d10 (Surr)	88		40 - 140
Fluoranthene-d10 (Surr)	88		40 - 140
Terphenyl-d14	92		58 - 132
Terphenyl-d14	92		58 - 132

QC Sample Results

Client: AECOM

Job ID: 580-111500-1

Project/Site: Site Char,P2 HT-LT Red Hill Bulk Fuel Storage

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 580-384606/1-A

Matrix: Water

Analysis Batch: 384661

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 384606

Analyte	MB	MB	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Diesel Range Organics (C10-C24)	172		110	65	ug/L		03/22/22 09:37	03/22/22 23:55	1
Motor Oil Range Organics (C24-C40)	239	J	350	180	ug/L		03/22/22 09:37	03/22/22 23:55	1
MB MB									
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	73		56 - 125				03/22/22 09:37	03/22/22 23:55	1

Lab Sample ID: LCS 580-384606/2-A

Matrix: Water

Analysis Batch: 384661

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 384606

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
							Limits		
Diesel Range Organics (C10-C24)	4000	4360		ug/L		109	36 - 132		
Motor Oil Range Organics (C24-C40)	4000	4930	Q	ug/L		123	41 - 113		
LCS LCS									
Surrogate	%Recovery	Qualifier	Limits						
<i>o</i> -Terphenyl	101		56 - 125						

Lab Sample ID: LCSD 580-384606/3-A

Matrix: Water

Analysis Batch: 384661

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 384606

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits		RPD	RPD Limit
							Limits			
Diesel Range Organics (C10-C24)	4000	4510		ug/L		113	36 - 132		3	20
Motor Oil Range Organics (C24-C40)	4000	4560	Q	ug/L		114	41 - 113		8	20
LCSD LCSD										
Surrogate	%Recovery	Qualifier	Limits							
<i>o</i> -Terphenyl	106		56 - 125							

Lab Sample ID: MB 580-385117/1-A

Matrix: Water

Analysis Batch: 385181

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 385117

Analyte	MB	MB	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Diesel Range Organics (C10-C24)	100	U	110	65	ug/L		03/25/22 10:21	03/26/22 10:02	1
Motor Oil Range Organics (C24-C40)	300	U	350	180	ug/L		03/25/22 10:21	03/26/22 10:02	1
MB MB									
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	96		56 - 125				03/25/22 10:21	03/26/22 10:02	1

QC Sample Results

Client: AECOM
 Project/Site: Site Char,P2 HT-LT Red Hill Bulk Fuel Storage

Job ID: 580-111500-1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC) (Continued)

Lab Sample ID: LCS 580-385117/2-A
Matrix: Water
Analysis Batch: 385181

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 385117

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Diesel Range Organics (C10-C24)	4000	3970		ug/L		99	36 - 132
Motor Oil Range Organics (C24-C40)	4000	4120		ug/L		103	41 - 113
		LCS	LCS				
Surrogate	%Recovery	Qualifier	Limits				
<i>o-Terphenyl</i>	79		56 - 125				

Lab Sample ID: LCSD 580-385117/3-A
Matrix: Water
Analysis Batch: 385181

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 385117

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Diesel Range Organics (C10-C24)	4000	4130		ug/L		103	36 - 132	4	20
Motor Oil Range Organics (C24-C40)	4000	4250		ug/L		106	41 - 113	3	20
		LCSD	LCSD						
Surrogate	%Recovery	Qualifier	Limits						
<i>o-Terphenyl</i>	74		56 - 125						

Lab Chronicle

Client: AECOM
 Project/Site: Site Char,P2 HT-LT Red Hill Bulk Fuel Storage

Job ID: 580-111500-1

Client Sample ID: LTE00.0-WGN01-030.0

Lab Sample ID: 580-111500-1

Date Collected: 03/16/22 09:00

Matrix: Water

Date Received: 03/17/22 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260/CALUFT DOD		1	384857	BNM	EET SEA	03/23/22 14:09
Total/NA	Analysis	8260D		1	384852	BNM	EET SEA	03/23/22 14:09
Total/NA	Prep	3510C			384887	JJY	EET SEA	03/23/22 13:50
Total/NA	Analysis	8270E SIM		1	385319	ADB	EET SEA	03/27/22 18:10
Total/NA	Prep	3510C			384606	JJY	EET SEA	03/22/22 11:42
Total/NA	Analysis	8015D DRO		1	384905	JAE	EET SEA	03/23/22 19:27
Total/NA	Prep	3510C			385117	JJY	EET SEA	03/25/22 10:21
Total/NA	Analysis	8015D DRO		1	385181	JAE	EET SEA	03/26/22 11:02

Client Sample ID: HTE00.0-WGN01-031.0

Lab Sample ID: 580-111500-2

Date Collected: 03/16/22 10:30

Matrix: Water

Date Received: 03/17/22 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260/CALUFT DOD		1	384857	BNM	EET SEA	03/23/22 13:45
Total/NA	Analysis	8260D		1	384852	BNM	EET SEA	03/23/22 13:45
Total/NA	Prep	3510C			384887	JJY	EET SEA	03/23/22 13:50
Total/NA	Analysis	8270E SIM		1	384984	W1T	EET SEA	03/24/22 13:08
Total/NA	Prep	3510C			384606	JJY	EET SEA	03/22/22 11:42
Total/NA	Analysis	8015D DRO		1	384905	JAE	EET SEA	03/23/22 19:46
Total/NA	Prep	3510C			385117	JJY	EET SEA	03/25/22 10:21
Total/NA	Analysis	8015D DRO		1	385181	JAE	EET SEA	03/26/22 11:22

Client Sample ID: TB-02

Lab Sample ID: 580-111500-3

Date Collected: 03/16/22 12:00

Matrix: Water

Date Received: 03/17/22 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260/CALUFT DOD		1	384857	BNM	EET SEA	03/23/22 13:21
Total/NA	Analysis	8260D		1	384852	BNM	EET SEA	03/23/22 13:21

Client Sample ID: HTE00.0-WGFD01-031.0

Lab Sample ID: 580-111502-1

Date Collected: 03/16/22 11:00

Matrix: Water

Date Received: 03/17/22 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260/CALUFT DOD		1	384857	BNM	EET SEA	03/23/22 18:07
Total/NA	Analysis	8260D		1	384852	BNM	EET SEA	03/23/22 18:07
Total/NA	Prep	3510C			384887	JJY	EET SEA	03/23/22 13:50
Total/NA	Analysis	8270E SIM		1	384984	W1T	EET SEA	03/24/22 13:28
Total/NA	Prep	3510C			384606	JJY	EET SEA	03/22/22 11:42
Total/NA	Analysis	8015D DRO		1	384905	JAE	EET SEA	03/23/22 20:26
Total/NA	Prep	3510C			385117	JJY	EET SEA	03/25/22 10:21
Total/NA	Analysis	8015D DRO		1	385181	JAE	EET SEA	03/26/22 11:42

Lab Chronicle

Client: AECOM

Job ID: 580-111500-1

Project/Site: Site Char,P2 HT-LT Red Hill Bulk Fuel Storage

Client Sample ID: LTW35.0-WGN01-028.0

Lab Sample ID: 580-111502-2

Date Collected: 03/16/22 12:00

Matrix: Water

Date Received: 03/17/22 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260/CALUFT DOD		1	384857	BNM	EET SEA	03/23/22 18:30
Total/NA	Analysis	8260D		1	384852	BNM	EET SEA	03/23/22 18:30
Total/NA	Prep	3510C			384887	JJY	EET SEA	03/23/22 13:50
Total/NA	Analysis	8270E SIM		1	384984	W1T	EET SEA	03/24/22 13:47
Total/NA	Prep	3510C	DL		384887	JJY	EET SEA	03/23/22 13:50
Total/NA	Analysis	8270E SIM	DL	50	385319	ADB	EET SEA	03/27/22 18:30
Total/NA	Prep	3510C			384606	JJY	EET SEA	03/22/22 11:42
Total/NA	Analysis	8015D DRO		1	384905	JAE	EET SEA	03/23/22 20:45
Total/NA	Prep	3510C			385117	JJY	EET SEA	03/25/22 10:21
Total/NA	Analysis	8015D DRO		1	385181	JAE	EET SEA	03/26/22 12:03

Client Sample ID: TB-01

Lab Sample ID: 580-111502-3

Date Collected: 03/16/22 12:00

Matrix: Water

Date Received: 03/17/22 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260/CALUFT DOD		1	384857	BNM	EET SEA	03/23/22 17:43
Total/NA	Analysis	8260D		1	384852	BNM	EET SEA	03/23/22 17:43

Laboratory References:

EET SEA = Eurofins Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: AECOM

Job ID: 580-111500-1

Project/Site: Site Char,P2 HT-LT Red Hill Bulk Fuel Storage

Laboratory: Eurofins Seattle

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2236	01-19-25

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Sample Summary

Client: AECOM

Job ID: 580-111500-1

Project/Site: Site Char,P2 HT-LT Red Hill Bulk Fuel Storage

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-111500-1	LTE00.0-WGN01-030.0	Water	03/16/22 09:00	03/17/22 09:40
580-111500-2	HTE00.0-WGN01-031.0	Water	03/16/22 10:30	03/17/22 09:40
580-111500-3	TB-02	Water	03/16/22 12:00	03/17/22 09:40
580-111502-1	HTE00.0-WGFD01-031.0	Water	03/16/22 11:00	03/17/22 09:40
580-111502-2	LTW35.0-WGN01-028.0	Water	03/16/22 12:00	03/17/22 09:40
580-111502-3	TB-01	Water	03/16/22 12:00	03/17/22 09:40

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- 9
- 10
- 11



580-111500 Chain of Custody

Eurofins-Seattle
5755 8th St E
Tacoma, WA 98424
Phone : 253-248-4972

Chain of Custody Record

eurofins
Environment Testing
America

Client Information Client Contact: Jeff Hart/ Peggy Schuler Company: AECOM-Honolulu			Sampler: Ethan House Phone: 720 884-7404			Lab PM: Elaine Walker E-Mail: M.Elaine.Walker@EurofinsET.com			Carrier Tracking No(s): State of Origin:			COC No: 2-44635 Page: Page 1 of 1 Job #:														
Address: AECOM-Honolulu City: Honolulu, Hawaii, 96813 State, Zip: Honolulu, Hawaii, 96813 Phone: 720 884-7404 Email: jeff.hart@aecom.com/peggy.schuler@aecom.com Project Name: Site Char, P2 HT-LT Site: Red Hill Bulk Fuel Storage Facility			Due Date Requested: TAT Requested (days): 4 Compliance Project: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No PO #: Purchase Order Requested WO #: Project #: SSOW#:			Analysis Requested									Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-6 L - EDA Z - Methanol Other:											
Sample Identification			Sample Date		Sample Time		Sample Type (C=Comp, G=grab)		Matrix (W-Groundwater, S-Solid, P-Product, GS-Soil vapor)		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		Total Number of Containers			Special Instructions/Note:								
LTE00.0-WGN01-030.0			3/16/22		9:00:00 AM		GRB		WG		X		X		T			4-40mL 2-1LAMB 2-1LAMB								
HTE00.0-WGN01-031.0			3/16/22		10:30:00 AM		GRB		WG		X		X		A			4-40mL 2-1LAMB 2-1LAMB								
TB-02			3/16/22								X		X		G			2-40mL								
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological															Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For <input type="checkbox"/> Months											
Deliverable Requested: I, II, III, IV, Other (specify)															Special Instructions/QC Requirements: HOLD 1668A + 8290A pending client direction											
Empty Kit Relinquished by:			Date:			Time:			Method of Shipment:																	
Relinquished by: Alex Edmond			Date/Time: 3/16/22 1235			Company: AECOM			Received by: Alex Edmond			Date/Time: 3/16/22 1239			Company: AECOM											
Relinquished by:			Date/Time: 3/16/22 1440			Company: AECOM			Received by:			Date/Time: 3/17/22 0940			Company: EFGS											
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No															Custody Seal No.:						Cooler Temperature(s) °C and Other Remarks:					

IR8 = -0.2/-0.4
Sub/west

Eurofins-Seattle

5755 8th St E
Tacoma, WA 98424
Phone : 253-248-4972



580-111502 Chain of Custody

Chain of Custody Record

eurofins Environment Testing America

Client Information Client Contact: Jeff Hart/ Peggy Schuler Company: AECOM-Honolulu Address: AECOM-Honolulu City: 1001 Bishop Street, ASB Tower, Suite 1600 State, Zip: Honolulu, Hawaii, 96813 Phone: 720 884-7404 Email: jeff.hart@aecom.com/ peggy.schuler@aecom.com Project Name: Site Char, P2 HT-LT Site: Red Hill Bulk Fuel Storage Facility		Sampler: Ethan House Phone: 720 884-7404 PWSID: Lab PM: Elaine Walker E-Mail: M.Elaine.Walker@EurofinsET.com Carrier Tracking No(s): State of Origin:		COD No: 3-44635 Page: Page 1 of 1 Job #:			
Analysis Requested Due Date Requested: TAT Requested (days): 4 Compliance Project: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No PO #: Purchase Order Requested WO #: Project #: SSOW#:		Field Filtered Samples (Yes or No) <input checked="" type="checkbox"/> Perform MS/MSD (Yes or No) <input checked="" type="checkbox"/> BTEX, TPH-g, e260D/5035B N,1 MN,2 MN TPH-d6, 8270D SIM/3550C 8015C/3550C BTEX, TPH-g, SW-846 e260D/ N,1 MN,2 MN, SW-846 8270E/3510C TPH-d6, 8015C		Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecalhydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - Methanol Other:			
Sample Identification Sample Date Sample Time Sample Type (C=comp, G=grab) Matrix (WG=Groundwater, SO=soil, P=product, SV=Soil vapor) Preservation Code:		Total Number of Containers		Special Instructions/Note:			
HTE00.0-WGFD01-031.0 LTW50.0-WGN01-028.0 35 TB-phi		3/16/22 11:00:00 AM GRB WG 3/16/22 12:00:00 PM GRB WG 3/16/22		T A S 4-40mL 2-1LAMB 2-1LAMB 4-40mL 2-1LAMB 2-1LAMB 2-40mL UR 3/16/22		X X X	
Possible Hazard Identification <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological				Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab Archive For _____ Months			
Deliverable Requested: I, II, III, IV, Other (specify)				Special Instructions/QC Requirements: HOLD 1668A + 8290A pending client direction			
Empty Kit Relinquished by:		Date:		Time:			
Relinquished by: Alex Edmonds		Date/Time: 3/16/22 1235		Company: AECOM			
Relinquished by: Alex Edmonds		Date/Time: 3/16/22 1440		Company: AECOM			
Relinquished by: Alex Edmonds		Date/Time: 3/17/22 0940		Company: EFGS			
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:			

IR8 - 0.1/-0.3
Bub/West

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-111500-1

Login Number: 111500

List Number: 1

Creator: Presley, Kim A

List Source: Eurofins Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	False	Narrative to indicate if headspace container used for analysis.
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-111500-1

Login Number: 111502

List Number: 1

Creator: Presley, Kim A

List Source: Eurofins Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	False	Refer to Job Narrative for details.
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	False	Narrative to indicate if headspace container used for analysis.
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ANALYTICAL REPORT

Eurofins Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-111503-1

Client Project/Site: Red Hill JBPHH N62742-17-D-1800
Revision: 2

For:
AECOM
1001 Bishop Street
Honolulu, Hawaii 96813

Attn: Jeff Hart

M. Elaine Walker

Authorized for release by:
9/1/2022 1:40:02 PM

Elaine Walker, Project Manager II
(253)248-4972

M.Elaine.Walker@et.eurofinsus.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Case Narrative

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Job ID: 580-111503-1

Laboratory: Eurofins Seattle

Narrative

CASE NARRATIVE

Client: AECOM

Project: Red Hill JBPHH N62742-17-D-1800

Report Number: 580-111503-1

REVISION 3: Septembr 1, 2022

Report revised to change the carbon range for GRO and to correct the collection date for sample 6.

REVISION 2 July 29, 2022

Report has been revised for 8260B CALUFT results. Chromatographic integrations have been adjusted to forced baseline-baseline integration per Method and SOP.

REVISION 1: JUNE 7, 2022

Revision was required to add missing QC data from the Level IV package for 8260D BTEX, 8260B CALUFT GRO, and 8015D DRO/ORO analyses.

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

Following DoD QSM guidelines, manual integrations were performed only when necessary and are in compliance with the laboratory's standard operating procedure, Acceptable Manual Integration Practices, SOP No.: Q-S-002. The reason(s) for manual integration have been documented on the affected chromatogram(s), which is/are provided in the raw data package. The raw data also includes the original chromatogram(s) prior to any manual integration being performed. Manual integrations are detailed in the manual integration summary forms following this narrative.

It should be noted that samples with elevated Limits of Quantitation (LOQs) resulting from a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the LOQs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes within the calibration range of the instrument or that reduces the interferences thereby enabling the quantification of target analytes.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

Eleven samples were received on 3/17/2022 9:40 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was -2.0° C.

Receipt Exceptions

No sample time or date is provided for the following sample. The earliest sample date was used. TB01-SO (580-111503-11)

No sample time was provided on the COC or containers for the following samples. LTE00.0-SOFD01-26-28 (580-111503-3) and HTE00.0-SOFD01-19-21 (580-111503-6). The client provided times for the samples as well as ID corrections and the email communication has been included in the report.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process

Case Narrative

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Job ID: 580-111503-1 (Continued)

Laboratory: Eurofins Seattle (Continued)

has begun, such as arrival on ice, etc.

GASOLINE RANGE ORGANICS (GRO) - WATER TB

Sample TB01-SO (580-111503-11) was analyzed for gasoline range organics (GRO) in accordance with 8260B CALUFT. The samples were analyzed on 03/23/2022.

The method blank for preparation batch 580-384563 and analytical batch 580-384586 contained Gasoline Range Organics (C6-C12) above the detection limit, less than the limit of quantiation (LOQ) but slightly above 1/2 the LOQ.

Due to the high concentration of Gasoline Range Organics (C6-C12), the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 580-384563 and analytical batch 580-384586 could not be evaluated for accuracy and precision. The associated laboratory control sample / laboratory control sample duplicate (LCS/LCSD) met acceptance criteria.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GASOLINE RANGE ORGANICS (GRO)

Samples LTE00.0-SON01-26-28 (580-111503-1), LTE00.0-SON01-38-40 (580-111503-2), LTE00.0-SOFD01-26-28 (580-111503-3), HTE00.0-SON01-19-21 (580-111503-4), HTE00.0-SON01-33-35 (580-111503-5), HTE00.0-SOFD01-19-21 (580-111503-6), LTW35.0-SON01-29-31 (580-111503-7), LTW35.0-SON01-34-36 (580-111503-8), LTS15.0-SON01-23-25 (580-111503-9) and LTS15.0-SON01-30-31 (580-111503-10) were analyzed for gasoline range organics (GRO) in accordance with 8260B CALUFT. The samples were prepared and analyzed on 03/21/2022.

The following samples were provided to the laboratory with a significantly different initial weight than that required by the reference method: LTE00.0-SON01-26-28 (580-111503-1), LTE00.0-SON01-38-40 (580-111503-2), LTE00.0-SOFD01-26-28 (580-111503-3), HTE00.0-SON01-19-21 (580-111503-4), HTE00.0-SON01-33-35 (580-111503-5), HTE00.0-SOFD01-19-21 (580-111503-6), LTW35.0-SON01-29-31 (580-111503-7), LTW35.0-SON01-34-36 (580-111503-8), LTS15.0-SON01-23-25 (580-111503-9), LTS15.0-SON01-30-31 (580-111503-10), HTE00.0-SOFD01-19-21 MS (580-111503-6 MS), and HTE00.0-SOFD01-19-21 MSD (580-111503-6 MSD). Deviations in the weight by more than 20% may affect reporting limits and potentially method performance. The method specifies 10g. The amount provided was below above this range.

Gasoline Range Organics (C6-C12) failed the recovery criteria high for the MS of sample HTE00.0-SOFD01-19-21MS (580-111503-6) in batch 580-384586. Gasoline Range Organics (C6-C12) failed the recovery criteria high for the MSD of sample HTE00.0-SOFD01-19-21MSD (580-111503-6) in batch 580-384586.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples LTE00.0-SON01-26-28 (580-111503-1), LTE00.0-SON01-38-40 (580-111503-2), LTE00.0-SOFD01-26-28 (580-111503-3), HTE00.0-SON01-19-21 (580-111503-4), HTE00.0-SON01-33-35 (580-111503-5), HTE00.0-SOFD01-19-21 (580-111503-6), LTW35.0-SON01-29-31 (580-111503-7), LTW35.0-SON01-34-36 (580-111503-8), LTS15.0-SON01-23-25 (580-111503-9) and LTS15.0-SON01-30-31 (580-111503-10) were analyzed for volatile organic compounds (GC-MS) in accordance with 8260D_DOD5. The samples were prepared and analyzed on 03/21/2022.

The following samples were provided to the laboratory with a significantly different initial weight than that required by the reference method: LTE00.0-SON01-26-28 (580-111503-1), LTE00.0-SON01-38-40 (580-111503-2), LTE00.0-SOFD01-26-28 (580-111503-3), HTE00.0-SON01-19-21 (580-111503-4), HTE00.0-SON01-33-35 (580-111503-5), HTE00.0-SOFD01-19-21 (580-111503-6), LTW35.0-SON01-29-31 (580-111503-7), LTW35.0-SON01-34-36 (580-111503-8), LTS15.0-SON01-23-25 (580-111503-9), LTS15.0-SON01-30-31 (580-111503-10), HTE00.0-SON01-33-35 MS (580-111503-5 MS), HTE00.0-SON01-33-35 MSD (580-111503-5 MSD). Deviations in the weight by more than 20% may affect reporting limits and potentially method performance. The method specifies 10g. The amount provided was below above this range.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOLATILE ORGANIC COMPOUNDS (GC-MS) - WATER TB

Sample TB01-SO (580-111503-11) was analyzed for volatile organic compounds (GC-MS) in accordance with 8260D_DOD5. The

Case Narrative

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Job ID: 580-111503-1 (Continued)

Laboratory: Eurofins Seattle (Continued)

samples were analyzed on 03/23/2022.

The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for analytical batch 580-384852 recovered outside control limits for the following analytes: 1,2-Dichloroethane-d4 (Surr). This surrogate was biased high in the LCS and reported analytes were not detected in the associated samples; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SEMIVOLATILE ORGANIC COMPOUNDS - SELECTED ION MODE (SIM)

Samples LTE00.0-SON01-26-28 (580-111503-1), LTE00.0-SON01-38-40 (580-111503-2), LTE00.0-SOFD01-26-28 (580-111503-3), HTE00.0-SON01-19-21 (580-111503-4), HTE00.0-SON01-33-35 (580-111503-5), HTE00.0-SOFD01-19-21 (580-111503-6), LTW35.0-SON01-29-31 (580-111503-7), LTW35.0-SON01-34-36 (580-111503-8), LTS15.0-SON01-23-25 (580-111503-9) and LTS15.0-SON01-30-31 (580-111503-10) were analyzed for semivolatile organic compounds - Selected Ion Mode (SIM) in accordance with 8270E SIM. The samples were prepared on 03/21/2022 and 03/22/2022 and analyzed on 03/22/2022 and 03/23/2022.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DIESEL RANGE ORGANICS

Samples LTE00.0-SON01-26-28 (580-111503-1), LTE00.0-SON01-38-40 (580-111503-2), LTE00.0-SOFD01-26-28 (580-111503-3), HTE00.0-SON01-19-21 (580-111503-4), HTE00.0-SON01-33-35 (580-111503-5), HTE00.0-SOFD01-19-21 (580-111503-6), LTW35.0-SON01-29-31 (580-111503-7), LTW35.0-SON01-34-36 (580-111503-8), LTS15.0-SON01-23-25 (580-111503-9) and LTS15.0-SON01-30-31 (580-111503-10) were analyzed for diesel range organics in accordance with 8015DRO. The samples were prepared on 03/18/2022 and analyzed on 03/21/2022 and 03/22/2022.

C10-C24 failed the recovery criteria low for the MS of sample 580-111291-9 in batch 580-384479. C24-C40 failed the recovery criteria high. C10-C24 failed the recovery criteria low for the MSD of sample 580-111291-9 in batch 580-384479. C24-C40 failed the recovery criteria high. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PERCENT SOLIDS

Samples LTE00.0-SON01-26-28 (580-111503-1), LTE00.0-SON01-38-40 (580-111503-2), LTE00.0-SOFD01-26-28 (580-111503-3), HTE00.0-SON01-19-21 (580-111503-4), HTE00.0-SON01-33-35 (580-111503-5), HTE00.0-SOFD01-19-21 (580-111503-6), LTW35.0-SON01-29-31 (580-111503-7), LTW35.0-SON01-34-36 (580-111503-8), LTS15.0-SON01-23-25 (580-111503-9) and LTS15.0-SON01-30-31 (580-111503-10) were analyzed for percent solids in accordance with ASTM D2216. The samples were analyzed on 03/21/2022.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

GC Semi VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
♠	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Client Sample ID: LTE00.0-SON01-26-28

Lab Sample ID: 580-111503-1

Date Collected: 03/11/22 10:15

Matrix: Solid

Date Received: 03/17/22 09:40

Percent Solids: 73.0

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	77		11	3.5	mg/Kg	☆	03/21/22 15:15	03/21/22 17:22	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		67 - 134				03/21/22 15:15	03/21/22 17:22	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.040	U	0.053	0.010	mg/Kg	☆	03/21/22 15:15	03/21/22 17:22	1
Toluene	0.080	U	0.16	0.036	mg/Kg	☆	03/21/22 15:15	03/21/22 17:22	1
Ethylbenzene	0.080	U	0.11	0.024	mg/Kg	☆	03/21/22 15:15	03/21/22 17:22	1
m-Xylene & p-Xylene	0.040	U	0.11	0.019	mg/Kg	☆	03/21/22 15:15	03/21/22 17:22	1
o-Xylene	0.040	U	0.11	0.013	mg/Kg	☆	03/21/22 15:15	03/21/22 17:22	1
Xylenes, Total	0.040	U	0.11	0.019	mg/Kg	☆	03/21/22 15:15	03/21/22 17:22	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	98		85 - 116				03/21/22 15:15	03/21/22 17:22	1
4-Bromofluorobenzene (Surr)	99		79 - 119				03/21/22 15:15	03/21/22 17:22	1
Dibromofluoromethane (Surr)	97	M	78 - 119				03/21/22 15:15	03/21/22 17:22	1
1,2-Dichloroethane-d4 (Surr)	104		71 - 136				03/21/22 15:15	03/21/22 17:22	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.68		0.0063	0.00079	mg/Kg	☆	03/22/22 15:42	03/23/22 13:10	1
2-Methylnaphthalene	0.63		0.0063	0.0026	mg/Kg	☆	03/22/22 15:42	03/23/22 13:10	1
Naphthalene	0.29		0.0063	0.0020	mg/Kg	☆	03/22/22 15:42	03/23/22 13:10	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	88		40 - 140				03/22/22 15:42	03/23/22 13:10	1
Fluoranthene-d10 (Surr)	89		40 - 140				03/22/22 15:42	03/23/22 13:10	1
Terphenyl-d14	95		58 - 132				03/22/22 15:42	03/23/22 13:10	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	59	J	65	13	mg/Kg	☆	03/18/22 10:15	03/21/22 00:43	1
Motor Oil Range Organics (C24-C40)	39	U	65	26	mg/Kg	☆	03/18/22 10:15	03/21/22 00:43	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	103		45 - 130				03/18/22 10:15	03/21/22 00:43	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	73.0		0.1	0.1	%			03/21/22 10:08	1
Percent Moisture	27.0		0.1	0.1	%			03/21/22 10:08	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Client Sample ID: LTE00.0-SON01-38-40

Lab Sample ID: 580-111503-2

Date Collected: 03/11/22 14:10

Matrix: Solid

Date Received: 03/17/22 09:40

Percent Solids: 66.2

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	150		12	4.0	mg/Kg	☆	03/21/22 15:15	03/21/22 17:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		67 - 134				03/21/22 15:15	03/21/22 17:45	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.047	U	0.062	0.012	mg/Kg	☆	03/21/22 15:15	03/21/22 17:45	1
Toluene	0.093	U	0.19	0.042	mg/Kg	☆	03/21/22 15:15	03/21/22 17:45	1
Ethylbenzene	0.093	U	0.12	0.028	mg/Kg	☆	03/21/22 15:15	03/21/22 17:45	1
m-Xylene & p-Xylene	0.047	U	0.12	0.022	mg/Kg	☆	03/21/22 15:15	03/21/22 17:45	1
o-Xylene	0.047	U	0.12	0.016	mg/Kg	☆	03/21/22 15:15	03/21/22 17:45	1
Xylenes, Total	0.047	U	0.12	0.022	mg/Kg	☆	03/21/22 15:15	03/21/22 17:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	98		85 - 116				03/21/22 15:15	03/21/22 17:45	1
4-Bromofluorobenzene (Surr)	99		79 - 119				03/21/22 15:15	03/21/22 17:45	1
Dibromofluoromethane (Surr)	98		78 - 119				03/21/22 15:15	03/21/22 17:45	1
1,2-Dichloroethane-d4 (Surr)	98		71 - 136				03/21/22 15:15	03/21/22 17:45	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0066	J M	0.0070	0.00089	mg/Kg	☆	03/22/22 15:42	03/23/22 13:29	1
2-Methylnaphthalene	0.0058	J M	0.0070	0.0029	mg/Kg	☆	03/22/22 15:42	03/23/22 13:29	1
Naphthalene	0.0049	J M	0.0070	0.0023	mg/Kg	☆	03/22/22 15:42	03/23/22 13:29	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	86		40 - 140				03/22/22 15:42	03/23/22 13:29	1
Fluoranthene-d10 (Surr)	92		40 - 140				03/22/22 15:42	03/23/22 13:29	1
Terphenyl-d14	98		58 - 132				03/22/22 15:42	03/23/22 13:29	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	45	U	75	15	mg/Kg	☆	03/18/22 10:15	03/21/22 01:03	1
Motor Oil Range Organics (C24-C40)	45	U	75	30	mg/Kg	☆	03/18/22 10:15	03/21/22 01:03	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	89		45 - 130				03/18/22 10:15	03/21/22 01:03	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	66.2		0.1	0.1	%			03/21/22 10:08	1
Percent Moisture	33.8		0.1	0.1	%			03/21/22 10:08	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Client Sample ID: LTE00.0-SOFD01-26-28

Lab Sample ID: 580-111503-3

Date Collected: 03/11/22 10:15

Matrix: Solid

Date Received: 03/17/22 09:40

Percent Solids: 73.0

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	6.3	J	12	3.8	mg/Kg	☆	03/21/22 15:15	03/21/22 18:07	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	98		67 - 134				03/21/22 15:15	03/21/22 18:07	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.044	U	0.059	0.011	mg/Kg	☆	03/21/22 15:15	03/21/22 18:07	1
Toluene	0.089	U	0.18	0.040	mg/Kg	☆	03/21/22 15:15	03/21/22 18:07	1
Ethylbenzene	0.089	U	0.12	0.027	mg/Kg	☆	03/21/22 15:15	03/21/22 18:07	1
m-Xylene & p-Xylene	0.044	U	0.12	0.021	mg/Kg	☆	03/21/22 15:15	03/21/22 18:07	1
o-Xylene	0.044	U	0.12	0.015	mg/Kg	☆	03/21/22 15:15	03/21/22 18:07	1
Xylenes, Total	0.044	U	0.12	0.021	mg/Kg	☆	03/21/22 15:15	03/21/22 18:07	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	98		85 - 116				03/21/22 15:15	03/21/22 18:07	1
4-Bromofluorobenzene (Surr)	98		79 - 119				03/21/22 15:15	03/21/22 18:07	1
Dibromofluoromethane (Surr)	100		78 - 119				03/21/22 15:15	03/21/22 18:07	1
1,2-Dichloroethane-d4 (Surr)	100		71 - 136				03/21/22 15:15	03/21/22 18:07	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	2.1		0.0058	0.00073	mg/Kg	☆	03/22/22 15:42	03/23/22 13:48	1
2-Methylnaphthalene	2.2		0.0058	0.0024	mg/Kg	☆	03/22/22 15:42	03/23/22 13:48	1
Naphthalene	1.1		0.0058	0.0019	mg/Kg	☆	03/22/22 15:42	03/23/22 13:48	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	88	M	40 - 140				03/22/22 15:42	03/23/22 13:48	1
Fluoranthene-d10 (Surr)	86		40 - 140				03/22/22 15:42	03/23/22 13:48	1
Terphenyl-d14	92		58 - 132				03/22/22 15:42	03/23/22 13:48	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	620		65	13	mg/Kg	☆	03/18/22 10:15	03/21/22 01:23	1
Motor Oil Range Organics (C24-C40)	39	U	65	26	mg/Kg	☆	03/18/22 10:15	03/21/22 01:23	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	102		45 - 130				03/18/22 10:15	03/21/22 01:23	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	73.0		0.1	0.1	%			03/21/22 10:08	1
Percent Moisture	27.0		0.1	0.1	%			03/21/22 10:08	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Client Sample ID: HTE00.0-SON01-19-21

Lab Sample ID: 580-111503-4

Date Collected: 03/09/22 11:15

Matrix: Solid

Date Received: 03/17/22 09:40

Percent Solids: 63.3

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	13		12	4.0	mg/Kg	☆	03/21/22 15:15	03/21/22 18:30	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	96		67 - 134				03/21/22 15:15	03/21/22 18:30	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.046	U	0.061	0.012	mg/Kg	☆	03/21/22 15:15	03/21/22 18:30	1
Toluene	0.091	U	0.18	0.041	mg/Kg	☆	03/21/22 15:15	03/21/22 18:30	1
Ethylbenzene	0.091	U	0.12	0.028	mg/Kg	☆	03/21/22 15:15	03/21/22 18:30	1
m-Xylene & p-Xylene	0.056	J	0.12	0.022	mg/Kg	☆	03/21/22 15:15	03/21/22 18:30	1
o-Xylene	0.046	U	0.12	0.015	mg/Kg	☆	03/21/22 15:15	03/21/22 18:30	1
Xylenes, Total	0.056	J	0.12	0.022	mg/Kg	☆	03/21/22 15:15	03/21/22 18:30	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	97		85 - 116				03/21/22 15:15	03/21/22 18:30	1
4-Bromofluorobenzene (Surr)	96		79 - 119				03/21/22 15:15	03/21/22 18:30	1
Dibromofluoromethane (Surr)	98		78 - 119				03/21/22 15:15	03/21/22 18:30	1
1,2-Dichloroethane-d4 (Surr)	100		71 - 136				03/21/22 15:15	03/21/22 18:30	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.11		0.0071	0.00089	mg/Kg	☆	03/21/22 13:24	03/22/22 13:44	1
2-Methylnaphthalene	0.10		0.0071	0.0029	mg/Kg	☆	03/21/22 13:24	03/22/22 13:44	1
Naphthalene	0.019	M	0.0071	0.0023	mg/Kg	☆	03/21/22 13:24	03/22/22 13:44	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	89		40 - 140				03/21/22 13:24	03/22/22 13:44	1
Fluoranthene-d10 (Surr)	98		40 - 140				03/21/22 13:24	03/22/22 13:44	1
Terphenyl-d14	104		58 - 132				03/21/22 13:24	03/22/22 13:44	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	280		70	14	mg/Kg	☆	03/18/22 10:15	03/21/22 01:43	1
Motor Oil Range Organics (C24-C40)	35	J	70	28	mg/Kg	☆	03/18/22 10:15	03/21/22 01:43	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	93		45 - 130				03/18/22 10:15	03/21/22 01:43	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	63.3		0.1	0.1	%			03/21/22 10:08	1
Percent Moisture	36.7		0.1	0.1	%			03/21/22 10:08	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Client Sample ID: HTE00.0-SON01-33-35

Lab Sample ID: 580-111503-5

Date Collected: 03/10/22 09:35

Matrix: Solid

Date Received: 03/17/22 09:40

Percent Solids: 76.1

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	8.8	U	12	3.8	mg/Kg	☼	03/21/22 15:15	03/21/22 20:47	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	93		67 - 134				03/21/22 15:15	03/21/22 20:47	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.044	U	0.059	0.011	mg/Kg	☼	03/21/22 15:15	03/21/22 20:47	1
Toluene	0.088	U	0.18	0.040	mg/Kg	☼	03/21/22 15:15	03/21/22 20:47	1
Ethylbenzene	0.088	U	0.12	0.027	mg/Kg	☼	03/21/22 15:15	03/21/22 20:47	1
m-Xylene & p-Xylene	0.044	U	0.12	0.021	mg/Kg	☼	03/21/22 15:15	03/21/22 20:47	1
o-Xylene	0.044	U	0.12	0.015	mg/Kg	☼	03/21/22 15:15	03/21/22 20:47	1
Xylenes, Total	0.044	U	0.12	0.021	mg/Kg	☼	03/21/22 15:15	03/21/22 20:47	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	100		85 - 116				03/21/22 15:15	03/21/22 20:47	1
4-Bromofluorobenzene (Surr)	93		79 - 119				03/21/22 15:15	03/21/22 20:47	1
Dibromofluoromethane (Surr)	97		78 - 119				03/21/22 15:15	03/21/22 20:47	1
1,2-Dichloroethane-d4 (Surr)	103		71 - 136				03/21/22 15:15	03/21/22 20:47	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0018	U M	0.0061	0.00077	mg/Kg	☼	03/22/22 15:42	03/23/22 14:26	1
2-Methylnaphthalene	0.0036	U M	0.0061	0.0025	mg/Kg	☼	03/22/22 15:42	03/23/22 14:26	1
Naphthalene	0.0049	U M	0.0061	0.0020	mg/Kg	☼	03/22/22 15:42	03/23/22 14:26	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	92		40 - 140				03/22/22 15:42	03/23/22 14:26	1
Fluoranthene-d10 (Surr)	101		40 - 140				03/22/22 15:42	03/23/22 14:26	1
Terphenyl-d14	106		58 - 132				03/22/22 15:42	03/23/22 14:26	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	37	U	62	12	mg/Kg	☼	03/18/22 10:15	03/21/22 02:03	1
Motor Oil Range Organics (C24-C40)	37	U	62	25	mg/Kg	☼	03/18/22 10:15	03/21/22 02:03	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	107		45 - 130				03/18/22 10:15	03/21/22 02:03	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	76.1		0.1	0.1	%			03/21/22 10:08	1
Percent Moisture	23.9		0.1	0.1	%			03/21/22 10:08	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Client Sample ID: HTE00.0-SOFD01-19-21

Lab Sample ID: 580-111503-6

Date Collected: 03/09/22 11:15

Matrix: Solid

Date Received: 03/17/22 09:40

Percent Solids: 66.4

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	17	J1	13	4.3	mg/Kg	☆	03/21/22 15:15	03/21/22 21:55	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		67 - 134				03/21/22 15:15	03/21/22 21:55	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.049	U	0.065	0.012	mg/Kg	☆	03/21/22 15:15	03/21/22 21:55	1
Toluene	0.098	U	0.20	0.044	mg/Kg	☆	03/21/22 15:15	03/21/22 21:55	1
Ethylbenzene	0.098	U	0.13	0.030	mg/Kg	☆	03/21/22 15:15	03/21/22 21:55	1
m-Xylene & p-Xylene	0.049	U	0.13	0.023	mg/Kg	☆	03/21/22 15:15	03/21/22 21:55	1
o-Xylene	0.049	U	0.13	0.016	mg/Kg	☆	03/21/22 15:15	03/21/22 21:55	1
Xylenes, Total	0.049	U	0.13	0.023	mg/Kg	☆	03/21/22 15:15	03/21/22 21:55	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	99		85 - 116				03/21/22 15:15	03/21/22 21:55	1
4-Bromofluorobenzene (Surr)	99		79 - 119				03/21/22 15:15	03/21/22 21:55	1
Dibromofluoromethane (Surr)	100	M	78 - 119				03/21/22 15:15	03/21/22 21:55	1
1,2-Dichloroethane-d4 (Surr)	104		71 - 136				03/21/22 15:15	03/21/22 21:55	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.24	M	0.0072	0.00090	mg/Kg	☆	03/22/22 15:42	03/23/22 14:46	1
2-Methylnaphthalene	0.18	M	0.0072	0.0029	mg/Kg	☆	03/22/22 15:42	03/23/22 14:46	1
Naphthalene	0.044	M	0.0072	0.0023	mg/Kg	☆	03/22/22 15:42	03/23/22 14:46	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	86	M	40 - 140				03/22/22 15:42	03/23/22 14:46	1
Fluoranthene-d10 (Surr)	92		40 - 140				03/22/22 15:42	03/23/22 14:46	1
Terphenyl-d14	100		58 - 132				03/22/22 15:42	03/23/22 14:46	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	490		71	14	mg/Kg	☆	03/18/22 10:15	03/21/22 02:24	1
Motor Oil Range Organics (C24-C40)	62	J	71	28	mg/Kg	☆	03/18/22 10:15	03/21/22 02:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	93		45 - 130				03/18/22 10:15	03/21/22 02:24	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	66.4		0.1	0.1	%			03/21/22 10:08	1
Percent Moisture	33.6		0.1	0.1	%			03/21/22 10:08	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Client Sample ID: LTW35.0-SON01-29-31

Lab Sample ID: 580-111503-7

Date Collected: 03/15/22 09:35

Matrix: Solid

Date Received: 03/17/22 09:40

Percent Solids: 67.2

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	260		16	5.3	mg/Kg	☆	03/21/22 15:15	03/21/22 18:53	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	104		67 - 134				03/21/22 15:15	03/21/22 18:53	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.061	U	0.082	0.016	mg/Kg	☆	03/21/22 15:15	03/21/22 18:53	1
Toluene	0.12	U	0.25	0.055	mg/Kg	☆	03/21/22 15:15	03/21/22 18:53	1
Ethylbenzene	0.12	U	0.16	0.037	mg/Kg	☆	03/21/22 15:15	03/21/22 18:53	1
m-Xylene & p-Xylene	0.061	U	0.16	0.029	mg/Kg	☆	03/21/22 15:15	03/21/22 18:53	1
o-Xylene	0.061	U	0.16	0.020	mg/Kg	☆	03/21/22 15:15	03/21/22 18:53	1
Xylenes, Total	0.061	U	0.16	0.029	mg/Kg	☆	03/21/22 15:15	03/21/22 18:53	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	97		85 - 116				03/21/22 15:15	03/21/22 18:53	1
4-Bromofluorobenzene (Surr)	104		79 - 119				03/21/22 15:15	03/21/22 18:53	1
Dibromofluoromethane (Surr)	96		78 - 119				03/21/22 15:15	03/21/22 18:53	1
1,2-Dichloroethane-d4 (Surr)	102		71 - 136				03/21/22 15:15	03/21/22 18:53	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0078	M	0.0071	0.00090	mg/Kg	☆	03/22/22 15:42	03/23/22 15:05	1
2-Methylnaphthalene	0.012		0.0071	0.0029	mg/Kg	☆	03/22/22 15:42	03/23/22 15:05	1
Naphthalene	0.33		0.0071	0.0023	mg/Kg	☆	03/22/22 15:42	03/23/22 15:05	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	86		40 - 140				03/22/22 15:42	03/23/22 15:05	1
Fluoranthene-d10 (Surr)	91		40 - 140				03/22/22 15:42	03/23/22 15:05	1
Terphenyl-d14	97		58 - 132				03/22/22 15:42	03/23/22 15:05	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	44	U	74	15	mg/Kg	☆	03/18/22 10:15	03/22/22 12:46	1
Motor Oil Range Organics (C24-C40)	44	U	74	29	mg/Kg	☆	03/18/22 10:15	03/22/22 12:46	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	93		45 - 130				03/18/22 10:15	03/22/22 12:46	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	67.2		0.1	0.1	%			03/21/22 10:08	1
Percent Moisture	32.8		0.1	0.1	%			03/21/22 10:08	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Client Sample ID: LTW35.0-SON01-34-36

Lab Sample ID: 580-111503-8

Date Collected: 03/15/22 10:25

Matrix: Solid

Date Received: 03/17/22 09:40

Percent Solids: 66.5

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	9.6	U	13	4.2	mg/Kg	☼	03/21/22 15:15	03/21/22 19:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	96		67 - 134				03/21/22 15:15	03/21/22 19:38	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.048	U	0.064	0.012	mg/Kg	☼	03/21/22 15:15	03/21/22 19:38	1
Toluene	0.096	U	0.19	0.043	mg/Kg	☼	03/21/22 15:15	03/21/22 19:38	1
Ethylbenzene	0.096	U	0.13	0.029	mg/Kg	☼	03/21/22 15:15	03/21/22 19:38	1
m-Xylene & p-Xylene	0.048	U	0.13	0.023	mg/Kg	☼	03/21/22 15:15	03/21/22 19:38	1
o-Xylene	0.048	U	0.13	0.016	mg/Kg	☼	03/21/22 15:15	03/21/22 19:38	1
Xylenes, Total	0.048	U	0.13	0.023	mg/Kg	☼	03/21/22 15:15	03/21/22 19:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	99		85 - 116				03/21/22 15:15	03/21/22 19:38	1
4-Bromofluorobenzene (Surr)	96		79 - 119				03/21/22 15:15	03/21/22 19:38	1
Dibromofluoromethane (Surr)	96		78 - 119				03/21/22 15:15	03/21/22 19:38	1
1,2-Dichloroethane-d4 (Surr)	101		71 - 136				03/21/22 15:15	03/21/22 19:38	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0020	J M	0.0069	0.00087	mg/Kg	☼	03/22/22 15:42	03/23/22 15:24	1
2-Methylnaphthalene	0.0042	U M	0.0069	0.0028	mg/Kg	☼	03/22/22 15:42	03/23/22 15:24	1
Naphthalene	0.0038	J M	0.0069	0.0022	mg/Kg	☼	03/22/22 15:42	03/23/22 15:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	81		40 - 140				03/22/22 15:42	03/23/22 15:24	1
Fluoranthene-d10 (Surr)	86		40 - 140				03/22/22 15:42	03/23/22 15:24	1
Terphenyl-d14	92		58 - 132				03/22/22 15:42	03/23/22 15:24	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	43	U	71	14	mg/Kg	☼	03/18/22 10:15	03/21/22 03:24	1
Motor Oil Range Organics (C24-C40)	43	U	71	28	mg/Kg	☼	03/18/22 10:15	03/21/22 03:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	79		45 - 130				03/18/22 10:15	03/21/22 03:24	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	66.5		0.1	0.1	%			03/21/22 10:08	1
Percent Moisture	33.5		0.1	0.1	%			03/21/22 10:08	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Client Sample ID: LTS15.0-SON01-23-25

Lab Sample ID: 580-111503-9

Date Collected: 03/15/22 16:10

Matrix: Solid

Date Received: 03/17/22 09:40

Percent Solids: 73.0

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	12		12	4.1	mg/Kg	☆	03/21/22 15:15	03/21/22 20:01	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	93		67 - 134				03/21/22 15:15	03/21/22 20:01	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.047	U	0.062	0.012	mg/Kg	☆	03/21/22 15:15	03/21/22 20:01	1
Toluene	0.094	U	0.19	0.042	mg/Kg	☆	03/21/22 15:15	03/21/22 20:01	1
Ethylbenzene	0.094	U	0.12	0.028	mg/Kg	☆	03/21/22 15:15	03/21/22 20:01	1
m-Xylene & p-Xylene	0.047	U	0.12	0.022	mg/Kg	☆	03/21/22 15:15	03/21/22 20:01	1
o-Xylene	0.047	U	0.12	0.016	mg/Kg	☆	03/21/22 15:15	03/21/22 20:01	1
Xylenes, Total	0.047	U	0.12	0.022	mg/Kg	☆	03/21/22 15:15	03/21/22 20:01	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	100		85 - 116				03/21/22 15:15	03/21/22 20:01	1
4-Bromofluorobenzene (Surr)	93		79 - 119				03/21/22 15:15	03/21/22 20:01	1
Dibromofluoromethane (Surr)	99	M	78 - 119				03/21/22 15:15	03/21/22 20:01	1
1,2-Dichloroethane-d4 (Surr)	100		71 - 136				03/21/22 15:15	03/21/22 20:01	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.11		0.0067	0.00084	mg/Kg	☆	03/22/22 15:42	03/23/22 15:44	1
2-Methylnaphthalene	0.046		0.0067	0.0027	mg/Kg	☆	03/22/22 15:42	03/23/22 15:44	1
Naphthalene	0.020	M	0.0067	0.0022	mg/Kg	☆	03/22/22 15:42	03/23/22 15:44	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	89		40 - 140				03/22/22 15:42	03/23/22 15:44	1
Fluoranthene-d10 (Surr)	93		40 - 140				03/22/22 15:42	03/23/22 15:44	1
Terphenyl-d14	99		58 - 132				03/22/22 15:42	03/23/22 15:44	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	180		62	12	mg/Kg	☆	03/18/22 10:15	03/21/22 03:44	1
Motor Oil Range Organics (C24-C40)	37	U	62	25	mg/Kg	☆	03/18/22 10:15	03/21/22 03:44	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	104	M	45 - 130				03/18/22 10:15	03/21/22 03:44	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	73.0		0.1	0.1	%			03/21/22 10:08	1
Percent Moisture	27.0		0.1	0.1	%			03/21/22 10:08	1

Client Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Client Sample ID: LTS15.0-SON01-30-31

Lab Sample ID: 580-111503-10

Date Collected: 03/15/22 16:35

Matrix: Solid

Date Received: 03/17/22 09:40

Percent Solids: 76.7

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	21		11	3.7	mg/Kg	☆	03/21/22 15:15	03/21/22 20:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	96		67 - 134				03/21/22 15:15	03/21/22 20:24	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.042	U	0.057	0.011	mg/Kg	☆	03/21/22 15:15	03/21/22 20:24	1
Toluene	0.085	U	0.17	0.038	mg/Kg	☆	03/21/22 15:15	03/21/22 20:24	1
Ethylbenzene	0.085	U	0.11	0.026	mg/Kg	☆	03/21/22 15:15	03/21/22 20:24	1
m-Xylene & p-Xylene	0.042	U	0.11	0.020	mg/Kg	☆	03/21/22 15:15	03/21/22 20:24	1
o-Xylene	0.042	U	0.11	0.014	mg/Kg	☆	03/21/22 15:15	03/21/22 20:24	1
Xylenes, Total	0.042	U	0.11	0.020	mg/Kg	☆	03/21/22 15:15	03/21/22 20:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	98		85 - 116				03/21/22 15:15	03/21/22 20:24	1
4-Bromofluorobenzene (Surr)	96		79 - 119				03/21/22 15:15	03/21/22 20:24	1
Dibromofluoromethane (Surr)	95		78 - 119				03/21/22 15:15	03/21/22 20:24	1
1,2-Dichloroethane-d4 (Surr)	101		71 - 136				03/21/22 15:15	03/21/22 20:24	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.023		0.0061	0.00077	mg/Kg	☆	03/22/22 15:42	03/23/22 16:03	1
2-Methylnaphthalene	0.024		0.0061	0.0025	mg/Kg	☆	03/22/22 15:42	03/23/22 16:03	1
Naphthalene	0.0092	M	0.0061	0.0020	mg/Kg	☆	03/22/22 15:42	03/23/22 16:03	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	85		40 - 140				03/22/22 15:42	03/23/22 16:03	1
Fluoranthene-d10 (Surr)	92		40 - 140				03/22/22 15:42	03/23/22 16:03	1
Terphenyl-d14	97		58 - 132				03/22/22 15:42	03/23/22 16:03	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (C10-C24)	12	J	62	12	mg/Kg	☆	03/18/22 10:15	03/21/22 04:04	1
Motor Oil Range Organics (C24-C40)	37	U	62	25	mg/Kg	☆	03/18/22 10:15	03/21/22 04:04	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	107		45 - 130				03/18/22 10:15	03/21/22 04:04	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	76.7		0.1	0.1	%			03/21/22 10:08	1
Percent Moisture	23.3		0.1	0.1	%			03/21/22 10:08	1

Client Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Client Sample ID: TB01-SO

Lab Sample ID: 580-111503-11

Date Collected: 03/09/22 12:00

Matrix: Water

Date Received: 03/17/22 09:40

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	80	U	100	31	ug/L			03/23/22 01:29	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	89		69 - 133		03/23/22 01:29	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.50	U	1.0	0.24	ug/L			03/23/22 14:33	1
Toluene	0.80	U	1.0	0.39	ug/L			03/23/22 14:33	1
Ethylbenzene	0.80	U	1.0	0.50	ug/L			03/23/22 14:33	1
m-Xylene & p-Xylene	0.80	U	2.0	0.53	ug/L			03/23/22 14:33	1
o-Xylene	0.80	U	1.0	0.39	ug/L			03/23/22 14:33	1
Xylenes, Total	0.80	U	2.0	0.53	ug/L			03/23/22 14:33	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	88		85 - 114		03/23/22 14:33	1
Toluene-d8 (Surr)	99		89 - 112		03/23/22 14:33	1
Dibromofluoromethane (Surr)	112		80 - 119		03/23/22 14:33	1
1,2-Dichloroethane-d4 (Surr)	117		81 - 118		03/23/22 14:33	1

QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-384563/1-A
Matrix: Solid
Analysis Batch: 384586

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 384563

Analyte	MB MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Gasoline Range Organics [C6 - C10]	1.38	J M	4.0	1.3	mg/Kg		03/21/22 15:15	03/21/22 15:27	1
Surrogate	MB MB		Limits			D	Prepared	Analyzed	Dil Fac
%Recovery	Qualifier								
4-Bromofluorobenzene (Surr)	97		67 - 134				03/21/22 15:15	03/21/22 15:27	1

Lab Sample ID: LCS 580-384563/4-A
Matrix: Solid
Analysis Batch: 384586

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 384563

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Gasoline Range Organics [C6 - C10]	40.0	47.2		mg/Kg		118	79 - 122
Surrogate	LCS LCS		Limits			D	%Rec
%Recovery	Qualifier						
4-Bromofluorobenzene (Surr)	100		67 - 134				

Lab Sample ID: LCSD 580-384563/5-A
Matrix: Solid
Analysis Batch: 384586

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 384563

Analyte	Spike Added	LCSD LCSD		Unit	D	%Rec	%Rec Limits	RPD	Limit
		Result	Qualifier						
Gasoline Range Organics [C6 - C10]	40.0	45.8		mg/Kg		115	79 - 122	3	30
Surrogate	LCSD LCSD		Limits			D	%Rec	RPD	Limit
%Recovery	Qualifier								
4-Bromofluorobenzene (Surr)	101		67 - 134						

Lab Sample ID: 580-111503-6 MS
Matrix: Solid
Analysis Batch: 384586

Client Sample ID: HTE00.0-SOFD01-19-21
Prep Type: Total/NA
Prep Batch: 384563

Analyte	Sample Result	Sample Qualifier	Spike Added	MS MS		Unit	D	%Rec	%Rec Limits
				Result	Qualifier				
Gasoline Range Organics [C6 - C10]	17	J1	131	319	J1	mg/Kg	✱	231	79 - 122
Surrogate	MS MS		Limits			D	%Rec	RPD	Limit
%Recovery	Qualifier								
4-Bromofluorobenzene (Surr)	102		67 - 134						

Lab Sample ID: 580-111503-6 MSD
Matrix: Solid
Analysis Batch: 384586

Client Sample ID: HTE00.0-SOFD01-19-21
Prep Type: Total/NA
Prep Batch: 384563

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD MSD		Unit	D	%Rec	%Rec Limits	RPD	Limit
				Result	Qualifier						
Gasoline Range Organics [C6 - C10]	17	J1	131	323	J1	mg/Kg	✱	234	79 - 122	1	30
Surrogate	MSD MSD		Limits			D	%Rec	RPD	Limit		
%Recovery	Qualifier										
4-Bromofluorobenzene (Surr)	103		67 - 134								

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QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-384698/5
Matrix: Water
Analysis Batch: 384698

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB	MB	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Gasoline Range Organics [C6 - C10]	80	U M	100	31	ug/L			03/22/22 23:06	1
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
4-Bromofluorobenzene (Surr)	90		69 - 133				03/22/22 23:06	1	

Lab Sample ID: LCS 580-384698/8
Matrix: Water
Analysis Batch: 384698

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Gasoline Range Organics [C6 - C10]	1000	1050		ug/L		105	78 - 122
Surrogate	%Recovery	Qualifier	Limits				
4-Bromofluorobenzene (Surr)	101		69 - 133				

Lab Sample ID: LCSD 580-384698/9
Matrix: Water
Analysis Batch: 384698

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD	LCSD	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
		Result	Qualifier						
Gasoline Range Organics [C6 - C10]	1000	1080		ug/L		108	78 - 122	2	30
Surrogate	%Recovery	Qualifier	Limits						
4-Bromofluorobenzene (Surr)	97		69 - 133						

Method: 8260D - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 580-384563/1-A
Matrix: Solid
Analysis Batch: 384585

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 384563

Analyte	MB	MB	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Benzene	0.015	U	0.020	0.0038	mg/Kg		03/21/22 15:15	03/21/22 15:27	1
Toluene	0.030	U	0.060	0.014	mg/Kg		03/21/22 15:15	03/21/22 15:27	1
Ethylbenzene	0.030	U	0.040	0.0091	mg/Kg		03/21/22 15:15	03/21/22 15:27	1
m-Xylene & p-Xylene	0.015	U	0.040	0.0071	mg/Kg		03/21/22 15:15	03/21/22 15:27	1
o-Xylene	0.015	U	0.040	0.0050	mg/Kg		03/21/22 15:15	03/21/22 15:27	1
Xylenes, Total	0.015	U	0.040	0.0071	mg/Kg		03/21/22 15:15	03/21/22 15:27	1
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac	
4-Bromofluorobenzene (Surr)	97		79 - 119			03/21/22 15:15	03/21/22 15:27	1	
Toluene-d8 (Surr)	97		85 - 116			03/21/22 15:15	03/21/22 15:27	1	
Dibromofluoromethane (Surr)	96		78 - 119			03/21/22 15:15	03/21/22 15:27	1	
1,2-Dichloroethane-d4 (Surr)	102		71 - 136			03/21/22 15:15	03/21/22 15:27	1	

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QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 580-384563/2-A
Matrix: Solid
Analysis Batch: 384585

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 384563

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits	
							Lower	Upper
Benzene	0.800	0.843		mg/Kg		105	77 - 121	
Toluene	0.800	0.829		mg/Kg		104	77 - 121	
Ethylbenzene	0.800	0.855		mg/Kg		107	76 - 122	
m-Xylene & p-Xylene	0.800	0.826		mg/Kg		103	77 - 124	
o-Xylene	0.800	0.816	M	mg/Kg		102	77 - 123	
Xylenes, Total	1.60	1.64		mg/Kg		103	78 - 124	

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	101		79 - 119
Toluene-d8 (Surr)	98		85 - 116
Dibromofluoromethane (Surr)	102		78 - 119
1,2-Dichloroethane-d4 (Surr)	100		71 - 136

Lab Sample ID: LCSD 580-384563/3-A
Matrix: Solid
Analysis Batch: 384585

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 384563

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits		RPD Limit	
							Lower	Upper	RPD	Limit
Benzene	0.800	0.899		mg/Kg		112	77 - 121	6	20	
Toluene	0.800	0.865		mg/Kg		108	77 - 121	4	20	
Ethylbenzene	0.800	0.890		mg/Kg		111	76 - 122	4	20	
m-Xylene & p-Xylene	0.800	0.856		mg/Kg		107	77 - 124	4	20	
o-Xylene	0.800	0.864	M	mg/Kg		108	77 - 123	6	20	
Xylenes, Total	1.60	1.72		mg/Kg		108	78 - 124	5	20	

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	98		79 - 119
Toluene-d8 (Surr)	98		85 - 116
Dibromofluoromethane (Surr)	103		78 - 119
1,2-Dichloroethane-d4 (Surr)	98		71 - 136

Lab Sample ID: 580-111503-5 MS
Matrix: Solid
Analysis Batch: 384585

Client Sample ID: HTE00.0-SON01-33-35
Prep Type: Total/NA
Prep Batch: 384563

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits	
									Lower	Upper
Benzene	0.044	U	1.18	1.32		mg/Kg	⊛	112	77 - 121	
Toluene	0.088	U	1.18	1.28		mg/Kg	⊛	109	77 - 121	
Ethylbenzene	0.088	U	1.18	1.32		mg/Kg	⊛	113	76 - 122	
m-Xylene & p-Xylene	0.044	U	1.18	1.26		mg/Kg	⊛	107	77 - 124	
o-Xylene	0.044	U	1.18	1.24	M	mg/Kg	⊛	105	77 - 123	
Xylenes, Total	0.044	U	2.35	2.50		mg/Kg	⊛	106	78 - 124	

Surrogate	MS %Recovery	MS Qualifier	Limits
4-Bromofluorobenzene (Surr)	98		79 - 119
Toluene-d8 (Surr)	98		85 - 116
Dibromofluoromethane (Surr)	102		78 - 119

QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 580-111503-5 MS
Matrix: Solid
Analysis Batch: 384585

Client Sample ID: HTE00.0-SON01-33-35
Prep Type: Total/NA
Prep Batch: 384563

Surrogate	%Recovery	MS MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	100		71 - 136

Lab Sample ID: 580-111503-5 MSD
Matrix: Solid
Analysis Batch: 384585

Client Sample ID: HTE00.0-SON01-33-35
Prep Type: Total/NA
Prep Batch: 384563

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit
Benzene	0.044	U	1.18	1.31		mg/Kg	⊛	111	77 - 121	0	20
Toluene	0.088	U	1.18	1.28		mg/Kg	⊛	109	77 - 121	0	20
Ethylbenzene	0.088	U	1.18	1.31		mg/Kg	⊛	111	76 - 122	1	20
m-Xylene & p-Xylene	0.044	U	1.18	1.25		mg/Kg	⊛	106	77 - 124	1	20
o-Xylene	0.044	U	1.18	1.23	M	mg/Kg	⊛	105	77 - 123	1	20
Xylenes, Total	0.044	U	2.35	2.48		mg/Kg	⊛	106	78 - 124	1	20

Surrogate	%Recovery	MSD MSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	97		79 - 119
Toluene-d8 (Surr)	99		85 - 116
Dibromofluoromethane (Surr)	103		78 - 119
1,2-Dichloroethane-d4 (Surr)	102		71 - 136

Lab Sample ID: MB 580-384852/5
Matrix: Water
Analysis Batch: 384852

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.50	U	1.0	0.24	ug/L			03/23/22 11:23	1
Toluene	0.80	U	1.0	0.39	ug/L			03/23/22 11:23	1
Ethylbenzene	0.80	U	1.0	0.50	ug/L			03/23/22 11:23	1
m-Xylene & p-Xylene	0.80	U	2.0	0.53	ug/L			03/23/22 11:23	1
o-Xylene	0.80	U	1.0	0.39	ug/L			03/23/22 11:23	1
Xylenes, Total	0.80	U	2.0	0.53	ug/L			03/23/22 11:23	1

Surrogate	%Recovery	MB MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	90		85 - 114		03/23/22 11:23	1
Toluene-d8 (Surr)	98		89 - 112		03/23/22 11:23	1
Dibromofluoromethane (Surr)	112		80 - 119		03/23/22 11:23	1
1,2-Dichloroethane-d4 (Surr)	117	M	81 - 118		03/23/22 11:23	1

Lab Sample ID: LCS 580-384852/6
Matrix: Water
Analysis Batch: 384852

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	10.0	10.6	Q	ug/L		106	79 - 120
Toluene	10.0	11.1	Q	ug/L		111	80 - 121
Ethylbenzene	10.0	11.4		ug/L		114	79 - 121
m-Xylene & p-Xylene	10.0	11.1		ug/L		111	80 - 121
o-Xylene	10.0	11.4		ug/L		114	78 - 122

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QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 580-384852/6
Matrix: Water
Analysis Batch: 384852

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Xylenes, Total	20.0	22.5		ug/L		113	79 - 121
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
4-Bromofluorobenzene (Surr)	97		85 - 114				
Toluene-d8 (Surr)	100		89 - 112				
Dibromofluoromethane (Surr)	113		80 - 119				
1,2-Dichloroethane-d4 (Surr)	119 M Q		81 - 118				

Lab Sample ID: LCSD 580-384852/7
Matrix: Water
Analysis Batch: 384852

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Benzene	10.0	10.6		ug/L		106	79 - 120	0	20
Toluene	10.0	10.9		ug/L		109	80 - 121	1	20
Ethylbenzene	10.0	11.2		ug/L		112	79 - 121	2	20
m-Xylene & p-Xylene	10.0	10.7		ug/L		107	80 - 121	3	20
o-Xylene	10.0	11.1 M		ug/L		111	78 - 122	3	20
Xylenes, Total	20.0	21.8		ug/L		109	79 - 121	3	20
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
4-Bromofluorobenzene (Surr)	94		85 - 114						
Toluene-d8 (Surr)	99		89 - 112						
Dibromofluoromethane (Surr)	113		80 - 119						
1,2-Dichloroethane-d4 (Surr)	117		81 - 118						

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 580-384550/1-A
Matrix: Solid
Analysis Batch: 384630

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 384550

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0015	U M	0.0050	0.00063	mg/Kg		03/21/22 13:24	03/22/22 13:05	1
2-Methylnaphthalene	0.0030	U M	0.0050	0.0021	mg/Kg		03/21/22 13:24	03/22/22 13:05	1
Naphthalene	0.0040	U M	0.0050	0.0016	mg/Kg		03/21/22 13:24	03/22/22 13:05	1
Surrogate	MB %Recovery	MB Qualifier	Limits						
2-methylnaphthalene-d10	100		40 - 140						
Fluoranthene-d10 (Surr)	116		40 - 140						
Terphenyl-d14	123		58 - 132						

Lab Sample ID: LCS 580-384550/2-A
Matrix: Solid
Analysis Batch: 384630

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 384550

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1-Methylnaphthalene	1.00	0.918		mg/Kg		92	43 - 111

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QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCS 580-384550/2-A
Matrix: Solid
Analysis Batch: 384630

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 384550

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
2-Methylnaphthalene	1.00	0.893		mg/Kg		89	39 - 114
Naphthalene	1.00	0.896		mg/Kg		90	38 - 111

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-methylnaphthalene-d10	97		40 - 140
Fluoranthene-d10 (Surr)	103		40 - 140
Terphenyl-d14	112		58 - 132

Lab Sample ID: MB 580-384687/1-A
Matrix: Solid
Analysis Batch: 384841

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 384687

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0015	U	0.0050	0.00063	mg/Kg		03/22/22 15:42	03/23/22 12:31	1
2-Methylnaphthalene	0.0030	U	0.0050	0.0021	mg/Kg		03/22/22 15:42	03/23/22 12:31	1
Naphthalene	0.0040	U M	0.0050	0.0016	mg/Kg		03/22/22 15:42	03/23/22 12:31	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	94		40 - 140	03/22/22 15:42	03/23/22 12:31	1
Fluoranthene-d10 (Surr)	105		40 - 140	03/22/22 15:42	03/23/22 12:31	1
Terphenyl-d14	112		58 - 132	03/22/22 15:42	03/23/22 12:31	1

Lab Sample ID: LCS 580-384687/2-A
Matrix: Solid
Analysis Batch: 384841

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 384687

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1-Methylnaphthalene	1.00	0.876		mg/Kg		88	43 - 111
2-Methylnaphthalene	1.00	0.848		mg/Kg		85	39 - 114
Naphthalene	1.00	0.855		mg/Kg		85	38 - 111

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-methylnaphthalene-d10	89		40 - 140
Fluoranthene-d10 (Surr)	92		40 - 140
Terphenyl-d14	100		58 - 132

Lab Sample ID: 580-111503-10 MS
Matrix: Solid
Analysis Batch: 384841

Client Sample ID: LTS15.0-SON01-30-31
Prep Type: Total/NA
Prep Batch: 384687

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
1-Methylnaphthalene	0.023		1.20	1.05		mg/Kg	☼	85	43 - 111
2-Methylnaphthalene	0.024		1.20	1.02		mg/Kg	☼	83	39 - 114
Naphthalene	0.0092	M	1.20	1.02		mg/Kg	☼	84	38 - 111

Surrogate	MS %Recovery	MS Qualifier	Limits
2-methylnaphthalene-d10	86		40 - 140

QC Sample Results

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: 580-111503-10 MS
Matrix: Solid
Analysis Batch: 384841

Client Sample ID: LTS15.0-SON01-30-31
Prep Type: Total/NA
Prep Batch: 384687

Surrogate	MS MS		Limits
	%Recovery	Qualifier	
Fluoranthene-d10 (Surr)	91		40 - 140
Terphenyl-d14	98		58 - 132

Lab Sample ID: 580-111503-10 MSD
Matrix: Solid
Analysis Batch: 384841

Client Sample ID: LTS15.0-SON01-30-31
Prep Type: Total/NA
Prep Batch: 384687

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD MSD		Unit	D	%Rec	%Rec		RPD	Limit
				Result	Qualifier				Limits	RPD		
1-Methylnaphthalene	0.023		1.15	0.982		mg/Kg	☼	83	43 - 111	7	20	
2-Methylnaphthalene	0.024		1.15	0.963		mg/Kg	☼	81	39 - 114	6	20	
Naphthalene	0.0092	M	1.15	0.981		mg/Kg	☼	84	38 - 111	4	20	

Surrogate	MSD MSD		Limits
	%Recovery	Qualifier	
2-methylnaphthalene-d10	85		40 - 140
Fluoranthene-d10 (Surr)	91		40 - 140
Terphenyl-d14	98		58 - 132

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 580-384294/1-A
Matrix: Solid
Analysis Batch: 384479

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 384294

Analyte	MB MB		LOQ	DL	Unit	D	Prepared		Analyzed		Dil Fac
	Result	Qualifier					Time	Time	Time	Time	
Diesel Range Organics (C10-C24)	30	U	50	9.9	mg/Kg		03/18/22 10:15	03/20/22 23:42			1
Motor Oil Range Organics (C24-C40)	30	U	50	20	mg/Kg		03/18/22 10:15	03/20/22 23:42			1

Surrogate	MB MB		Limits	Prepared		Analyzed		Dil Fac
	%Recovery	Qualifier		Time	Time	Time	Time	
o-Terphenyl	112		45 - 130	03/18/22 10:15		03/20/22 23:42		1

Lab Sample ID: LCS 580-384294/2-A
Matrix: Solid
Analysis Batch: 384479

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 384294

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec	
		Result	Qualifier				Limits	RPD
Diesel Range Organics (C10-C24)	500	460		mg/Kg		92	75 - 125	
Motor Oil Range Organics (C24-C40)	500	458		mg/Kg		92	39 - 106	

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
o-Terphenyl	90		45 - 130

QC Sample Results

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC) (Continued)

Lab Sample ID: LCSD 580-384294/3-A
Matrix: Solid
Analysis Batch: 384479

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 384294

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec		RPD Limit
							Limits	RPD	
Diesel Range Organics (C10-C24)	500	468		mg/Kg		94	75 - 125	2	20
Motor Oil Range Organics (C24-C40)	500	462		mg/Kg		92	39 - 106	1	20
Surrogate		LCS D %Recovery	LCS D Qualifier						Limits
<i>o-Terphenyl</i>		89							45 - 130

Method: 2540G - SM 2540G

Lab Sample ID: 580-111503-1 DU
Matrix: Solid
Analysis Batch: 384511

Client Sample ID: LTE00.0-SON01-26-28
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD
								Limit
Percent Solids	73.0		72.0		%		1	20
Percent Moisture	27.0		28.0		%		4	20

Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Client Sample ID: LTE00.0-SON01-26-28
 Date Collected: 03/11/22 10:15
 Date Received: 03/17/22 09:40

Lab Sample ID: 580-111503-1
 Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	384511	TOA	EET SEA	03/21/22 10:08

Client Sample ID: LTE00.0-SON01-26-28
 Date Collected: 03/11/22 10:15
 Date Received: 03/17/22 09:40

Lab Sample ID: 580-111503-1
 Matrix: Solid
 Percent Solids: 73.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			384563	BNM	EET SEA	03/21/22 15:15
Total/NA	Analysis	8260/CALUFT DOD		1	384586	CJ	EET SEA	03/21/22 17:22
Total/NA	Prep	5035			384563	BNM	EET SEA	03/21/22 15:15
Total/NA	Analysis	8260D		1	384585	RJL	EET SEA	03/21/22 17:22
Total/NA	Prep	3546			384687	DH	EET SEA	03/22/22 15:42
Total/NA	Analysis	8270E SIM		1	384841	W1T	EET SEA	03/23/22 13:10
Total/NA	Prep	3546			384294	JCM	EET SEA	03/18/22 10:15
Total/NA	Analysis	8015D DRO		1	384479	JAE	EET SEA	03/21/22 00:43

Client Sample ID: LTE00.0-SON01-38-40
 Date Collected: 03/11/22 14:10
 Date Received: 03/17/22 09:40

Lab Sample ID: 580-111503-2
 Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	384511	TOA	EET SEA	03/21/22 10:08

Client Sample ID: LTE00.0-SON01-38-40
 Date Collected: 03/11/22 14:10
 Date Received: 03/17/22 09:40

Lab Sample ID: 580-111503-2
 Matrix: Solid
 Percent Solids: 66.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			384563	BNM	EET SEA	03/21/22 15:15
Total/NA	Analysis	8260/CALUFT DOD		1	384586	CJ	EET SEA	03/21/22 17:45
Total/NA	Prep	5035			384563	BNM	EET SEA	03/21/22 15:15
Total/NA	Analysis	8260D		1	384585	RJL	EET SEA	03/21/22 17:45
Total/NA	Prep	3546			384687	DH	EET SEA	03/22/22 15:42
Total/NA	Analysis	8270E SIM		1	384841	W1T	EET SEA	03/23/22 13:29
Total/NA	Prep	3546			384294	JCM	EET SEA	03/18/22 10:15
Total/NA	Analysis	8015D DRO		1	384479	JAE	EET SEA	03/21/22 01:03

Client Sample ID: LTE00.0-SOFD01-26-28
 Date Collected: 03/11/22 10:15
 Date Received: 03/17/22 09:40

Lab Sample ID: 580-111503-3
 Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	384511	TOA	EET SEA	03/21/22 10:08

Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Client Sample ID: LTE00.0-SOFD01-26-28

Lab Sample ID: 580-111503-3

Date Collected: 03/11/22 10:15

Matrix: Solid

Date Received: 03/17/22 09:40

Percent Solids: 73.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			384563	BNM	EET SEA	03/21/22 15:15
Total/NA	Analysis	8260/CALUFT DOD		1	384586	CJ	EET SEA	03/21/22 18:07
Total/NA	Prep	5035			384563	BNM	EET SEA	03/21/22 15:15
Total/NA	Analysis	8260D		1	384585	RJL	EET SEA	03/21/22 18:07
Total/NA	Prep	3546			384687	DH	EET SEA	03/22/22 15:42
Total/NA	Analysis	8270E SIM		1	384841	W1T	EET SEA	03/23/22 13:48
Total/NA	Prep	3546			384294	JCM	EET SEA	03/18/22 10:15
Total/NA	Analysis	8015D DRO		1	384479	JAE	EET SEA	03/21/22 01:23

Client Sample ID: HTE00.0-SON01-19-21

Lab Sample ID: 580-111503-4

Date Collected: 03/09/22 11:15

Matrix: Solid

Date Received: 03/17/22 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	384511	TOA	EET SEA	03/21/22 10:08

Client Sample ID: HTE00.0-SON01-19-21

Lab Sample ID: 580-111503-4

Date Collected: 03/09/22 11:15

Matrix: Solid

Date Received: 03/17/22 09:40

Percent Solids: 63.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			384563	BNM	EET SEA	03/21/22 15:15
Total/NA	Analysis	8260/CALUFT DOD		1	384586	CJ	EET SEA	03/21/22 18:30
Total/NA	Prep	5035			384563	BNM	EET SEA	03/21/22 15:15
Total/NA	Analysis	8260D		1	384585	RJL	EET SEA	03/21/22 18:30
Total/NA	Prep	3546			384550	DH	EET SEA	03/21/22 13:24
Total/NA	Analysis	8270E SIM		1	384630	TL1	EET SEA	03/22/22 13:44
Total/NA	Prep	3546			384294	JCM	EET SEA	03/18/22 10:15
Total/NA	Analysis	8015D DRO		1	384479	JAE	EET SEA	03/21/22 01:43

Client Sample ID: HTE00.0-SON01-33-35

Lab Sample ID: 580-111503-5

Date Collected: 03/10/22 09:35

Matrix: Solid

Date Received: 03/17/22 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	384511	TOA	EET SEA	03/21/22 10:08

Client Sample ID: HTE00.0-SON01-33-35

Lab Sample ID: 580-111503-5

Date Collected: 03/10/22 09:35

Matrix: Solid

Date Received: 03/17/22 09:40

Percent Solids: 76.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			384563	BNM	EET SEA	03/21/22 15:15
Total/NA	Analysis	8260/CALUFT DOD		1	384586	CJ	EET SEA	03/21/22 20:47
Total/NA	Prep	5035			384563	BNM	EET SEA	03/21/22 15:15
Total/NA	Analysis	8260D		1	384585	RJL	EET SEA	03/21/22 20:47

Eurofins Seattle

Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Client Sample ID: HTE00.0-SON01-33-35

Lab Sample ID: 580-111503-5

Date Collected: 03/10/22 09:35

Matrix: Solid

Date Received: 03/17/22 09:40

Percent Solids: 76.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3546			384687	DH	EET SEA	03/22/22 15:42
Total/NA	Analysis	8270E SIM		1	384841	W1T	EET SEA	03/23/22 14:26
Total/NA	Prep	3546			384294	JCM	EET SEA	03/18/22 10:15
Total/NA	Analysis	8015D DRO		1	384479	JAE	EET SEA	03/21/22 02:03

Client Sample ID: HTE00.0-SOFD01-19-21

Lab Sample ID: 580-111503-6

Date Collected: 03/09/22 11:15

Matrix: Solid

Date Received: 03/17/22 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	384511	TOA	EET SEA	03/21/22 10:08

Client Sample ID: HTE00.0-SOFD01-19-21

Lab Sample ID: 580-111503-6

Date Collected: 03/09/22 11:15

Matrix: Solid

Date Received: 03/17/22 09:40

Percent Solids: 66.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			384563	BNM	EET SEA	03/21/22 15:15
Total/NA	Analysis	8260/CALUFT DOD		1	384586	CJ	EET SEA	03/21/22 21:55
Total/NA	Prep	5035			384563	BNM	EET SEA	03/21/22 15:15
Total/NA	Analysis	8260D		1	384585	RJL	EET SEA	03/21/22 21:55
Total/NA	Prep	3546			384687	DH	EET SEA	03/22/22 15:42
Total/NA	Analysis	8270E SIM		1	384841	W1T	EET SEA	03/23/22 14:46
Total/NA	Prep	3546			384294	JCM	EET SEA	03/18/22 10:15
Total/NA	Analysis	8015D DRO		1	384479	JAE	EET SEA	03/21/22 02:24

Client Sample ID: LTW35.0-SON01-29-31

Lab Sample ID: 580-111503-7

Date Collected: 03/15/22 09:35

Matrix: Solid

Date Received: 03/17/22 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	384511	TOA	EET SEA	03/21/22 10:08

Client Sample ID: LTW35.0-SON01-29-31

Lab Sample ID: 580-111503-7

Date Collected: 03/15/22 09:35

Matrix: Solid

Date Received: 03/17/22 09:40

Percent Solids: 67.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			384563	BNM	EET SEA	03/21/22 15:15
Total/NA	Analysis	8260/CALUFT DOD		1	384586	CJ	EET SEA	03/21/22 18:53
Total/NA	Prep	5035			384563	BNM	EET SEA	03/21/22 15:15
Total/NA	Analysis	8260D		1	384585	RJL	EET SEA	03/21/22 18:53
Total/NA	Prep	3546			384687	DH	EET SEA	03/22/22 15:42
Total/NA	Analysis	8270E SIM		1	384841	W1T	EET SEA	03/23/22 15:05
Total/NA	Prep	3546			384294	JCM	EET SEA	03/18/22 10:15
Total/NA	Analysis	8015D DRO		1	384664	JAE	EET SEA	03/22/22 12:46

Eurofins Seattle

Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Client Sample ID: LTW35.0-SON01-34-36

Lab Sample ID: 580-111503-8

Date Collected: 03/15/22 10:25

Matrix: Solid

Date Received: 03/17/22 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	384511	TOA	EET SEA	03/21/22 10:08

Client Sample ID: LTW35.0-SON01-34-36

Lab Sample ID: 580-111503-8

Date Collected: 03/15/22 10:25

Matrix: Solid

Date Received: 03/17/22 09:40

Percent Solids: 66.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			384563	BNM	EET SEA	03/21/22 15:15
Total/NA	Analysis	8260/CALUFT DOD		1	384586	CJ	EET SEA	03/21/22 19:38
Total/NA	Prep	5035			384563	BNM	EET SEA	03/21/22 15:15
Total/NA	Analysis	8260D		1	384585	RJL	EET SEA	03/21/22 19:38
Total/NA	Prep	3546			384687	DH	EET SEA	03/22/22 15:42
Total/NA	Analysis	8270E SIM		1	384841	W1T	EET SEA	03/23/22 15:24
Total/NA	Prep	3546			384294	JCM	EET SEA	03/18/22 10:15
Total/NA	Analysis	8015D DRO		1	384479	JAE	EET SEA	03/21/22 03:24

Client Sample ID: LTS15.0-SON01-23-25

Lab Sample ID: 580-111503-9

Date Collected: 03/15/22 16:10

Matrix: Solid

Date Received: 03/17/22 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	384511	TOA	EET SEA	03/21/22 10:08

Client Sample ID: LTS15.0-SON01-23-25

Lab Sample ID: 580-111503-9

Date Collected: 03/15/22 16:10

Matrix: Solid

Date Received: 03/17/22 09:40

Percent Solids: 73.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			384563	BNM	EET SEA	03/21/22 15:15
Total/NA	Analysis	8260/CALUFT DOD		1	384586	CJ	EET SEA	03/21/22 20:01
Total/NA	Prep	5035			384563	BNM	EET SEA	03/21/22 15:15
Total/NA	Analysis	8260D		1	384585	RJL	EET SEA	03/21/22 20:01
Total/NA	Prep	3546			384687	DH	EET SEA	03/22/22 15:42
Total/NA	Analysis	8270E SIM		1	384841	W1T	EET SEA	03/23/22 15:44
Total/NA	Prep	3546			384294	JCM	EET SEA	03/18/22 10:15
Total/NA	Analysis	8015D DRO		1	384479	JAE	EET SEA	03/21/22 03:44

Client Sample ID: LTS15.0-SON01-30-31

Lab Sample ID: 580-111503-10

Date Collected: 03/15/22 16:35

Matrix: Solid

Date Received: 03/17/22 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	2540G		1	384511	TOA	EET SEA	03/21/22 10:08

Lab Chronicle

Client: AECOM
 Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Client Sample ID: LTS15.0-SON01-30-31

Lab Sample ID: 580-111503-10

Date Collected: 03/15/22 16:35

Matrix: Solid

Date Received: 03/17/22 09:40

Percent Solids: 76.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			384563	BNM	EET SEA	03/21/22 15:15
Total/NA	Analysis	8260/CALUFT DOD		1	384586	CJ	EET SEA	03/21/22 20:24
Total/NA	Prep	5035			384563	BNM	EET SEA	03/21/22 15:15
Total/NA	Analysis	8260D		1	384585	RJL	EET SEA	03/21/22 20:24
Total/NA	Prep	3546			384687	DH	EET SEA	03/22/22 15:42
Total/NA	Analysis	8270E SIM		1	384841	W1T	EET SEA	03/23/22 16:03
Total/NA	Prep	3546			384294	JCM	EET SEA	03/18/22 10:15
Total/NA	Analysis	8015D DRO		1	384479	JAE	EET SEA	03/21/22 04:04

Client Sample ID: TB01-SO

Lab Sample ID: 580-111503-11

Date Collected: 03/09/22 12:00

Matrix: Water

Date Received: 03/17/22 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260/CALUFT DOD		1	384698	BNM	EET SEA	03/23/22 01:29
Total/NA	Analysis	8260D		1	384852	BNM	EET SEA	03/23/22 14:33

Laboratory References:

EET SEA = Eurofins Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: AECOM
Project/Site: Red Hill JBPHH N62742-17-D-1800

Job ID: 580-111503-1

Laboratory: Eurofins Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2236	01-19-25

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
2540G		Solid	Percent Moisture
2540G		Solid	Percent Solids



Sample Summary

Client: AECOM

Job ID: 580-111503-1

Project/Site: Red Hill JBPHH N62742-17-D-1800

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-111503-1	LTE00.0-SON01-26-28	Solid	03/11/22 10:15	03/17/22 09:40
580-111503-2	LTE00.0-SON01-38-40	Solid	03/11/22 14:10	03/17/22 09:40
580-111503-3	LTE00.0-SOFD01-26-28	Solid	03/11/22 10:15	03/17/22 09:40
580-111503-4	HTE00.0-SON01-19-21	Solid	03/09/22 11:15	03/17/22 09:40
580-111503-5	HTE00.0-SON01-33-35	Solid	03/10/22 09:35	03/17/22 09:40
580-111503-6	HTE00.0-SOFD01-19-21	Solid	03/09/22 11:15	03/17/22 09:40
580-111503-7	LTW35.0-SON01-29-31	Solid	03/15/22 09:35	03/17/22 09:40
580-111503-8	LTW35.0-SON01-34-36	Solid	03/15/22 10:25	03/17/22 09:40
580-111503-9	LTS15.0-SON01-23-25	Solid	03/15/22 16:10	03/17/22 09:40
580-111503-10	LTS15.0-SON01-30-31	Solid	03/15/22 16:35	03/17/22 09:40
580-111503-11	TB01-SO	Water	03/09/22 12:00	03/17/22 09:40

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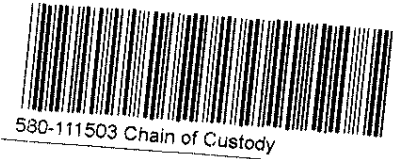
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Eurofins-Seattle
5755 8th St E
Tacoma, WA 98424
Phone : 253-248-4972

Chain of Custody Record



580-111503 Chain of Custody

eurofins
Environmental Testing
America

Client Information		Sampler: Ethan House		Lab PM: Elaine Walker		Carrier Tracking Note(s)		COC No: 1-44635											
Client Contact: Jeff Hart/ Peggy Schuler		Phone: 720 884-7404		E-Mail: M.Elaine.Walker@EurofinsET.com		State of Origin:		Page: Page 1 of 1											
Company: AECOM-Honolulu		PWSID:		Analysis Requested						Job #:									
Address: AECOM-Honolulu		Due Date Requested:		<table border="1"> <tr> <td>Field Filtered Sample (Yes or No)</td> <td>Perform MS/MSD (Yes or No)</td> <td>BTEX, TPH-g, 8260D/5035B</td> <td>N,1MM,2MM TPH-d6, 8270D 81M2550C 80TSC0550C</td> <td>BTEX, TPH-g, SW-846 8260D/</td> <td>N,1MM,2MM, SW-846 8270E/8510C</td> <td>TPH-d6, 8015C</td> <td>Total Number of Containers:</td> </tr> </table>						Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	BTEX, TPH-g, 8260D/5035B	N,1MM,2MM TPH-d6, 8270D 81M2550C 80TSC0550C	BTEX, TPH-g, SW-846 8260D/	N,1MM,2MM, SW-846 8270E/8510C	TPH-d6, 8015C	Total Number of Containers:	Preservation Codes:	
Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	BTEX, TPH-g, 8260D/5035B	N,1MM,2MM TPH-d6, 8270D 81M2550C 80TSC0550C							BTEX, TPH-g, SW-846 8260D/	N,1MM,2MM, SW-846 8270E/8510C	TPH-d6, 8015C	Total Number of Containers:						
City: 1001 Bishop Street, ASB Tower, Suite 1600		TAT Requested (days): 4								A - HCL		M - Hexane							
State, Zip: Honolulu, Hawaii, 96813		Compliance Project: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No								B - NaOH		N - None							
Phone: 720 884-7404		PO #:								C - Zn Acetate		O - AsNaO2							
Email: jeff.hart@aecom.com/ peggy.schuler@aecom.com		Purchase Order Requested		D - Nitric Acid		P - Na2O4S													
Project Name: Site Char, P2 HT-LT		Project #:		E - NaHSO4		Q - Na2SO3													
Site: Red Hill Bulk Fuel Storage Facility		SSOW#:		F - MeOH		R - Na2S2O3													
				G - Amchlor		S - H2SO4													
				H - Ascorbic Acid		T - TSP Dodecahydrate													
				I - Ice		U - Acetone													
				J - DI Water		V - MCAA													
				K - EDTA		W - pH 4-5													
				L - EDA		Z - Methanol													
				Other:															

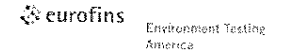
 Special Instructions/Note: | || **Sample Identification** | | **Sample Date** | | **Sample Time** | | **Sample Type (C=Comp, G=grab)** | | **Matrix (W=Groundwater, R=SO=soil, PR=product, GS=Soil vapor)** | | **Preservation Code:** | | **Special Instructions/Note:** | |
LTE00.0-SON01-0200-2C-28		3/11/22		10:15:00 AM		GRB SO		SO		F			
LTE00.0-SON01-0800-38-40		3/11/22		2:10:00 PM		GRB SO		SO		A			
LTE00.0-SON01-0260-LTE00.0-SON01-DUP2		3/11/22		~~10:15:00 AM~~		GRB SO		SO		G			
HTE00.0-SON01-0400-19-21		3/9/22		11:15:00 AM		GRB SO		SO					
HTE00.0-SON01-0320-33-35		3/10/22		9:35:00 AM		GRB SO		SO					
HTE00.0-SON01-0400-DUP1		3/10/22		~~11:15:00 AM~~		GRB SO		SO					
LTW35.0-SON01-0240-29-31		3/15/22		9:35:00 AM		GRB SO		SO					
LTW35.0-SON01-0940-34-36		3/15/22		10:25:00 AM		GRB SO		SO					
LTS15.0-SON01-23-25		3/15/22		1610		GRB SO		SO		2-40mL		1-4oz	
LTS15.0-SON01-30-31		3/15/22		1635		GRB SO		SO		2-40mL		1-4oz	
Possible Hazard Identification										**Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)**			
Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological										Return To Client Disposal By Lab Archive For Months			
Deliverable Requested: I, II, III, IV, Other (specify)										Special Instructions/QC Requirements: HOLD 1668A + 8290A pending client direction			
Empty Kit Relinquished by:			Date:			Time:			Method of Shipment:				
Relinquished by: *[Signature]*			Date/Time: 3/16/22 1305			Company: AECOM			Received by: *[Signature]*				
Relinquished by:			Date/Time:			Company:			Received by: *[Signature]*				
Relinquished by:			Date/Time:			Company:			Received by: *[Signature]*				
Custody Seals Intact: Yes No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: 20.9 - 20.1 °C									

Lg Red/wet/But FedEx w/cs

Eurofins-Seattle

5755 8th St E
Tacoma, WA 98424
Phone : 253-248-4972

Chain of Custody Record



Client Information		Sampler: Ethan House		Lab PM: Elaine Walker		Carrier Tracking No(s)		COC No: 2-44635			
Client Contact: Jeff Hart/ Peggy Schuler		Phone: 720 884-7404		E-Mail: M.Elaine.Walker@EurofinsET.com		State of Origin:		Page: Page 1 of 1			
Company: AECOM-Honolulu		PWSID:		Analysis Requested						Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - Methanol	
Address: AECOM-Honolulu		Due Date Requested:									
City: 1001 Bishop Street, ASB Tower, Suite 1600		TAT Requested (days): 4		Field Filtered Sample (Yes or No) <input checked="" type="checkbox"/>		Perform MS/MSD (Yes or No) <input checked="" type="checkbox"/>		Total Number of Containers		Special Instructions/Note:	
State, Zip: Honolulu, Hawaii, 96813		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No									
Phone: 720 884-7404		PO #:		BTEX, TPH-g, 82600/5036B		N, 1MM, 2MM TPH-dio, 82700 SIM/2550C 8015C/9550C		BTEX, TPH-g, SW-846 82600/		N, 1MM, 2MM, SW-846 8270E/8510C	
Email: jeff.hart@aecom.com/ peggy.schuler@aecom.com		Purchase Order Requested									
Project Name: Site Char, P2 HT-LT		Project #:		TPH-dio, 8015C							
Site: Red Hill Bulk Fuel Storage Facility		SSOW#:									
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (WG=Groundwater, S=Soil, PR=product, GS=Soil vapor)	Preservation Code:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
LTE00-C WGN01-030-0		3/16/22	8:00:00 AM	GRB	WQ	WQ	WQ	WQ	WQ	WQ	WQ
NTE00-0 WGN01-034-0		3/16/22	10:30:00 AM	GRB	WQ	WQ	WQ	WQ	WQ	WQ	WQ
TB01-S0		-	-	G	WATER	-	2-40ML				
TB02		-	-	G	WATER	-	2-40ML				
UN 3/16/22											
Possible Hazard Identification						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)					
<input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological						<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months					
Deliverable Requested: I, II, III, IV, Other (specify)						Special Instructions/QC Requirements: HOLD 1668A + 8290A pending client direction					
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:					
Relinquished by: <i>EAH</i>		Date/Time: 3/16/22 1305		Company: AECOM		Received by: Alex Edmonds		Date/Time: 3/16/22 1305		Company: AECOM	
Relinquished by: Alex Edmonds		Date/Time: 3/16/22 1440		Company: AECOM		Received by: <i>EAH</i>		Date/Time: 3/17/22 940		Company: EFGS	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:							

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-111503-1

Login Number: 111503

List Number: 1

Creator: Presley, Kim A

List Source: Eurofins Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	False	Refer to Job Narrative for details.
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Walker, M Elaine

From: Schuler, Peggy <peggy.schuler@aecom.com>
Sent: Friday, March 18, 2022 8:25 PM
To: Walker, M Elaine
Subject: Sample IDs for SDGs 111500, 502, and 503

EXTERNAL EMAIL*

Elaine,
Sorry this took so long, had to dig up the field notes to figure out which samples were the duplicates. Discovered the date on one of them was incorrect. Please see the table below for the correct sample IDs for these SDGs:

Lab ID	Field ID	CORRECTED Field ID	Date	Time	Comment
580-111500-1	LTE00.0-WGN01-030.0		3/16/2022	9:00:00 AM	[Combining 500
580-111500-2	HTE00.0-WGN01-031.0		3/16/2022	10:30:00 AM	Should be parent sampl
580-111500-3	TB-02		3/16/2022	12:00:00 AM	
580-111502-1	HTE00.0-WGFD01-031.0		3/16/2022	11:00:00 AM	Should be field dup. Lab
580-111502-2	LTW35.0-WGN01-028.0		3/16/2022	12:00:00 PM	
580-111502-3	TB-01		3/16/2022	12:00:00 AM	
580-111503-1	LTE00.0-SON01-26-28		3/11/2022	10:15:00 AM	
580-111503-2	LTE00.0-SON01-38-40		3/11/2022	2:10:00 PM	
580-111503-3	LTE00.0-SON01-DUP2	LTE00.0-SOFD01-26-28	3/11/2022	10:15:00 PM	
580-111503-4	HTE00.0-SON01-19-21		3/9/2022	11:15:00 AM	
580-111503-5	HTE00.0-SON01-33-35		3/10/2022	9:35:00 AM	
580-111503-6	HTE00.0-SON01-DUP1	HTE00.0-SOFD01-19-21	3/9/2022	11:15:00 AM	
580-111503-7	LTW35.0-SON01-29-31		3/15/2022	9:35:00 AM	
580-111503-8	LTW35.0-SON01-34-36		3/15/2022	10:25:00 AM	
580-111503-9	LTS15.0-SON01-23-25		3/15/2022	4:10:00 PM	
580-111503-10	LTS15.0-SON01-30-31		3/15/2022	4:35:00 PM	
580-111503-11	TB01-SO		3/9/2022	12:00:00 AM	

If you didn't see the email from Jeff Hart, there will be eight more samples for this event arriving there on Tuesday, March 22. I'll send you a chain as soon as I get one.

Peggy

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ANALYTICAL REPORT

Eurofins Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-111720-1

Client Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-
HT-LT

Revision: 2

For:

AECOM
1001 Bishop Street
Honolulu, Hawaii 96813

Attn: Jeff Hart

Kristine D. Allen

Authorized for release by:

7/29/2022 4:30:07 PM

Kristine Allen, Client Service Manager
(253)433-0390

Kristine.Allen@et.eurofinsus.com

Designee for

Elaine Walker, Project Manager II
(253)248-4972

M.Elaine.Walker@et.eurofinsus.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: AECOM

Job ID: 580-111720-1

Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-LT

Job ID: 580-111720-1

Laboratory: Eurofins Seattle

Narrative

CASE NARRATIVE

Client: AECOM

Project: RH Bulk Fuel Storage Facility Site Char. P2-HT-LT

Report Number: 580-111720-1

REVISION 2 July 29, 2022

Report has been revised for 8260B CALUFT results. Chromatographic integrations have been adjusted to forced baseline-baseline integration per Method and SOP.

REVISION 1: APRIL 7, 2022

This revision is to correct the client IDs as follows: sample 580-111720-3 has been updated from LTE35.0-SON01-016.0 to LTN35.0-SON01-016.0, and sample (580-111720-4 has been updated from LTE35.0-SON01-018.0 to LTN35.0-SON01-018.0 per client email. It should be noted that the sample chromatograms and quantitation reports are unable to be updated as they are processed outside of the LIMS. All other forms have been corrected.

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

Following DoD QSM guidelines, manual integrations were performed only when necessary and are in compliance with the laboratory's standard operating procedure, Acceptable Manual Integration Practices, SOP No.: Q-S-002. The reason(s) for manual integration have been documented on the affected chromatogram(s), which is/are provided in the raw data package. The raw data also includes the original chromatogram(s) prior to any manual integration being performed. Manual integrations are detailed in the manual integration summary forms following this narrative.

It should be noted that samples with elevated Limits of Quantitation (LOQs) resulting from a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the LOQs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes within the calibration range of the instrument or that reduces the interferences thereby enabling the quantification of target analytes.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

Nine samples were received on 3/23/2022 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was -2.1° C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

GASOLINE RANGE ORGANICS (GRO)

Samples LTE15.0-SON01-018.0 (580-111720-1), LTE15.0-SON01-026.0 (580-111720-2), LTN35.0-SON01-016.0 (580-111720-3) and LTN35.0-SON01-018.0 (580-111720-4) were analyzed for gasoline range organics (GRO) in accordance with 8260B CALUFT. The samples were prepared and analyzed on 03/28/2022 and 03/29/2022.

The following samples were provided to the laboratory with a significantly different initial weight than that required by the reference method: LTE15.0-SON01-018.0 (580-111720-1), LTE15.0-SON01-026.0 (580-111720-2), LTN35.0-SON01-016.0 (580-111720-3), LTN35.0-SON01-018.0 (580-111720-4), HTN15.0-SON01-006.0 (580-111720-5), HTN15.0-SON01-018.0 (580-111720-6),

Case Narrative

Client: AECOM

Job ID: 580-111720-1

Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-LT

Job ID: 580-111720-1 (Continued)

Laboratory: Eurofins Seattle (Continued)

LTE15.0-SON01-018.0 MS (580-111720-1 MS), LTE15.0-SON01-018.0 MSD (580-111720-1 MSD), LTN35.0-SON01-016.0 MS (580-111720-3 MS), and LTN35.0-SON01-016.0 MSD (580-111720-3 MSD). Deviations in the weight by more than 20% may affect reporting limits and potentially method performance. The method specifies 10g. The amount provided was below this range.

The continuing calibration verification (CCV) associated with batch 580-385449 recovered above the upper control limit for Gasoline Range Organics (GRO)-C6-C10. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated samples are impacted: LTE15.0-SON01-018.0 (580-111720-1), LTE15.0-SON01-026.0 (580-111720-2), (CCV 580-385449/15), (CCV 580-385449/24), (CCVIS 580-385449/4), LTE15.0-SON01-018.0 MS (580-111720-1 MS), and LTE15.0-SON01-018.0 MSD (580-111720-1 MSD).

Gasoline Range Organics (C6-C12) and Gasoline Range Organics (GRO)-C6-C10 failed the recovery criteria high for LCS 580-385440/15-A. Gasoline Range Organics (C6-C12) and Gasoline Range Organics (GRO)-C6-C10 failed the recovery criteria high for LCSD 580-385440/16-A.

Gasoline Range Organics (C6-C12) and Gasoline Range Organics (GRO)-C6-C10 failed the recovery criteria high for the MS of sample LTE15.0-SON01-018.0MS (580-111720-1) in batch 580-385449. Gasoline Range Organics (C6-C12) and Gasoline Range Organics (GRO)-C6-C10 failed the recovery criteria high for the MSD of sample LTE15.0-SON01-018.0MSD (580-111720-1) in batch 580-385449.

Gasoline Range Organics (C6-C12) and Gasoline Range Organics (GRO)-C6-C10 failed the recovery criteria high for the MS of sample LTE35.0-SON01-016.0MS (580-111720-3) in batch 580-385570. Gasoline Range Organics (C6-C12) and Gasoline Range Organics (GRO)-C6-C10 failed the recovery criteria high for the MSD of sample LTN35.0-SON01-016.0MSD (580-111720-3) in batch 580-385570. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

The following samples CCVIS (27.3% and 27.0%), LCS (27% and 28%), and LCSD (25% and 26%) all fail high for Gasoline Range Organics (C6-C12) and Gasoline Range Organics (GRO)-C6-C10
LTE15.0-SON01-018.0 (580-111720-1), LTE15.0-SON01-026.0 (580-111720-2), LTN35.0-SON01-016.0 (580-111720-3), LTN35.0-SON01-018.0 (580-111720-4), (CCVIS 580-385449/4), (LCS 580-385440/15-A), (LCSD 580-385440/16-A), (580-111720-B-1-B MS) and (580-111720-B-1-C MSD)

The following sample was analyzed at reduced volume due to high concentrations of target analytes: LTN35.0-SON01-016.0 (580-111720-3). The calculation was performed using an initial volume adjustment rather than a dilution factor. The reporting limits have been elevated by the appropriate factor.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GASOLINE RANGE ORGANICS (GRO) - TRIP BLANK

Sample Trip Blank (580-111720-9) was analyzed for gasoline range organics (GRO) in accordance with 8260B CALUFT. The sample was analyzed on 03/29/2022.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples LTE15.0-SON01-018.0 (580-111720-1), LTE15.0-SON01-026.0 (580-111720-2), LTN35.0-SON01-016.0 (580-111720-3) and LTN35.0-SON01-018.0 (580-111720-4) were analyzed for volatile organic compounds (GC-MS) in accordance with 8260D_DOD5. The samples were prepared and analyzed on 03/28/2022.

The following samples were provided to the laboratory with a significantly different initial weight than that required by the reference method: LTE15.0-SON01-018.0 (580-111720-1), LTE15.0-SON01-026.0 (580-111720-2), LTN35.0-SON01-016.0 (580-111720-3), LTN35.0-SON01-018.0 (580-111720-4), HTN15.0-SON01-006.0 (580-111720-5), HTN15.0-SON01-018.0 (580-111720-6), LTE15.0-SON01-018.0 MS (580-111720-1 MS), LTE15.0-SON01-018.0 MSD (580-111720-1 MSD), LTN35.0-SON01-016.0 MS (580-111720-3 MS), and LTN35.0-SON01-016.0 MSD (580-111720-3 MSD). Deviations in the weight by more than 20% may affect reporting limits and potentially method performance. The method specifies 10g. The amount provided was below this range.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Case Narrative

Client: AECOM

Job ID: 580-111720-1

Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-LT

Job ID: 580-111720-1 (Continued)

Laboratory: Eurofins Seattle (Continued)

VOLATILE ORGANIC COMPOUNDS (GC-MS) - TRIP BLANK

Sample Trip Blank (580-111720-9) was analyzed for volatile organic compounds (GC-MS) in accordance with 8260D_DOD5. The sample was analyzed on 03/29/2022.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SEMIVOLATILE ORGANIC COMPOUNDS - SELECTED ION MODE (SIM)

Samples LTE15.0-SON01-018.0 (580-111720-1), LTE15.0-SON01-026.0 (580-111720-2), LTN35.0-SON01-016.0 (580-111720-3), LTN35.0-SON01-018.0 (580-111720-4), HTN15.0-SON01-006.0 (580-111720-5), HTN15.0-SON01-018.0 (580-111720-6), HTW35.0-SON01-014.0 (580-111720-7) and HTW35.0-SON01-016.0 (580-111720-8) were analyzed for semivolatile organic compounds - Selected Ion Mode (SIM) in accordance with 8270E SIM. The samples were prepared on 03/29/2022 and analyzed on 03/30/2022.

Sample LTN35.0-SON01-018.0 (580-111720-4)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DIESEL RANGE ORGANICS

Samples LTE15.0-SON01-018.0 (580-111720-1), LTE15.0-SON01-026.0 (580-111720-2), LTN35.0-SON01-016.0 (580-111720-3), LTN35.0-SON01-018.0 (580-111720-4), HTN15.0-SON01-006.0 (580-111720-5), HTN15.0-SON01-018.0 (580-111720-6), HTW35.0-SON01-014.0 (580-111720-7) and HTW35.0-SON01-016.0 (580-111720-8) were analyzed for diesel range organics in accordance with 8015DRO. The samples were prepared on 03/24/2022 and analyzed on 03/27/2022 and 03/28/2022.

C10-C24 and C24-C40 failed the recovery criteria low for the MS of sample LTE15.0-SON01-018.0MS (580-111720-1) in batch 580-385296. C10-C24 and C24-C40 failed the recovery criteria low for the MSD of sample LTE15.0-SON01-018.0MSD (580-111720-1) in batch 580-385296. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount.

Sample LTN35.0-SON01-018.0 (580-111720-4)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PERCENT SOLIDS

Samples LTE15.0-SON01-018.0 (580-111720-1), LTE15.0-SON01-026.0 (580-111720-2), LTN35.0-SON01-016.0 (580-111720-3), LTN35.0-SON01-018.0 (580-111720-4), HTN15.0-SON01-006.0 (580-111720-5), HTN15.0-SON01-018.0 (580-111720-6), HTW35.0-SON01-014.0 (580-111720-7) and HTW35.0-SON01-016.0 (580-111720-8) were analyzed for percent solids in accordance with ASTM D2216. The samples were analyzed on 03/24/2022.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: AECOM

Job ID: 580-111720-1

Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-L

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

GC/MS Semi VOA

Qualifier	Qualifier Description
D	The reported value is from a dilution.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

GC Semi VOA

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
D	The reported value is from a dilution.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points

Eurofins Seattle

Definitions/Glossary

Client: AECOM

Job ID: 580-111720-1

Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-L

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

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Client Sample Results

Client: AECOM
Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-L

Job ID: 580-111720-1

Client Sample ID: LTE15.0-SON01-018.0

Lab Sample ID: 580-111720-1

Date Collected: 03/16/22 10:40

Matrix: Solid

Date Received: 03/23/22 09:30

Percent Solids: 66.8

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO)-C6-C10	9.6	U Q J1	13	4.2	mg/Kg	☆	03/28/22 16:40	03/28/22 21:06	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	94		67 - 134				03/28/22 16:40	03/28/22 21:06	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.048	U	0.064	0.012	mg/Kg	☆	03/28/22 16:40	03/28/22 21:06	1
Toluene	0.096	U	0.19	0.043	mg/Kg	☆	03/28/22 16:40	03/28/22 21:06	1
Ethylbenzene	0.096	U	0.13	0.029	mg/Kg	☆	03/28/22 16:40	03/28/22 21:06	1
m-Xylene & p-Xylene	0.048	U	0.13	0.023	mg/Kg	☆	03/28/22 16:40	03/28/22 21:06	1
o-Xylene	0.048	U	0.13	0.016	mg/Kg	☆	03/28/22 16:40	03/28/22 21:06	1
Xylenes, Total	48	U	130	23	ug/Kg	☆	03/28/22 16:40	03/28/22 21:06	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	98		85 - 116				03/28/22 16:40	03/28/22 21:06	1
4-Bromofluorobenzene (Surr)	94		79 - 119				03/28/22 16:40	03/28/22 21:06	1
Dibromofluoromethane (Surr)	104		78 - 119				03/28/22 16:40	03/28/22 21:06	1
1,2-Dichloroethane-d4 (Surr)	104		71 - 136				03/28/22 16:40	03/28/22 21:06	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	4.8		0.0068	0.00086	mg/Kg	☆	03/29/22 11:46	03/30/22 02:09	1
2-Methylnaphthalene	6.4		0.0068	0.0028	mg/Kg	☆	03/29/22 11:46	03/30/22 02:09	1
Naphthalene	1.8	M	0.0068	0.0022	mg/Kg	☆	03/29/22 11:46	03/30/22 02:09	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	68		28 - 143				03/29/22 11:46	03/30/22 02:09	1
2-methylnaphthalene-d10	83	M	40 - 140				03/29/22 11:46	03/30/22 02:09	1
Fluoranthene-d10 (Surr)	92		40 - 140				03/29/22 11:46	03/30/22 02:09	1
Terphenyl-d14	103		58 - 132				03/29/22 11:46	03/30/22 02:09	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	6600	J1	66	13	mg/Kg	☆	03/24/22 16:12	03/27/22 23:17	1
C24-C40	39	J J1	66	26	mg/Kg	☆	03/24/22 16:12	03/27/22 23:17	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	94		45 - 130				03/24/22 16:12	03/27/22 23:17	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	66.8		0.1	0.1	%			03/24/22 17:20	1
Percent Moisture	33.2		0.1	0.1	%			03/24/22 17:20	1

Client Sample Results

Client: AECOM

Job ID: 580-111720-1

Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-L

Client Sample ID: LTE15.0-SON01-026.0

Lab Sample ID: 580-111720-2

Date Collected: 03/16/22 13:30

Matrix: Solid

Date Received: 03/23/22 09:30

Percent Solids: 76.6

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO)-C6-C10	9.2	U Q	12	4.0	mg/Kg	☆	03/28/22 16:40	03/28/22 22:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	101		67 - 134				03/28/22 16:40	03/28/22 22:38	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.046	U	0.061	0.012	mg/Kg	☆	03/28/22 16:40	03/28/22 22:38	1
Toluene	0.092	U	0.18	0.041	mg/Kg	☆	03/28/22 16:40	03/28/22 22:38	1
Ethylbenzene	0.092	U	0.12	0.028	mg/Kg	☆	03/28/22 16:40	03/28/22 22:38	1
m-Xylene & p-Xylene	0.046	U	0.12	0.022	mg/Kg	☆	03/28/22 16:40	03/28/22 22:38	1
o-Xylene	0.046	U	0.12	0.015	mg/Kg	☆	03/28/22 16:40	03/28/22 22:38	1
Xylenes, Total	46	U	120	22	ug/Kg	☆	03/28/22 16:40	03/28/22 22:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	103		85 - 116				03/28/22 16:40	03/28/22 22:38	1
4-Bromofluorobenzene (Surr)	101		79 - 119				03/28/22 16:40	03/28/22 22:38	1
Dibromofluoromethane (Surr)	105		78 - 119				03/28/22 16:40	03/28/22 22:38	1
1,2-Dichloroethane-d4 (Surr)	108		71 - 136				03/28/22 16:40	03/28/22 22:38	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.38		0.0059	0.00074	mg/Kg	☆	03/29/22 11:46	03/30/22 02:34	1
2-Methylnaphthalene	0.29		0.0059	0.0024	mg/Kg	☆	03/29/22 11:46	03/30/22 02:34	1
Naphthalene	0.077	M	0.0059	0.0019	mg/Kg	☆	03/29/22 11:46	03/30/22 02:34	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	75		28 - 143				03/29/22 11:46	03/30/22 02:34	1
2-methylnaphthalene-d10	86		40 - 140				03/29/22 11:46	03/30/22 02:34	1
Fluoranthene-d10 (Surr)	96		40 - 140				03/29/22 11:46	03/30/22 02:34	1
Terphenyl-d14	107		58 - 132				03/29/22 11:46	03/30/22 02:34	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	46	J	65	13	mg/Kg	☆	03/24/22 16:12	03/28/22 00:18	1
C24-C40	39	U	65	26	mg/Kg	☆	03/24/22 16:12	03/28/22 00:18	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	110		45 - 130				03/24/22 16:12	03/28/22 00:18	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	76.6		0.1	0.1	%			03/24/22 17:20	1
Percent Moisture	23.4		0.1	0.1	%			03/24/22 17:20	1

Client Sample Results

Client: AECOM
Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-L

Job ID: 580-111720-1

Client Sample ID: LTN35.0-SON01-016.0

Lab Sample ID: 580-111720-3

Date Collected: 03/17/22 09:55

Matrix: Solid

Date Received: 03/23/22 09:30

Percent Solids: 91.3

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO)-C6-C10	330	Q	88	29	mg/Kg	☆	03/28/22 16:40	03/28/22 23:01	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	100		67 - 134				03/28/22 16:40	03/28/22 23:01	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.33	U	0.44	0.083	mg/Kg	☆	03/28/22 16:40	03/28/22 23:01	1
Toluene	0.66	U	1.3	0.30	mg/Kg	☆	03/28/22 16:40	03/28/22 23:01	1
Ethylbenzene	0.66	U	0.88	0.20	mg/Kg	☆	03/28/22 16:40	03/28/22 23:01	1
m-Xylene & p-Xylene	0.33	U	0.88	0.16	mg/Kg	☆	03/28/22 16:40	03/28/22 23:01	1
o-Xylene	0.33	U	0.88	0.11	mg/Kg	☆	03/28/22 16:40	03/28/22 23:01	1
Xylenes, Total	330	U	880	160	ug/Kg	☆	03/28/22 16:40	03/28/22 23:01	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	96		85 - 116				03/28/22 16:40	03/28/22 23:01	1
4-Bromofluorobenzene (Surr)	100		79 - 119				03/28/22 16:40	03/28/22 23:01	1
Dibromofluoromethane (Surr)	106		78 - 119				03/28/22 16:40	03/28/22 23:01	1
1,2-Dichloroethane-d4 (Surr)	105	M	71 - 136				03/28/22 16:40	03/28/22 23:01	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.30		0.0050	0.00063	mg/Kg	☆	03/29/22 11:46	03/30/22 02:58	1
2-Methylnaphthalene	0.33		0.0050	0.0020	mg/Kg	☆	03/29/22 11:46	03/30/22 02:58	1
Naphthalene	0.045	M	0.0050	0.0016	mg/Kg	☆	03/29/22 11:46	03/30/22 02:58	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	75		28 - 143				03/29/22 11:46	03/30/22 02:58	1
2-methylnaphthalene-d10	92		40 - 140				03/29/22 11:46	03/30/22 02:58	1
Fluoranthene-d10 (Surr)	101		40 - 140				03/29/22 11:46	03/30/22 02:58	1
Terphenyl-d14	110		58 - 132				03/29/22 11:46	03/30/22 02:58	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	94		51	10	mg/Kg	☆	03/24/22 16:12	03/28/22 00:38	1
C24-C40	210		51	20	mg/Kg	☆	03/24/22 16:12	03/28/22 00:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	105		45 - 130				03/24/22 16:12	03/28/22 00:38	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	91.3		0.1	0.1	%			03/24/22 17:20	1
Percent Moisture	8.7		0.1	0.1	%			03/24/22 17:20	1

Client Sample Results

Client: AECOM

Job ID: 580-111720-1

Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-L

Client Sample ID: LTN35.0-SON01-018.0

Lab Sample ID: 580-111720-4

Date Collected: 03/17/22 10:05

Matrix: Solid

Date Received: 03/23/22 09:30

Percent Solids: 92.5

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO)-C6-C10	62	Q	8.3	2.7	mg/Kg	☆	03/28/22 16:40	03/28/22 23:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	97		67 - 134				03/28/22 16:40	03/28/22 23:24	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.031	U	0.042	0.0079	mg/Kg	☆	03/28/22 16:40	03/28/22 23:24	1
Toluene	0.062	U	0.12	0.028	mg/Kg	☆	03/28/22 16:40	03/28/22 23:24	1
Ethylbenzene	0.062	U	0.083	0.019	mg/Kg	☆	03/28/22 16:40	03/28/22 23:24	1
m-Xylene & p-Xylene	0.031	U	0.083	0.015	mg/Kg	☆	03/28/22 16:40	03/28/22 23:24	1
o-Xylene	0.031	U	0.083	0.010	mg/Kg	☆	03/28/22 16:40	03/28/22 23:24	1
Xylenes, Total	31	U	83	15	ug/Kg	☆	03/28/22 16:40	03/28/22 23:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	95		85 - 116				03/28/22 16:40	03/28/22 23:24	1
4-Bromofluorobenzene (Surr)	97		79 - 119				03/28/22 16:40	03/28/22 23:24	1
Dibromofluoromethane (Surr)	101		78 - 119				03/28/22 16:40	03/28/22 23:24	1
1,2-Dichloroethane-d4 (Surr)	101		71 - 136				03/28/22 16:40	03/28/22 23:24	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.60	D	0.024	0.0030	mg/Kg	☆	03/29/22 11:46	03/30/22 03:22	5
2-Methylnaphthalene	0.71	D	0.024	0.0098	mg/Kg	☆	03/29/22 11:46	03/30/22 03:22	5
Naphthalene	0.13	D M	0.024	0.0078	mg/Kg	☆	03/29/22 11:46	03/30/22 03:22	5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	58		28 - 143				03/29/22 11:46	03/30/22 03:22	5
2-methylnaphthalene-d10	90		40 - 140				03/29/22 11:46	03/30/22 03:22	5
Fluoranthene-d10 (Surr)	101		40 - 140				03/29/22 11:46	03/30/22 03:22	5
Terphenyl-d14	108		58 - 132				03/29/22 11:46	03/30/22 03:22	5

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	350	D	260	52	mg/Kg	☆	03/24/22 16:12	03/28/22 00:58	5
C24-C40	440	D	260	100	mg/Kg	☆	03/24/22 16:12	03/28/22 00:58	5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	92		45 - 130				03/24/22 16:12	03/28/22 00:58	5

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	92.5		0.1	0.1	%			03/24/22 17:20	1
Percent Moisture	7.5		0.1	0.1	%			03/24/22 17:20	1

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Client Sample Results

Client: AECOM
 Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-L

Job ID: 580-111720-1

Client Sample ID: HTN15.0-SON01-006.0

Lab Sample ID: 580-111720-5

Date Collected: 03/16/22 14:25

Matrix: Solid

Date Received: 03/23/22 09:30

Percent Solids: 90.2

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0078	M	0.0052	0.00065	mg/Kg	✱	03/29/22 11:46	03/30/22 03:47	1
2-Methylnaphthalene	0.010		0.0052	0.0021	mg/Kg	✱	03/29/22 11:46	03/30/22 03:47	1
Naphthalene	0.0052	M	0.0052	0.0017	mg/Kg	✱	03/29/22 11:46	03/30/22 03:47	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	82		28 - 143	03/29/22 11:46	03/30/22 03:47	1
2-methylnaphthalene-d10	93		40 - 140	03/29/22 11:46	03/30/22 03:47	1
Fluoranthene-d10 (Surr)	108		40 - 140	03/29/22 11:46	03/30/22 03:47	1
Terphenyl-d14	119		58 - 132	03/29/22 11:46	03/30/22 03:47	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	520		50	9.9	mg/Kg	✱	03/24/22 16:12	03/28/22 01:18	1
C24-C40	760		50	20	mg/Kg	✱	03/24/22 16:12	03/28/22 01:18	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	101		45 - 130	03/24/22 16:12	03/28/22 01:18	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	90.2		0.1	0.1	%			03/24/22 17:20	1
Percent Moisture	9.8		0.1	0.1	%			03/24/22 17:20	1

Client Sample Results

Client: AECOM
 Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-L

Job ID: 580-111720-1

Client Sample ID: HTN15.0-SON01-018.0

Lab Sample ID: 580-111720-6

Date Collected: 03/16/22 15:30

Matrix: Solid

Date Received: 03/23/22 09:30

Percent Solids: 93.8

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0032	J	0.0051	0.00064	mg/Kg	☼	03/29/22 11:46	03/30/22 04:11	1
2-Methylnaphthalene	0.0036	J	0.0051	0.0021	mg/Kg	☼	03/29/22 11:46	03/30/22 04:11	1
Naphthalene	0.0023	J M	0.0051	0.0016	mg/Kg	☼	03/29/22 11:46	03/30/22 04:11	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	84		28 - 143				03/29/22 11:46	03/30/22 04:11	1
2-methylnaphthalene-d10	90		40 - 140				03/29/22 11:46	03/30/22 04:11	1
Fluoranthene-d10 (Surr)	111		40 - 140				03/29/22 11:46	03/30/22 04:11	1
Terphenyl-d14	117	M	58 - 132				03/29/22 11:46	03/30/22 04:11	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	420		47	9.3	mg/Kg	☼	03/24/22 16:12	03/28/22 01:58	1
C24-C40	480		47	19	mg/Kg	☼	03/24/22 16:12	03/28/22 01:58	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	84		45 - 130				03/24/22 16:12	03/28/22 01:58	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	93.8		0.1	0.1	%			03/24/22 17:20	1
Percent Moisture	6.2		0.1	0.1	%			03/24/22 17:20	1

Client Sample Results

Client: AECOM
 Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-L

Job ID: 580-111720-1

Client Sample ID: HTW35.0-SON01-014.0

Lab Sample ID: 580-111720-7

Date Collected: 03/17/22 12:00

Matrix: Solid

Date Received: 03/23/22 09:30

Percent Solids: 84.2

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0076		0.0048	0.00061	mg/Kg	✱	03/29/22 11:46	03/30/22 04:36	1
2-Methylnaphthalene	0.011		0.0048	0.0020	mg/Kg	✱	03/29/22 11:46	03/30/22 04:36	1
Naphthalene	0.013		0.0048	0.0016	mg/Kg	✱	03/29/22 11:46	03/30/22 04:36	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	100		28 - 143	03/29/22 11:46	03/30/22 04:36	1
2-methylnaphthalene-d10	91		40 - 140	03/29/22 11:46	03/30/22 04:36	1
Fluoranthene-d10 (Surr)	104		40 - 140	03/29/22 11:46	03/30/22 04:36	1
Terphenyl-d14	116		58 - 132	03/29/22 11:46	03/30/22 04:36	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	19	J	58	12	mg/Kg	✱	03/24/22 16:12	03/28/22 02:19	1
C24-C40	97		58	23	mg/Kg	✱	03/24/22 16:12	03/28/22 02:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	102		45 - 130	03/24/22 16:12	03/28/22 02:19	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	84.2		0.1	0.1	%			03/24/22 17:20	1
Percent Moisture	15.8		0.1	0.1	%			03/24/22 17:20	1

Client Sample Results

Client: AECOM
 Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-L

Job ID: 580-111720-1

Client Sample ID: HTW35.0-SON01-016.0

Lab Sample ID: 580-111720-8

Date Collected: 03/17/22 12:20

Matrix: Solid

Date Received: 03/23/22 09:30

Percent Solids: 82.0

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0039	J	0.0052	0.00065	mg/Kg	☼	03/29/22 11:46	03/30/22 05:00	1
2-Methylnaphthalene	0.0027	J	0.0052	0.0021	mg/Kg	☼	03/29/22 11:46	03/30/22 05:00	1
Naphthalene	0.0017	J M	0.0052	0.0017	mg/Kg	☼	03/29/22 11:46	03/30/22 05:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	94		28 - 143	03/29/22 11:46	03/30/22 05:00	1
2-methylnaphthalene-d10	91		40 - 140	03/29/22 11:46	03/30/22 05:00	1
Fluoranthene-d10 (Surr)	109		40 - 140	03/29/22 11:46	03/30/22 05:00	1
Terphenyl-d14	119	M	58 - 132	03/29/22 11:46	03/30/22 05:00	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C10-C24	35	U	58	11	mg/Kg	☼	03/24/22 16:12	03/28/22 02:39	1
C24-C40	30	J	58	23	mg/Kg	☼	03/24/22 16:12	03/28/22 02:39	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	106		45 - 130	03/24/22 16:12	03/28/22 02:39	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	82.0		0.1	0.1	%			03/24/22 17:20	1
Percent Moisture	18.0		0.1	0.1	%			03/24/22 17:20	1

Client Sample Results

Client: AECOM

Job ID: 580-111720-1

Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-L

Client Sample ID: Trip Blank

Lab Sample ID: 580-111720-9

Date Collected: 03/17/22 12:00

Matrix: Water

Date Received: 03/23/22 09:30

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO)-C6-C10	0.080	U	0.10	0.031	mg/L			03/29/22 15:46	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	101		69 - 133					03/29/22 15:46	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.50	U	1.0	0.24	ug/L			03/29/22 16:36	1
Toluene	0.80	U	1.0	0.39	ug/L			03/29/22 16:36	1
Ethylbenzene	0.80	U	1.0	0.50	ug/L			03/29/22 16:36	1
m-Xylene & p-Xylene	0.80	U	2.0	0.53	ug/L			03/29/22 16:36	1
o-Xylene	0.80	U	1.0	0.39	ug/L			03/29/22 16:36	1
Xylenes, Total	0.80	U	2.0	0.53	ug/L			03/29/22 16:36	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	96		85 - 114					03/29/22 16:36	1
Toluene-d8 (Surr)	98		89 - 112					03/29/22 16:36	1
Dibromofluoromethane (Surr)	104		80 - 119					03/29/22 16:36	1
1,2-Dichloroethane-d4 (Surr)	108		81 - 118					03/29/22 16:36	1

QC Sample Results

Client: AECOM

Job ID: 580-111720-1

Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-L

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-385440/1-A

Matrix: Solid

Analysis Batch: 385449

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 385440

Analyte	MB MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Gasoline Range Organics (GRO)-C6-C10	3.0	U	4.0	1.3	mg/Kg		03/28/22 16:40	03/28/22 18:02	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
4-Bromofluorobenzene (Surr)	95		67 - 134	03/28/22 16:40	03/28/22 18:02	1

Lab Sample ID: LCS 580-385440/15-A

Matrix: Solid

Analysis Batch: 385449

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 385440

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	Limits
		Result	Qualifier				
Gasoline Range Organics (GRO)-C6-C10	40.0	51.1	Q	mg/Kg		128	79 - 122

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	102		67 - 134

Lab Sample ID: LCSD 580-385440/16-A

Matrix: Solid

Analysis Batch: 385449

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 385440

Analyte	Spike Added	LCSD LCSD		Unit	D	%Rec	Limits	RPD	Limit
		Result	Qualifier						
Gasoline Range Organics (GRO)-C6-C10	40.0	50.3	Q	mg/Kg		126	79 - 122	2	30

Surrogate	LCSD LCSD		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	101		67 - 134

Lab Sample ID: 580-111720-1 MS

Matrix: Solid

Analysis Batch: 385449

Client Sample ID: LTE15.0-SON01-018.0

Prep Type: Total/NA

Prep Batch: 385440

Analyte	Sample Result	Sample Qualifier	Spike Added	MS MS		Unit	D	%Rec	Limits
				Result	Qualifier				
Gasoline Range Organics (GRO)-C6-C10	9.6	U Q J1	128	184	J1	mg/Kg	☼	143	79 - 122

Surrogate	MS MS		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	101		67 - 134

Lab Sample ID: 580-111720-1 MSD

Matrix: Solid

Analysis Batch: 385449

Client Sample ID: LTE15.0-SON01-018.0

Prep Type: Total/NA

Prep Batch: 385440

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD MSD		Unit	D	%Rec	Limits	RPD	Limit
				Result	Qualifier						
Gasoline Range Organics (GRO)-C6-C10	9.6	U Q J1	128	168	J1	mg/Kg	☼	131	79 - 122	9	30

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QC Sample Results

Client: AECOM
 Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-L

Job ID: 580-111720-1

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 580-111720-1 MSD
Matrix: Solid
Analysis Batch: 385449

Client Sample ID: LTE15.0-SON01-018.0
Prep Type: Total/NA
Prep Batch: 385440

Surrogate	MSD		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	102		67 - 134

Lab Sample ID: MB 580-385581/15
Matrix: Water
Analysis Batch: 385581

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Gasoline Range Organics (GRO)-C6-C10	0.080	U	0.10	0.031	mg/L			03/29/22 14:35	1

Surrogate	MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
4-Bromofluorobenzene (Surr)	100		69 - 133		03/29/22 14:35	1

Lab Sample ID: LCS 580-385581/16
Matrix: Water
Analysis Batch: 385581

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Gasoline Range Organics (GRO)-C6-C10	1.00	0.991		mg/L		99	78 - 122

Surrogate	LCS		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	104		69 - 133

Lab Sample ID: LCSD 580-385581/17
Matrix: Water
Analysis Batch: 385581

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD		Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
		Result	Qualifier						
Gasoline Range Organics (GRO)-C6-C10	1.00	0.997		mg/L		100	78 - 122	1	30

Surrogate	LCSD		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	106		69 - 133

Method: 8260D - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 580-385440/1-A
Matrix: Solid
Analysis Batch: 385448

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 385440

Analyte	MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Benzene	0.015	U	0.020	0.0038	mg/Kg		03/28/22 16:40	03/28/22 18:02	1
Toluene	0.030	U	0.060	0.014	mg/Kg		03/28/22 16:40	03/28/22 18:02	1
Ethylbenzene	0.030	U	0.040	0.0091	mg/Kg		03/28/22 16:40	03/28/22 18:02	1
m-Xylene & p-Xylene	0.015	U	0.040	0.0071	mg/Kg		03/28/22 16:40	03/28/22 18:02	1
o-Xylene	0.015	U	0.040	0.0050	mg/Kg		03/28/22 16:40	03/28/22 18:02	1
Xylenes, Total	15	U	40	7.1	ug/Kg		03/28/22 16:40	03/28/22 18:02	1

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QC Sample Results

Client: AECOM

Job ID: 580-111720-1

Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-L

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 580-385440/1-A

Matrix: Solid

Analysis Batch: 385448

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 385440

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
4-Bromofluorobenzene (Surr)	95		79 - 119	03/28/22 16:40	03/28/22 18:02	1
Toluene-d8 (Surr)	99		85 - 116	03/28/22 16:40	03/28/22 18:02	1
Dibromofluoromethane (Surr)	103		78 - 119	03/28/22 16:40	03/28/22 18:02	1
1,2-Dichloroethane-d4 (Surr)	103		71 - 136	03/28/22 16:40	03/28/22 18:02	1

Lab Sample ID: LCS 580-385440/2-A

Matrix: Solid

Analysis Batch: 385448

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 385440

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Benzene	0.800	0.886		mg/Kg		111	77 - 121
Toluene	0.800	0.854		mg/Kg		107	77 - 121
Ethylbenzene	0.800	0.889		mg/Kg		111	76 - 122
m-Xylene & p-Xylene	0.800	0.855		mg/Kg		107	77 - 124
o-Xylene	0.800	0.862	M	mg/Kg		108	77 - 123
Xylenes, Total	1600	1720		ug/Kg		107	78 - 124

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	104		79 - 119
Toluene-d8 (Surr)	100		85 - 116
Dibromofluoromethane (Surr)	110	M	78 - 119
1,2-Dichloroethane-d4 (Surr)	100		71 - 136

Lab Sample ID: LCSD 580-385440/3-A

Matrix: Solid

Analysis Batch: 385448

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 385440

Analyte	Spike Added	LCSD LCSD		Unit	D	%Rec	%Rec Limits	RPD	Limit
		Result	Qualifier						
Benzene	0.800	0.880		mg/Kg		110	77 - 121	1	20
Toluene	0.800	0.844		mg/Kg		105	77 - 121	1	20
Ethylbenzene	0.800	0.874		mg/Kg		109	76 - 122	2	20
m-Xylene & p-Xylene	0.800	0.835		mg/Kg		104	77 - 124	2	20
o-Xylene	0.800	0.841		mg/Kg		105	77 - 123	2	20
Xylenes, Total	1600	1680		ug/Kg		105	78 - 124	2	20

Surrogate	LCSD LCSD		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	102		79 - 119
Toluene-d8 (Surr)	98		85 - 116
Dibromofluoromethane (Surr)	107		78 - 119
1,2-Dichloroethane-d4 (Surr)	100		71 - 136

Lab Sample ID: MB 580-385516/7

Matrix: Water

Analysis Batch: 385516

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Benzene	0.50	U	1.0	0.24	ug/L			03/29/22 14:03	1
Toluene	0.80	U	1.0	0.39	ug/L			03/29/22 14:03	1

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QC Sample Results

Client: AECOM

Job ID: 580-111720-1

Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-L

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 580-385516/7

Client Sample ID: Method Blank

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 385516

Analyte	MB MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Ethylbenzene	0.80	U	1.0	0.50	ug/L			03/29/22 14:03	1
m-Xylene & p-Xylene	0.80	U	2.0	0.53	ug/L			03/29/22 14:03	1
o-Xylene	0.80	U	1.0	0.39	ug/L			03/29/22 14:03	1
Xylenes, Total	0.80	U	2.0	0.53	ug/L			03/29/22 14:03	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
4-Bromofluorobenzene (Surr)	96		85 - 114		03/29/22 14:03	1
Toluene-d8 (Surr)	101		89 - 112		03/29/22 14:03	1
Dibromofluoromethane (Surr)	98		80 - 119		03/29/22 14:03	1
1,2-Dichloroethane-d4 (Surr)	105		81 - 118		03/29/22 14:03	1

Lab Sample ID: LCS 580-385516/4

Client Sample ID: Lab Control Sample

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 385516

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Benzene	5.00	5.57		ug/L		111	79 - 120
Toluene	5.00	5.53		ug/L		111	80 - 121
Ethylbenzene	5.00	6.01	M	ug/L		120	79 - 121
m-Xylene & p-Xylene	5.00	5.77		ug/L		115	80 - 121
o-Xylene	5.00	5.93		ug/L		119	78 - 122
Xylenes, Total	10.0	11.7		ug/L		117	79 - 121

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	99		85 - 114
Toluene-d8 (Surr)	101		89 - 112
Dibromofluoromethane (Surr)	93		80 - 119
1,2-Dichloroethane-d4 (Surr)	97		81 - 118

Lab Sample ID: LCSD 580-385516/5

Client Sample ID: Lab Control Sample Dup

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 385516

Analyte	Spike Added	LCSD LCSD		Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
		Result	Qualifier						
Benzene	5.00	5.54		ug/L		111	79 - 120	1	20
Toluene	5.00	5.48		ug/L		110	80 - 121	1	20
Ethylbenzene	5.00	5.99		ug/L		120	79 - 121	0	20
m-Xylene & p-Xylene	5.00	5.65		ug/L		113	80 - 121	2	20
o-Xylene	5.00	5.87		ug/L		117	78 - 122	1	20
Xylenes, Total	10.0	11.5		ug/L		115	79 - 121	2	20

Surrogate	LCSD LCSD		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	99		85 - 114
Toluene-d8 (Surr)	103		89 - 112
Dibromofluoromethane (Surr)	95		80 - 119
1,2-Dichloroethane-d4 (Surr)	95		81 - 118

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QC Sample Results

Client: AECOM

Job ID: 580-111720-1

Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-L

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 580-385549/1-A

Matrix: Solid

Analysis Batch: 385624

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 385549

Analyte	MB MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1-Methylnaphthalene	0.0015	U	0.0050	0.00063	mg/Kg		03/29/22 11:46	03/29/22 22:53	1
2-Methylnaphthalene	0.0030	U	0.0050	0.0021	mg/Kg		03/29/22 11:46	03/29/22 22:53	1
Naphthalene	0.0040	U M	0.0050	0.0016	mg/Kg		03/29/22 11:46	03/29/22 22:53	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
2,4,6-Tribromophenol	83		28 - 143	03/29/22 11:46	03/29/22 22:53	1
2-methylnaphthalene-d10	92		40 - 140	03/29/22 11:46	03/29/22 22:53	1
Fluoranthene-d10 (Surr)	107		40 - 140	03/29/22 11:46	03/29/22 22:53	1
Terphenyl-d14	121		58 - 132	03/29/22 11:46	03/29/22 22:53	1

Lab Sample ID: LCS 580-385549/2-A

Matrix: Solid

Analysis Batch: 385624

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 385549

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
1-Methylnaphthalene	1.00	0.959		mg/Kg		96	43 - 111
2-Methylnaphthalene	1.00	0.986		mg/Kg		99	39 - 114
Naphthalene	1.00	0.903		mg/Kg		90	38 - 111

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
2,4,6-Tribromophenol	102		28 - 143
2-methylnaphthalene-d10	136		40 - 140
Fluoranthene-d10 (Surr)	101		40 - 140
Terphenyl-d14	113		58 - 132

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 580-385049/1-A

Matrix: Solid

Analysis Batch: 385296

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 385049

Analyte	MB MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
C10-C24	30	U M	50	9.9	mg/Kg		03/24/22 16:12	03/27/22 22:17	1
C24-C40	30	U M	50	20	mg/Kg		03/24/22 16:12	03/27/22 22:17	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
o-Terphenyl	115		45 - 130	03/24/22 16:12	03/27/22 22:17	1

Lab Sample ID: LCS 580-385049/2-A

Matrix: Solid

Analysis Batch: 385296

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 385049

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
C10-C24	500	444		mg/Kg		89	75 - 125
C24-C40	500	413		mg/Kg		83	39 - 106

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QC Sample Results

Client: AECOM

Job ID: 580-111720-1

Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-L

Method: 8015D DRO - Diesel Range Organics (DRO) (GC) (Continued)

Lab Sample ID: LCS 580-385049/2-A
Matrix: Solid
Analysis Batch: 385296

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 385049

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
<i>o</i> -Terphenyl	98		45 - 130

Lab Sample ID: LCSD 580-385049/3-A
Matrix: Solid
Analysis Batch: 385296

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 385049

Analyte	Spike Added	LCSD LCSD		Unit	D	%Rec	%Rec RPD		
		Result	Qualifier				Limits	RPD	Limit
C10-C24	500	465		mg/Kg		93	75 - 125	5	20
C24-C40	500	437		mg/Kg		87	39 - 106	5	20

Surrogate	LCSD LCSD		Limits
	%Recovery	Qualifier	
<i>o</i> -Terphenyl	105		45 - 130

Lab Sample ID: 580-111720-1 MS
Matrix: Solid
Analysis Batch: 385296

Client Sample ID: LTE15.0-SON01-018.0
Prep Type: Total/NA
Prep Batch: 385049

Analyte	Sample		Spike Added	MS MS		Unit	D	%Rec	%Rec		
	Result	Qualifier		Result	Qualifier				Limits	RPD	Limit
C10-C24	6600	J1	648	4280	4	mg/Kg	⊛	-359	75 - 125		
C24-C40	39	J1	648	30.5	J J1	mg/Kg	⊛	-1	39 - 106		

Surrogate	MS MS		Limits
	%Recovery	Qualifier	
<i>o</i> -Terphenyl	90		45 - 130

Lab Sample ID: 580-111720-1 MSD
Matrix: Solid
Analysis Batch: 385296

Client Sample ID: LTE15.0-SON01-018.0
Prep Type: Total/NA
Prep Batch: 385049

Analyte	Sample		Spike Added	MSD MSD		Unit	D	%Rec	%Rec RPD		
	Result	Qualifier		Result	Qualifier				Limits	RPD	Limit
C10-C24	6600	J1	721	4370	4	mg/Kg	⊛	-309	75 - 125	2	20
C24-C40	39	J1	721	31.0	J J1	mg/Kg	⊛	-1	39 - 106	2	20

Surrogate	MSD MSD		Limits
	%Recovery	Qualifier	
<i>o</i> -Terphenyl	99		45 - 130

Lab Chronicle

Client: AECOM

Job ID: 580-111720-1

Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-L

Client Sample ID: LTE15.0-SON01-018.0

Lab Sample ID: 580-111720-1

Date Collected: 03/16/22 10:40

Matrix: Solid

Date Received: 03/23/22 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	385077	03/24/22 17:20	ASL	FGS SEA

Client Sample ID: LTE15.0-SON01-018.0

Lab Sample ID: 580-111720-1

Date Collected: 03/16/22 10:40

Matrix: Solid

Date Received: 03/23/22 09:30

Percent Solids: 66.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			385440	03/28/22 16:40	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	385449	03/28/22 21:06	RJL	FGS SEA
Total/NA	Prep	5035			385440	03/28/22 16:40	JBT	FGS SEA
Total/NA	Analysis	8260D		1	385448	03/28/22 21:06	RJL	FGS SEA
Total/NA	Prep	3546			385549	03/29/22 11:46	TOA	FGS SEA
Total/NA	Analysis	8270E SIM		1	385624	03/30/22 02:09	E1L	FGS SEA
Total/NA	Prep	3546			385049	03/24/22 16:12	DH	FGS SEA
Total/NA	Analysis	8015D DRO		1	385296	03/27/22 23:17	JAE	FGS SEA

Client Sample ID: LTE15.0-SON01-026.0

Lab Sample ID: 580-111720-2

Date Collected: 03/16/22 13:30

Matrix: Solid

Date Received: 03/23/22 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	385077	03/24/22 17:20	ASL	FGS SEA

Client Sample ID: LTE15.0-SON01-026.0

Lab Sample ID: 580-111720-2

Date Collected: 03/16/22 13:30

Matrix: Solid

Date Received: 03/23/22 09:30

Percent Solids: 76.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			385440	03/28/22 16:40	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	385449	03/28/22 22:38	RJL	FGS SEA
Total/NA	Prep	5035			385440	03/28/22 16:40	JBT	FGS SEA
Total/NA	Analysis	8260D		1	385448	03/28/22 22:38	RJL	FGS SEA
Total/NA	Prep	3546			385549	03/29/22 11:46	TOA	FGS SEA
Total/NA	Analysis	8270E SIM		1	385624	03/30/22 02:34	E1L	FGS SEA
Total/NA	Prep	3546			385049	03/24/22 16:12	DH	FGS SEA
Total/NA	Analysis	8015D DRO		1	385296	03/28/22 00:18	JAE	FGS SEA

Client Sample ID: LTN35.0-SON01-016.0

Lab Sample ID: 580-111720-3

Date Collected: 03/17/22 09:55

Matrix: Solid

Date Received: 03/23/22 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	385077	03/24/22 17:20	ASL	FGS SEA

Lab Chronicle

Client: AECOM

Job ID: 580-111720-1

Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-L

Client Sample ID: LTN35.0-SON01-016.0

Lab Sample ID: 580-111720-3

Date Collected: 03/17/22 09:55

Matrix: Solid

Date Received: 03/23/22 09:30

Percent Solids: 91.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			385440	03/28/22 16:40	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	385449	03/28/22 23:01	RJL	FGS SEA
Total/NA	Prep	5035			385440	03/28/22 16:40	JBT	FGS SEA
Total/NA	Analysis	8260D		1	385448	03/28/22 23:01	RJL	FGS SEA
Total/NA	Prep	3546			385549	03/29/22 11:46	TOA	FGS SEA
Total/NA	Analysis	8270E SIM		1	385624	03/30/22 02:58	E1L	FGS SEA
Total/NA	Prep	3546			385049	03/24/22 16:12	DH	FGS SEA
Total/NA	Analysis	8015D DRO		1	385296	03/28/22 00:38	JAE	FGS SEA

Client Sample ID: LTN35.0-SON01-018.0

Lab Sample ID: 580-111720-4

Date Collected: 03/17/22 10:05

Matrix: Solid

Date Received: 03/23/22 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	385077	03/24/22 17:20	ASL	FGS SEA

Client Sample ID: LTN35.0-SON01-018.0

Lab Sample ID: 580-111720-4

Date Collected: 03/17/22 10:05

Matrix: Solid

Date Received: 03/23/22 09:30

Percent Solids: 92.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			385440	03/28/22 16:40	JBT	FGS SEA
Total/NA	Analysis	8260/CALUFT DOD		1	385449	03/28/22 23:24	RJL	FGS SEA
Total/NA	Prep	5035			385440	03/28/22 16:40	JBT	FGS SEA
Total/NA	Analysis	8260D		1	385448	03/28/22 23:24	RJL	FGS SEA
Total/NA	Prep	3546			385549	03/29/22 11:46	TOA	FGS SEA
Total/NA	Analysis	8270E SIM		5	385624	03/30/22 03:22	E1L	FGS SEA
Total/NA	Prep	3546			385049	03/24/22 16:12	DH	FGS SEA
Total/NA	Analysis	8015D DRO		5	385296	03/28/22 00:58	JAE	FGS SEA

Client Sample ID: HTN15.0-SON01-006.0

Lab Sample ID: 580-111720-5

Date Collected: 03/16/22 14:25

Matrix: Solid

Date Received: 03/23/22 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	385077	03/24/22 17:20	ASL	FGS SEA

Client Sample ID: HTN15.0-SON01-006.0

Lab Sample ID: 580-111720-5

Date Collected: 03/16/22 14:25

Matrix: Solid

Date Received: 03/23/22 09:30

Percent Solids: 90.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			385549	03/29/22 11:46	TOA	FGS SEA
Total/NA	Analysis	8270E SIM		1	385624	03/30/22 03:47	E1L	FGS SEA
Total/NA	Prep	3546			385049	03/24/22 16:12	DH	FGS SEA
Total/NA	Analysis	8015D DRO		1	385296	03/28/22 01:18	JAE	FGS SEA

Eurofins Seattle

Lab Chronicle

Client: AECOM

Job ID: 580-111720-1

Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-L

Client Sample ID: HTN15.0-SON01-018.0

Lab Sample ID: 580-111720-6

Date Collected: 03/16/22 15:30

Matrix: Solid

Date Received: 03/23/22 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	385077	03/24/22 17:20	ASL	FGS SEA

Client Sample ID: HTN15.0-SON01-018.0

Lab Sample ID: 580-111720-6

Date Collected: 03/16/22 15:30

Matrix: Solid

Date Received: 03/23/22 09:30

Percent Solids: 93.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			385549	03/29/22 11:46	TOA	FGS SEA
Total/NA	Analysis	8270E SIM		1	385624	03/30/22 04:11	E1L	FGS SEA
Total/NA	Prep	3546			385049	03/24/22 16:12	DH	FGS SEA
Total/NA	Analysis	8015D DRO		1	385296	03/28/22 01:58	JAE	FGS SEA

Client Sample ID: HTW35.0-SON01-014.0

Lab Sample ID: 580-111720-7

Date Collected: 03/17/22 12:00

Matrix: Solid

Date Received: 03/23/22 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	385077	03/24/22 17:20	ASL	FGS SEA

Client Sample ID: HTW35.0-SON01-014.0

Lab Sample ID: 580-111720-7

Date Collected: 03/17/22 12:00

Matrix: Solid

Date Received: 03/23/22 09:30

Percent Solids: 84.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			385549	03/29/22 11:46	TOA	FGS SEA
Total/NA	Analysis	8270E SIM		1	385624	03/30/22 04:36	E1L	FGS SEA
Total/NA	Prep	3546			385049	03/24/22 16:12	DH	FGS SEA
Total/NA	Analysis	8015D DRO		1	385296	03/28/22 02:19	JAE	FGS SEA

Client Sample ID: HTW35.0-SON01-016.0

Lab Sample ID: 580-111720-8

Date Collected: 03/17/22 12:20

Matrix: Solid

Date Received: 03/23/22 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	2540G		1	385077	03/24/22 17:20	ASL	FGS SEA

Client Sample ID: HTW35.0-SON01-016.0

Lab Sample ID: 580-111720-8

Date Collected: 03/17/22 12:20

Matrix: Solid

Date Received: 03/23/22 09:30

Percent Solids: 82.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			385549	03/29/22 11:46	TOA	FGS SEA
Total/NA	Analysis	8270E SIM		1	385624	03/30/22 05:00	E1L	FGS SEA
Total/NA	Prep	3546			385049	03/24/22 16:12	DH	FGS SEA
Total/NA	Analysis	8015D DRO		1	385296	03/28/22 02:39	JAE	FGS SEA

Eurofins Seattle

Lab Chronicle

Client: AECOM

Job ID: 580-111720-1

Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-L

Client Sample ID: Trip Blank

Lab Sample ID: 580-111720-9

Date Collected: 03/17/22 12:00

Matrix: Water

Date Received: 03/23/22 09:30

<u>Prep Type</u>	<u>Batch Type</u>	<u>Batch Method</u>	<u>Run</u>	<u>Dilution Factor</u>	<u>Batch Number</u>	<u>Prepared or Analyzed</u>	<u>Analyst</u>	<u>Lab</u>
Total/NA	Analysis	8260/CALUFT DOD		1	385581	03/29/22 15:46	BNM	FGS SEA
Total/NA	Analysis	8260D		1	385516	03/29/22 16:36	BNM	FGS SEA

Laboratory References:

FGS SEA = Eurofins Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310



Accreditation/Certification Summary

Client: AECOM

Job ID: 580-111720-1

Project/Site: RH Bulk Fuel Storage Facility Site Char. P2-HT-L

Laboratory: Eurofins Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2236	01-19-25

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
2540G		Solid	Percent Moisture
2540G		Solid	Percent Solids

1

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Sample Summary

Client: AECOM

Job ID: 580-111720-1

Project/Site: RH Bulk Fuel Storage Facility Site Char.
P2-HT-LT

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-111720-1	LTE15.0-SON01-018.0	Solid	03/16/22 10:40	03/23/22 09:30
580-111720-2	LTE15.0-SON01-026.0	Solid	03/16/22 13:30	03/23/22 09:30
580-111720-3	LTN35.0-SON01-016.0	Solid	03/17/22 09:55	03/23/22 09:30
580-111720-4	LTN35.0-SON01-018.0	Solid	03/17/22 10:05	03/23/22 09:30
580-111720-5	HTN15.0-SON01-006.0	Solid	03/16/22 14:25	03/23/22 09:30
580-111720-6	HTN15.0-SON01-018.0	Solid	03/16/22 15:30	03/23/22 09:30
580-111720-7	HTW35.0-SON01-014.0	Solid	03/17/22 12:00	03/23/22 09:30
580-111720-8	HTW35.0-SON01-016.0	Solid	03/17/22 12:20	03/23/22 09:30
580-111720-9	Trip Blank	Water	03/17/22 12:00	03/23/22 09:30

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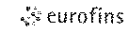


580-111720 Chain of Custody

Eurofins-Seattle

5755 8th St E
Tacoma, WA 98424
Phone : 253-248-4972

Chain of Custody Record



Environment Testing
America

Client Information		Sampler: Ethan House		Lab PM: Elaine Walker		Carrier Tracking No(s):		COC No: 1-44641									
Client Contact: Jeff Hart/ Peggy Schuler		Phone: 720 884-7404		E-Mail: M.Elaine.Walker@EurofinsET.com		State of Origin:		Page: Page 1 of 1									
Company: AECOM-Honolulu		PWSID:		Analysis Requested						Job #:							
Address: AECOM-Honolulu		Due Date Requested:															
City: 1001 Bishop Street, ASB Tower, Suite 1600		TAT Requested (days): 4		Field Filled Sample (Yes or No)		Platform #/S/MSD (Yes or No)		Total Number of Containers		Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2OAS E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - Methanol							
State, Zip: Honolulu, Hawaii, 96813		Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No															
Phone: 720 884-7404		PO #: Purchase Order Requested		BTEX, TPH-g, 8260D/5035B		N,1MIN,2MIN TPH-d/o, 8270D SIMI/3550C 8015C/3550C		BTEX, TPH-g, SW-846 8260D/		N,1MIN,2MIN, SW-846 8270E/3510C		TPH-d/o, 8015C					
Email: jeff.hart@aecom.com/ peggy.schuler@aecom.com		WO #:															
Project Name: Site Char, P2 HT-LT		Project #:		SSOW#:													
Site: Red Hill Bulk Fuel Storage Facility																	
Sample Identification		Sample Date		Sample Time		Sample Type (C=Comp, G=grab)		Matrix (WG=Groundwater, SO=soil, PR=product, QS=Soil vapor)		Field Filled Sample (Yes or No)		Platform #/S/MSD (Yes or No)		Total Number of Containers		Special Instructions/Note:	
1 LTE15.0-SON01-018.0		3/16/22		10:40:00 AM		GRB		SO									
2 LTE15.0-SON01-026.0		3/16/22		1:30:00 PM		GRB		SO									
3 LTN35.0-SON01-016.0		3/17/22		9:55:00 AM		GRB		SO									
4 LTN35.0-SON01-018.0		3/17/22		10:05:00 AM		GRB		SO									
5 HTN15.0-SON01-006.0		3/16/22		2:25:00 PM		GRB		SO									
6 HTN15.0-SON01-018.0		3/16/22		3:30:00 PM		GRB		SO									
7 HTW35.0-SON01-014.0		3/17/22		12:00:00 PM		GRB		SO									
8 HTW35.0-SON01-016.0		3/17/22		12:20:00 PM		GRB		SO									
9 Trip Blank		3/17/22		12:00:00 PM		GRB		QC									
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months											
Deliverable Requested: I, II, III, IV, Other (specify)						Special Instructions/QC Requirements:											
Empty Kit Relinquished by:				Date:		Time:		Method of Shipment:									
Relinquished by: <i>AE</i>		Date/Time: <i>3/22/22 1158</i>		Company: <i>AECOM</i>		Received by: <i>Alex Edwards</i>		Date/Time: <i>3/22/22 1158</i>		Company: <i>AECOM</i>							
Relinquished by: <i>Alex Edwards</i>		Date/Time: <i>3/22/22 1440</i>		Company: <i>AECOM</i>		Received by: <i>Alex Edwards</i>		Date/Time: <i>3/23/22 930</i>		Company: <i>ETGS</i>							
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: <i>IR 8 -2.1/-1.9</i>													

Lg Red/wet/Bub

Fedex PD w/CS

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-111720-1

Login Number: 111720

List Number: 1

Creator: Greene, Ashton R

List Source: Eurofins Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Walker, M Elaine

From: Hart, Jeff <Jeff.Hart@aecom.com>
Sent: Tuesday, March 29, 2022 11:03 AM
To: Walker, M Elaine
Cc: Schuler, Peggy; Ramos, Alethea
Subject: RE: VOA samples with no methanol in them for job 580-111720-1

EXTERNAL EMAIL*

Hi Elaine.

I am not sure why there was no methanol in the voas. Please cancel the 8015 CALUFT and BTEX 8260 for those samples. We will not be able to resample.

Good news is BTEX and GRO has been nondetect or very low in these samples and the TPH-d and PAHs are the drivers. Please complete those analyses on schedule.

Thanks you!

Respectfully,
Jeff Hart
AECOM Technical Services
D +1-281-543-7636
jeff.hart@aecom.com

AECOM
1001 Bishop St
Honolulu, HI 96813, USA

From: Walker, M Elaine <M.Elaine.Walker@Eurofinset.com>
Sent: Tuesday, March 29, 2022 7:32 AM
To: Hart, Jeff <Jeff.Hart@aecom.com>
Cc: Schuler, Peggy <peggy.schuler@aecom.com>; Ramos, Alethea <alethea.ramos@aecom.com>
Subject: [EXTERNAL] FW: VOA samples with no methanol in them for job 580-111720-1
Importance: High

Good morning,

I am following up on the email I sent yesterday. I have to cancel the GRO and VOC on these samples as there was no methanol present. Are you able to recollect?

Thanks,
M. Elaine Walker

Direct: +1 253-248-4972

Email: M.Elaine.Walker@EurofinsET.com

Follow us! [Facebook](#) | [LinkedIn](#)

From: Walker, M Elaine

Sent: Monday, March 28, 2022 5:48 PM

To: Hart, Jeff <Jeff.Hart@aecom.com>; Schuler, Peggy <peggy.schuler@aecom.com>

Cc: Ramos, Alethea <alethea.amos@aecom.com>

Subject: VOA samples with no methanol in them for job 580-111720-1

Importance: High

Good afternoon,

Please see attached COC. Samples 5-8 did not have any methanol in the samples, so we are unable to run the 8260D VOCs or the 8260CALUFT GRO analyses. Samples were collected on 3/16 and 3/17. These are the HTN and HTW samples.

Thanks,

M. Elaine Walker

Project Manager II

Eurofins Environment Testing Northwest

5755 8th Street East

Tacoma, WA 98424

Direct: +1 253-248-4972

Mobile: +1 303-725-4557

M.Elaine.Walker@EurofinsET.com

www.EurofinsUS.com/env

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ANALYTICAL REPORT

Eurofins Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-112198-2

Client Project/Site: RH Site Characterization JBPHH N62742-17
Revision: 1

For:
AECOM
1001 Bishop Street
Honolulu, Hawaii 96813

Attn: Jeff Hart

Kristine D. Allen

Authorized for release by:

8/1/2022 2:03:16 PM

Kristine Allen, Client Service Manager
(253)433-0390

Kristine.Allen@et.eurofinsus.com

Designee for

Elaine Walker, Project Manager II
(253)248-4972

M.Elaine.Walker@et.eurofinsus.com

LINKS

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results through



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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Case Narrative

Client: AECOM
Project/Site: RH Site Characterization JBPHH N62742-17

Job ID: 580-112198-2

Job ID: 580-112198-2

Laboratory: Eurofins Seattle

Narrative

CASE NARRATIVE

Client: AECOM

Project: RH Site Characterization JBPHH N62742-17

Report Number: 580-112198-2

Revision 1 - August 1, 2022

Report has been revised for 8260B CA LUFT GRO results. Chromatographic integrations have been adjusted to forced baseline-baseline integration per Method and SOP.

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

Following DoD QSM guidelines, manual integrations were performed only when necessary and are in compliance with the laboratory's standard operating procedure, Acceptable Manual Integration Practices, SOP No.: Q-S-002. The reason(s) for manual integration have been documented on the affected chromatogram(s), which is/are provided in the raw data package. The raw data also includes the original chromatogram(s) prior to any manual integration being performed. Manual integrations are detailed in the manual integration summary forms following this narrative.

It should be noted that samples with elevated Limits of Quantitation (LOQs) resulting from a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the LOQs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes within the calibration range of the instrument or that reduces the interferences thereby enabling the quantification of target analytes.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 4/5/2022 9:50 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 1.6° C, 2.3° C and 4.4° C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

GASOLINE RANGE ORGANICS (GRO)

Samples HTE00.0-WGN02-031.0 (580-112198-7), LTW35.0-WGN02-028.0 (580-112198-8), LTW35.0-WGFD02-028.0 (580-112198-9), LTE00.0-WGN02-030.0 (580-112198-10) and Trip Blank-1 (580-112198-11) were analyzed for gasoline range organics (GRO) in accordance with 8260B CALUFT. The samples were analyzed on 04/09/2022.

The CCV recovery for Gasoline Range Organics (GRO)-C6-C10 failed outside the limits of recovery at -20.3%. This rounds into an acceptable -20%; therefore re-analysis was not needed. LTW35.0-WGN02-028.0 (580-112198-8), LTW35.0-WGFD02-028.0 (580-112198-9), LTE00.0-WGN02-030.0 (580-112198-10) and (CCV 580-386909/30).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples HTE00.0-WGN02-031.0 (580-112198-7), LTW35.0-WGN02-028.0 (580-112198-8), LTW35.0-WGFD02-028.0 (580-112198-9), LTE00.0-WGN02-030.0 (580-112198-10) and Trip Blank-1 (580-112198-11) were analyzed for volatile organic compounds (GC-MS) in

Case Narrative

Client: AECOM
Project/Site: RH Site Characterization JBPHH N62742-17

Job ID: 580-112198-2

Job ID: 580-112198-2 (Continued)

Laboratory: Eurofins Seattle (Continued)

accordance with 8260D_DOD5. The samples were analyzed on 04/09/2022.

The continuing calibration verification (CCV) associated with batch 580-386906 recovered above the upper control limit for o-Xylene. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated samples are impacted: HTE00.0-WGN02-031.0 (580-112198-7), LTW35.0-WGN02-028.0 (580-112198-8), LTW35.0-WGFD02-028.0 (580-112198-9), LTE00.0-WGN02-030.0 (580-112198-10), Trip Blank-1 (580-112198-11) and (CCVIS 580-386906/3).

Toluene failed the recovery criteria high for LCS 580-386906/6. Toluene failed the recovery criteria high for LCSD 580-386906/7. The analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

SEMIVOLATILE ORGANIC COMPOUNDS (GC-MS - SIM)

Samples HTE00.0-WGN02-031.0 (580-112198-7), LTW35.0-WGN02-028.0 (580-112198-8), LTW35.0-WGFD02-028.0 (580-112198-9) and LTE00.0-WGN02-030.0 (580-112198-10) were analyzed for semivolatile organic compounds (GC-MS - SIM) in accordance with 8270E SIM. The samples were prepared on 04/08/2022 and analyzed on 04/09/2022.

1-Methylnaphthalene was detected in method blank MB 580-386864/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. This target analyte concentration was less than half the reporting limit therefore, re-extraction and/or re-analysis of samples was not performed.

Due to sample matrix effect on the internal standard (ISTD), a dilution was required for the following samples: LTW35.0-WGN02-028.0 (580-112198-8) and LTW35.0-WGFD02-028.0 (580-112198-9). The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DIESEL RANGE ORGANICS

Samples HTE00.0-WGN02-031.0 (580-112198-7), LTW35.0-WGN02-028.0 (580-112198-8), LTW35.0-WGFD02-028.0 (580-112198-9) and LTE00.0-WGN02-030.0 (580-112198-10) were analyzed for Diesel Range Organics in accordance with 8015D DRO. The samples were prepared on 04/08/2022 and analyzed on 04/13/2022.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: AECOM
Project/Site: RH Site Characterization JBPHH N62742-17

Job ID: 580-112198-2

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

GC Semi VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client Sample Results

Client: AECOM
Project/Site: RH Site Characterization JBPHH N62742-17

Job ID: 580-112198-2

Client Sample ID: HTE00.0-WGN02-031.0

Lab Sample ID: 580-112198-7

Date Collected: 04/01/22 18:00

Matrix: Water

Date Received: 04/05/22 09:50

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO)-C6-C10	0.065	J M	0.10	0.031	mg/L			04/09/22 07:03	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	87		69 - 133					04/09/22 07:03	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.38	J	1.0	0.24	ug/L			04/09/22 07:03	1
Toluene	0.80	U Q	1.0	0.39	ug/L			04/09/22 07:03	1
Ethylbenzene	0.55	J	1.0	0.50	ug/L			04/09/22 07:03	1
m-Xylene & p-Xylene	0.80	U	2.0	0.53	ug/L			04/09/22 07:03	1
o-Xylene	0.80	U Q	1.0	0.39	ug/L			04/09/22 07:03	1
Xylenes, Total	0.80	U	2.0	0.53	ug/L			04/09/22 07:03	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	87		85 - 114					04/09/22 07:03	1
Toluene-d8 (Surr)	104		89 - 112					04/09/22 07:03	1
Dibromofluoromethane (Surr)	85		80 - 119					04/09/22 07:03	1
1,2-Dichloroethane-d4 (Surr)	91		81 - 118					04/09/22 07:03	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.49		0.11	0.020	ug/L		04/08/22 11:35	04/09/22 09:08	1
2-Methylnaphthalene	0.086	U	0.22	0.042	ug/L		04/08/22 11:35	04/09/22 09:08	1
Naphthalene	0.17	M	0.11	0.033	ug/L		04/08/22 11:35	04/09/22 09:08	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	58		46 - 122				04/08/22 11:35	04/09/22 09:08	1
2-methylnaphthalene-d10	53		40 - 140				04/08/22 11:35	04/09/22 09:08	1
Fluoranthene-d10 (Surr)	79		40 - 140				04/08/22 11:35	04/09/22 09:08	1
Terphenyl-d14	92		58 - 132				04/08/22 11:35	04/09/22 09:08	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C24-C40	490		360	180	ug/L		04/08/22 10:03	04/13/22 13:00	1
C10-C24	490		110	66	ug/L		04/08/22 10:03	04/13/22 13:00	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	75		56 - 125				04/08/22 10:03	04/13/22 13:00	1

Client Sample Results

Client: AECOM
Project/Site: RH Site Characterization JBPHH N62742-17

Job ID: 580-112198-2

Client Sample ID: LTW35.0-WGN02-028.0

Lab Sample ID: 580-112198-8

Date Collected: 04/01/22 17:50

Matrix: Water

Date Received: 04/05/22 09:50

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO)-C6-C10	0.038	J M	0.10	0.031	mg/L			04/09/22 07:50	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	89		69 - 133					04/09/22 07:50	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.94	J	1.0	0.24	ug/L			04/09/22 07:50	1
Toluene	0.80	U Q M	1.0	0.39	ug/L			04/09/22 07:50	1
Ethylbenzene	3.2		1.0	0.50	ug/L			04/09/22 07:50	1
m-Xylene & p-Xylene	0.80	U M	2.0	0.53	ug/L			04/09/22 07:50	1
o-Xylene	0.74	J Q	1.0	0.39	ug/L			04/09/22 07:50	1
Xylenes, Total	0.74	J	2.0	0.53	ug/L			04/09/22 07:50	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	89		85 - 114					04/09/22 07:50	1
Toluene-d8 (Surr)	101		89 - 112					04/09/22 07:50	1
Dibromofluoromethane (Surr)	90		80 - 119					04/09/22 07:50	1
1,2-Dichloroethane-d4 (Surr)	92		81 - 118					04/09/22 07:50	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	24		0.10	0.020	ug/L		04/08/22 11:35	04/09/22 09:32	1
2-Methylnaphthalene	16		0.21	0.041	ug/L		04/08/22 11:35	04/09/22 09:32	1
Naphthalene	14		0.10	0.032	ug/L		04/08/22 11:35	04/09/22 09:32	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	60		40 - 140				04/08/22 11:35	04/09/22 09:32	1
Fluoranthene-d10 (Surr)	84		40 - 140				04/08/22 11:35	04/09/22 09:32	1
Terphenyl-d14	97		58 - 132				04/08/22 11:35	04/09/22 09:32	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) - DL

Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	93	M	46 - 122				04/08/22 11:35	04/09/22 20:40	50

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C24-C40	310	J	360	180	ug/L		04/08/22 10:03	04/13/22 13:20	1
C10-C24	3400		110	66	ug/L		04/08/22 10:03	04/13/22 13:20	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	72		56 - 125				04/08/22 10:03	04/13/22 13:20	1

Client Sample Results

Client: AECOM
Project/Site: RH Site Characterization JBPHH N62742-17

Job ID: 580-112198-2

Client Sample ID: LTW35.0-WGFD02-028.0

Lab Sample ID: 580-112198-9

Date Collected: 04/01/22 17:50

Matrix: Water

Date Received: 04/05/22 09:50

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO)-C6-C10	0.037	J M	0.10	0.031	mg/L			04/09/22 08:14	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	91		69 - 133					04/09/22 08:14	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.96	J	1.0	0.24	ug/L			04/09/22 08:14	1
Toluene	0.80	U Q M	1.0	0.39	ug/L			04/09/22 08:14	1
Ethylbenzene	3.1		1.0	0.50	ug/L			04/09/22 08:14	1
m-Xylene & p-Xylene	0.80	U M	2.0	0.53	ug/L			04/09/22 08:14	1
o-Xylene	0.80	U Q M	1.0	0.39	ug/L			04/09/22 08:14	1
Xylenes, Total	0.80	U	2.0	0.53	ug/L			04/09/22 08:14	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	91		85 - 114					04/09/22 08:14	1
Toluene-d8 (Surr)	101		89 - 112					04/09/22 08:14	1
Dibromofluoromethane (Surr)	92		80 - 119					04/09/22 08:14	1
1,2-Dichloroethane-d4 (Surr)	93		81 - 118					04/09/22 08:14	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	22		0.11	0.020	ug/L		04/08/22 11:35	04/09/22 09:56	1
2-Methylnaphthalene	14		0.21	0.042	ug/L		04/08/22 11:35	04/09/22 09:56	1
Naphthalene	12		0.11	0.033	ug/L		04/08/22 11:35	04/09/22 09:56	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	50		40 - 140				04/08/22 11:35	04/09/22 09:56	1
Fluoranthene-d10 (Surr)	78		40 - 140				04/08/22 11:35	04/09/22 09:56	1
Terphenyl-d14	90		58 - 132				04/08/22 11:35	04/09/22 09:56	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) - DL

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	90	M	46 - 122	04/08/22 11:35	04/09/22 21:05	50

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C24-C40	820		390	200	ug/L		04/08/22 10:03	04/13/22 13:39	1
C10-C24	3900		120	72	ug/L		04/08/22 10:03	04/13/22 13:39	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	78		56 - 125				04/08/22 10:03	04/13/22 13:39	1

Client Sample Results

Client: AECOM
Project/Site: RH Site Characterization JBPHH N62742-17

Job ID: 580-112198-2

Client Sample ID: LTE00.0-WGN02-030.0

Lab Sample ID: 580-112198-10

Date Collected: 04/01/22 16:45

Matrix: Water

Date Received: 04/05/22 09:50

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO)-C6-C10	0.080	U	0.10	0.031	mg/L			04/09/22 08:37	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	88		69 - 133					04/09/22 08:37	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.50	U M	1.0	0.24	ug/L			04/09/22 08:37	1
Toluene	0.80	U Q M	1.0	0.39	ug/L			04/09/22 08:37	1
Ethylbenzene	0.80	U M	1.0	0.50	ug/L			04/09/22 08:37	1
m-Xylene & p-Xylene	0.80	U M	2.0	0.53	ug/L			04/09/22 08:37	1
o-Xylene	0.80	U Q M	1.0	0.39	ug/L			04/09/22 08:37	1
Xylenes, Total	0.80	U	2.0	0.53	ug/L			04/09/22 08:37	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	88		85 - 114					04/09/22 08:37	1
Toluene-d8 (Surr)	104		89 - 112					04/09/22 08:37	1
Dibromofluoromethane (Surr)	86		80 - 119					04/09/22 08:37	1
1,2-Dichloroethane-d4 (Surr)	90		81 - 118					04/09/22 08:37	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.10	J	0.11	0.021	ug/L		04/08/22 11:35	04/09/22 10:20	1
2-Methylnaphthalene	0.15	J	0.22	0.044	ug/L		04/08/22 11:35	04/09/22 10:20	1
Naphthalene	0.090	J M	0.11	0.035	ug/L		04/08/22 11:35	04/09/22 10:20	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	72		46 - 122				04/08/22 11:35	04/09/22 10:20	1
2-methylnaphthalene-d10	54		40 - 140				04/08/22 11:35	04/09/22 10:20	1
Fluoranthene-d10 (Surr)	81		40 - 140				04/08/22 11:35	04/09/22 10:20	1
Terphenyl-d14	88		58 - 132				04/08/22 11:35	04/09/22 10:20	1

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C24-C40	400		370	190	ug/L		04/08/22 10:03	04/13/22 13:58	1
C10-C24	190		110	68	ug/L		04/08/22 10:03	04/13/22 13:58	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	78		56 - 125				04/08/22 10:03	04/13/22 13:58	1

Client Sample Results

Client: AECOM
 Project/Site: RH Site Characterization JBPHH N62742-17

Job ID: 580-112198-2

Client Sample ID: Trip Blank-1

Lab Sample ID: 580-112198-11

Date Collected: 03/31/22 00:00

Matrix: Water

Date Received: 04/05/22 09:50

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO)-C6-C10	0.080	U	0.10	0.031	mg/L			04/09/22 01:32	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	85		69 - 133					04/09/22 01:32	1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.50	U M	1.0	0.24	ug/L			04/09/22 01:32	1
Toluene	0.80	U Q M	1.0	0.39	ug/L			04/09/22 01:32	1
Ethylbenzene	0.80	U M	1.0	0.50	ug/L			04/09/22 01:32	1
m-Xylene & p-Xylene	0.80	U M	2.0	0.53	ug/L			04/09/22 01:32	1
o-Xylene	0.80	U Q M	1.0	0.39	ug/L			04/09/22 01:32	1
Xylenes, Total	0.80	U	2.0	0.53	ug/L			04/09/22 01:32	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	85		85 - 114					04/09/22 01:32	1
Toluene-d8 (Surr)	102		89 - 112					04/09/22 01:32	1
Dibromofluoromethane (Surr)	91		80 - 119					04/09/22 01:32	1
1,2-Dichloroethane-d4 (Surr)	90		81 - 118					04/09/22 01:32	1

QC Sample Results

Client: AECOM
Project/Site: RH Site Characterization JBPHH N62742-17

Job ID: 580-112198-2

Method: 8260/CALUFT DOD - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-386909/5
Matrix: Water
Analysis Batch: 386909

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO)-C6-C10	0.080	U	0.10	0.031	mg/L			04/08/22 23:11	1
Surrogate	%Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	85		69 - 133					04/08/22 23:11	1

Lab Sample ID: LCS 580-386909/8
Matrix: Water
Analysis Batch: 386909

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Gasoline Range Organics (GRO)-C6-C10	1.00	0.879		mg/L		88	78 - 122		
Surrogate	LCS %Recovery		LCS Qualifier	Limits					
4-Bromofluorobenzene (Surr)	95			69 - 133					

Lab Sample ID: LCSD 580-386909/9
Matrix: Water
Analysis Batch: 386909

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Gasoline Range Organics (GRO)-C6-C10	1.00	0.892		mg/L		89	78 - 122	1	30
Surrogate	LCSD %Recovery		LCSD Qualifier	Limits					
4-Bromofluorobenzene (Surr)	94			69 - 133					

Method: 8260D - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 580-386906/5
Matrix: Water
Analysis Batch: 386906

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.50	U M	1.0	0.24	ug/L			04/08/22 23:11	1
Toluene	0.80	U M	1.0	0.39	ug/L			04/08/22 23:11	1
Ethylbenzene	0.80	U M	1.0	0.50	ug/L			04/08/22 23:11	1
m-Xylene & p-Xylene	0.80	U M	2.0	0.53	ug/L			04/08/22 23:11	1
o-Xylene	0.80	U M	1.0	0.39	ug/L			04/08/22 23:11	1
Xylenes, Total	0.80	U	2.0	0.53	ug/L			04/08/22 23:11	1
Surrogate	%Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	85		85 - 114					04/08/22 23:11	1
Toluene-d8 (Surr)	101		89 - 112					04/08/22 23:11	1
Dibromofluoromethane (Surr)	87		80 - 119					04/08/22 23:11	1
1,2-Dichloroethane-d4 (Surr)	92		81 - 118					04/08/22 23:11	1

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QC Sample Results

Client: AECOM
Project/Site: RH Site Characterization JBPHH N62742-17

Job ID: 580-112198-2

Method: 8260D - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 580-386906/6
Matrix: Water
Analysis Batch: 386906

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	10.0	12.0		ug/L		120	79 - 120
Toluene	10.0	12.3	M Q	ug/L		123	80 - 121
Ethylbenzene	10.0	12.0	M	ug/L		120	79 - 121
m-Xylene & p-Xylene	10.0	11.9		ug/L		119	80 - 121
o-Xylene	10.0	12.1		ug/L		121	78 - 122
Xylenes, Total	20.0	24.0		ug/L		120	79 - 121

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	92		85 - 114
Toluene-d8 (Surr)	103		89 - 112
Dibromofluoromethane (Surr)	90		80 - 119
1,2-Dichloroethane-d4 (Surr)	96		81 - 118

Lab Sample ID: LCSD 580-386906/7
Matrix: Water
Analysis Batch: 386906

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Benzene	10.0	11.5		ug/L		115	79 - 120	4	20
Toluene	10.0	12.3	Q	ug/L		123	80 - 121	0	20
Ethylbenzene	10.0	12.0		ug/L		120	79 - 121	0	20
m-Xylene & p-Xylene	10.0	11.8		ug/L		118	80 - 121	1	20
o-Xylene	10.0	12.2	M	ug/L		122	78 - 122	1	20
Xylenes, Total	20.0	24.0		ug/L		120	79 - 121	0	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	94		85 - 114
Toluene-d8 (Surr)	104		89 - 112
Dibromofluoromethane (Surr)	87		80 - 119
1,2-Dichloroethane-d4 (Surr)	89		81 - 118

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 580-386864/1-A
Matrix: Water
Analysis Batch: 386961

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 386864

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0255	J	0.10	0.019	ug/L		04/08/22 11:35	04/09/22 02:43	1
2-Methylnaphthalene	0.080	U	0.20	0.039	ug/L		04/08/22 11:35	04/09/22 02:43	1
Naphthalene	0.080	U M	0.10	0.031	ug/L		04/08/22 11:35	04/09/22 02:43	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	79		46 - 122	04/08/22 11:35	04/09/22 02:43	1
2-methylnaphthalene-d10	64		40 - 140	04/08/22 11:35	04/09/22 02:43	1
Fluoranthene-d10 (Surr)	92		40 - 140	04/08/22 11:35	04/09/22 02:43	1
Terphenyl-d14	105		58 - 132	04/08/22 11:35	04/09/22 02:43	1

Eurofins Seattle

QC Sample Results

Client: AECOM
Project/Site: RH Site Characterization JBPHH N62742-17

Job ID: 580-112198-2

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCS 580-386864/2-A
Matrix: Water
Analysis Batch: 386961

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 386864

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits	
							Lower	Upper
1-Methylnaphthalene	4.00	2.41		ug/L		60	41	115
2-Methylnaphthalene	4.00	2.35		ug/L		59	39	114
Naphthalene	4.00	2.31		ug/L		58	43	114

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
2,4,6-Tribromophenol	90		46 - 122
2-methylnaphthalene-d10	70		40 - 140
Fluoranthene-d10 (Surr)	93		40 - 140
Terphenyl-d14	105		58 - 132

Lab Sample ID: LCSD 580-386864/3-A
Matrix: Water
Analysis Batch: 386961

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 386864

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits		RPD Limit	
							Lower	Upper	RPD	Limit
1-Methylnaphthalene	4.00	2.37		ug/L		59	41	115	2	20
2-Methylnaphthalene	4.00	2.37		ug/L		59	39	114	1	20
Naphthalene	4.00	2.25		ug/L		56	43	114	3	20

Surrogate	LCSD LCSD		Limits
	%Recovery	Qualifier	
2,4,6-Tribromophenol	86		46 - 122
2-methylnaphthalene-d10	63		40 - 140
Fluoranthene-d10 (Surr)	92		40 - 140
Terphenyl-d14	103		58 - 132

Method: 8015D DRO - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 580-386838/1-A
Matrix: Water
Analysis Batch: 387300

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 386838

Analyte	MB MB		LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
C24-C40	300	U	350	180	ug/L		04/08/22 10:03	04/13/22 11:42	1
C10-C24	100	U	110	65	ug/L		04/08/22 10:03	04/13/22 11:42	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
o-Terphenyl	81		56 - 125	04/08/22 10:03	04/13/22 11:42	1

Lab Sample ID: LCS 580-386838/2-A
Matrix: Water
Analysis Batch: 387300

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 386838

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits	
							Lower	Upper
C24-C40	4000	3660		ug/L		92	41	113
C10-C24	4000	3150		ug/L		79	36	132

QC Sample Results

Client: AECOM
 Project/Site: RH Site Characterization JBPHH N62742-17

Job ID: 580-112198-2

Method: 8015D DRO - Diesel Range Organics (DRO) (GC) (Continued)

Lab Sample ID: LCS 580-386838/2-A
Matrix: Water
Analysis Batch: 387300

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 386838

Surrogate	LCS		Limits
	%Recovery	Qualifier	
<i>o</i> -Terphenyl	90	M	56 - 125

Lab Sample ID: LCSD 580-386838/3-A
Matrix: Water
Analysis Batch: 387300

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 386838

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec		Limit
							Limits	RPD	
C24-C40	4000	3620		ug/L		91	41 - 113	1	20
C10-C24	4000	3270		ug/L		82	36 - 132	4	20

Surrogate	LCSD		Limits
	%Recovery	Qualifier	
<i>o</i> -Terphenyl	95		56 - 125

Lab Chronicle

Client: AECOM
 Project/Site: RH Site Characterization JBPHH N62742-17

Job ID: 580-112198-2

Client Sample ID: HTE00.0-WGN02-031.0

Lab Sample ID: 580-112198-7

Date Collected: 04/01/22 18:00

Matrix: Water

Date Received: 04/05/22 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260/CALUFT DOD		1	386909	04/09/22 07:03	BNM	FGS SEA
Total/NA	Analysis	8260D		1	386906	04/09/22 07:03	BNM	FGS SEA
Total/NA	Prep	3510C			386864	04/08/22 11:35	KLW	FGS SEA
Total/NA	Analysis	8270E SIM		1	386961	04/09/22 09:08	JCM	FGS SEA
Total/NA	Prep	3510C			386838	04/08/22 10:03	KLW	FGS SEA
Total/NA	Analysis	8015D DRO		1	387300	04/13/22 13:00	Y1F	FGS SEA

Client Sample ID: LTW35.0-WGN02-028.0

Lab Sample ID: 580-112198-8

Date Collected: 04/01/22 17:50

Matrix: Water

Date Received: 04/05/22 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260/CALUFT DOD		1	386909	04/09/22 07:50	BNM	FGS SEA
Total/NA	Analysis	8260D		1	386906	04/09/22 07:50	BNM	FGS SEA
Total/NA	Prep	3510C			386864	04/08/22 11:35	KLW	FGS SEA
Total/NA	Analysis	8270E SIM		1	386961	04/09/22 09:32	JCM	FGS SEA
Total/NA	Prep	3510C	DL		386864	04/08/22 11:35	KLW	FGS SEA
Total/NA	Analysis	8270E SIM	DL	50	386976	04/09/22 20:40	E1L	FGS SEA
Total/NA	Prep	3510C			386838	04/08/22 10:03	KLW	FGS SEA
Total/NA	Analysis	8015D DRO		1	387300	04/13/22 13:20	Y1F	FGS SEA

Client Sample ID: LTW35.0-WGFD02-028.0

Lab Sample ID: 580-112198-9

Date Collected: 04/01/22 17:50

Matrix: Water

Date Received: 04/05/22 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260/CALUFT DOD		1	386909	04/09/22 08:14	BNM	FGS SEA
Total/NA	Analysis	8260D		1	386906	04/09/22 08:14	BNM	FGS SEA
Total/NA	Prep	3510C			386864	04/08/22 11:35	KLW	FGS SEA
Total/NA	Analysis	8270E SIM		1	386961	04/09/22 09:56	JCM	FGS SEA
Total/NA	Prep	3510C	DL		386864	04/08/22 11:35	KLW	FGS SEA
Total/NA	Analysis	8270E SIM	DL	50	386976	04/09/22 21:05	E1L	FGS SEA
Total/NA	Prep	3510C			386838	04/08/22 10:03	KLW	FGS SEA
Total/NA	Analysis	8015D DRO		1	387300	04/13/22 13:39	Y1F	FGS SEA

Client Sample ID: LTE00.0-WGN02-030.0

Lab Sample ID: 580-112198-10

Date Collected: 04/01/22 16:45

Matrix: Water

Date Received: 04/05/22 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260/CALUFT DOD		1	386909	04/09/22 08:37	BNM	FGS SEA
Total/NA	Analysis	8260D		1	386906	04/09/22 08:37	BNM	FGS SEA
Total/NA	Prep	3510C			386864	04/08/22 11:35	KLW	FGS SEA
Total/NA	Analysis	8270E SIM		1	386961	04/09/22 10:20	JCM	FGS SEA

Lab Chronicle

Client: AECOM

Job ID: 580-112198-2

Project/Site: RH Site Characterization JBPHH N62742-17

Client Sample ID: LTE00.0-WGN02-030.0

Lab Sample ID: 580-112198-10

Date Collected: 04/01/22 16:45

Matrix: Water

Date Received: 04/05/22 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			386838	04/08/22 10:03	KLW	FGS SEA
Total/NA	Analysis	8015D DRO		1	387300	04/13/22 13:58	Y1F	FGS SEA

Client Sample ID: Trip Blank-1

Lab Sample ID: 580-112198-11

Date Collected: 03/31/22 00:00

Matrix: Water

Date Received: 04/05/22 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260/CALUFT DOD		1	386909	04/09/22 01:32	BNM	FGS SEA
Total/NA	Analysis	8260D		1	386906	04/09/22 01:32	BNM	FGS SEA

Laboratory References:

FGS SEA = Eurofins Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: AECOM
Project/Site: RH Site Characterization JBPHH N62742-17

Job ID: 580-112198-2

Laboratory: Eurofins Seattle

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2236	01-19-25

- 1
- 2
- 3
- 4
- 5
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- 10
- 11

Sample Summary

Client: AECOM

Job ID: 580-112198-2

Project/Site: RH Site Characterization JBPHH N62742-17

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-112198-7	HTE00.0-WGN02-031.0	Water	04/01/22 18:00	04/05/22 09:50
580-112198-8	LTW35.0-WGN02-028.0	Water	04/01/22 17:50	04/05/22 09:50
580-112198-9	LTW35.0-WGFD02-028.0	Water	04/01/22 17:50	04/05/22 09:50
580-112198-10	LTE00.0-WGN02-030.0	Water	04/01/22 16:45	04/05/22 09:50
580-112198-11	Trip Blank-1	Water	03/31/22 00:00	04/05/22 09:50

- 1
- 2
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- 4
- 5
- 6
- 7
- 8
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- 10
- 11



Ei
57. 580-112198 Chain of Custody
Tel.
Phone : 253-248-4972

Chain of Custody Record

eurofins
Environment Testing
America

Client Information			Sampler: Petros Paulos, Jim Christopher		Lab PM: Elaine Walker		Carrier Tracking No(s):			COC No: 1-44635								
Client Contact: Jeff Hart/ Peggy Schuler			Phone: 720 884-7404		E-Mail: M.Elaine.Walker@EurofinsET.com		State of Origin:			Page: Page 1 of 3								
Company: AECOM-Honolulu			PWSID:		Analysis Requested			Job #:										
Address: AECOM-Honolulu City: 1001 Bishop Street, ASB Tower, Suite 1600 State, Zip: Honolulu, Hawaii, 96813 Phone: 720 884-7404 Email: jeff.hart@aecom.com/ peggy.schuler@aecom.com			Due Date Requested: TAT Requested (days): 4 Compliance Project: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Field Filtered Sample (Yes or No) <input checked="" type="checkbox"/> Perform MSWSP (Yes or No) <input checked="" type="checkbox"/>			<table border="1"> <tr> <td>BTEX, TPH-g, 82600/8095B</td> <td>N,1MN,2MN TPH-d6, 82700 8015C/8550C</td> <td>BTEX, TPH-g, SW-846 82600/</td> <td>N,1MN,2MN, SW-846 82700/8510C</td> <td>TPH-d6, 8015C</td> </tr> </table>			BTEX, TPH-g, 82600/8095B	N,1MN,2MN TPH-d6, 82700 8015C/8550C	BTEX, TPH-g, SW-846 82600/	N,1MN,2MN, SW-846 82700/8510C	TPH-d6, 8015C	Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDTA M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - Methanol		
BTEX, TPH-g, 82600/8095B	N,1MN,2MN TPH-d6, 82700 8015C/8550C	BTEX, TPH-g, SW-846 82600/	N,1MN,2MN, SW-846 82700/8510C	TPH-d6, 8015C														
Project Name: SiteCharP2Tunnels Site: Red Hill Bulk Fuel Storage Facility			Project #: SSOW#:		Purchase Order Requested WO #:			Total Number of Containers			Special Instructions/Note:							
Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (WG=Groundwater, SO=soil, PR=product, GS=Soil vapor)	Field Filtered Sample (Yes or No)	Perform MSWSP (Yes or No)												
1 PSCOOILING-WSN01-000.0	3/21/22	12:15	GRAB	WS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	F		A	4-40mL	2-250mlAmb	2-250mlAmb						
2 PSCOOILING-WSFD01-000.0	3/23/22	12:15	GRAB	WS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				4-40mL	2-250mlAmb	2-250mlAmb						
3 SUMPDRN-WSN01-000.0	3/31/22	11:30	GRAB	WS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				4-40mL	2-250mlAmb	2-250mlAmb						
4 SUMP-WSN01-000.0	3/31/22	9:45	GRAB	WS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				4-40mL	2-250mlAmb	2-250mlAmb						
5 A3015-SON01-002.0	4/1/22	16:45	GRAB	SO	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2-40mlVOA	1-4ozJar					3					
6 A3015-WGN01-002.0	4/1/22	16:00	GRAB	WG	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				4-40mL	2-250mlAmb	2-250mlAmb	8					
7 HTE00.0-WGN02-031.0	4/1/22	18:00	GRAB	WG	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				4-40mL	2-250mlAmb	2-250mlAmb						
8 LTW35.0-WGN02-028.0	4/1/22	17:50	GRAB	WG	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				4-40mL	2-250mlAmb	2-250mlAmb						
9 LTW35.0-WGFD02-028.0	4/1/22	17:50	GRAB	WG	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				4-40mL	2-250mlAmb	2-250mlAmb						
10 LTE00.0-WGN02-030.0	4/1/22	16:45	GRAB	WG	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				4-40mL	2-250mlAmb	2-250mlAmb	8					
11 Trip Blank -/				TD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				4-40mL								
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months												
Deliverable Requested: I, II, III, IV, Other (specify)						Special Instructions/GC Requirements: HOLD 1668A + 8290A pending client direction												
Empty Kit Relinquished by:			Date:		Time:		Method of Shipment:											
Relinquished by: <i>Jetro Paulos</i>			Date/Time: 4/4/22 14:38		Company: AECOM		Received by: <i>Tom Blum</i>			Date/Time: 4/5/22 09:50		Company: EFGS						
Relinquished by:			Date/Time:		Company:		Received by:			Date/Time:		Company:						
Relinquished by:			Date/Time:		Company:		Received by:			Date/Time:		Company:						
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: FedPo 4g Blu/wet/bub A2 4.4/4.5 w/cs 4g Blu/wet/bub A2 1.6/1.7w/cs 4g Blu/wet/bub A2 2.3/2.4 w/cs														

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-112198-2

Login Number: 112198

List Source: Eurofins Seattle

List Number: 1

Creator: Greene, Ashton R

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

***Appendix D – Initial and Phase 2 Holding Tank and Leach Tank
Level IV Laboratory Reports***
(Provided in EDMS)

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Appendix E – Data Validation Reports

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Memorandum

Project: Joint Base Pearl Harbor-Hickam, Hawaii
 Red Hill Bulk Fuel Storage Facility

Site Characterization Study

Laboratory: Eurofins, Seattle, WA

Laboratory Number: 580-109299-1

Analyses/Method: Volatile Organic Compounds (BTEX) by EPA Method 8260D

Validation Level: Stage 2B

Project Number: 60674414.00.50.01

Prepared by: Kristin Rutherford/AECOM Completed on: 04/29/2022

Reviewed by: Lori Herberich /AECOM File Name: 580-109299-1_BTEX_memo

SUMMARY

The samples listed below were collected by AECOM from the Joint Base Pearl Harbor-Hickam, Hawaii site on January 11 and 12, 2022.

Sample ID	Lab ID	Matrix/Sample Type
LT-W17.5-12-13	580-109299-01	Soil
LT-N10-21-22	580-109299-02	Soil
LT-E10-7-8	580-109299-03	Soil
LT-S25-7-8	580-109299-04	Soil
LT-W10-11-12	580-109299-05	Soil
LT-W10-19-20	580-109299-06	Soil
HT-N10-19-20	580-109299-07	Soil
LT-N40-7-8	580-109299-08	Soil
LT-N25-16-17	580-109299-09	Soil
LT-S10-17-18	580-109299-10	Soil
LT-N10-7-8	580-109299-11	Soil
HT-N10-24-25	580-109299-12	Soil
HT-W10-18-19	580-109299-13	Soil
HT-W10-22-23	580-109299-14	Soil
LT-S17.5-5-6	580-109299-15	Soil
LT-W55-17-18	580-109299-16	Soil
LT-W19.5-14-15	580-109299-17	Soil
LT-S10-23-24	580-109299-18	Soil
LT-W40-9-10	580-109299-19	Soil
LT-N25-27-27.5	580-109299-20	Soil

**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

Sample ID	Lab ID	Matrix/Sample Type
LT-S25-14-15	580-109299-21	Soil
LT-W25-14-15	580-109299-22	Soil
LT-N10-7-8-Dup	580-109299-23	Field duplicate of LT-N10-7-8

Data validation activities were conducted with reference to:

- *SW-846 Method 8260D: Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)* (June 2018)
- *Preliminary Site Characterization Plan, Joint Base Pearl Harbor-Hickam, Hawaii* (January 2022)
- *Site Characterization Plan Addendum – Holding Tank-Leach Tank Phase 2, Joint Base Pearl Harbor-Hickam, Hawaii* (March 2022)
- *Module 1 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC/MS, Department of Defense, Revision 1* (May 2020)
- *General Data Validation Guidelines, Department of Defense, Revision 1* (November 2019)
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review* (November 2020).

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody [COC])/sample integrity
- ✓ Holding times and sample preservation
- ✓ Instrument tuning
- ✓ Initial calibration/initial and continuing calibration verification
- ✓ Laboratory blanks/field blanks/equipment blanks
- ✗ Surrogate spike recoveries
- ✓ Matrix spike (MS) and matrix spike duplicate (MSD) results
- ✓ Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
- ✗ Field duplicate results
- ✓ Internal standard results
- ✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

The data appear valid as qualified and may be used for decision making purposes. Select data points were estimated due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Trip blank sample TB01 (580-109299-24) was received broken at the laboratory and was therefore, not analyzed. Naphthalene was requested on the COC with the BTEX analysis by method 8260, as well as by 8270SIM. Naphthalene was reported only by SVOC method 8270SIM.

Laboratory Blanks/Field Blanks/Equipment Blanks

Target compounds were not detected in the laboratory method blanks associated with the samples in this data set. Trip blank sample TB01 (580-109299-24) was received broken at the laboratory and was therefore, not analyzed. An equipment blank was not submitted with the samples in this data set.

Surrogate Spike Recoveries

The following surrogate percent recoveries were above the control limits:

Sample	Surrogate	%Recovery	%Recovery Limits
LT-N10-7-8-Dup	1,2-Dichloroethane-d4	140	71-136
LT-N10-7-8-Dup	Toluene-d8	117	85-116

The positive results in this sample were qualified as estimated "J" and may be biased high. Qualified sample results are shown in Table 1.

Field Duplicate Results

Field duplicate relative percent differences (RPDs) were reviewed for conformance with the QC acceptance criteria of $\leq 50\%$ (solids) or $\leq 30\%$ (aqueous) if both results were greater than five times the LOQ or the absolute difference was less than two times the LOQ if one or both results is less than five times the LOQ.

Field duplicate precision was not met for the following:



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

Sample ID	Duplicate ID	Compound	Sample Result	Duplicate Result	LOQ	Units	RPD	Abs Diff
LT-N10-7-8	LT-N10-7-8-Dup	Ethylbenzene	0	0.16	0.063	mg/kg	NA	0.16
LT-N10-7-8	LT-N10-7-8-Dup	m/p-Xylene	0.063	1.1	0.063	mg/kg	NA	1.04
LT-N10-7-8	LT-N10-7-8-Dup	o-Xylene	0.41	0.85	0.063	mg/kg	69.8	NA
LT-N10-7-8	LT-N10-7-8-Dup	Toluene	0	0.87	0.095	mg/kg	NA	0.87

The results in samples LT-N10-7-8 and LT-N10-7-8-Dup were qualified (J/UJ) as estimated. Qualified sample results are shown in Table 1.

Sample Results/Reporting Issues

If applicable, the sample results detected at concentrations less than the Limit of Quantitation (LOQ) but greater than the Detection Limit (DL) are qualified by the laboratory as estimated (J). This “J” qualifier is retained during data validation.

Insufficient sample was received for the percent solids determination for sample LT-N10-7-8-Dup (580-109299-23). The laboratory was instructed to use the percent solids from its parent sample, LT-N10-7-8 (72.9%). No qualifications were required.

Samples LT-W17.5-12-13 (580-109299-1), LT-W10-11-12 (580-109299-5), LT-W10-19-20 (580-109299-6), LT-N25-16-17 (580-109299-9), and LT-N10-7-8-Dup (580-109299-23) were analyzed at reduced volumes due to high target compound concentrations. Several samples were received with significantly lower sample weights than required by method (10g).

The following nondetect results exceeded the site screening criteria:

Sample Name	Analyte	Result	LOD	Screening Criteria	Units
LT-N25-16-17	Benzene	ND	0.56	0.30	mg/kg
LT-W17.5-12-13	Benzene	ND	0.69	0.30	mg/kg

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.



Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility

Table 1
QA/QC Data Summary Review
Red Hill Site Characterization
Laboratory Group: 580-109299-1

Laboratory Group	Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Units	Final Result	Reason Code
580-109299-1	LT-N10-7-8	580-109299-11	8260D	Ethylbenzene	ND	mg/kg	0.047 UJ	D3
580-109299-1	LT-N10-7-8	580-109299-11	8260D	m/p-Xylene	0.063	mg/kg	0.063 J	D3
580-109299-1	LT-N10-7-8	580-109299-11	8260D	o-Xylene	0.41	mg/kg	0.41 J	D3
580-109299-1	LT-N10-7-8	580-109299-11	8260D	Toluene	ND	mg/kg	0.047 UJ	D3
580-109299-1	LT-N10-7-8-Dup	580-109299-23	8260D	Ethylbenzene	0.16	mg/kg	0.16 J	I/D3
580-109299-1	LT-N10-7-8-Dup	580-109299-23	8260D	m/p-Xylene	1.1	mg/kg	1.1 J	I/D3
580-109299-1	LT-N10-7-8-Dup	580-109299-23	8260D	o-Xylene	0.85	mg/kg	0.85 J	I/D3
580-109299-1	LT-N10-7-8-Dup	580-109299-23	8260D	Toluene	0.87	mg/kg	0.87 J	I/D3

Laboratory: Eurofins Seattle
Laboratory SDG/Job No: 580-109299-1
Validation Level: Stage 2B
 (using Level IV data package)
Number of Samples/Matrix: 23 soils (including 1 FD)
Analysis (Include Method #): BTEX SW846 8260D

Client/Site Name: Red Hill Site Characterization
Project Number: 60674414.00.50.01
Date: 04/28/22
Validator: K Rutherford
Reviewer and Date: Lori Herberich 5/2/2022

QAPP (QSM 5.4), DoD Module 1, Region 1/NFG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	Trip blank sample TB01 (580-109299-24) rec'd broken, not analyzed. Insufficient sample received for %solids determination for sample LT-N10-7-8-Dup (580-109299-23). Naphthalene was requested on the COC with the BTEX analysis by method 8260, as well as by 8270SIM. Naphthalene was reported only by SVOC method 8270SIM.
Sample Preservation	Yes	No	2.7C
Holding Time	Yes	No	Collected 1/11/22-1/12/22, analyzed within 14d.
Quantitation Limits	Yes	No	Samples LT-W17.5-12-13 (580-109299-1), LT-W10-11-12 (580-109299-5), LT-W10-19-20 (580-109299-6), LT-N25-16-17 (580-109299-9), LT-N10-7-8-Dup (580-109299-23) analyzed at reduced volume due to high target compound concentrations. RLs were adjusted. Several samples were received with significantly lower sample weights than required by method (10g), RLs were adjusted. ND results at DL meet action limits.
Percent Solids (>30%)	No	No	Insufficient sample received for %solids determination for sample LT-N10-7-8-Dup (580-109299-23). The lab was instructed to use the %Solids from its parent sample, LT-N10-7-8 (72.9%). No qualification required.
Method Blanks	Yes	No	MB 580-378429/1-A, MB 580-378453/1-A ND
Other Laboratory Blanks ^{1,2}	NA	NA	Not applicable to these analyses.
Trip/Equipment Blanks	NA	NA	Trip blank sample TB01 (580-109299-24) rec'd broken, not analyzed.
Initial Calibration	Yes	No	01/13/22 Inst TAC041, criteria met
Initial Calibration Verification	Yes	No	ICV 580-378299/12 within %D ≤20%
Continuing Calibration Verification	Yes	No	CCVIS 580-378485/3, CCVC 580-378485/30, CCVIS 580-378460/3, CCVC 580-378460/28, CCVIS 580-378538/3, CCVC 580-378538/10 within opening and closing CCV criteria
Matrix Spike	Yes	No	
Matrix Spike Duplicate RPD ²	Yes	No	MS/MSD on sample LT-W17.5-12-13. %R and RPD within limits.
Laboratory Duplicate ²	NA	NA	Not applicable to these analyses.
Surrogate Standards ²	No	Yes	Surr DCA and TOL %R above limits in sample LT-N10-7-8-Dup. Positive results qualified (J+, reason code I) and may be biased high.
Laboratory Control Standards	Yes	No	LCS 580-378429/2-A/LCSD 580-378429/3-A, LCS 580-378453/2-A/LCSD 580-378453/3-A
Internal Standards ^{2,3}	Yes	No	
Field Duplicate	No	Yes	LT-N10-7-8 (580-109299-11) and LT-N10-7-8-Dup (580-109299-23): precision criteria not met - see field duplicates tab. Results for Toluene, Ethylbenzene, m-Xylene & p-Xylene, o-Xylene qualified (J/UJ) in FD pair. Note the FD sample was analyzed at 10X 'dilution'; RLs are 10X different.
GC/MS Tunes ²	Yes	No	
Calculation Spot Checks ³	NA	NA	Not a required validation element for this project.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

Note: it may not be appropriate to make a direct quantitative comparison for aqueous field blanks (such as equipment blanks reported as µg/mL) to a solid parent sample (such as a soil sample reported as mg/kg). At best, only a qualitative comparison can be made.

Screening Criteria	mg/kg
Benzene	0.30
Toluene	3.2
Ethylbenzene	3.7
Total Xylenes	2.1

Compound	QL	5x QL	LT-N10-7-8	LT-N10-7-8-Dup	RPD	Abs. Diff	Action
Benzene	0.032	0.16	0	0	#DIV/0!	0.00	None both ND
Ethylbenzene	0.063	0.32	0	0.16	200.0	0.160	Qualify J/UJ abs diff >2X QL
m-Xylene & p-Xylene	0.063	0.32	0.063	1.1	178.3	1.04	Qualify J/UJ abs diff >2X QL
o-Xylene	0.063	0.32	0.41	0.85	69.8	0.44	Qualify J/UJ RPD >50%
Toluene	0.095	0.48	0	0.87	200.0	0.87	Qualify J/UJ abs diff >2X QL

LT-N10-7-8-Dup RL	2X QL
0.33	0.064
0.66	0.126
0.66	0.126
0.66	0.126
0.98	0.19

RPD limits: $\leq 30\%$ (aqueous) and $\leq 50\%$ (solid)
 (when both sample concentrations are $> 5x$ the
 LOQ) or

absolute difference between concentrations are
 $\leq 2x$ LOQ (when the sample or field duplicate
 concentrations are $\leq 5x$ LOQ)

Memorandum

Project: Joint Base Pearl Harbor-Hickam, Hawaii
 Red Hill Bulk Fuel Storage Facility

Site Characterization Study

Laboratory: Eurofins, Seattle, WA

Laboratory Number: 580-109299-1

Analyses/Method: Semivolatile Organic Compounds by EPA Method 8270E-SIM
 (1-Methylnaphthalene, 2-Methylnaphthalene, Naphthalene)

Validation Level: Stage 2B

Project Number: 60674414.00.50.01

Prepared by: Kristin Rutherford/AECOM Completed on: 04/29/2022

Reviewed by: Lori Herberich/AECOM File Name: 580-109299-1_SVOC_memo

SUMMARY

The samples listed below were collected by AECOM from the Joint Base Pearl Harbor-Hickam, Hawaii site on January 11 and 12, 2022.

Sample ID	Lab ID	Matrix/Sample Type
LT-W17.5-12-13	580-109299-01	Soil
LT-N10-21-22	580-109299-02	Soil
LT-E10-7-8	580-109299-03	Soil
LT-S25-7-8	580-109299-04	Soil
LT-W10-11-12	580-109299-05	Soil
LT-W10-19-20	580-109299-06	Soil
HT-N10-19-20	580-109299-07	Soil
LT-N40-7-8	580-109299-08	Soil
LT-N25-16-17	580-109299-09	Soil
LT-S10-17-18	580-109299-10	Soil
LT-N10-7-8	580-109299-11	Soil
HT-N10-24-25	580-109299-12	Soil
HT-W10-18-19	580-109299-13	Soil
HT-W10-22-23	580-109299-14	Soil
LT-S17.5-5-6	580-109299-15	Soil
LT-W55-17-18	580-109299-16	Soil
LT-W19.5-14-15	580-109299-17	Soil
LT-S10-23-24	580-109299-18	Soil
LT-W40-9-10	580-109299-19	Soil

**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

Sample ID	Lab ID	Matrix/Sample Type
LT-N25-27-27.5	580-109299-20	Soil
LT-S25-14-15	580-109299-21	Soil
LT-W25-14-15	580-109299-22	Soil
LT-N10-7-8-Dup	580-109299-23	Field duplicate of LT-N10-7-8

Data validation activities were conducted with reference to:

- *SW-846 Method 8270E: Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)* (June 2018)
- *Preliminary Site Characterization Plan, Joint Base Pearl Harbor-Hickam, Hawaii* (January 2022)
- *Site Characterization Plan Addendum – Holding Tank-Leach Tank Phase 2, Joint Base Pearl Harbor-Hickam, Hawaii* (March 2022)
- *Module 1 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC/MS, Department of Defense, Revision 1* (May 2020)
- *General Data Validation Guidelines, Department of Defense, Revision 1* (November 2019)
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review* (November 2020).

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody [COC])/sample integrity
- ✓ Holding times and sample preservation
- ✓ Instrument tuning
- ✓ Initial calibration/initial and continuing calibration verification
- ✓ Laboratory blanks/field blanks/equipment blanks
- ✓ Surrogate spike recoveries
- ✗ Matrix spike (MS) and matrix spike duplicate (MSD) results
- ✓ Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
- ✓ Field duplicate results
- ✓ Internal standard results
- ✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

The data appear valid as qualified and may be used for decision making purposes. Select data points were estimated due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.

RESULTS

MS and MSD Results

The following matrix spike percent recoveries were outside the control limits:

Sample	Compound	%MS/MSD Recovery	%Recovery Limits	RPD	RPD Limits
LT-W17.5-12-13	Naphthalene	161/63	35-123	28	40

The positive result for naphthalene in sample LT-W17.5-12-13 was qualified as estimated “J”. Qualified sample results are shown in Table 1.

Sample Results/Reporting Issues

If applicable, the sample results detected at concentrations less than the Limit of Quantitation (LOQ) but greater than the Detection Limit (DL) are qualified by the laboratory as estimated (J). This “J” qualifier is retained during data validation. Laboratory limits of detection (LOD) meet screening criteria for all samples.

The following analytes exceeded the project screening criteria:

Sample Name	Analyte	Result	LOD	Screening Criteria	Units
LT-W17.5-12-13	1-Methylnaphthalene	9.1	0.0025	4.2	mg/kg
LT-W17.5-12-13	2-Methylnaphthalene	13	0.0050	4.1	mg/kg
LT-N25-16-17	1-Methylnaphthalene	6.9	0.0021	4.2	mg/kg
LT-N25-16-17	2-Methylnaphthalene	11	0.0041	4.1	mg/kg

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.



Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility

Table 1
QA/QC Data Summary Review
Red Hill Site Characterization
Laboratory Group: 580-109299-1

Laboratory Group	Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Units	Final Result	Reason Code
580-109299-1	LT-W17.5-12-13	580-109299-1	8270E	Naphthalene	4.1	mg/kg	4.1J	M

Laboratory:	Eurofins Seattle	Client/Site Name: Red Hill Site Characterization
Laboratory SDG/Job No:	580-109299-1	Project Number: 60674414.00.50.01
Validation Level:	Stage 2B (using Level IV data package)	Date: 04/29/22
Number of Samples/Matrix:	23 soils (including 1 FD)	Validator: K Rutherford
Analysis (Include Method #):	SVOCs, SW846 8270E-SIM (Naphthalene, 1-Methylnaphthalene, 2-Methylnaphthalene)	Reviewer and Date: Lori Herberich 5/2/2022

DoD QSM 5.4, DoD Module 1, NFG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Sample Preservation	Yes	No	2.7C
Holding Time	Yes	No	Collected 1/11/22-1/12/22, extracted within 14d, analyzed within 40d.
Quantitation Limits	Yes	No	No dilutions
Percent Solids (>30%)	Yes	No	
Method Blanks	Yes	No	MB 580-378391/1-A, MB 580-378402/1-A ND
Other Laboratory Blanks ^{1,2}	NA	NA	Not applicable to these analyses.
Trip/Equipment Blanks	NA	NA	An equipment blank was not submitted
Initial Calibration	Yes	No	ICAL 10/05/2021 Inst SEA101, criteria met
Initial Calibration Verification	Yes	No	ICV 580-369708/18 %D ≤20%
Continuing Calibration Verification	Yes	No	CCVIS 580-378418/3, CCVC 580-378418/28, CCVIS 580-378443/3 %D ≤20%
Matrix Spike	No	Yes	LT-W17.5-12-13 MS/MSD: %R outside QSM criteria and RPD outside lab limits (≤ 20%) for all compounds (different from lab limits, see below and DoD QC limits tab). Result for naphthalene in parent sample qualified (J, reason codes M,D). No quals for 1-MN or 2_MN since sample conc >4X spiked amount.
Matrix Spike Duplicate RPD ²	No	Yes	
Matrix Spike	Yes	No	LT-S25-14-15 MS/MSD: %R within QSM criteria for all compounds (different from lab limits, see below and DoD QC limits tab). RPD within lab limits (≤ 20%). No actions required.
Matrix Spike Duplicate RPD ²	Yes	No	
Laboratory Duplicate ²	NA	NA	Not applicable to these analyses.
Surrogate Standards ²	No	No	Lab limits used in absence of QSM limits for 2MN, FLN10. QSM 5.4 limits used to assess TPHL and TBP (lab limits different). %R for TBP below limits for some samples; no actions since this is an acid surrogate and target compounds are B/N.
Laboratory Control Standards	Yes	No	LCS 580-378391/2-A, LCS 580-378402/2-A %R: QSM criteria met (different from lab limits, see below and DoD QC limits tab).
Internal Standards ^{2,3}	Yes	No	
Field Duplicate	NA	NA	FD not submitted for SVOC (LT-N10-7-8-Dup not analyzed for SVOC)
GC/MS Tunes ²	Yes	No	
Calculation Spot Checks ³	NA	NA	Not a required validation element for this project.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

QSM 5.4 LCS criteria	%R Limits
1-Methylnaphthalene	40-119
2-Methylnaphthalene	38-122
Naphthalene	35-123

Memorandum

Project: Joint Base Pearl Harbor-Hickam, Hawaii
 Red Hill Bulk Fuel Storage Facility

Site Characterization Study

Laboratory: Eurofins, Seattle, WA

Laboratory Number: 580-109299-1

Analyses/Method: TPH-Gasoline Range Organics (TPH-g, C6-C12) by EPA Method 8260D
 TPH-Diesel Range Organics (TPH-d, C10-C24) by EPA Method 8015D
 TPH-Residual Range Organics (TPH-o, C24-C40) by EPA Method 8015D

Validation Level: Stage 2B

Project Number: 60674414.00.50.01

Prepared by: Kristin Rutherford/AECOM Completed on: 04/29/2022

Reviewed by: Lori Herberich/AECOM File Name: 580-109299-1_GRO_DRO_memo

SUMMARY

The samples listed below were collected by AECOM from the Joint Base Pearl Harbor-Hickam, Hawaii site on January 11 and 12, 2022.

Sample ID	Lab ID	Matrix/Sample Type
LT-W17.5-12-13	580-109299-1	Soil
LT-N10-21-22	580-109299-2	Soil
LT-E10-7-8	580-109299-3	Soil
LT-S25-7-8	580-109299-4	Soil
LT-W10-11-12	580-109299-5	Soil
LT-W10-19-20	580-109299-6	Soil
HT-N10-19-20	580-109299-7	Soil
LT-N40-7-8	580-109299-8	Soil
LT-N25-16-17	580-109299-9	Soil
LT-S10-17-18	580-109299-10	Soil
LT-N10-7-8	580-109299-11	Soil
HT-N10-24-25	580-109299-12	Soil
HT-W10-18-19	580-109299-13	Soil
HT-W10-22-23	580-109299-14	Soil
LT-S17.5-5-6	580-109299-15	Soil
LT-W55-17-18	580-109299-16	Soil
LT-W19.5-14-15	580-109299-17	Soil
LT-S10-23-24	580-109299-18	Soil
LT-W40-9-10	580-109299-19	Soil

**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

Sample ID	Lab ID	Matrix/Sample Type
LT-N25-27-27.5	580-109299-20	Soil
LT-S25-14-15	580-109299-21	Soil
LT-W25-14-15	580-109299-22	Soil
LT-N10-7-8-Dup	580-109299-23	Field duplicate of LT-N10-7-8 (GRO only)

Data validation activities were conducted with reference to:

- *SW-846 Method 8260D: Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)* (June 2018)
- *SW-846 Method 8015D: Nonhalogenated Organics Using GC/FID* (June 2003)
- *Preliminary Site Characterization Plan, Joint Base Pearl Harbor-Hickam, Hawaii* (January 2022)
- *Site Characterization Plan Addendum – Holding Tank-Leach Tank Phase 2, Joint Base Pearl Harbor-Hickam, Hawaii* (March 2022)
- *Module 1 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC/MS, Department of Defense, Revision 1* (May 2020)
- *Module 4 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC, Department of Defense, Revision 1* (March 2021)
- *General Data Validation Guidelines, Department of Defense, Revision 1* (November 2019)
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review* (November 2020).

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody [COC])/sample integrity
- ✓ Holding times and sample preservation
- ✓ Instrument tuning
- ✓ Initial calibration/initial and continuing calibration verification
- ✓ Laboratory blanks/field blanks/equipment blanks
- ✗ Surrogate spike recoveries
- ✓ Matrix spike (MS) and matrix spike duplicate (MSD) results
- ✓ Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
- ✗ Field duplicate results
- ✓ Internal standard results
- ✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and

**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

therefore not reviewed. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as qualified and may be used for decision making purposes. Select data points were estimated due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Trip blank sample TB01 (580-109299-24) was received broken at the laboratory and was therefore, not analyzed.

Laboratory Blanks/Field Blanks/Equipment Blanks

Target compounds were not detected in the laboratory method blanks associated with the samples in this data set. Trip blank sample TB01 (580-109299-24) was received broken at the laboratory and was therefore, not analyzed. An equipment blank was not submitted with the samples in this data set.

Surrogate Spike Recoveries

The following TPH-GRO surrogate percent recoveries were above the laboratory control limits:

Sample	Surrogate	%Recovery	%Recovery Limits
LT-W10-19-20	4-Bromofluorobenzene	140	67-134
LT-N10-7-8	4-Bromofluorobenzene	153	67-134

The positive results for TPH-GRO in these samples were qualified as estimated "J" and may be biased high.

Field Duplicate Results

Field duplicate relative percent differences (RPDs) were reviewed for conformance with the QC acceptance criteria of $\leq 50\%$ (solids) or $\leq 30\%$ (aqueous) if both results were greater than five times the LOQ or the absolute difference was less than two times the LOQ if one or both results is less than five times the LOQ.

Field duplicate precision was not met for TPH-g:



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

Sample ID	Duplicate ID	Compound	Sample Result	Duplicate Result	LOQ	Units	Abs Diff
LT-N10-7-8	LT-N10-7-8-Dup	TPH-g	160	ND	6.3	mg/kg	160

The TPH-g results in samples LT-N10-7-8 and LT-N10-7-8-Dup were qualified (J/UJ) as estimated. Qualified sample results are shown in Table 1.

TPH-d/TPH-o analysis was not requested for field duplicate sample LT-N10-7-8-Dup.

Sample Results/Reporting Issues

If applicable, the sample results detected at concentrations less than the Limit of Quantitation (LOQ) but greater than the Detection Limit (DL) are qualified by the laboratory as estimated (J). This “J” qualifier is retained during data validation.

All samples were analyzed for TPH-g undiluted. The laboratory limit of detection (LOD) met the screening criteria (100 mg/kg) for all nondetect results except sample LT-N10-7-8-Dup (see table below).

Sample LT-N40-7-8 was analyzed at a 10X dilution for TPH-d/TPH-o.

The following nondetect results exceeded the site screening criteria:

Sample Name	Analyte	Result	LOD	Screening Criteria	Units
LT-N40-7-8	TPH-d	ND	370	220	mg/kg
LT-N10-7-8-Dup	TPH-g	ND	490	100	mg/kg

The following positive results exceeded the site screening criteria:

Sample Name	Analyte	Result	Screening Criteria	Units
LT-W17.5-12-13	TPH-g	3300	100	mg/kg
LT-N10-7-8	TPH-g	160	100	mg/kg
HT-N10-24-25	TPH-g	170	100	mg/kg
HT-W10-18-19	TPH-g	200	100	mg/kg
LT-W10-11-12	TPH-g	250	100	mg/kg
LT-W10-19-20	TPH-g	140	100	mg/kg
HT-N10-19-20	TPH-g	160	100	mg/kg
LT-N25-16-17	TPH-g	980	100	mg/kg
HT-N10-19-20	TPH-d	1200	220	mg/kg
HT-W10-18-19	TPH-d	1300	220	mg/kg
LT-N10-7-8	TPH-d	3500	220	mg/kg
LT-N25-16-17	TPH-d	5900	220	mg/kg
LT-S10-17-18	TPH-d	420	220	mg/kg
LT-W10-11-12	TPH-d	370	220	mg/kg



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

Sample Name	Analyte	Result	Screening Criteria	Units
LT-W10-19-20	TPH-d	510	220	mg/kg
LT-W17.5-12-13	TPH-d	4700	220	mg/kg
LT-N40-7-8	TPH-o	640	220	mg/kg

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.



Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility

Table 1
QA/QC Data Summary Review
Red Hill Site Characterization
Laboratory Group: 580-109299-1

Laboratory Group	Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Units	Final Result	Reason Code
580-109299-1	LT-W10-19-20	580-109299-6	8260D	TPH-g	140	mg/kg	140J	I
580-109299-1	LT-N10-7-8	580-109299-11	8260D	TPH-g	160	mg/kg	160J	I/D3
580-109299-1	LT-N10-7-8-Dup	580-109299-23	8260D	TPH-g	ND	mg/kg	490 UJ	D3

Laboratory: Eurofins Seattle
Laboratory SDG/Job No: 580-109299-1
Validation Level: Stage 2B
 (using Level IV data package)
Number of Samples/Matrix: 23 soils
Analysis (Include Method #): GRO C6-C12 SW-846 8260D

Client/Site Name: Red Hill Site Characterization
Project Number: 60674414.00.50.01
Date: 04/29/22
Validator: K Rutherford
Reviewer and Date: Lori Herberich 5/2/2022

QSM 5.4, DoD Module 4, NFG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	Insufficient sample volume was provided for the following samples for the Moisture analysis: LT-N10-7-8-Dup (580-109299-23). The lab was instructed to use the %Solids from its parent sample, LT-N10-7-8 (72.9%). No qualification required.
Sample Preservation	Yes	No	
Holding Time	Yes	No	
Quantitation Limits	No	No	No dilutions. Lab DLs for ND results for GRO meet PAL (100 mg/kg) except for sample LT-N10-7-8-Dup (LOD 490 mg/kg) which was analyzed at a reduced volume due to high conc of target analytes (per case narrative). Some positive results were >PAL, as noted in the memo.
Quantitation Limits	Yes	No	The following samples were analyzed at reduced volume due to high concentrations of target analytes: LT-W17.5-12-13 (580-109299-1), LT-W10-11-12 (580-109299-5) and LT-N25-16-17 (580-109299-9), LT-N10-7-8-Dup (580-109299-23) (490 mg/kg). The calculation was performed using an initial volume adjustment rather than a dilution factor. The reporting limits have been elevated by the appropriate factor.
Percent Solids (>30%)	No	No	Insufficient sample volume was provided for the Moisture analysis of sample LT-N10-7-8-Dup (580-109299-23). The lab was instructed to use the %Solids from its parent sample, LT-N10-7-8 (72.9%). No qualification required.
Method Blanks	Yes	No	MB 580-378434/1-A, MB 580-378452/1-A
Trip/Equipment Blanks	NA	NA	Trip blank sample TB01 (580-109299-24) rec'd broken, not analyzed. No equipment blank submitted with these samples.
Initial Calibration	Yes	No	SEA046 01/04/22, SEA046 01/14/22, SEA046 01/16/22
Initial Calibration Verification	Yes	No	ICV 580-378315/13 meets criteria. ICV 580-377386/13 or ICV 580-378492/13 analyzed but not reported on QC forms; no issues noted in case narrative. No actions taken.
Continuing Calibration Verification	Yes	No	CCVIS 580-378437/3, CCV 580-378437/14, CCV 580-378437/25, CCV 580-378437/31, CCVIS 580-378464/3, CCV 580-378464/14, CCV 580-378464/25, CCVIS 580-378543/3, CCV 580-378543/9.
Matrix Spike	Yes	No	LT-S25-7-8 MS/MSD %R, RPD within criteria
Matrix Spike Duplicate RPD ²	Yes	No	
Laboratory Duplicate ²	NA	NA	Surrogate BFB above QSM limits in samples LT-W10-19-20 (140%) and LT-N10-7-8 (153%). Results qualified (J+, reason code I) as estimated, biased high.
Surrogate Standards ²	No	Yes	
Laboratory Control Standards	Yes	No	LCS 580-378434/2-A / LCSD 580-378434/3-A, LCS 580-378452/2-A / LCSD 580-378452/3-A
Field Duplicate	No	Yes	LT-N10-7-8 (580-109299-11) and LT-N10-7-8-Dup (580-109299-23): precision criteria not met for GRO; results qualified (J/UJ, reason code D3).
Internal Standards ^{2,3}	Yes	No	
GC/MS Tunes ²	Yes	No	
Calculation Spot Checks ³	NA	NA	Not a required validation element for this project.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

Gasoline Range Organics (C6-C12)
 Diesel Range Organics (C10-C24)
 Oil Range Organics (C24-C40)

Sample	Compound	LOD (mg/kg)	PAL (mg/kg)
LT-N10-7-8-Dup	GRO	490	100

Sample	Compound	Result (mg/kg)	PAL (mg/kg)
LT-W17.5-12-13	GRO C6-C10	3300	100
LT-N10-7-8	GRO C6-C10	160	100
HT-N10-24-25	GRO C6-C10	170	100
HT-W10-18-19	GRO C6-C10	200	100
LT-S25-7-8	GRO C6-C10	116	100
LT-S25-7-8	GRO C6-C10	115	100
LT-W10-11-12	GRO C6-C10	250	100
LT-W10-19-20	GRO C6-C10	140	100
HT-N10-19-20	GRO C6-C10	160	100
LT-N25-16-17	GRO C6-C10	980	100

Laboratory: Eurofins Seattle
Laboratory SDG/Job No: 580-109299-1
Validation Level: Stage 2B
 (using Level IV data package)
Number of Samples/Matrix: 23 soils
Analysis (Include Method #): GRO and/or DRO/ORO SW-846 8015C

Client/Site Name: Red Hill Site Characterization
Project Number: 60674414.00.50.01
Date: 04/29/22
Validator: K Rutherford
Reviewer and Date: Lori Herberich 5/2/2022

QSM 5.4, DoD Module 4, NFG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Sample Preservation	Yes	No	2.7C
Holding Time	Yes	No	Collected 1/11/22-1/12/22, extracted within 14d, analyzed within 40d.
Quantitation Limits	No	No	SAP DRO C10-C24, ORO C24-C40, PAL 220 mg/kg. Sample LT-N40-7-8 analyzed at 10X dilution. ND result for TPH-d (370 U mg/kg) was reported at the LOD which is above PAL. Some positive results above PAL, noted in memo.
Quantitation Limits	Yes	No	Per case narrative: The peak profile present in this sample LT-S17.5-5-6 (580-109299-15) and LT-W19.5-14-15 (580-109299-17) is atypical of a hydrocarbon pattern and consists of discrete peaks.
Percent Solids (>30%)	Yes	No	
Method Blanks	Yes	No	MB 580-378393/1-A, MB 580-378410/1-A ND
Equipment Blanks	NA	NA	No equipment blank submitted with these samples.
Initial Calibration	Yes	No	
Initial Calibration Verification	Yes	No	ICV 580-376805/14,
Continuing Calibration Verification	Yes	No	CCVRT 580-378473/3, CCV 580-378473/39, CCV 580-378473/38, CCV 580-378473/37, CCV 580-378473/36, CCV 580-378
Matrix Spike	No	No	LT-W17.5-12-13 MS/MSD %R above criteria for DRO C10-C24. No qualifications made since sample concentration >4X spiked amount for DRO C10-C24. RPD within lab limits for DRO, ORO.
Matrix Spike Duplicate RPD ²	Yes	No	
Matrix Spike	Yes	No	LT-S25-14-15 MS/MSD %R and RPD within criteria. (Lab used 75-125%R for DRO (C10-C24)).
Matrix Spike Duplicate RPD ²	Yes	No	
Laboratory Duplicate ²	NA	NA	
Surrogate Standards ²	Yes	No	
Laboratory Control Standards	Yes	No	DRO C10-C24 limits per QSM 5.4 are 38-132%R. Lab used 75-125%R. LCS 580-378393/2-A / LCSD 580-378393/3-A, LCS 580-378410/2-A / LCSD 580-378410/3-A within limits for %R and RPD (≤20% lab limits)
Field Duplicate	NA	NA	FD not submitted for DRO/ORO (LT-N10-7-8-Dup not analyzed for DRO/ORO)
Calculation Spot Checks ³	NA	NA	Not a required validation element for this project.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

Gasoline Range Organics (C6-C12)
 Diesel Range Organics (C10-C24)
 Oil Range Organics (C24-C40)

Sample	Compound	LOD (mg/kg)	PAL (mg/kg)
HT-N10-19-20	DRO	1200	220
HT-W10-18-19	DRO	1300	220
LT-N10-7-8	DRO	3500	220
LT-N25-16-17	DRO	5900	220
LT-S10-17-18	DRO	420	220
LT-W10-11-12	DRO	370	220
LT-W10-19-20	DRO	510	220
LT-W17.5-12-13	DRO	4700	220
LT-N40-7-8	ORO	640	220

Compound	QL	5x QL	LT-N10-7-8	LT-N10-7-8-Dup	RPD	Abs. Diff	Action
Gasoline Range Organics (C6-C10)	6.30	31.5	160	0.0	200.0	160.0	Qualify (J)
		0.0			#DIV/0!	0.0	NONE
		0.0			#DIV/0!	0.0	NONE

RPD limits: $\leq 30\%$ (aqueous) and $\leq 50\%$ (solid) (when both sample concentrations are $> 5x$ the LOQ) or
absolute difference between concentrations are $\leq 2x$ LOQ (when the sample or field duplicate concentrations are $\leq 5x$ LOQ)

Facility: RHBFS Site Characterization
 Event: Site Characterization HT-LT Phase 1
 SDG: 5801092991
 Guidance Document: Red Hill Bulk Fuel Storage Facility Site Characterization UFP-QAPP
 Prime Contractor: AECOM, Honolulu, HI
 Project Manager:
 Contract Laboratory(ies): Eurofins Environment Testing TestAmerica, Tacoma, WA
 Data Review Contractor:
 Data Review Level:
 Primary Data Reviewer: ,
 Date Submitted:

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	BNASIM	SW8015D	SW8260	SW8260D
HT-N10-19-20	580-109299-7	Solid	Field Sample/N	X	X	X	X
HT-N10-24-25	580-109299-12	Solid	Field Sample/N	X	X	X	X
HT-W10-18-19	580-109299-13	Solid	Field Sample/N	X	X	X	X
HT-W10-22-23	580-109299-14	Solid	Field Sample/N	X	X	X	X
LT-E10-7-8	580-109299-3	Solid	Field Sample/N	X	X	X	X
LT-N10-21-22	580-109299-2	Solid	Field Sample/N	X	X	X	X
LT-N10-7-8	580-109299-11	Solid	Field Sample/N	X	X	X	X
LT-N10-7-8-Dup	580-109299-23	Solid	Field Sample/N			X	X
LT-N25-16-17	580-109299-9	Solid	Field Sample/N	X	X	X	X
LT-N25-27-27.5	580-109299-20	Solid	Field Sample/N	X	X	X	X
LT-N40-7-8	580-109299-8	Solid	Field Sample/N	X	X	X	X
LT-S10-17-18	580-109299-10	Solid	Field Sample/N	X	X	X	X
LT-S10-23-24	580-109299-18	Solid	Field Sample/N	X	X	X	X
LT-S17.5-5-6	580-109299-15	Solid	Field Sample/N	X	X	X	X
LT-S25-14-15	580-109299-21	Solid	Field Sample/N	X	X	X	X
LT-S25-7-8	580-109299-4	Solid	Field Sample/N	X	X	X	X
LT-W10-11-12	580-109299-5	Solid	Field Sample/N	X	X	X	X
LT-W10-19-20	580-109299-6	Solid	Field Sample/N	X	X	X	X
LT-W17.5-12-13	580-109299-1	Solid	Field Sample/N	X	X	X	X
LT-W19.5-14-15	580-109299-17	Solid	Field Sample/N	X	X	X	X
LT-W25-14-15	580-109299-22	Solid	Field Sample/N	X	X	X	X

Data Validation Report for 5801092991

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	BNASIM	SW8015D	SW8260	SW8260D
LT-W40-9-10	580-109299-19	Solid	Field Sample/N	X	X	X	X
LT-W55-17-18	580-109299-16	Solid	Field Sample/N	X	X	X	X

Data Validation Report for 5801092991

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Red Hill Bulk Fuel Storage Facility Site Characterization UFP-QAPP and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by AECOM, Honolulu, HI; analyses were performed by Eurofins Environment Testing TestAmerica, Tacoma, WA and were reported under sample delivery group (SDG) 5801092991. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Lab Blank
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 12 results (4.43%) out of the 271 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Data Validation Report for 5801092991

Narrative Comments

Analytical Method Data Reviewer Comment

Reviewed by , ,

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.



Reviewed by , Senior Scientist,

September 29, 2022

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Data Validation Report for 5801092991

Quality Control Outliers for test method BNASIM, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LT-W17.5-12-13 (MS)	1- Methylnaphthalene	147.0	43 - 111	10 - 111	percent	J/None	M	
LT-W17.5-12-13 (SD)	1- Methylnaphthalene	-58.00	43 - 111	10 - 111	percent	J/X	M	
LT-W17.5-12-13 (MS)	2- Methylnaphthalene	200.0	39 - 114	10 - 114	percent	J/None	M	
LT-W17.5-12-13 (SD)	2- Methylnaphthalene	-31.00	39 - 114	10 - 114	percent	J/X	M	
LT-W17.5-12-13 (MS)	Naphthalene	159.0	38 - 111	10 - 111	percent	J/None	M	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the MS Recovery for BNASIM

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LT-W17.5-12-13 580-109299-1	N	Naphthalene	0.00840	4.10 J1	4.10 J		mg/kg	M

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 5801092991

Quality Control Outliers for test method SW8015D, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LT-W17.5-12-13 (MS)	C10-C24 Petroleum Hydrocarbons	167.0	38 - 132	20 - 132	percent	J/None	M	
LT-W17.5-12-13 (SD)	C10-C24 Petroleum Hydrocarbons	227.0	38 - 132	20 - 132	percent	J/None	M	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Data Validation Report for 5801092991

Quality Control Outliers for test method SW8260, Surrogate

Method performance for individual samples is demonstrated through spiking activities. All samples are spiked with surrogate compounds prior to sample preparation. The sample itself may produce effects due to such factors as interferences and high concentrations of analytes. Summary forms were evaluated and compared to electronic data deliverables. Surrogate results that were outside of the acceptance criteria are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LT-N10-7-8 (N)	1-Bromo-4-fluorobenzene (4-Bromofluorobenzene)	153.0	67 - 134	67 - 134	percent	R/R	I	
LT-W10-19-20 (N)	1-Bromo-4-fluorobenzene (4-Bromofluorobenzene)	140.0	67 - 134	67 - 134	percent	R/R	I	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Surrogate for SW8260

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LT-N10-7-8 580-109299-11	N	C6-C10 Gasoline Range Organics	6.30	160	160 J		mg/kg	I/D3
LT-W10-19-20 580-109299-6	N	C6-C10 Gasoline Range Organics	7.50	140	140 J		mg/kg	I

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 5801092991

Quality Control Outliers for test method SW8260D, Surrogate

Method performance for individual samples is demonstrated through spiking activities. All samples are spiked with surrogate compounds prior to sample preparation. The sample itself may produce effects due to such factors as interferences and high concentrations of analytes. Summary forms were evaluated and compared to electronic data deliverables. Surrogate results that were outside of the acceptance criteria are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LT-N10-7-8-DUP (N)	1,2-Dichloroethane-d4	141.0	70 - 130	70 - 130	percent	R/R	I	
LT-W25-14-15 (N)	1,2-Dichloroethane-d4	131.0	70 - 130	70 - 130	percent	R/R	I	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Surrogate for SW8260D

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LT-N10-7-8-Dup 580-109299-23	N	Ethylbenzene	0.660	0.160 J Q	0.160 J		mg/kg	I/TR/D3
LT-N10-7-8-Dup 580-109299-23	N	m,p-Xylene	0.660	1.10 Q	1.10 J		mg/kg	I/D3
LT-N10-7-8-Dup 580-109299-23	N	o-Xylene	0.660	0.850 M Q	0.850 J		mg/kg	I/D3
LT-N10-7-8-Dup 580-109299-23	N	Toluene	0.980	0.870 J Q	0.870 J		mg/kg	I/TR/D3

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 5801092991

Table of All Qualified Results

Test Method: BNASIM		Extraction Method: SW3546						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LT-W17.5-12-13 580-109299-1	N	Naphthalene	0.00840	4.10 J1	4.10 J		mg/kg	M
Test Method: SW8260		Extraction Method: SW5035						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LT-N10-7-8 580-109299-11	N	C6-C10 Gasoline Range Organics	6.30	160	160 J		mg/kg	I/D3
LT-N10-7-8-Dup 580-109299-23	N	C6-C10 Gasoline Range Organics	660	490 U	490 UJ		mg/kg	D3
LT-W10-19-20 580-109299-6	N	C6-C10 Gasoline Range Organics	7.50	140	140 J		mg/kg	I
Test Method: SW8260D		Extraction Method: SW5035						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LT-N10-7-8 580-109299-11	N	Ethylbenzene	0.0630	0.0470 U	0.0470 UJ		mg/kg	D3
LT-N10-7-8 580-109299-11	N	m,p-Xylene	0.0630	0.0630	0.0630 J		mg/kg	D3
LT-N10-7-8 580-109299-11	N	o-Xylene	0.0630	0.410	0.410 J		mg/kg	D3
LT-N10-7-8 580-109299-11	N	Toluene	0.0950	0.0470 U	0.0470 UJ		mg/kg	D3
LT-N10-7-8-Dup 580-109299-23	N	Ethylbenzene	0.660	0.160 J Q	0.160 J		mg/kg	I/TR/D3
LT-N10-7-8-Dup 580-109299-23	N	m,p-Xylene	0.660	1.10 Q	1.10 J		mg/kg	I/D3
LT-N10-7-8-Dup 580-109299-23	N	o-Xylene	0.660	0.850 M Q	0.850 J		mg/kg	I/D3
LT-N10-7-8-Dup 580-109299-23	N	Toluene	0.980	0.870 J Q	0.870 J		mg/kg	I/TR/D3

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
In instances where no LOD is provided, results are reported down to the LOQ.

Trace values are not included in the qualified results table unless additional reason codes are associated.

Data Validation Report for 5801092991

Table of Results with Modified Qualifiers

Modified Qualifiers for test method BNASIM

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
LT-W17.5-12-13 580-109299-1	N	1-Methylnaphthalene	0.00840	9.10 J1	9.10 J	9.10	
LT-W17.5-12-13 580-109299-1	N	2-Methylnaphthalene	0.00840	13.0 J1	13.0 J	13.0	

Modified Qualifiers for test method SW8015D

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
LT-W17.5-12-13 580-109299-1	N	C10-C24 Petroleum Hydrocarbons	77.0	4700 J1	4700 J	4700	

Modified Qualifiers for test method SW8260

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
LT-N10-7-8 580-109299-11	N	C6-C10 Gasoline Range Organics	6.30	160	160 R	160 J	I/D3
LT-N10-7-8-Dup 580-109299-23	N	C6-C10 Gasoline Range Organics	660	490 U	490 U	490 UJ	D3
LT-W10-19-20 580-109299-6	N	C6-C10 Gasoline Range Organics	7.50	140	140 R	140 J	I

Modified Qualifiers for test method SW8260D

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
LT-N10-7-8 580-109299-11	N	Ethylbenzene	0.0630	0.0470 U	0.0470 U	0.0470 UJ	D3
LT-N10-7-8 580-109299-11	N	m,p-Xylene	0.0630	0.0630	0.0630	0.0630 J	D3
LT-N10-7-8 580-109299-11	N	o-Xylene	0.0630	0.410	0.410	0.410 J	D3
LT-N10-7-8 580-109299-11	N	Toluene	0.0950	0.0470 U	0.0470 U	0.0470 UJ	D3
LT-N10-7-8-Dup 580-109299-23	N	Benzene	0.330	0.250 U Q	0.250 R	0.250 U	
LT-N10-7-8-Dup 580-109299-23	N	Ethylbenzene	0.660	0.160 J Q	0.160 R	0.160 J	I/TR/D3
LT-N10-7-8-Dup 580-109299-23	N	m,p-Xylene	0.660	1.10 Q	1.10 R	1.10 J	I/D3
LT-N10-7-8-Dup 580-109299-23	N	o-Xylene	0.660	0.850 M Q	0.850 R	0.850 J	I/D3
LT-N10-7-8-Dup 580-109299-23	N	Toluene	0.980	0.870 J Q	0.870 R	0.870 J	I/TR/D3
LT-N10-7-8-Dup 580-109299-23	N	Xylenes, Total	0.660	2.00 Q	2.00 R	2.00	
LT-W25-14-15 580-109299-22	N	Benzene	0.0380	0.0280 U	0.0280 R	0.0280 U	
LT-W25-14-15 580-109299-22	N	Ethylbenzene	0.0750	0.0570 U	0.0570 R	0.0570 U	
LT-W25-14-15 580-109299-22	N	m,p-Xylene	0.0750	0.0280 U	0.0280 R	0.0280 U	
LT-W25-14-15 580-109299-22	N	o-Xylene	0.0750	0.0280 U	0.0280 R	0.0280 U	

Data Validation Report for 5801092991

Table of Results with Modified Qualifiers

Modified Qualifiers for test method SW8260D

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
LT-W25-14-15 580-109299-22	N	Toluene	0.110	0.0570 U	0.0570 R	0.0570 U	
LT-W25-14-15 580-109299-22	N	Xylenes, Total	0.0750	0.0280 U	0.0280 R	0.0280 U	

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ. Trace values are not included in the qualified results table unless additional reason codes are associated.

Reason Code Definitions

Code	Definition
D3	Field Duplicate RPD
I	Surrogate recovery outside project limits.
M	MS Recovery
TR	Trace Level Detect

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Data Validation Report for 5801092991

Review Questions

Memorandum

Project: Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility

Site Characterization Study

Laboratory: Eurofins, Seattle, WA

Laboratory Number: 580-109327-1

Analyses/Method: Volatile Organic Compounds (BTEX) by EPA Method 8260D

Validation Level: Stage 2B

Project Number: 60674414.00.50.01

Prepared by: Kristin Rutherford/AECOM Completed on: 05/03/2022

Reviewed by: Lori Herberich /AECOM File Name: 580-109327-1_BTEX_memo

SUMMARY

The samples listed below were collected by AECOM from the Joint Base Pearl Harbor-Hickam, Hawaii site on January 13, 2022.

Sample ID	Lab ID	Matrix/Sample Type
EB	580-109327-1	Soil
HT-E25-7-8	580-109327-2	Soil
HT-E17.5-14-15	580-109327-3	Soil
HT-S17.5-8-9	580-109327-4	Soil
HT-E10-23-24	580-109327-5	Soil
HT-S10-17-18	580-109327-6	Soil
HT-N25-10-11 DUPLICATE	580-109327-7	Field duplicate of HT-N25-10-11
HT-E25-14-15	580-109327-8	Soil
HT-S10-15-16	580-109327-9	Soil
HT-E17.5-7-8	580-109327-10	Soil
HT-N25-14-15	580-109327-11	Soil
HT-N25-14-15 DUPLICATE	580-109327-12	Field duplicate of HT-N25-14-15
HT-E10-21-22	580-109327-13	Soil
HT-N25-10-11	580-109327-14	Soil
HT-S25-14-15	580-109327-15	Soil
HT-S25-8-9	580-109327-16	Soil

Data validation activities were conducted with reference to:

- *SW-846 Method 8260D: Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)* (June 2018)



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

- *Preliminary Site Characterization Plan, Joint Base Pearl Harbor-Hickam, Hawaii* (January 2022)
- *Site Characterization Plan Addendum – Holding Tank-Leach Tank Phase 2, Joint Base Pearl Harbor-Hickam, Hawaii* (March 2022)
- *Module 1 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC/MS, Department of Defense, Revision 1* (May 2020)
- *General Data Validation Guidelines, Department of Defense, Revision 1* (November 2019)
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review* (November 2020).

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody [COC])/sample integrity
- ✓ Holding times and sample preservation
- ✓ Instrument tuning
- ✓ Initial calibration/initial and continuing calibration verification
- ✓ Laboratory blanks/field blanks/equipment blanks
- ✓ Surrogate spike recoveries
- ✓ Matrix spike (MS) and matrix spike duplicate (MSD) results
- ✓ Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
- ✓ Field duplicate results
- ✓ Internal standard results
- ✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. The symbol (X) indicates that a QC nonconformance resulted in the qualification of data. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as qualified and may be used for decision making purposes. There were no data points qualified as a result of this data review.

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.



Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility

- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Naphthalene was requested on the COC with the BTEX analysis by method 8260, as well as by 8270SIM. Naphthalene was reported only by SVOC method 8270SIM.

Sample Results/Reporting Issues

If applicable, the sample results detected at concentrations less than the Limit of Quantitation (LOQ) but greater than the Detection Limit (DL) are qualified by the laboratory as estimated (J). This “J” qualifier is retained during data validation.

The following analyte exceeded the site screening criteria:

Sample Name	Analyte	Result	LOD	Screening Criteria	Units
HT-S10-15-16	o-xylene	6.1	0.10	4.1	mg/kg

QUALIFICATION ACTIONS

There were no sample results qualified as a result of this data review

Laboratory: Eurofins Seattle
Laboratory SDG/Job No: 580-109327-1
Validation Level: Stage 2B
 (using Level IV data package)
Number of Samples/Matrix: 15 soils (including 2 FDs), 1 EB
Analysis (Include Method #): BTEX SW846 8260D

Client/Site Name: Red Hill Site Characterization
Project Number: 60674414.00.50.01
Date: 05/03/22
Validator: K Rutherford
Reviewer and Date: Lori Herberich 5/24/2022

QAPP (QSM 5.4), DoD Module 1, NFG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	Three 40 ml VOA Vials were submitted for sample EB (580-109327-1) and there are only two listed on the COC. Naphthalene was requested on the COC with the BTEX analysis by method 8260, as well as by 8270SIM. Naphthalene was reported only by SVOC method 8270SIM.
Sample Preservation	Yes	No	0.5° C and 1.4° C.
Holding Time	Yes	No	Collected 1/13/22, analyzed within 14d.
Quantitation Limits	No	No	No dilutions. ND results at LOD meet action limits. The positive result for o-xylene (6.1 mg/kg) in sample HT-S10-15-16 (580-109327-9) was above the PAL (total xylene 2.1 mg/kg).
Percent Solids (>30%)	Yes	No	
Method Blanks	Yes	No	MB 580-378453/1-A, MB 580-378553/4
Other Laboratory Blanks ^{1,2}	Yes	No	CCB 580-378592/4, CCB 580-378597/4 ND
Trip/Equipment Blanks	Yes	No	Equipment blank sample EB (580-109327-1) was ND for BTEX. No trip blank submitted with the samples reported in this SDG.
Initial Calibration	Yes	No	01/09/22 Inst TAC036, 01/13/22 Inst TAC041 criteria met
Initial Calibration Verification	Yes	No	ICV 580-377879/14, ICV 580-378299/12 within %D ≤20%
Continuing Calibration Verification	No	No	CCVIS 580-378553/2 %D for toluene (23.6%) and m/p-xylene (20.3%) outside criteria. Since the bias is high and the results for toluene and m,p-xylene in assoc sample EB (580-109327-1) were ND, no qualifications were made. CCVIS 580-378597/3 %D for benzene (22.2%), toluene (22.9%) outside criteria. Since the bias is high and the results for benzene and toluene in assoc samples HT-S10-17-18 (580-109327-6), HT-S10-15-16 (580-109327-9) and HT-S25-8-9 (580-109327-16) were ND, no qualifications were made. CCVIS 580-378460/3, CCVC 580-378553/29, CCVIS 580-378460/3, CCVC 580-378460/28, CCVIS 580-378592/3, CCVC 580-378592/22, CCVC 580-378597/8 within criteria.
Matrix Spike	NA	NA	
Matrix Spike Duplicate RPD ²	NA	NA	An MS/MSD was not analyzed on a sample in this SDG.
Laboratory Duplicate ²	NA	NA	Not applicable to these analyses.
Surrogate Standards ²	Yes	No	Surrogate %Rs within QSM limits
Laboratory Control Standards	Yes	No	LCS 580-378453/2-A, LCS 580-378453/3-A, LCS 580-378553/5, LCSD 580-378553/6: %Rs within QSM limits, RPDs within lab limits.
Internal Standards ^{2,3}	Yes	No	
Field Duplicate	Yes	No	HT-N25-10-11 (580-109327-14) and HT-N25-10-11 DUPLICATE (580-109327-7): precision criteria met -both samples ND
Field Duplicate	Yes	No	HT-N25-14-15 (580-109327-11) and HT-N25-14-15 DUPLICATE (580-109327-12): precision criteria met - both samples ND
GC/MS Tunes ²	Yes	No	
Calculation Spot Checks ³	NA	NA	Not a required validation element for this project.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

Note: it may not be appropriate to make a direct quantitative comparison for aqueous field blanks (such as equipment blanks reported as µg/mL) to a solid parent sample (such as a soil sample reported as mg/kg). At best, only a qualitative comparison can be made.

HT-S10-15-16 (580-109327-9)	Result (mg/kg)	PAL (mg/kg)
o-Xylene	6.1	2.1

Compound	QL	5x QL	HT-N25-10-11 580-109327-14	HT-N25-10-11 DUPLICATE 580-109327-7	RPD	Abs. Diff	Action
Benzene	0.061	0.31	0	0	#DIV/0!	0.00	None both ND
Toluene	0.18	0.90	0	0	#DIV/0!	0.00	None both ND
Ethylbenzene	0.12	0.60	0	0	#DIV/0!	0.00	None both ND
m-Xylene & p-Xylene	0.12	0.60	0	0	#DIV/0!	0.00	None both ND
o-Xylene	0.12	0.60	0	0	#DIV/0!	0.00	None both ND

Compound	QL	5x QL	HT-N25-14-15 580-109327-11	HT-N25-14-15 DUPLICATE 580-109327-12	RPD	Abs. Diff	Action
Benzene	0.065	0.33	0	0	#DIV/0!	0.00	None both ND
Toluene	0.2	1.00	0	0	#DIV/0!	0.00	None both ND
Ethylbenzene	0.13	0.65	0	0	#DIV/0!	0.00	None both ND
m-Xylene & p-Xylene	0.13	0.65	0	0	#DIV/0!	0.00	None both ND
o-Xylene	0.13	0.65	0	0	#DIV/0!	0.00	None both ND

RPD limits: $\leq 30\%$ (aqueous) and $\leq 50\%$ (solid)
 (when both sample concentrations are $> 5x$ the
 LOQ) or

absolute difference between concentrations are
 $\leq 2x$ LOQ (when the sample or field duplicate
 concentrations are $\leq 5x$ LOQ)

Memorandum

Project: Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility

Site Characterization Study

Laboratory: Eurofins, Seattle, WA

Laboratory Number: 580-109327-1

Analyses/Method: Semivolatile Organic Compounds by EPA Method 8270E-SIM
(1-Methylnaphthalene, 2-Methylnaphthalene, Naphthalene)

Validation Level: Stage 2B

Project Number: 60674414.00.50.01

Prepared by: Kristin Rutherford/AECOM Completed on: 05/03/2022

Reviewed by: Lori Herberich/AECOM File Name: 580-109327-1_SVOC_memo

SUMMARY

The samples listed below were collected by AECOM from the Joint Base Pearl Harbor-Hickam, Hawaii site on January 13, 2022.

Sample ID	Lab ID	Matrix/Sample Type
EB	580-109327-1	Soil
HT-E25-7-8	580-109327-2	Soil
HT-E17.5-14-15	580-109327-3	Soil
HT-S17.5-8-9	580-109327-4	Soil
HT-E10-23-24	580-109327-5	Soil
HT-S10-17-18	580-109327-6	Soil
HT-N25-10-11 DUPLICATE	580-109327-7	Field duplicate of HT-N25-10-11
HT-E25-14-15	580-109327-8	Soil
HT-S10-15-16	580-109327-9	Soil
HT-E17.5-7-8	580-109327-10	Soil
HT-N25-14-15	580-109327-11	Soil
HT-N25-14-15 DUPLICATE	580-109327-12	Field duplicate of HT-N25-14-15
HT-E10-21-22	580-109327-13	Soil
HT-N25-10-11	580-109327-14	Soil
HT-S25-14-15	580-109327-15	Soil
HT-S25-8-9	580-109327-16	Soil
LT-SEDIMENT	580-109327-17	Soil

**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

Data validation activities were conducted with reference to:

- *SW-846 Method 8270E: Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)* (June 2018)
- *Preliminary Site Characterization Plan, Joint Base Pearl Harbor-Hickam, Hawaii* (January 2022)
- *Site Characterization Plan Addendum – Holding Tank-Leach Tank Phase 2, Joint Base Pearl Harbor-Hickam, Hawaii* (March 2022)
- *Module 1 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC/MS, Department of Defense, Revision 1* (May 2020)
- *General Data Validation Guidelines, Department of Defense, Revision 1* (November 2019)
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review* (November 2020).

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody [COC])/sample integrity
- ✓ Holding times and sample preservation
- ✓ Instrument tuning
- ✓ Initial calibration/initial and continuing calibration verification
- ✓ Laboratory blanks/field blanks/equipment blanks
- ✓ Surrogate spike recoveries
- ✓ Matrix spike (MS) and matrix spike duplicate (MSD) results
- ✓ Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
- ✗ Field duplicate results
- ✓ Internal standard results
- ✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as qualified and may be used for decision making purposes. Select data points were estimated due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

RESULTS

Field Duplicate Results

The relative percent difference (RPD) was outside the control limits for field duplicate precision in the following field duplicate pair:

Sample	Field Duplicate	Compound	Result (mg/kg)	FD Result (mg/kg)	RPD	RPD Limits
HT-N25-10-11	HT-N25-10-11 DUPLICATE	1-Methylnaphthalene	0	0.013	NC	50
HT-N25-10-11	HT-N25-10-11 DUPLICATE	2-Methylnaphthalene	0	0.019	NC	50

NC – Not calculated since one result is nondetect

The results for 1-methylnaphthalene and 2-methylnaphthalene in field duplicate pair HT-N25-10-11 and HT-N25-10-11 DUPLICATE were qualified (J/UJ) as estimated. Qualified sample results are shown in Table 1.

Sample Results/Reporting Issues

If applicable, the sample results detected at concentrations less than the Limit of Quantitation (LOQ) but greater than the Detection Limit (DL) are qualified by the laboratory as estimated (J). This “J” qualifier is retained during data validation. Laboratory limits of detection (LOD) meet screening criteria for all samples.

The following compounds exceeded the project screening criteria:

Sample Name	Compound	Result	LOD	Screening Criteria	Units
HT-S10-17-18	1-Methylnaphthalene	4.4	0.0018	4.2	mg/kg
HT-S10-17-18	2-Methylnaphthalene	6.5	0.0036	4.1	mg/kg
HT-S10-15-16	1-Methylnaphthalene	29	0.020	4.2	mg/kg
HT-S10-15-16	2-Methylnaphthalene	45	0.040	4.1	mg/kg
HT-S10-15-16	Naphthalene	8.9	0.0054	4.4	mg/kg
LT-SEDIMENT	1-Methylnaphthalene	52	0.022	4.2	mg/kg
LT-SEDIMENT	2-Methylnaphthalene	74	0.044	4.1	mg/kg
LT-SEDIMENT	Naphthalene	7.2	0.0058	4.4	mg/kg

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.



Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility

Table 1
QA/QC Data Summary Review
Red Hill Site Characterization
Laboratory Group: 580-109327-1

Laboratory Group	Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Units	Final Result	Reason Code
580-109327-1	HT-N25-10-11	580-109327-14	8270E	1-Methylnaphthalene	0.0016	mg/kg	0.0016 UJ	D3
580-109327-1	HT-N25-10-11	580-109327-14	8270E	2-Methylnaphthalene	0.0032	mg/kg	0.0032 UJ	D3
580-109327-1	HT-N25-10-11 DUPLICATE	580-109327-7	8270E	1-Methylnaphthalene	0.013 U	mg/kg	0.013 J	D3
580-109327-1	HT-N25-10-11 DUPLICATE	580-109327-7	8270E	2-Methylnaphthalene	0.019 U	mg/kg	0.019 J	D3

Laboratory: Eurofins Seattle
Laboratory SDG/Job No: 580-109327-1
Validation Level: Stage 2B
 (using Level IV data package)
Number of Samples/Matrix: 16 soils (including 2 FDs), 1 EB
Analysis (Include Method #): SVOCs, SW846 8270E-SIM (Naphthalene, 1-Methylnaphthalene, 2-Methylnaphthalene)

Client/Site Name: Red Hill Site Characterization
Project Number: 60674414.00.50.01
Date: 05/03/22
Validator: K Rutherford
Reviewer and Date: Lori Herberich 5/24/2022

DoD QSM 5.4, DoD Module 1, NFG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Sample Preservation	Yes	No	1.4, 0.5C
Holding Time	Yes	No	Collected 1/13/22, extracted within 14d, analyzed within 40d.
Quantitation Limits	No	No	HT-S10-15-16 (10X), LT-SEDIMENT (10X). ND results were not reported from dilutions; LODs meet PALs. Positive results exceed PALs in samples HT-S10-17-18 (1-MN, 2-MN), HT-S10-15-16 (Naph, 1-MN, 2-MN), LT-SEDIMENT (Naph, 1-MN, 2-MN).
Percent Solids (>30%)	Yes	No	
Method Blanks	Yes	No	MB 580-378465/1-A, MB 580-378478/1-A ND
Other Laboratory Blanks ^{1,2}	NA	NA	Not applicable to these analyses.
Trip/Equipment Blanks	Yes	No	EB ND
Initial Calibration	Yes	No	ICAL 10/05/2021 Inst SEA101, criteria met
Initial Calibration Verification	Yes	No	ICV 580-369708/18, ICV 580-378263/18 %D ≤20%
Continuing Calibration Verification	Yes	No	CCVIS 580-378516/3, CCVC 580-378516/25, CCVIS 580-378609/3, CCVC 580-378609/6, CCVIS 580-378522/3, CCVC 580-378522/8 %D ≤20%
Matrix Spike	Yes	No	
Matrix Spike Duplicate RPD ²	Yes	No	HT-E25-7-8 MS/MSD: %R and RPD within QSM criteria for all compounds.
Laboratory Duplicate ²	NA	NA	Not applicable to these analyses.
Surrogate Standards ²	Yes	No	%Rs within lab limits (per QSM) for PAH surrogates fluoranthene-d10 and 2-methylnaphthalene-d10
Laboratory Control Standards	Yes	No	LCS 580-378465/2-A, LCS 580-378478/2-A, LCSD 580-378478/3-A QSM criteria met for %R, RPD within lab limit (≤20%).
Internal Standards ^{2,3}	Yes	No	
Field Duplicate	No	Yes	HT-N25-10-11 and HT-N25-10-11 DUPLICATE: precision criteria not met for 1-Methylnaphthalene and 2-Methylnaphthalene (see FD tab). Results in FD pair qualified (J/UJ) as estimated.
Field Duplicate	Yes	No	HT-N25-14-15 and HT-N25-14-15 DUPLICATE: precision criteria met, both samples ND
GC/MS Tunes ²	Yes	No	
Calculation Spot Checks ³	NA	NA	Not a required validation element for this project.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

QSM 5.4 C-27 Soils LCS criteria	%R Limits
1-Methylnaphthalene	43-111
2-Methylnaphthalene	39-114
Naphthalene	38-111

Surrogate lab limits

	QC LIMITS
2MN = 2-methylnaphthalene-d10	40-140
TBP = 2,4,6-Tribromophenol	28-140
FLN10 = Fluoranthene-d10 (Surrogate)	40-140
TPHL = Terphenyl-d14	55-192

Sample	Compound	Result (mg/kg)	PAL (mg/kg)
HT-S10-17-18	1-Methylnaphthalene	4.4	4.2
	2-Methylnaphthalene	6.5	4.1
HT-S10-15-16	1-Methylnaphthalene	29	4.2
	2-Methylnaphthalene	45	4.1
	Naphthalene	8.9	4.4
LT-SEDIMENT	1-Methylnaphthalene	52	4.2
	2-Methylnaphthalene	74	4.1
	Naphthalene	7.2	4.4

Compound	QL	5x QL	HT-N25-10-11	HT-N25-10-11 DUPLICATE	RPD	Abs. Diff	Action
			580-109327-14	580-109327-7			
1-Methylnaphthalene	0.0054	0.027	0	0.013	200.0	0.013	Qualify (J/UJ) Abs Diff >2X QL
2-Methylnaphthalene	0.0054	0.027	0	0.019	200.0	0.019	Qualify (J/UJ) Abs Diff >2X QL
Naphthalene	0.0054	0.027	0	0	#DIV/0!	0.0	NONE both ND

2X QL
0.0108
0.0108

Compound	QL	5x QL	HT-N25-14-15	HT-N25-14-15 DUPLICATE	RPD	Abs. Diff	Action
			580-109327-11	580-109327-12			
1-Methylnaphthalene	0.0076	0.038	0	0	#DIV/0!	0.0	NONE both ND
2-Methylnaphthalene	0.0076	0.038	0	0	#DIV/0!	0.0	NONE both ND
Naphthalene	0.0076	0.038	0	0	#DIV/0!	0.0	NONE both ND

RPD limits: $\leq 30\%$ (aqueous) and $\leq 50\%$ (solid) (when both sample concentrations are $> 5x$ the LOQ) or
absolute difference between concentrations are $\leq 2x$ LOQ (when the sample or field duplicate concentrations are $\leq 5x$ LOQ)

Memorandum

Project: Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility

Site Characterization Study

Laboratory: Eurofins, Seattle, WA

Laboratory Number: 580-109327-1

Analyses/Method: TPH-Gasoline Range Organics (TPH-g, C6-C10) by EPA Method 8260D
TPH-Diesel Range Organics (TPH-d, C10-C24) by EPA Method 8015D
TPH-Residual Range Organics (TPH-o, C24-C40) by EPA Method 8015D

Validation Level: Stage 2B

Project Number: 60674414.00.50.01

Prepared by: Kristin Rutherford/AECOM Completed on: 05/04/2022

Reviewed by: Danielle Woitas/AECOM File Name: 580-109327-1_GRO_DRO_memo

SUMMARY

The samples listed below were collected by AECOM from the Joint Base Pearl Harbor-Hickam, Hawaii site on January 13, 2022.

Sample ID	Lab ID	Matrix/Sample Type
EB	580-109327-1	Aqueous equipment blank
HT-E25-7-8	580-109327-2	Soil
HT-E17.5-14-15	580-109327-3	Soil
HT-S17.5-8-9	580-109327-4	Soil
HT-E10-23-24	580-109327-5	Soil
HT-S10-17-18	580-109327-6	Soil
HT-N25-10-11 DUPLICATE	580-109327-7	Field duplicate of HT-N25-10-11
HT-E25-14-15	580-109327-8	Soil
HT-S10-15-16	580-109327-9	Soil
HT-E17.5-7-8	580-109327-10	Soil
HT-N25-14-15	580-109327-11	Soil
HT-N25-14-15 DUPLICATE	580-109327-12	Field duplicate of HT-N25-14-15
HT-E10-21-22	580-109327-13	Soil
HT-N25-10-11	580-109327-14	Soil
HT-S25-14-15	580-109327-15	Soil
HT-S25-8-9	580-109327-16	Soil

**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

Data validation activities were conducted with reference to:

- *SW-846 Method 8260D: Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)* (June 2018)
- *SW-846 Method 8015D: Nonhalogenated Organics Using GC/FID* (June 2003)
- *Preliminary Site Characterization Plan, Joint Base Pearl Harbor-Hickam, Hawaii* (January 2022)
- *Site Characterization Plan Addendum – Holding Tank-Leach Tank Phase 2, Joint Base Pearl Harbor-Hickam, Hawaii* (March 2022)
- *Module 1 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC/MS, Department of Defense, Revision 1* (May 2020)
- *Module 4 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC, Department of Defense, Revision 1* (March 2021)
- *General Data Validation Guidelines, Department of Defense, Revision 1* (November 2019)
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review* (November 2020).

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody [COC])/sample integrity
- ✓ Holding times and sample preservation
- ✓ Instrument tuning
- ✗ Initial calibration/initial and continuing calibration verification
- ✓ Laboratory blanks/field blanks/equipment blanks
- ✓ Surrogate spike recoveries
- ✓ Matrix spike (MS) and matrix spike duplicate (MSD) results
- ✓ Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
- ✓ Field duplicate results
- ✓ Internal standard results
- ✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as qualified and may be used for decision making purposes. Select data points were estimated due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

RESULTS

Initial Calibration/Initial and Continuing Calibration Verification

The following TPH-g initial calibration verification standard was outside the percent difference (%D) criteria:

Calibration Standard	Analyte	%D	%D Limits
ICV 580-377928/13	TPH-g	-21.4	≤ 20

The nondetect result for TPH-g in the associated equipment blank sample, EB, was qualified (UJ) as estimated.

Sample Results/Reporting Issues

If applicable, the sample results detected at concentrations less than the Limit of Quantitation (LOQ) but greater than the Detection Limit (DL) are qualified by the laboratory as estimated (J). This “J” qualifier is retained during data validation.

Samples HT-S10-17-18 (580-109327-6) and HT-S10-15-16 (580-109327-9) were analyzed for TPH-g at reduced volume due to high concentrations of target analytes. The calculation was performed using an initial volume adjustment rather than a dilution factor. The reporting limits have been elevated by the appropriate factor.

The laboratory limit of detection (LOD) met the screening criteria for TPH-g (100 mg/kg) and TPH-d/TPH-o (220 mg/kg) for all nondetect results with the following exception.

The following nondetect result exceeds the site screening criteria:

Sample Name	Analyte	Result	LOD	Screening Criteria	Units
HT-S10-15-16	TPH-g	ND	1000	100	mg/kg

The following positive results exceeded the site screening criteria:

Sample Name	Analyte	Result	LOD	Screening Criteria	Units
HT-S10-17-18	TPH-g	370	110	100	mg/kg
HT-E10-21-22	TPH-d	430	40	220	mg/kg
HT-S10-15-16	TPH-d	3200	33	220	mg/kg
HT-S10-17-18	TPH-d	2600	38	220	mg/kg
LT-SEDIMENT	TPH-d	13000	42	220	mg/kg
LT-SEDIMENT	TPH-o	250	42	220	mg/kg



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.



Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility

Table 1
QA/QC Data Summary Review
Red Hill Site Characterization
Laboratory Group: 580-109327-1

Laboratory Group	Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Units	Final Result	Reason Code
580-109327-1	EB	580-109327-1	8260D	TPH-g	ND	mg/kg	80UJ	V1

Laboratory: Eurofins Seattle
Laboratory SDG/Job No: 580-109327-1
Validation Level: Stage 2B
 (using Level IV data package)
Number of Samples/Matrix: 15 soils (including 2 FDs), 1 EB
Analysis (Include Method #): GRO C6-C10 SW-846 8260D

Client/Site Name: Red Hill Site Characterization
Project Number: 60674414.00.50.01
Date: 05/03/22
Validator: K Rutherford
Reviewer and Date: Danielle Woitas 9/29/22

QSM 5.4, DoD Module 4, NFG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Sample Preservation	Yes	No	0.5° C and 1.4° C.
Holding Time	Yes	No	Collected 1/13/22, analyzed within 14d for methanol preserved samples
Quantitation Limits	No	No	No dilutions. Lab LODs for ND results for GRO meet PAL (100 mg/kg) except for sample HT-S10-15-16 (1000 mg/kg) due to reduced sample volume (see below).
Quantitation Limits	No	No	The following samples were analyzed at reduced volume due to high concentrations of target analytes: HT-S10-17-18 (580-109327-6) and HT-S10-15-16 (580-109327-9). The calculation was performed using an initial volume adjustment rather than a dilution factor. The reporting limits have been elevated by the appropriate factor. The ND results for GRO meet PAL (100 mg/kg) except for sample HT-S10-15-16 (1000 mg/kg) due to reduced sample volume. The result for GRO in sample HT-S10-17-18 (370 mg/kg) exceeds the project screening level of 100 mg/kg - see below.
Percent Solids (>30%)	Yes	No	
Method Blanks	Yes	No	MB 580-378452/1-A, MB 580-378552/4, CCB 580-378543/4 were ND. No qualifications required.
Trip/Equipment Blanks	Yes	No	Equipment blank sample EB (580-109327-1) was ND for GRO.
Initial Calibration	Yes	No	SEA046 01/14/22, TAC036 01/10/22
Initial Calibration Verification	No	Yes	ICV 580-378315/13, ICV 580-377885/14, ICV 580-377928/13 meet criteria. ICV 580-377928/13 outside criteria (-21.4%D) on Inst TAC036, associated with the equipment blank EB (580-109327-1). The ND result in the EB was qualified (UJ) as estimated.
Continuing Calibration Verification	Yes	No	CCVIS 580-378464/3, CCV 580-378464/14, CCV 580-378464/25, CCVIS 580-378543/3, CCV 580-378543/9, CCVIS 580-378552/3, CCV 580-378552/10, CCV 580-378552/21
Matrix Spike	Yes	No	
Matrix Spike Duplicate RPD ²	Yes	No	An MS/MSD was performed on a site sample HT-E17.5-14-15 (580-109327-3). %R and RPD within criteria.
Laboratory Duplicate ²	NA	NA	
Surrogate Standards ²	Yes	No	Surrogate BFB within QSM limits
Laboratory Control Standards	Yes	No	LCS 580-378452/2-A, LCSD 580-378452/3-A, LCS 580-378552/7, LCSD 580-378552/8
Field Duplicate	Yes	No	HT-N25-10-11 (580-109327-14) and HT-N25-10-11 DUPLICATE (580-109327-7): precision criteria met for GRO; no qualifications. See FD tab.
Field Duplicate	Yes	No	HT-N25-14-15 (580-109327-11) and HT-N25-14-15 DUPLICATE (580-109327-12): precision criteria met for GRO; no qualifications. See FD tab.
Internal Standards ^{2,3}	Yes	No	
GC/MS Tunes ²	Yes	No	
Calculation Spot Checks ³	NA	NA	Not a required validation element for this project.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

Gasoline Range Organics (C6-C10)
 Diesel Range Organics (C10-C24)
 Oil Range Organics (C24-C40)

Sample	Compound	Result (mg/kg)	PAL (mg/kg)
HT-S10-17-18	GRO C6-C10	370	100
Sample	Compound	Result (mg/kg)	PAL (mg/kg)
HT-S10-15-16	GRO C6-C10	1000 U	100

Laboratory: Eurofins Seattle
Laboratory SDG/Job No: 580-109327-1
Validation Level: Stage 2B
 (using Level IV data package)
Number of Samples/Matrix: 15 soils (including 2 FDs), 1 EB
Analysis (Include Method #): DRO/ORO SW-846 8015C

Client/Site Name: Red Hill Site Characterization
Project Number: 60674414.00.50.01
Date: 05/04/22
Validator: K Rutherford
Reviewer and Date: Lori Herberich 5/24/2022

QSM 5.4, DoD Module 4, NFG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Sample Preservation	Yes	No	0.5° C and 1.4° C.
Holding Time	Yes	No	Collected 1/13/22, extracted within 14d, analyzed within 40d.
Quantitation Limits	No	No	No dilutions. LODs for ND results meet PAL (220 mg/kg). Results for DRO and/or ORO were above PALs in some samples - see below.
Percent Solids (>30%)	Yes	No	
Method Blanks	Yes	No	MB 580-378451/1-A, MB 580-378479/1-A ND
Equipment Blanks	NA	NA	Equipment blank EB (580-109327-1) submitted with these samples is ND.
Initial Calibration	Yes	No	TAC013 12/27/21, TAC020 12/21/21
Initial Calibration Verification	Yes	No	ICV 580-376805/14, ICV 580-376527/14 within criteria
Continuing Calibration Verification	Yes	No	CCVRT 580-378500/3, CCV 580-378500/14, CCVRT 580-378495/3, CCV 580-378495/14, CCV 580-378495/25, CCV 580-378495/36 within criteria
Matrix Spike	Yes	No	HT-E25-7-8 MS/MSD %R within criteria for DRO and ORO. RPD within lab limits for DRO, ORO. No qualifications required.
Matrix Spike Duplicate RPD ²	Yes	No	
Laboratory Duplicate ²	NA	NA	
Surrogate Standards ²	Yes	No	
Laboratory Control Standards	Yes	No	DRO C10-C24 limits per QSM 5.4 are 38-132%R. Lab used 75-125%R. LCS 580-378451/2-A, LCSD 580-378451/3-A, LCS 580-378479/2-A, LCSD 580-378479/3-A within limits for %R and RPD (≤20% lab limits)
Field Duplicate	Yes	No	HT-N25-10-11 (580-109327-14) and HT-N25-10-11 DUPLICATE (580-109327-7): precision criteria met for DRO/ORO; no qualifications. See FD tab.
Field Duplicate	Yes	No	HT-N25-14-15 (580-109327-11) and HT-N25-14-15 DUPLICATE (580-109327-12): precision criteria met for DRO/ORO; no qualifications. See FD tab.
Calculation Spot Checks ³	NA	NA	Not a required validation element for this project.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

Gasoline Range Organics (C6-C10)
 Diesel Range Organics (C10-C24)
 Oil Range Organics (C24-C40)

Sample	Compound	Result (mg/kg)	PAL (mg/kg)
HT-E10-21-22	DRO C10-C24	430	220
HT-S10-15-16	DRO C10-C24	3200	220
HT-S10-17-18	DRO C10-C24	2600	220
LT-SEDIMENT	DRO C10-C24	13000	220
LT-SEDIMENT	DRO C24-C40	250	220

Compound	QL	5x QL	HT-N25-10-11	HT-N25-10-11 DUPLICATE	RPD	Abs. Diff	Action
			580-109327-14	580-109327-7			
Gasoline Range Organics (C6-C10)	12	60	4.5	12	90.9	7.5	NONE both <5XQL, abs diff <2X QL
DRO C10-C24	61	305	21	18	15.4	3.0	NONE abs diff <2X QL
DRO C24-C40	61	305	0	40	200.0	40	NONE abs diff <2X QL
Compound	QL	5x QL	HT-N25-14-15	HT-N25-14-15 DUPLICATE	RPD	Abs. Diff	Action
			580-109327-11	580-109327-12			
Gasoline Range Organics (C6-C10)	13	65	0	0	#DIV/0!	0.0	NONE both ND
DRO C10-C24	77	385	20	25	22.2	5.0	NONE abs diff <2X QL
DRO C24-C40	77	385	0	0	#DIV/0!	0.0	NONE both ND

RPD limits: $\leq 30\%$ (aqueous) and $\leq 50\%$ (solid) (when both sample concentrations are $> 5x$ the LOQ) or
absolute difference between concentrations are $\leq 2x$ LOQ (when the sample or field duplicate concentrations are $\leq 5x$ LOQ)

Facility: RHBFS Site Characterization
 Event: Site Characterization HT-LT Phase 1
 SDG: 5801093271
 Guidance Document: Red Hill Bulk Fuel Storage Facility Site Characterization UFP-QAPP
 Prime Contractor: AECOM, Honolulu, HI
 Project Manager:
 Contract Laboratory(ies): Eurofins Environment Testing TestAmerica, Tacoma, WA
 Data Review Contractor:
 Data Review Level:
 Primary Data Reviewer: ,
 Date Submitted:

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	BNASIM	SW8015D	SW8260	SW8260D
HT-E10-21-22	580-109327-13	Solid	Field Sample/N	X	X	X	X
HT-E10-23-24	580-109327-5	Solid	Field Sample/N	X	X	X	X
HT-E17.5-14-15	580-109327-3	Solid	Field Sample/N	X	X	X	X
HT-E17.5-7-8	580-109327-10	Solid	Field Sample/N	X	X	X	X
HT-E25-14-15	580-109327-8	Solid	Field Sample/N	X	X	X	X
HT-E25-7-8	580-109327-2	Solid	Field Sample/N	X	X	X	X
HT-N25-10-11	580-109327-14	Solid	Field Sample/N	X	X	X	X
HT-N25-10-11 DUPLICATE	580-109327-7	Solid	Field Duplicate/FD	X	X	X	X
HT-N25-14-15	580-109327-11	Solid	Field Sample/N	X	X	X	X
HT-N25-14-15 DUPLICATE	580-109327-12	Solid	Field Duplicate/FD	X	X	X	X
HT-S10-15-16	580-109327-9	Solid	Field Sample/N	X	X	X	X
HT-S10-17-18	580-109327-6	Solid	Field Sample/N	X	X	X	X
HT-S17.5-8-9	580-109327-4	Solid	Field Sample/N	X	X	X	X
HT-S25-14-15	580-109327-15	Solid	Field Sample/N	X	X	X	X
HT-S25-8-9	580-109327-16	Solid	Field Sample/N	X	X	X	X
LT-SEDIMENT	580-109327-17	Solid	Field Sample/N	X	X		
EB	580-109327-1	Water	Equipment Blank/EB	X	X	X	X

Data Validation Report for 5801093271

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Red Hill Bulk Fuel Storage Facility Site Characterization UFP-QAPP and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by AECOM, Honolulu, HI; analyses were performed by Eurofins Environment Testing TestAmerica, Tacoma, WA and were reported under sample delivery group (SDG) 5801093271. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Calibration Blank
- Calibration Blank - Negative
- Continuing Calibration Verification
- Equipment Blank
- Field Duplicate RPD
- Lab Blank
- LCS Recovery
- LCS RPD
- MS Recovery
- MS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 5 results (2.54%) out of the 197 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Data Validation Report for 5801093271

Narrative Comments

Analytical Method Data Reviewer Comment

Reviewed by , ,

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.



Reviewed by , Senior Scientist,

September 29, 2022

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Data Validation Report for 5801093271

No Outliers were associated with this sample delivery group.

Table of All Qualified Results

Test Method: BNASIM		Extraction Method: SW3546						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
HT-N25-10-11 580-109327-14	N	1-Methylnaphthalene	0.00540	0.00160 U	0.00160 UJ		mg/kg	D3
HT-N25-10-11 580-109327-14	N	2-Methylnaphthalene	0.00540	0.00320 U	0.00320 UJ		mg/kg	D3
HT-N25-10-11 DUPLICATE 580-109327-7	FD	1-Methylnaphthalene	0.00560	0.0130 M	0.0130 J		mg/kg	D3
HT-N25-10-11 DUPLICATE 580-109327-7	FD	2-Methylnaphthalene	0.00560	0.0190 M	0.0190 J		mg/kg	D3
Test Method: SW8260		Extraction Method: SW5030						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
EB 580-109327-1	EB	C6-C10 Gasoline Range Organics	100	80.0 U	80.0 UJ		ug/l	V1

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.

In instances where no LOD is provided, results are reported down to the LOQ.

Trace values are not included in the qualified results table unless additional reason codes are associated.

Data Validation Report for 5801093271

Table of Results with Modified Qualifiers

Modified Qualifiers for test method BNASIM

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
HT-N25-10-11 580-109327-14	N	1-Methylnaphthalene	0.00540	0.00160 U	0.00160 U	0.00160 UJ	D3
HT-N25-10-11 580-109327-14	N	2-Methylnaphthalene	0.00540	0.00320 U	0.00320 U	0.00320 UJ	D3
HT-N25-10-11 DUPLICATE 580-109327-7	FD	1-Methylnaphthalene	0.00560	0.0130 M	0.0130	0.0130 J	D3
HT-N25-10-11 DUPLICATE 580-109327-7	FD	2-Methylnaphthalene	0.00560	0.0190 M	0.0190	0.0190 J	D3

Modified Qualifiers for test method SW8260

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
EB 580-109327-1	EB	C6-C10 Gasoline Range Organics	100	80.0 U	80.0 U	80.0 UJ	V1

Modified Qualifiers for test method SW8260

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
HT-N25-10-11 580-109327-14	N	C6-C10 Gasoline Range Organics	12.0	4.50 J	4.50 J	9.10 U	
HT-S25-14-15 580-109327-15	N	C6-C10 Gasoline Range Organics	14.0	7.00 J	7.00 J	11.0 U	
HT-S25-8-9 580-109327-16	N	C6-C10 Gasoline Range Organics	11.0	4.30 J	4.30 J	8.10 U	

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ. Trace values are not included in the qualified results table unless additional reason codes are associated.

Reason Code Definitions

Code	Definition
D3	Field Duplicate RPD
TR	Trace Level Detect
V1	ICV

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Data Validation Report for 5801093271

Bias

-
- | | |
|---|-------------------------------|
| - | The result may be biased low |
| + | The result may be biased high |
-

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Data Validation Report for 5801093271

Review Questions

Memorandum

Project: Joint Base Pearl Harbor-Hickam, Hawaii
 Red Hill Bulk Fuel Storage Facility

Site Characterization Study

Laboratory: Eurofins, Seattle, WA

Laboratory Number: 580-109724-1

Analyses/Method: Volatile Organic Compounds (BTEX) by EPA Method 8260D

Validation Level: Stage 2B

Project Number: 60674414.00.50.01

Prepared by: Jared DeSadier / AECOM Completed on: 05/18/2022

Reviewed by: Danielle Woitas / AECOM File Name: 580-109724-1_BTEX_memo

SUMMARY

The samples listed below were collected by AECOM from the Joint Base Pearl Harbor-Hickam, Hawaii site on January 26, 2022.

Sample ID	Lab ID	Matrix/Sample Type
ERH2495	580-109724-1	Groundwater
ERH2494	580-109724-2	Trip Blank

Data validation activities were conducted with reference to:

- *SW-846 Method 8260D: Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)* (June 2018)
- *Preliminary Site Characterization Plan, Joint Base Pearl Harbor-Hickam, Hawaii* (January 2022)
- *Site Characterization Plan Addendum – Holding Tank-Leach Tank Phase 2, Joint Base Pearl Harbor-Hickam, Hawaii* (March 2022)
- *Module 1 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC/MS, Department of Defense, Revision 1* (May 2020)
- *General Data Validation Guidelines, Department of Defense, Revision 1* (November 2019)
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review* (November 2020).



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody [COC])/sample integrity
- ✓ Holding times and sample preservation
- ✓ Instrument tuning
- ✓ Initial calibration/initial and continuing calibration verification
- ✓ Laboratory blanks/field blanks/equipment blanks
- ✓ Surrogate spike recoveries
- NA Matrix spike (MS) and matrix spike duplicate (MSD) results
- ✓ Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
- ✓ Field duplicate results
- ✓ Internal standard results
- ✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. The symbol (X) indicates that a QC nonconformance resulted in the qualification of data. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. There were no data points qualified as a result of this data review.

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Sample Results/Reporting Issues

If applicable, the sample results detected at concentrations less than the Limit of Quantitation (LOQ) but greater than the Detection Limit (DL) are qualified by the laboratory as estimated (J). This “J” qualifier is retained during data validation.

The reporting limits for nondetect results were within the site screening criteria, and no sample results exceeded the site screening limits.



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

QUALIFICATION ACTIONS

No qualification of data was required for VOCs in this SDG.

Laboratory: Eurofins Seattle
Laboratory SDG/Job No: 580-109724-1
Validation Level: Stage 2B
 (using Level IV data package)
Number of Samples/Matrix: 1 groundwater, 1 TB
Analysis (Include Method #): BTEX SW846 8260D

Client/Site Name: Red Hill Site Characterization
Project Number: 60674414.00.50.01
Date: 05/18/22
Validator: J. DeSadier
Reviewer and Date: Danielle Woitas 9/12/22

QAPP (QSM 5.4), DoD Module 1, NFG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Sample Preservation	Yes	No	0.8°C
Holding Time	Yes	No	Collected 1/26/22, analyzed within HT.
Quantitation Limits	Yes	No	No dilutions. ND results at LOD meet action limits.
Percent Solids (>30%)	NA	NA	
Method Blanks	Yes	No	MB 580-378734/5
Other Laboratory Blanks ^{1,2}	NA	NA	
Trip/Equipment Blanks	Yes	No	Trip blank sample ERH2494 was ND for BTEX.
Initial Calibration	Yes	No	01/25/22 Inst SEA102, criteria met
Initial Calibration Verification	Yes	No	ICV 580-379280/15, criteria met
Continuing Calibration Verification	Yes	No	CCVIS 580-379738/3
Matrix Spike	NA	NA	
Matrix Spike Duplicate RPD ²	NA	NA	An MS/MSD was not analyzed on a sample in this SDG.
Laboratory Duplicate ²	NA	NA	Not applicable to these analyses.
Surrogate Standards ²	Yes	No	
Laboratory Control Standards	Yes	No	LCS 580-379738/6, LCSD 580-379738/7. The RPD for benzene was above criteria. Associated results were nondetect and no qualification of data was required.
Internal Standards ^{2,3}	Yes	No	
Field Duplicate	NA	NA	
GC/MS Tunes ²	Yes	No	
Calculation Spot Checks ³	NA	NA	Not a required validation element for this project.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

Note: it may not be appropriate to make a direct quantitative comparison for aqueous field blanks (such as equipment blanks reported as µg/mL) to a solid parent sample (such as a soil sample reported as mg/kg). At best, only a qualitative comparison can be made.



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

Project:	Joint Base Pearl Harbor-Hickam, Hawaii Red Hill Bulk Fuel Storage Facility	
	Site Characterization Study	
Laboratory:	Eurofins, Seattle, WA	
Laboratory Number:	580-109724-1	
Analyses/Method:	Semivolatile Organic Compounds by EPA Method 8270E-SIM (1-Methylnaphthalene, 2-Methylnaphthalene, Naphthalene)	
Validation Level:	Stage 2B	
Project Number:	60674414.00.50.01	
Prepared by:	Jared DeSadier / AECOM	Completed on: 05/18/2022
Reviewed by:	Danielle Woitas / AECOM	File Name: 580-109724-1_SVOC_memo

SUMMARY

The samples listed below were collected by AECOM from the Joint Base Pearl Harbor-Hickam, Hawaii site on January 26, 2022.

Sample ID	Lab ID	Matrix/Sample Type
ERH2495	580-109724-1	Groundwater

Data validation activities were conducted with reference to:

- *SW-846 Method 8270E: Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)* (June 2018)
- *Preliminary Site Characterization Plan, Joint Base Pearl Harbor-Hickam, Hawaii* (January 2022)
- *Site Characterization Plan Addendum – Holding Tank-Leach Tank Phase 2, Joint Base Pearl Harbor-Hickam, Hawaii* (March 2022)
- *Module 1 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC/MS, Department of Defense, Revision 1* (May 2020)
- *General Data Validation Guidelines, Department of Defense, Revision 1* (November 2019)
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review* (November 2020).



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody [COC])/sample integrity
- ✓ Holding times and sample preservation
- ✓ Instrument tuning
- ✓ Initial calibration/initial and continuing calibration verification
- ✓ Laboratory blanks/field blanks/equipment blanks
- ✓ Surrogate spike recoveries
- NA Matrix spike (MS) and matrix spike duplicate (MSD) results
- ✓ Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
- NA Field duplicate results
- ✓ Internal standard results
- ✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. The symbol (X) indicates that a QC nonconformance resulted in the qualification of data. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. There were no results qualified on the basis of this data review.

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Sample Results/Reporting Issues

If applicable, the sample results detected at concentrations less than the Limit of Quantitation (LOQ) but greater than the Detection Limit (DL) are qualified by the laboratory as estimated (J). This “J” qualifier is retained during data validation. Laboratory limits of detection (LOD) meet screening criteria for all samples.



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

QUALIFICATION ACTIONS

No qualification of data was required for method 8270E-SIM.

Laboratory:
Laboratory SDG/Job No:
Validation Level:

Eurofins Seattle
 580-109724-1
 Stage 2B
 (using Level IV data package)

Client/Site Name: Red Hill Site Characterization

Project Number: 60674414.00.50.01

Date: 05/05/22

Validator: J. DeSadier

Number of Samples/Matrix:
Analysis (Include Method #):

1 groundwater
 SVOCs, SW846 8270E-SIM (Naphthalene, 1-Methylnaphthalene, 2-Methylnaphthalene)

Reviewer and Date: Danielle Woitas 9/13/22

DoD QSM 5.4, DoD Module 1, NFG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Sample Preservation	Yes	No	0.8°C
Holding Time	Yes	No	Collected 1/26/22, analyzed within HT.
Quantitation Limits	Yes	No	No dilutions. Lab DLs for ND results meet PAL.
Percent Solids (>30%)	NA	NA	
Method Blanks	Yes	No	MB 580-379767/1-A, ND
Other Laboratory Blanks ^{1,2}	NA	NA	Not applicable to these analyses.
Trip/Equipment Blanks	NA	NA	
Initial Calibration	Yes	No	ICAL 10/5/2021 Inst SEA101, criteria met
Initial Calibration Verification	Yes	No	ICV 580-369707/18, criteria met
Continuing Calibration Verification	Yes	No	CCVIS 580-379790/3, criteria met
Matrix Spike	NA	NA	
Matrix Spike Duplicate RPD ²	NA	NA	An MS/MSD was not analyzed on a sample in this SDG.
Laboratory Duplicate ²	NA	NA	Not applicable to these analyses.
Surrogate Standards ²	Yes	No	%Rs within lab limits (per QSM) for PAH surrogates fluoranthene-d10 and 2-methylnaphthalene-d10
Laboratory Control Standards	Yes	No	LCS 580-379767/2-A, LCSD 580-379767/3-A, criteria met
Internal Standards ^{2,3}	Yes	No	
Field Duplicate	NA	NA	
GC/MS Tunes ²	Yes	No	
Calculation Spot Checks ³	NA	NA	Not a required validation element for this project.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

Project:	Joint Base Pearl Harbor-Hickam, Hawaii Red Hill Bulk Fuel Storage Facility	
	Site Characterization Study	
Laboratory:	Eurofins, Seattle, WA	
Laboratory Number:	580-109724-1	
Analyses/Method:	TPH-Gasoline Range Organics (TPH-g, C6-C10) by EPA Method 8260D TPH-Diesel Range Organics (TPH-d, C10-C24) by EPA Method 8015D TPH-Residual Range Organics (TPH-o, C24-C40) by EPA Method 8015D	
Validation Level:	Stage 2B	
Project Number:	60674414.00.50.01	
Prepared by:	Jared DeSadier / AECOM	Completed on: 05/18/2022
Reviewed by:	Danielle Woitas / AECOM	File Name: 580-109724-1_GRO_DRO_memo

SUMMARY

The samples listed below were collected by AECOM from the Joint Base Pearl Harbor-Hickam, Hawaii site on January 26, 2022.

Sample ID	Lab ID	Matrix/Sample Type
ERH2495	580-109724-1	Groundwater
ERH2494	580-109724-2	Trip Blank

Data validation activities were conducted with reference to:

- *SW-846 Method 8260D: Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)* (June 2018)
- *SW-846 Method 8015D: Nonhalogenated Organics Using GC/FID* (June 2003)
- *Preliminary Site Characterization Plan, Joint Base Pearl Harbor-Hickam, Hawaii* (January 2022)
- *Site Characterization Plan Addendum – Holding Tank-Leach Tank Phase 2, Joint Base Pearl Harbor-Hickam, Hawaii* (March 2022)
- *Module 1 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC/MS, Department of Defense, Revision 1* (May 2020)
- *Module 4 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC, Department of Defense, Revision 1* (March 2021)
- *General Data Validation Guidelines, Department of Defense, Revision 1* (November 2019)
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review* (November 2020).



**Summary Data Quality Review
 Joint Base Pearl Harbor-Hickam, Hawaii
 Red Hill Bulk Fuel Storage Facility**

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody [COC])/sample integrity
- ✓ Holding times and sample preservation
- ✓ Instrument tuning
- ✗ Initial calibration/initial and continuing calibration verification
- ✓ Laboratory blanks/field blanks/equipment blanks
- ✓ Surrogate spike recoveries
- NA Matrix spike (MS) and matrix spike duplicate (MSD) results
- ✓ Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
- NA Field duplicate results
- ✓ Internal standard results
- ✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as qualified and may be used for decision making purposes. Select data points were estimated due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Initial Calibration Verification

The following percent difference (%D) was outside of control limits:

ICV ID	Analyte	%D	%D Limit
ICV 580-379339/13	TPH-g	-27.5	20



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

Associated nondetect results were qualified as estimated "UJ" as shown in Table 1, below.

Sample Results/Reporting Issues

If applicable, the sample results detected at concentrations less than the Limit of Quantitation (LOQ) but greater than the Detection Limit (DL) are qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.



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Memorandum

Table 1
QA/QC Data Summary Review
Red Hill Site Characterization
Laboratory Group: 580-109724-1

Laboratory Group	Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Units	Final Result	Reason Code
580-109724-1	ERH2494	580-109724-1	8260	TPH-g	80 U	mg/kg	80 UJ	V1
580-109724-1	ERH2495	580-109724-2	8260	TPH-g	80 U	mg/kg	80 UJ	V1

Laboratory:
Laboratory SDG/Job No:
Validation Level:

Eurofins Seattle
 580-109724-1
 Stage 2B
 (using Level IV data package)
 1 groundwater, 1 TB
 GRO C6-C10 SW-846 8260D

Client/Site Name: Red Hill Site Characterization
Project Number: 60674414.00.50.01
Date: 05/18/22
Validator: J. DeSadier
Reviewer and Date: Danielle Woitas 10/3/22

Number of Samples/Matrix:
Analysis (Include Method #):

QSM 5.4, DoD Module 4, NFG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Sample Preservation	Yes	No	0.8°C
Holding Time	Yes	No	Collected 1/26/22, analyzed within HT.
Quantitation Limits	Yes	No	No dilutions. Lab DLs for ND results meet PAL.
Percent Solids (>30%)	NA	NA	
Method Blanks	Yes	No	MB 580-379734/5
Trip/Equipment Blanks	Yes	No	ERH2494, GRO ND
Initial Calibration	Yes	No	SEA102 01/25/22 17:19, SEA102 01/25/22 23:09
Initial Calibration Verification	No	Yes	ICV 580-379276/16, ICV 580-379339/13, within criteria. The %D was below criteria for GRO in 580-379339/13 (-27.5%); associated nondetect results qualified as estimated "UJ".
Continuing Calibration Verification	Yes	No	CCVIS 580-379734/4, CCV 580-379734/15, CCV 580-379734/26, CCV 580-379734/28
Matrix Spike	NA	NA	An MS/MSD was not performed on a site sample in this data set.
Matrix Spike Duplicate RPD ²	NA	NA	
Laboratory Duplicate ²	NA	NA	
Surrogate Standards ²	Yes	No	
Laboratory Control Standards	Yes	No	LCS 580-379734/8, LCSD 580-379734/9
Field Duplicate	NA	NA	A field duplicate was not submitted with the samples in this SDG.
Internal Standards ^{2,3}	Yes	No	
GC/MS Tunes ²	Yes	No	
Calculation Spot Checks ³	NA	NA	Not a required validation element for this project.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

Gasoline Range Organics (C6-C10)
 Diesel Range Organics (C10-C24)
 Oil Range Organics (C24-C40)

Laboratory: Eurofins Seattle
Laboratory SDG/Job No: 580-109724-1
Validation Level: Stage 2B
 (using Level IV data package)
Number of Samples/Matrix: 1 groundwater
Analysis (Include Method #): DRO/ORO SW-846 8015C

Client/Site Name: Red Hill Site Characterization
Project Number: 60674414.00.50.01
Date: 05/18/22
Validator: J. DeSadier
Reviewer and Date: Danielle Woitas 9/13/22

QSM 5.4, DoD Module 4, NFG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Sample Preservation	Yes	No	0.8°C
Holding Time	Yes	No	Collected 1/26/22, analyzed within HT.
Quantitation Limits	Yes	No	No dilutions. Lab DLs for ND results meet PAL.
Percent Solids (>30%)	NA	NA	
Method Blanks	Yes	No	MB 580-379706/1-B
Equipment Blanks	NA	NA	
Initial Calibration	Yes	No	TAC020 12/21/21
Initial Calibration Verification	Yes	No	ICV 580-376527/14, within criteria
Continuing Calibration Verification	Yes	No	CCVRT 580-379789/3, CCV 580-379789/25, CCV 580-379789/33, within criteria
Matrix Spike	NA	NA	An MS/MSD was not performed on a site sample in this data set.
Matrix Spike Duplicate RPD ²	NA	NA	
Laboratory Duplicate ²	NA	NA	
Surrogate Standards ²	Yes	No	
Laboratory Control Standards	Yes	No	LCS 580-379706/2-B, LCSD 580-379706/3-B
Field Duplicate	NA	NA	A field duplicate was not submitted with the samples in this SDG.
Calculation Spot Checks ³	NA	NA	Not a required validation element for this project.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

Gasoline Range Organics (C6-C10)
 Diesel Range Organics (C10-C24)
 Oil Range Organics (C24-C40)

Facility: RHBFS Site Characterization
 Event: Site Characterization HT-LT Phase 1
 SDG: 5801097241
 Guidance Document: Red Hill Bulk Fuel Storage Facility Site Characterization UFP-QAPP
 Prime Contractor: AECOM, Honolulu, HI
 Project Manager:
 Contract Laboratory(ies): Eurofins Environment Testing TestAmerica, Tacoma, WA
 Data Review Contractor:
 Data Review Level:
 Primary Data Reviewer: ,
 Date Submitted:

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	BNASIM	M8015D	SW8260	SW8260D
ERH2494	580-109724-2	Water	Trip Blank/TB			X	X
ERH2495	580-109724-1	Water	Field Sample/N	X	X	X	X

Data Validation Report for 5801097241

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Red Hill Bulk Fuel Storage Facility Site Characterization UFP-QAPP and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by AECOM, Honolulu, HI; analyses were performed by Eurofins Environment Testing TestAmerica, Tacoma, WA and were reported under sample delivery group (SDG) 5801097241. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Continuing Calibration Verification
- Lab Blank
- LCS Recovery
- LCS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time
- Trip Blank

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 2 results (10.53%) out of the 19 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Data Validation Report for 5801097241

Narrative Comments

Analytical Method Data Reviewer Comment

Reviewed by , ,

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.



Reviewed by , Senior Scientist,

October 04, 2022

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Data Validation Report for 5801097241

No Outliers were associated with this sample delivery group.

Table of All Qualified Results

Test Method: SW8260		Extraction Method: SW5030							
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason	
ERH2494 580-109724-2	TB	C6-C10 Gasoline Range Organics	100	80.0 U	80.0 UJ		ug/l	V1	
ERH2495 580-109724-1	N	C6-C10 Gasoline Range Organics	100	80.0 U	80.0 UJ		ug/l	V1	

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.

In instances where no LOD is provided, results are reported down to the LOQ.

Trace values are not included in the qualified results table unless additional reason codes are associated.

Data Validation Report for 5801097241

Table of Results with Modified Qualifiers

Modified Qualifiers for test method SW8260

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
ERH2494 580-109724-2	TB	C6-C10 Gasoline Range Organics	100	80.0 U	80.0 U	80.0 UJ	V1
ERH2495 580-109724-1	N	C6-C10 Gasoline Range Organics	100	80.0 U	80.0 U	80.0 UJ	V1

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.

In instances where no LOD is provided, results are reported down to the LOQ.

Trace values are not included in the qualified results table unless additional reason codes are associated.

Reason Code Definitions

Code	Definition
TR	Trace Level Detect
V1	ICV

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Data Validation Report for 5801097241

Review Questions

Memorandum

Project: Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility

Site Characterization Study

Laboratory: Eurofins, Seattle, WA

Laboratory Number: 580-111500-1

Analyses/Method: Volatile Organic Compounds (BTEX) by EPA Method 8260D

Validation Level: Stage 2B

Project Number: 60674414.00.50.01

Prepared by: Jared DeSadier / AECOM Completed on: 05/05/2022

Reviewed by: Kristin Rutherford / AECOM File Name: 580-111500-1_BTEX_memo

SUMMARY

The samples listed below were collected by AECOM from the Joint Base Pearl Harbor-Hickam, Hawaii site on March 16, 2022.

Sample ID	Lab ID	Matrix/Sample Type
LTE00.0-WGN01-030.0	580-111500-1	Groundwater
HTE00.0-WGN01-031.0	580-111500-2	Groundwater
TB-02	580-111500-3	Trip blank
HTE00.0-WGFD01-031.0	580-111502-1	Field duplicate of HTE00.0-WGN01-031.0
LTW35.0-WGN01-028.0	580-111502-2	Groundwater
TB-01	580-111502-3	Trip blank

Data validation activities were conducted with reference to:

- *SW-846 Method 8260D: Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)* (June 2018)
- *Preliminary Site Characterization Plan, Joint Base Pearl Harbor-Hickam, Hawaii* (January 2022)
- *Site Characterization Plan Addendum – Holding Tank-Leach Tank Phase 2, Joint Base Pearl Harbor-Hickam, Hawaii* (March 2022)
- *Module 1 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC/MS, Department of Defense, Revision 1* (May 2020)
- *General Data Validation Guidelines, Department of Defense, Revision 1* (November 2019)
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review* (November 2020).



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody [COC])/sample integrity
- ✓ Holding times and sample preservation
- ✓ Instrument tuning
- ✓ Initial calibration/initial and continuing calibration verification
- ✓ Laboratory blanks/field blanks/equipment blanks
- ✗ Surrogate spike recoveries
- ✓ Matrix spike (MS) and matrix spike duplicate (MSD) results
- ✓ Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
- ✓ Field duplicate results
- ✓ Internal standard results
- ✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as qualified and may be used for decision making purposes. There were no data points qualified as a result of this data review.

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Surrogate Results

The following surrogate recoveries were outside the control limits:

Sample	Surrogate	Recovery	Recovery Limits
LTE00.0-WGN01-030.0	1,2-dichloroethane-d4	122	81-118
HTE00.0-WGN01-031.0	1,2-dichloroethane-d4	119	81-118



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

Sample	Surrogate	Recovery	Recovery Limits
HTE00.0-WGFD01-031.0	1,2-dichloroethane-d4	123	81-118
LTW35.0-WGN01-028.0	1,2-dichloroethane-d4	126	81-118

The detected results in sample LTW35.0-WGN01-028.0 were qualified as estimated “J”. Qualified sample results are shown in Table 1. Nondetect results associated with high bias did not require qualification.

Sample Results/Reporting Issues

If applicable, the sample results detected at concentrations less than the Limit of Quantitation (LOQ) but greater than the Detection Limit (DL) are qualified by the laboratory as estimated (J). This “J” qualifier is retained during data validation.

The reporting limits for nondetect results were within the site screening criteria, and no sample results exceeded the site screening limits.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.



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Memorandum

Table 1
QA/QC Data Summary Review
Red Hill Site Characterization
Laboratory Group: 580-111500-1

Laboratory Group	Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Units	Final Result	Reason Code
580-111500-1	LTW35.0-WGN01-028.0	580-111502-2	8260D	o-xylene	4.8	ug/L	4.8 J	I
580-111500-1	LTW35.0-WGN01-028.0	580-111502-2	8260D	total xylenes	4.8	ug/L	4.8 J	I

Laboratory: Eurofins Seattle
Laboratory SDG/Job No: 580-111500-1
Validation Level: Stage 2B
 (using Level IV data package)
Number of Samples/Matrix: 4 groundwater (including 1 FD), 2 TB
Analysis (Include Method #): BTEX SW846 8260D

Client/Site Name: Red Hill Site Characterization
Project Number: 60674414.00.50.01
Date: 05/05/22
Validator: J. DeSadier
Reviewer and Date: K Rutherford 5/10/22

QAPP (QSM 5.4), DoD Module 1, NFG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	The sample label for HTE00.0-WGN01-031.0 did not match the COC. The sample was logged via the COC. Sample HTE00.0-WGFD01-031.0 was originally logged in SDG 580-111502-1, but per request, 580-111502-1 was combined with 580-111500-1 to include a parent and duplicate sample together.
Sample Preservation	Yes	No	-0.2° C and -0.1° C.
Holding Time	Yes	No	Collected 3/16/22, analyzed within HT.
Quantitation Limits	Yes	No	No dilutions. ND results at LOD meet action limits.
Percent Solids (>30%)	NA	NA	
Method Blanks	Yes	No	MB 580-384857/5, MB 580-384852/5
Other Laboratory Blanks ^{1,2}	Yes	No	
Trip/Equipment Blanks	Yes	No	Trip blank samples TB-01 and TB-02 were ND for BTEX.
Initial Calibration	Yes	No	01/28/22 Inst TAC036, criteria met
Initial Calibration Verification	Yes	No	ICV 580-379724/14, criteria met
Continuing Calibration Verification	Yes	No	CCVIS 580-384852/3, CCVC 580-384852/27, CCCV 580-38485243, within criteria.
Matrix Spike	NA	NA	An MS/MSD was not analyzed on a sample in this SDG.
Matrix Spike Duplicate RPD ²	NA	NA	
Laboratory Duplicate ²	NA	NA	Not applicable to these analyses.
Surrogate Standards ²	No	Yes	The surrogate 1,2-dichloroethene was above criteria in each sample. Nondetect results did not require qualification and the detections in sample LTW35.0-WGN01-028.0 were qualified as estimated "J".
Laboratory Control Standards	Yes	No	LCS 580-384852/6, LCSD 580-384852/7, within criteria
Internal Standards ^{2,3}	Yes	No	
Field Duplicate	Yes	No	HTE00.0-WGN01-031.0 (580-111500-2) and HTE00.0-WGFD01-031.0 (580-111502-1): precision criteria met
GC/MS Tunes ²	Yes	No	
Calculation Spot Checks ³	NA	NA	Not a required validation element for this project.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

Note: it may not be appropriate to make a direct quantitative comparison for aqueous field blanks (such as equipment blanks reported as µg/mL) to a solid parent sample (such as a soil sample reported as mg/kg). At best, only a qualitative comparison can be made.

Samples	Lab ID
LTE00.0-WGN01-030.0	580-111500-1
HTE00.0-WGN01-031.0	580-111500-2
TB-02	580-111500-3
HTE00.0-WGFD01-031.0	580-111502-1
LTW35.0-WGN01-028.0	580-111502-2
TB-01	580-111502-3

Compound	QL	5x QL	HTE00.0-WGN01-031.0	HTE00.0-WGFD01-031.0	RPD	Abs. Diff	Action
			580-111500-2	580-111502-1			
Benzene	1	5.00	0	0	#DIV/0!	0.00	None both ND
Toluene	1	5.00	0	0	#DIV/0!	0.00	None both ND
Ethylbenzene	1	5.00	0	0	#DIV/0!	0.00	None both ND
m-Xylene & p-Xylene	2	10.00	0	0	#DIV/0!	0.00	None both ND
o-Xylene	1	5.00	0	0	#DIV/0!	0.00	None both ND
total xylenes	2	10.00	0	0	#DIV/0!	0.00	None both ND

RPD limits: $\leq 30\%$ (aqueous) and $\leq 50\%$ (solid)
 (when both sample concentrations are $> 5x$ the
 LOQ) or

absolute difference between concentrations are
 $\leq 2x$ LOQ (when the sample or field duplicate
 concentrations are $\leq 5x$ LOQ)

Memorandum

Project: Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility

Site Characterization Study

Laboratory: Eurofins, Seattle, WA

Laboratory Number: 580-111500-1

Analyses/Method: Semivolatile Organic Compounds by EPA Method 8270E-SIM
(1-Methylnaphthalene, 2-Methylnaphthalene, Naphthalene)

Validation Level: Stage 2B

Project Number: 60674414.00.50.01

Prepared by: Jared DeSadier / AECOM Completed on: 05/05/2022

Reviewed by: Kristin Rutherford / AECOM File Name: 580-111500-1_SVOC_memo

SUMMARY

The samples listed below were collected by AECOM from the Joint Base Pearl Harbor-Hickam, Hawaii site on March 16, 2022.

Sample ID	Lab ID	Matrix/Sample Type
LTE00.0-WGN01-030.0	580-111500-1	Groundwater
HTE00.0-WGN01-031.0	580-111500-2	Groundwater
HTE00.0-WGFD01-031.0	580-111502-1	Field duplicate of HTE00.0-WGN01-031.0
LTW35.0-WGN01-028.0	580-111502-2	Groundwater

Data validation activities were conducted with reference to:

- *SW-846 Method 8270E: Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)* (June 2018)
- *Preliminary Site Characterization Plan, Joint Base Pearl Harbor-Hickam, Hawaii* (January 2022)
- *Site Characterization Plan Addendum – Holding Tank-Leach Tank Phase 2, Joint Base Pearl Harbor-Hickam, Hawaii* (March 2022)
- *Module 1 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC/MS, Department of Defense, Revision 1* (May 2020)
- *General Data Validation Guidelines, Department of Defense, Revision 1* (November 2019)
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review* (November 2020).

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody [COC])/sample integrity



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

- ✓ Holding times and sample preservation
- ✓ Instrument tuning
- ✓ Initial calibration/initial and continuing calibration verification
- ✓ Laboratory blanks/field blanks/equipment blanks
- ✓ Surrogate spike recoveries
- ✓ Matrix spike (MS) and matrix spike duplicate (MSD) results
- ✓ Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
- ✓ Field duplicate results
- ✓ Internal standard results
- ✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. The symbol (X) indicates that a QC nonconformance resulted in the qualification of data. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as qualified and may be used for decision making purposes. There were no results qualified on the basis of this data review.

RESULTS

Sample Results/Reporting Issues

If applicable, the sample results detected at concentrations less than the Limit of Quantitation (LOQ) but greater than the Detection Limit (DL) are qualified by the laboratory as estimated (J). This “J” qualifier is retained during data validation. Laboratory limits of detection (LOD) meet screening criteria for all samples.

The following analytes exceeded the project screening criteria:

Sample Name	Analyte	Result	LOD	Screening Criteria	Units
LTW35.0-WG01-028.0	1-Methylnaphthalene	75	1.6	17	ug/L
LTW35.0-WG01-028.0	2-Methylnaphthalene	34	0.080	27	ug/L
LTW35.0-WG01-028.0	Naphthalene	24	0.080	24	ug/L

QUALIFICATION ACTIONS

No qualification of data was required for method 8270E-SIM.

Laboratory: Eurofins Seattle
Laboratory SDG/Job No: 580-111500-1
Validation Level: Stage 2B
 (using Level IV data package)
Number of Samples/Matrix: 4 groundwater (including 1 FD)
Analysis (Include Method #): SVOCs, SW846 8270E-SIM (Naphthalene, 1-Methylnaphthalene, 2-Methylnaphthalene)

Client/Site Name: Red Hill Site Characterization
Project Number: 60674414.00.50.01
Date: 05/05/22
Validator: J. DeSadier
Reviewer and Date: K Rutherford 5/10/22

DoD QSM 5.4, DoD Module 1, NFG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	The sample label for HTE00.0-WGN01-031.0 did not match the COC. The sample was logged via the COC. Sample HTE0.0-WGFD01-031.0 was originally logged in SDG 580-111502-1, but per request, 580-111502-1 was combined with 580-111500-1 to include a parent and duplicate sample together.
Sample Preservation	Yes	No	-0.2° C and -0.1° C.
Holding Time	Yes	No	Collected 3/16/22, analyzed within HT.
Quantitation Limits	No	No	Sample LTW35.0-WGN01-028.0 was diluted to bring the concentration of target analytes within calibration range. Positive results in the sample exceeded PALs for naphthalene, 1-MN, and 2-MN.
Percent Solids (>30%)	NA	NA	
Method Blanks	Yes	No	MB 580-384887/1-A, ND
Other Laboratory Blanks ^{1,2}	NA	NA	Not applicable to these analyses.
Trip/Equipment Blanks	NA	NA	
Initial Calibration	Yes	No	ICAL 01/14/2022 Inst TAC050, criteria met
Initial Calibration Verification	Yes	No	ICV 580-378262/18, ICV 580-378263/18, criteria met
Continuing Calibration Verification	Yes	No	CCVIS 580-384984/2, CCVC 580-384984/24, CCVIS 580-385319/3, CCVC 580-385319/6, criteria met
Matrix Spike	NA	NA	
Matrix Spike Duplicate RPD ²	NA	NA	An MS/MSD was not analyzed on a sample in this SDG.
Laboratory Duplicate ²	NA	NA	Not applicable to these analyses.
Surrogate Standards ²	Yes	No	%Rs within lab limits (per QSM) for PAH surrogates fluoranthene-d10 and 2-methylnaphthalene-d10
Laboratory Control Standards	Yes	No	LCS 580-384887/2-A, LCSd 580-384887/3-A, criteria met
Internal Standards ^{2,3}	Yes	No	
Field Duplicate	Yes	No	HTE00.0-WGN01-031.0 (580-111500-2) and HTE00.0-WGFD01-031.0 (580-111502-1): precision criteria met
GC/MS Tunes ²	Yes	No	
Calculation Spot Checks ³	NA	NA	Not a required validation element for this project.

¹May include reagent blanks, calibration blanks, etc.
²May not be applicable to all analyses.
³Level IV validation only. See full NFG worksheets for details.

QSM 5.4 C-27 Soils LCS criteria	%R Limits
1-Methylnaphthalene	41-115
2-Methylnaphthalene	39-114
Naphthalene	43-114

Surrogate lab limits

	QC LIMITS
2MN = 2-methylnaphthalene-d10	40-140
TBP = 2,4,6-Tribromophenol	28-143
FLN10 = Fluoranthene-d10 (Surr)	40-140
TPHL = Terphenyl-d14	58-132

Samples	Lab ID
LTE00.0-WGN01-030.0	580-111500-1
HTE00.0-WGN01-031.0	580-111500-2
HTE00.0-WGFD01-031.0	580-111502-1
LTW35.0-WGN01-028.0	580-111502-2

Sample	Compound	Result (ug/L)	PAL (ug/L)
LTW35.0-WG01-028.0	1-Methylnaphthalene	75	17
LTW35.0-WG01-028.0	2-Methylnaphthalene	34	27
LTW35.0-WG01-028.0	Naphthalene	24	24

Compound	QL	5x QL	HTE00.0-WGN01-031.0	HTE00.0-WGFD01-031.0	RPD	Abs. Diff	Action
			580-111500-2	580-111502-1			
1-Methylnaphthalene	0.1000	0.500	0	0.049	200.0	0.049	None, Abs Diff <2X QL
2-Methylnaphthalene	0.2000	1.000	0	0	#DIV/0!	0.000	NONE both ND
Naphthalene	0.1000	0.500	0	0	#DIV/0!	0.000	NONE both ND

2X QL

0.2

0.4

0.2

RPD limits: $\leq 30\%$ (aqueous) and $\leq 50\%$ (solid) (when both sample concentrations are $> 5x$ the LOQ) or
absolute difference between concentrations are $\leq 2x$ LOQ (when the sample or field duplicate concentrations are $\leq 5x$ LOQ)

Memorandum

Project: Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility

Site Characterization Study

Laboratory: Eurofins, Seattle, WA

Laboratory Number: 580-111500-1

Analyses/Method: TPH-Gasoline Range Organics (TPH-g, C6-C10) by EPA Method 8260D
TPH-Diesel Range Organics (TPH-d, C10-C24) by EPA Method 8015D
TPH-Residual Range Organics (TPH-o, C24-C40) by EPA Method 8015D

Validation Level: Stage 2B

Project Number: 60674414.00.50.01

Prepared by: Jared DeSadier / AECOM Completed on: 05/05/2022

Reviewed by: Kristin Rutherford / AECOM File Name: 580-111500-1_GRO_DRO_memo

SUMMARY

The samples listed below were collected by AECOM from the Joint Base Pearl Harbor-Hickam, Hawaii site on March 16, 2022.

Sample ID	Lab ID	Matrix/Sample Type
LTE00.0-WGN01-030.0	580-111500-1	Groundwater
HTE00.0-WGN01-031.0	580-111500-2	Groundwater
HTE00.0-WGFD01-031.0	580-111502-1	Field duplicate of HTE00.0-WGN01-031.0
LTW35.0-WGN01-028.0	580-111502-2	Groundwater

Data validation activities were conducted with reference to:

- *SW-846 Method 8260D: Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)* (June 2018)
- *SW--846 Method 8015D: Nonhalogenated Organics Using GC/FID* (June 2003)
- *Preliminary Site Characterization Plan, Joint Base Pearl Harbor-Hickam, Hawaii* (January 2022)
- *Site Characterization Plan Addendum – Holding Tank-Leach Tank Phase 2, Joint Base Pearl Harbor-Hickam, Hawaii* (March 2022)
- *Module 1 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC/MS, Department of Defense, Revision 1* (May 2020)
- *Module 4 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC, Department of Defense, Revision 1* (March 2021)
- *General Data Validation Guidelines, Department of Defense, Revision 1* (November 2019)
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review* (November 2020).



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody [COC])/sample integrity
- ✓ Holding times and sample preservation
- ✓ Instrument tuning
- ✓ Initial calibration/initial and continuing calibration verification
- ✗ Laboratory blanks/field blanks/equipment blanks
- ✓ Surrogate spike recoveries
- ✓ Matrix spike (MS) and matrix spike duplicate (MSD) results
- ✓ Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
- ✓ Field duplicate results
- ✓ Internal standard results
- ✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as qualified and may be used for decision making purposes. Select data points were estimated due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Holding Time

Samples LTE00.0-WGN01-030.0, HTE00.0-WGN01-031.0, and HTE00.0-WGFD01-031.0 were re-prepared outside of holding time due to method blank contamination and LCS/LCSD recoveries associated with the initial analysis. Based on professional judgement, the results from the initial analysis within holding time were reported and qualified due to method blank and LCS nonconformances. No actions were taken due to holding time.



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

Method Blank

TPH-d (C10-C24) and TPH-o (C24-C40) were detected in the method blank associated with the initial analysis of the soils in this data set at the following concentrations:

Method Blank	Analyte	Blank Result	LOQ
580-384606/1-A	C24-C40	239	350
580-384606/1-A	C10-C24	172	110

Detected results above the reporting limit were qualified as estimated “J” and results below the reporting limit were qualified as nondetect “U” at the reporting limit as shown in Table 1 below.

LCS/LCSD

The following TPH-o (C24-C40) LCS recoveries were above the laboratory control limits:

LCS/LCSD	Analyte	Recovery	Recovery Limits
580-384606/2-A	C24-C40	123	41-113
580-384606/3-A	C24-C40	114	41-113

Associated results were previously qualified as nondetect due to blank contamination and did not require additional qualification due to high bias.

Sample Results/Reporting Issues

If applicable, the sample results detected at concentrations less than the Limit of Quantitation (LOQ) but greater than the Detection Limit (DL) are qualified by the laboratory as estimated (J). This “J” qualifier is retained during data validation.

The following results exceeded the site screening criteria:

Sample Name	Analyte	Result	LOD	Screening Criteria	Units
LTE00.0-WGN01-030.0	C10-C24	500	100	400	ug/L
LTE00.0-WGN01-030.0	C10-C24	540	100	400	ug/L
LTW35.0-WGN01-028.0	C10-C24	3700	100	400	ug/L

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.



Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility

Table 1
QA/QC Data Summary Review
Red Hill Site Characterization
Laboratory Group: 580-111500-1

Laboratory Group	Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Units	Final Result	Reason Code
580-111500-1	LTE00.0-WGN01-030.0	580-111500-1	8015D	C10-C24	500	ug/L	500 J	L
580-111500-1	LTE00.0-WGN01-030.0	580-111500-1	8015D	C24-C40	210	ug/L	350 U	L
580-111500-1	HTE00.0-WGN01-031.0	580-111500-2	8015D	C10-C24	310	ug/L	310 J	L
580-111500-1	HTE00.0-WGN01-031.0	580-111500-2	8015D	C24-C40	190	ug/L	350 U	L
580-111500-1	HTE00.0-WGFD01-031.0	580-111502-1	8015D	C10-C24	280	ug/L	280 J	L
580-111500-1	HTE00.0-WGFD01-031.0	580-111502-1	8015D	C24-C40	180	ug/L	350 U	L
580-111500-1	LTW35.0-WGN01-028.0	580-111502-2	8015D	C10-C24	3700	ug/L	3700 J	L
580-111500-1	LTW35.0-WGN01-028.0	580-111502-2	8015D	C24-C40	200	ug/L	350 U	L

Laboratory:
Laboratory SDG/Job No:
Validation Level:

Eurofins Seattle
 580-111500-1
 Stage 2B
 (using Level IV data package)
 4 groundwater (including 1 FD)
 GRO C6-C10 SW-846 8260D

Client/Site Name: Red Hill Site Characterization
Project Number: 60674414.00.50.01
Date: 05/05/22
Validator: J. DeSadier
Reviewer and Date: K Rutherford 05/09/22

Number of Samples/Matrix:
Analysis (Include Method #):

QSM 5.4, DoD Module 4, NFG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Sample Preservation	Yes	No	-0.2° C and -0.1° C.
Holding Time	Yes	No	Collected 3/16/22, analyzed within HT.
Quantitation Limits	Yes	No	No dilutions. Lab DLs for ND results meet PAL.
Percent Solids (>30%)	NA	NA	
Method Blanks	Yes	No	MB 580-384857/5
Trip/Equipment Blanks	NA	NA	
Initial Calibration	Yes	No	TAC036 01/09/22, TAC036 01/22/2022, TAC036 01/28/2022
Initial Calibration Verification	Yes	No	ICV 580-379063/13, ICV 580-379730/14
Continuing Calibration Verification	Yes	No	CCVIS 580-384857/4, CCV 580-384857/15, CCV 580-384857/26
Matrix Spike	NA	NA	
Matrix Spike Duplicate RPD ²	NA	NA	An MS/MSD was not performed on a site sample in this data set.
Laboratory Duplicate ²	NA	NA	
Surrogate Standards ²	Yes	No	
Laboratory Control Standards	Yes	No	LCS 580-384857/8, LCSD 580-384857/9
Field Duplicate	Yes	No	HTE00.0-WGN01-031.0 (580-111500-2) and HTE00.0-WGFD01-031.0 (580-111502-1): precision criteria met
Internal Standards ^{2,3}	Yes	No	
GC/MS Tunes ²	Yes	No	
Calculation Spot Checks ³	NA	NA	Not a required validation element for this project.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

Gasoline Range Organics (C6-C10)
 Diesel Range Organics (C10-C24)
 Oil Range Organics (C24-C40)

Samples	Lab ID
LTE00.0-WGN01-030.0	580-111500-1
HTE00.0-WGN01-031.0	580-111500-2
HTE00.0-WGFD01-031.0	580-111502-1
LTW35.0-WGN01-028.0	580-111502-2

*The relative abundance of specific ions is not applicable to the GRO method since the analysis performed on the GC/MS is based on the total ion chromatograph and not a selected quantitation ion. The qualitative identification of the presence or absence of GRO in the samples is based on defining the retention time window with the analysis of a retention time standard that includes compounds which mark the start and end of the C6-C12 window, and not as the result of comparison to a reference spectrum. Quantitation is based on the use of an initial calibration which is determined using the total ion chromatograph and not a selected quantitation ion. Therefore, nonconformances noted for the BFB tunes are not applicable and data validation actions are not required.

Laboratory: Eurofins Seattle
Laboratory SDG/Job No: 580-111500-1
Validation Level: Stage 2B
 (using Level IV data package)
Number of Samples/Matrix: 4 groundwater (including 1 FD)
Analysis (Include Method #): DRO/ORO SW-846 8015C

Client/Site Name: Red Hill Site Characterization
Project Number: 60674414.00.50.01
Date: 05/05/22
Validator: J. DeSadier
Reviewer and Date:

QSM 5.4, DoD Module 4, NFG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Sample Preservation	Yes	No	-0.2° C and -0.1° C.
Holding Time	No	No	Samples LTE00.0-WGN01-030.0, HTE00.0-WGN01-031.0, and HTE00.0-WGFD01-031.0 were re-prepared outside of holding time due to method blank contamination and LCS/LCSD recoveries. Both sets of data are presented in the report. The results from the initial run were reported as final and qualifications were applied as described in the Items below.
Quantitation Limits	No	No	No dilutions. Results for DRO and/or ORO were above PALs in some samples - see below.
Percent Solids (>30%)	NA	NA	
Method Blanks	No	Yes	MB 580-384606/1-A, 580-385117/1-A, DRO and ORO were detected in 580-384606/1-A. Associated results <RL were qualified as nondetect (U) and results >RL and > EB were qualified as estimated (J).
Equipment Blanks	NA	NA	
Initial Calibration	Yes	No	TAC020 02/07/2022
Initial Calibration Verification	Yes	No	ICV 580-376805/14, ICV 580-380510/14
Continuing Calibration Verification	Yes	No	CCVRT 580-384661/3, CCV 580-384661/5, CCV 580-384661/36, CCV 580-384661/47, CCVRT 580-384905/3, CCV 580-384905/14, CCV 580-384905/17
Matrix Spike	NA	NA	An MS/MSD was not performed on a site sample in this data set.
Matrix Spike Duplicate RPD ²	NA	NA	
Laboratory Duplicate ²	NA	NA	
Surrogate Standards ²	Yes	No	
Laboratory Control Standards	No	No	LCS 580-384606/2-A, LCSD 580-384606/3-A, LCS 580-385117/2-A, LCSD 580-385117/3-A. ORO recovery in 580-384606/2-A (123%) and 580-384606/3-A (114%) was above criteria (41-113%). Associated results were previously qualified as nondetect due to method blank contamination and did not require additional qualification due to high bias.
Field Duplicate	Yes	No	HTE00.0-WGN01-031.0 (580-111500-2) and HTE00.0-WGFD01-031.0 (580-111502-1): precision criteria met
Calculation Spot Checks ³	NA	NA	Not a required validation element for this project.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

Gasoline Range Organics (C6-C10)
 Diesel Range Organics (C10-C24)
 Oil Range Organics (C24-C40)

Samples	Lab ID
LTE00.0-WGN01-030.0	580-111500-1
HTE00.0-WGN01-031.0	580-111500-2
HTE00.0-WGFD01-031.0	580-111502-1
LTW35.0-WGN01-028.0	580-111502-2

Sample	Compound	Result (ug/L)	PAL (ug/L)
LTW35.0-WG01-028.0	C10-C24	500	400
LTW35.0-WG01-028.0	C10-C24	540	400
LTW35.0-WG01-028.0	C10-C24	3700	400

Compound	QL	5x QL	HTE00.0-WGN01-031.0	HTE00.0-WGFD01-031.0	RPD	Abs. Diff	Action
			580-111500-2	580-111502-1			
Gasoline Range Organics (C6-C10)	100	500	0	0	#DIV/0!	0.0	NONE both <5XQL, abs diff <2X QL
C10-C24	110	550	310	280	10.2	30.0	NONE abs diff <2X QL
C10-C24	110	550	240	320	28.6	80.0	NONE abs diff <2X QL
C24-C40	350	1750	190	180	5.4	10	NONE abs diff <2X QL
C24-C40	350	1750	0	0	#DIV/0!	0	NONE both ND

RPD limits: $\leq 30\%$ (aqueous) and $\leq 50\%$ (solid) (when both sample concentrations are $> 5x$ the LOQ) or
absolute difference between concentrations are $\leq 2x$ LOQ (when the sample or field duplicate concentrations are $\leq 5x$ LOQ)

Facility: RHBFS Site Characterization
 Event: Site Characterization HT-LT Phase 2
 SDG: 5801115001
 Guidance Document: Red Hill Bulk Fuel Storage Facility Site Characterization UFP-QAPP
 Prime Contractor: AECOM, Honolulu, HI
 Project Manager:
 Contract Laboratory(ies): Eurofins Environment Testing TestAmerica, Tacoma, WA
 Data Review Contractor:
 Data Review Level:
 Primary Data Reviewer: ,
 Date Submitted:

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	BNASIM	SW8015D	SW8260	SW8260D
HTE00.0-WGFD01-031.0	580-111502-1	Water	Field Duplicate/FD	X	X	X	X
HTE00.0-WGN01-031.0	580-111500-2	Water	Field Sample/N	X	X	X	X
LTE00.0-WGN01-030.0	580-111500-1	Water	Field Sample/N	X	X	X	X
LTW35.0-WGN01-028.0	580-111502-2	Water	Field Sample/N	X	X	X	X
TB-01	580-111502-3	Water	Trip Blank/TB			X	X
TB-02	580-111500-3	Water	Trip Blank/TB			X	X

Data Validation Report for 5801115001

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Red Hill Bulk Fuel Storage Facility Site Characterization UFP-QAPP and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by AECOM, Honolulu, HI; analyses were performed by Eurofins Environment Testing TestAmerica, Tacoma, WA and were reported under sample delivery group (SDG) 5801115001. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Continuing Calibration Verification
- Field Duplicate RPD
- Lab Blank
- LCS Recovery
- LCS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time
- Trip Blank

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 10 results (16.13%) out of the 62 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Data Validation Report for 5801115001

Narrative Comments

Analytical Method Data Reviewer Comment

Reviewed by , ,

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.



Reviewed by , Senior Scientist,

September 28, 2022

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Data Validation Report for 5801115001

Quality Control Outliers for test method BNASIM, Prep Hold Time

Hold times are ascertained based on project requirements. Holding times were determined by comparing the chain of custody records with the dates of extraction found in the electronic data deliverable and laboratory summary forms. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
HTE00.0-WGFD01-031.0 (FD)		7.120	< 7	< 14	days	J/UJ	H2	Prep Exceeds UWL
HTE00.0-WGN01-031.0 (N)		7.140	< 7	< 14	days	J/UJ	H2	Prep Exceeds UWL
LTE00.0-WGN01-030.0 (N)		7.200	< 7	< 14	days	J/UJ	H2	Prep Exceeds UWL
LTW35.0-WGN01-028.0 (N)		7.080	< 7	< 14	days	J/UJ	H2	Prep Exceeds UWL

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Data Validation Report for 5801115001

Quality Control Outliers for test method SW8015D, Lab Blank

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
MB5803846061A (LB)	C10-C24 Petroleum Hydrocarbons	172.0	< 65	< 110	ug/l	U/None*	L	
MB5803846061A (LB)	C24-C40 Petroleum Hydrocarbons	239.0	< 180	< 350	ug/l	U/None*	L	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

*Blank flags displayed in the above table identify qualification of the sample result when it is less than or equal to the LOQ/RL. Sample results above the LOQ will be qualified based on the validation type such as J+ at the sample result.

Qualified Results associated with the Lab Blank for SW8015D

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
HTE00.0-WGFD01-031.0 580-111502-1	FD	C10-C24 Petroleum Hydrocarbons	110	280 B	280 J		ug/l	L
HTE00.0-WGFD01-031.0 580-111502-1	FD	C24-C40 Petroleum Hydrocarbons	350	180 J B Q	300 U		ug/l	L
HTE00.0-WGN01-031.0 580-111500-2	N	C10-C24 Petroleum Hydrocarbons	110	310 B	310 J		ug/l	L
HTE00.0-WGN01-031.0 580-111500-2	N	C24-C40 Petroleum Hydrocarbons	350	190 J B Q	300 U		ug/l	L
LTE00.0-WGN01-030.0 580-111500-1	N	C10-C24 Petroleum Hydrocarbons	110	500 B	500 J		ug/l	L
LTE00.0-WGN01-030.0 580-111500-1	N	C24-C40 Petroleum Hydrocarbons	350	210 J Q B	300 U		ug/l	L
LTW35.0-WGN01-028.0 580-111502-2	N	C10-C24 Petroleum Hydrocarbons	110	3700 B	3700 J		ug/l	L
LTW35.0-WGN01-028.0 580-111502-2	N	C24-C40 Petroleum Hydrocarbons	350	200 J B Q	300 U		ug/l	L

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 5801115001

Quality Control Outliers for test method SW8015D, LCS Recovery

The laboratory control sample/laboratory control sample duplicate (LCS/LCSD) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LCS5803846062A (BS)	C24-C40 Petroleum Hydrocarbons	123.0	41 - 113	41 - 113	percent	J/None	C	
LCSD5803846063A (BD)	C24-C40 Petroleum Hydrocarbons	114.0	41 - 113	41 - 113	percent	J/None	C	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Data Validation Report for 5801115001

Table of All Qualified Results

Test Method: SW8015D		Extraction Method: SW3510						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
HTE00.0-WGFD01-031.0 580-111502-1	FD	C10-C24 Petroleum Hydrocarbons	110	280 B	280 J		ug/l	L
HTE00.0-WGFD01-031.0 580-111502-1	FD	C24-C40 Petroleum Hydrocarbons	350	180 J B Q	300 U		ug/l	L
HTE00.0-WGN01-031.0 580-111500-2	N	C10-C24 Petroleum Hydrocarbons	110	310 B	310 J		ug/l	L
HTE00.0-WGN01-031.0 580-111500-2	N	C24-C40 Petroleum Hydrocarbons	350	190 J B Q	300 U		ug/l	L
LTE00.0-WGN01-030.0 580-111500-1	N	C10-C24 Petroleum Hydrocarbons	110	500 B	500 J		ug/l	L
LTE00.0-WGN01-030.0 580-111500-1	N	C24-C40 Petroleum Hydrocarbons	350	210 J Q B	300 U		ug/l	L
LTW35.0-WGN01-028.0 580-111502-2	N	C10-C24 Petroleum Hydrocarbons	110	3700 B	3700 J		ug/l	L
LTW35.0-WGN01-028.0 580-111502-2	N	C24-C40 Petroleum Hydrocarbons	350	200 J B Q	300 U		ug/l	L
Test Method: SW8260D		Extraction Method: SW5030						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LTW35.0-WGN01-028.0 580-111502-2	N	o-Xylene	1.00	4.80	4.80 J		ug/l	I
LTW35.0-WGN01-028.0 580-111502-2	N	Xylenes, Total	2.00	4.80	4.80 J		ug/l	I

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ.

Trace values are not included in the qualified results table unless additional reason codes are associated.

Data Validation Report for 5801115001

Table of Results with Modified Qualifiers

Modified Qualifiers for test method BNASIM							
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
HTE00.0-WGFD01-031.0 580-111502-1	FD	1-Methylnaphthalene	0.100	0.0490 J M	0.0490 J	0.0490 J	TR
HTE00.0-WGFD01-031.0 580-111502-1	FD	2-Methylnaphthalene	0.200	0.0800 U	0.0800 UJ	0.0800 U	
HTE00.0-WGFD01-031.0 580-111502-1	FD	Naphthalene	0.100	0.0800 U	0.0800 UJ	0.0800 U	
HTE00.0-WGN01-031.0 580-111500-2	N	1-Methylnaphthalene	0.100	0.0320 U	0.0320 UJ	0.0320 U	
HTE00.0-WGN01-031.0 580-111500-2	N	2-Methylnaphthalene	0.200	0.0800 U	0.0800 UJ	0.0800 U	
HTE00.0-WGN01-031.0 580-111500-2	N	Naphthalene	0.100	0.0800 U	0.0800 UJ	0.0800 U	
LTE00.0-WGN01-030.0 580-111500-1	N	1-Methylnaphthalene	0.100	0.370 M	0.370 J	0.370	
LTE00.0-WGN01-030.0 580-111500-1	N	2-Methylnaphthalene	0.200	0.0770 J M	0.0770 J	0.0770 J	TR
LTE00.0-WGN01-030.0 580-111500-1	N	Naphthalene	0.100	0.150 M	0.150 J	0.150	
LTW35.0-WGN01-028.0 580-111502-2	N	1-Methylnaphthalene	5.00	75.0 D	75.0 J	75.0	
LTW35.0-WGN01-028.0 580-111502-2	N	2-Methylnaphthalene	0.200	34.0	34.0 J	34.0	
LTW35.0-WGN01-028.0 580-111502-2	N	Naphthalene	0.100	24.0	24.0 J	24.0	
Modified Qualifiers for test method SW8015D							
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
HTE00.0-WGFD01-031.0 580-111502-1	FD	C10-C24 Petroleum Hydrocarbons	110	280 B	280	280 J	L
HTE00.0-WGFD01-031.0 580-111502-1	FD	C24-C40 Petroleum Hydrocarbons	350	180 J B Q	180 J	300 U	L
HTE00.0-WGN01-031.0 580-111500-2	N	C10-C24 Petroleum Hydrocarbons	110	310 B	310	310 J	L
HTE00.0-WGN01-031.0 580-111500-2	N	C24-C40 Petroleum Hydrocarbons	350	190 J B Q	190 J	300 U	L
LTE00.0-WGN01-030.0 580-111500-1	N	C10-C24 Petroleum Hydrocarbons	110	500 B	500	500 J	L
LTE00.0-WGN01-030.0 580-111500-1	N	C24-C40 Petroleum Hydrocarbons	350	210 J Q B	210 J	300 U	L
LTW35.0-WGN01-028.0 580-111502-2	N	C10-C24 Petroleum Hydrocarbons	110	3700 B	3700	3700 J	L
LTW35.0-WGN01-028.0 580-111502-2	N	C24-C40 Petroleum Hydrocarbons	350	200 J B Q	200 J	300 U	L
Modified Qualifiers for test method SW8260D							
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
LTW35.0-WGN01-028.0 580-111502-2	N	o-Xylene	1.00	4.80	4.80	4.80 J	I

Data Validation Report for 5801115001

Table of Results with Modified Qualifiers

Modified Qualifiers for test method SW8260D

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
LTW35.0-WGN01-028.0 580-111502-2	N	Xylenes, Total	2.00	4.80	4.80	4.80 J	I

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ. Trace values are not included in the qualified results table unless additional reason codes are associated.

Reason Code Definitions

Code	Definition
C	LCS Recovery
H2	Prep Hold Time
I	Surrogate recovery outside project limits.
L	Lab Blank
TR	Trace Level Detect

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Data Validation Report for 5801115001

Review Questions

Memorandum

Project: Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility

Site Characterization Study

Laboratory: Eurofins, Seattle, WA

Laboratory Number: 580-111503-1

Analyses/Method: Select Volatile Organic Compounds by SW-846 Method 8260D
[Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)]

Validation Level: Stage 4

Project Number: 60674414.00.50.01

Prepared by: Paula DiMattei/AECOM Completed on: 07/12/2022

Reviewed by: Robert Kennedy /AECOM File Name: 580-111503-1_Stage 4_BTEX_memo

SUMMARY

The samples listed below were collected by AECOM from the Joint Base Pearl Harbor-Hickam, Hawaii site on March 9-11 and 15, 2022.

Sample ID	Lab ID	Matrix/Sample Type
LTE00.0-SON01-26-28	580-111503-1	Soil
LTE00.0SON01-38-40	580-111503-2	Soil
LTE00.0-SOFD01-26-28	580-111503-3	Soil/Field duplicate of LTE00.0-SON01-26-28
HTE00.0-SON01-19-21	580-111503-4	Soil
HTE00.0-SON01-33-35	580-111503-5	Soil
HTE00.0SOFD01-19-21	580-111503-6	Soil/Field duplicate of HTE00.0-SON01-19-21
LTW35.0-SON01-29-31	580-111503-7	Soil
LTW35.0-SON01-34-36	580-111503-8	Soil
LTS15.0-SON01-23-25	580-111503-9	Soil
LTS15.0-SON01-30-31	580-111503-10	Soil
TB01-SO	580-111503-11	Trip blank

Data validation activities were conducted with reference to:

- *SW-846 Method 8260D: Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)* (June 2018)
- *Preliminary Site Characterization Plan, Joint Base Pearl Harbor-Hickam, Hawaii* (January 2022)
- *Site Characterization Plan Addendum – Holding Tank-Leach Tank Phase 2, Joint Base Pearl Harbor-Hickam, Hawaii* (March 2022)
- *Module 1 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC/MS, Department of Defense, Revision 1* (May 2020)

**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

- *General Data Validation Guidelines, Department of Defense, Revision 1 (November 2019)*

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody [COC])/sample integrity
- ✓ Holding times and sample preservation
- ✓ Instrument tuning
- ✓ Initial calibration/initial and continuing calibration verification
- ✓ Laboratory blanks/trip blanks
- ✓ Surrogate spike recoveries
- ✓ Matrix spike (MS) and matrix spike duplicate (MSD) results
- ✓ Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
- ✓ Field duplicate results
- ✓ Internal standard results
- ✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. The symbol (X) indicates that a QC nonconformance resulted in the qualification of data. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. There were no data points qualified as a result of this data review.

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

The case narrative noted instances of missing collection times. Corrected sample IDs and dates of sample collection were provided to the laboratory by AECOM after the samples were received at the laboratory.



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

Holding Times and Sample Preservation

Sample preservation and analytical holding times were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Instrument Tuning

Instrument tuning results were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Initial Calibration/Initial and Continuing Calibration Verification

Calibration data were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met. Select results were recalculated as part of the Stage 4 validation.

Laboratory Blanks/Trip Blanks

Laboratory blanks and trip blanks are evaluated as to whether there are contaminants detected above the method detection limit (MDL).

Target compounds were not detected in the laboratory blanks or trip blank associated with the samples in this data set.

Surrogate Spike Recoveries

The surrogate percent recoveries (%Rs) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met. Select surrogate recovery results were recalculated as part of the Stage 4 validation.

MS/MSD Results

The MS/MSD %Rs and relative percent differences (RPDs) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met. Select spike recovery and relative percent difference results were recalculated as part of the Stage 4 validation.

LCS/LCSD Results

The LCS/LCSD %Rs and RPDs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met. Select spike recovery and relative percent difference results were recalculated as part of the Stage 4 validation.

Field Duplicate Results

The field duplicate results were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Internal Standard Results

Internal standard results were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

Sample Results/Reporting Issues

When applicable, compounds detected at concentrations less than the reporting limit (RL) but greater than the method detection limit (MDL) are qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation.

For the samples undergoing Stage 4 validation, detected sample results were reviewed to ensure that all identification criteria are met. Additionally, the chromatograms for samples where all results are nondetect were reviewed to ensure against laboratory reporting of false negative results.

The detected sample results or the limit of detection (LOD) for each target compound met the project screening criteria tabulated below.

Compound	Screening Criteria	Units
Benzene	0.30	mg/kg
Ethylbenzene	3.7	mg/kg
Toluene	3.2	mg/kg
Total Xylenes	2.1	mg/kg

Verification of calculations was performed on a subset of the sample results using the provided data. No significant discrepancies were noted.

QUALIFICATION ACTIONS

There were no sample results qualified as a result of this data review.

Laboratory:
Laboratory SDG/Job No:
Validation Level:

Eurofins Seattle
580-111503-1
 Stage 4
 (using Level IV data package)
 10 soils, 1 TB
 BTEX SW846 8260D

Client/Site Name: Red Hill Site Characterization
Project Number: 60674414.00.50.01
Date: 5/2/2022
Validator: Paula DiMattei
Reviewer and Date: Robert Kennedy 081722

Number of Samples/Matrix:
Analysis (Include Method #):

QAPP (QSM 5.4), DoD Module 1

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	The case narrative noted missing collection times and sample ID corrections which were provided in an email from AECOM. See sample info tab for email. The case narrative notes that the sample weight received was less than that noted in the reference method. No actions were taken on this basis.
Sample Preservation	Yes	No	Case narrative indicates all samples rec'd properly preserved. Cooler -2.0C
Holding Time	Yes	No	Note: The sample summary on p. 46 of the pdf notes the date for HTE00.0-SOFD01-19-21 as 3/10/2022 and the email (on the sample info tab) indicates the date should be 3/9/2022. Email date was used to calculate holding times.
Quantitation Limits	Yes	No	No dilutions All detects and nondetect results met the project screening criteria. Note: the total xylenes in this lab report are reported in ug/Kg rather than mg/kg.
Percent Solids (>30%)	Yes	No	
Method Blanks	Yes	No	MB 580-384852/5 [Associated with TB]: all ND MB 580-384563/1-A [Associated with all soils]: All ND
Other Laboratory Blanks ^{1,2}	NA	NA	Not applicable to these analyses.
Trip/Equipment Blanks	Yes	No	TB01-SO: all ND
Initial Calibration	Yes	No	1/28/2022 (instrument TAC036) and 3/15/2022 (instrument TAC041)
Initial Calibration Verification	Yes	No	
Continuing Calibration Verification	Yes	No	
Matrix Spike	Yes	No	
Matrix Spike Duplicate RPD ²	Yes	No	Performed on HTE00.0-SON01-33-35
Laboratory Duplicate ²	NA	NA	Not applicable to these analyses.
Surrogate Standards ²	Yes	No	
Laboratory Control Standards	Yes	No	LCS 580-384852/ 580-384563/2-A & 3-A [Associated with all soils]: All met LCS 580-384852/6 & 7 [Associated with TB]: All met
Internal Standards ^{2,3}	Yes	No	
Field Duplicate	Yes	No	LTE00.0-SON01-26-28 and LTE00.0-SOFD01-26-28: BTEX ND in both samples; precision deemed acceptable. HTE00.0-SON01-19-21 and HTE00.0-SOFD-19-21: BTEX ND in both samples; precision deemed acceptable.
GC/MS Tunes ²	Yes	No	
Compound Identification	see comments		No discrepancies were noted.
Calculation Spot Checks ³	see comments		No significant discrepancies

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

Note: it may not be appropriate to make a direct quantitative comparison for aqueous field blanks (such as equipment blanks reported as µg/mL) to a solid parent sample (such as a soil sample reported as mg/kg). At best, only a qualitative comparison can be made.

SDG: 580-111503-1

Initial Calibration

Compound conc	Compound response	IS response	IS conc.	X _s	Y _s
m, p xylenes					
0.400	8599	136130	10.0	0.4000000	0.6316756
1.000	18497	121585	10.0	1.0000000	1.5213225
5.000	90887	136312	10.0	5.0000000	6.6675715
10.000	173156	134433	10.0	10.0000000	12.8804683
20.000	364698	151057	10.0	20.0000000	24.1430718
50.000	833765	142242	10.0	50.0000000	58.6159503
100.000	1587122	148315	10.0	100.0000000	107.0102147
150.000	2186431	148999	10.0	150.0000000	146.7413204

per option 1 in method 800D (see section 11.5.2)

$$X_s = C_s \quad Y_s = A_s \times C_s / A_{1s}$$

Curve values from poly wrksheet 1

a= -0.00229877
b= 1.3046
c= 0.1251

Curve values from Lab

a= -0.00229000
b= 1.305
c= 0.1251

Table 1

Xs	Ys
0.4000000	0.6316756
1.0000000	1.5213225
5.0000000	6.6675715
10.0000000	12.8804683
20.0000000	24.1430718
50.0000000	58.6159503
100.0000000	107.0102147
150.0000000	146.7413204

R² from poly wrksheet 1= 0.998
R² reported from Lab= 0.998

Table 2: Sample concentration		SOIL SAMPLES
LCS ID	LCS 580-384563/2-A	
Compound	m,p-xylenes	
Compound area response	364417	
IS area response	139645	
IS concentration	10.0	
Interim calculated result	26.095958	
Calculated concentration from poly wrksheet 1 (ug/L)	20.6586969	
Sample weight (g)	10.0	
Extract final volume (ml)	10.0	
VOA vial volume (ml)	43.0	
Amt of MEOH extract (ml)	1.075	
AECOM calculated conc. (ug/Kg)	826.348	
AECOM calculated conc. (mg/Kg)	0.826	%D=
Lab reported conc. (mg/Kg)	0.826	0.04
LCS Spike conc. (mg/Kg)	0.800	
AECOM calculated % recovery	103.3	%D=
Lab reported %recovery	103.0	0.28
LCSD %R	107	
AECOM calculated RPD	3.53	%D=
Lab reported RPD	4.00	-11.87

MS/MSD ID	HTE00.0-SON01-33-35
Compound	m,p-xylenes
Compound area response	185954
IS area response	148990
IS concentration	10.0
Interim calculated result	12.480972
Calculated concentration from poly wrksheet 1 (ug/L)	9.6343491
Sample weight (g)	5.007
% solids	0.761
% moisture	23.900
Extract final volume (ml)	10.0
Extract final volume (ml)-miscible solvent corrected	11.197
VOA vial volume (ml)	43.0
Amt of MEOH extract (ml)	1.075
Dilution	1.000
AECOM calculated conc. (ug/Kg)	1132.424
AECOM calculated conc. (mg/Kg)	1.132
Lab reported conc. (mg/Kg)	1.26

%D=
-10.13

MS Spike conc. (mg/Kg)	1.18
Parent sample conc. (mg/Kg)	0.0
AECOM calculated % recovery	96.0
Lab reported %recovery	107.0

%D=
-10.31

MSD %R	106.0
AECOM calculated RPD	9.93
Lab reported RPD	1.00

%D=
893.41

results are reproducible when lab values are used in the calculation

LOQ calculation	
Sample ID	HTE00.0-SON01-19-21
Compound	m & p-xylenes
Low standard conc.	1.000
Sample weight (g)	6.42
% solids	0.633
% moisture	36.7
Extract final volume (ml)	10
Extract final volume (ml)-miscible solvent corrected	12.356
VOA vial volume (ml)	43
Amt of MEOH extract (ml)	1.075
Dilution	1.000
AECOM calculated conc. (ug/Kg)	121.6197
AECOM calculated conc. (mg/Kg)	0.1216
Lab reported conc. (ng/g)	0.120

The LOQ is based on the 1.0 std rather than the lowest std (0.40).

%D=
1.35

Sample ID	HTE00.0-SON01-19-21
Compound	m,p-xylenes
Compound area response	9020
IS area response	140761
IS concentration	10.0
Interim calculated result	0.640802
Calculated concentration from poly wrksheet 1 (ug/L)	0.3955676
Sample weight (g)	6.420
% solids	0.633
% moisture	36.7
Extract final volume (ml)	10
Extract final volume (ml)-miscible solvent corrected	12.356
VOA vial volume (ml)	43.0
Amt of MEOH extract (ml)	1.075
Dilution	1.000
AECOM calculated conc. (ug/Kg)	48.109
AECOM calculated conc. (mg/Kg)	0.048
Lab reported conc. (mg/Kg)	0.056

%D=
-14.09

Surrogate

Sample ID HTE00.0-SON01-19-21
Surrogate compound 4-Bromofluorobenzene

Surrogate Compound (ug) = $Ac * Cis * DF / Ais * RRFical$

Ac= 60801
Ais= 123514
Cis 10
RRFical 0.513
Dilution factor 1.00

AECOM calculated result (ug) = 9.5957 %D=
Lab reported result (ug) = 9.6 -0.04

%Recovery of surrogate

$\%R = [\text{surrogate result (ug)} / \text{surrogate spike concentration(ug)}] * 100$

Surrogate Spike Concentration (ug) 10

AECOM calculated recovery (%) 96.0 %D=
Lab reported recovery (%) 96.0 -0.04

key:

A=area
C=concentration
RRFical=ical average response factor
is=internal standard
c=compound
DF = dilution factor
%R = percent recovery

Memorandum

Project: Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility

Site Characterization Study

Laboratory: Eurofins, Seattle, WA

Laboratory Number: 580-111503-1

Analyses/Method: Select Semivolatile Organic Compounds by SW-846 Method 8270E-SIM
(Naphthalene, 1-Methylnaphthalene, 2-Methylnaphthalene)

Validation Level: Stage 4

Project Number: 60674414.00.50.01

Prepared by: Paula DiMattei/AECOM Completed on: 07/12/2022

Reviewed by: Robert Kennedy /AECOM File Name:580-111503-1_Stage 4_SVOC
SIM_memo

SUMMARY

The samples listed below were collected by AECOM from the Joint Base Pearl Harbor-Hickam, Hawaii site on March 9-11 and 15, 2022.

Sample ID	Lab ID	Matrix/Sample Type
LTE00.0-SON01-26-28	580-111503-1	Soil
LTE00.0SON01-38-40	580-111503-2	Soil
LTE00.0-SOFD01-26-28	580-111503-3	Soil/Field duplicate of LTE00.0-SON01-26-28
HTE00.0-SON01-19-21	580-111503-4	Soil
HTE00.0-SON01-33-35	580-111503-5	Soil
HTE00.0SOFD01-19-21	580-111503-6	Soil/Field duplicate of HTE00.0-SON01-19-21
LTW35.0-SON01-29-31	580-111503-7	Soil
LTW35.0-SON01-34-36	580-111503-8	Soil
LTS15.0-SON01-23-25	580-111503-9	Soil
LTS15.0-SON01-30-31	580-111503-10	Soil

Data validation activities were conducted with reference to:

- *SW-846 Method 8270E: Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)* (June 2018)
- *Preliminary Site Characterization Plan, Joint Base Pearl Harbor-Hickam, Hawaii* (January 2022)
- *Site Characterization Plan Addendum – Holding Tank-Leach Tank Phase 2, Joint Base Pearl Harbor-Hickam, Hawaii* (March 2022)
- *Module 1 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC/MS, Department of Defense, Revision 1* (May 2020)



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
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- *General Data Validation Guidelines, Department of Defense, Revision 1 (November 2019)*

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody [COC])/sample integrity
- ✓ Holding times and sample preservation
- ✓ Instrument tuning
- ✓ Initial calibration/initial and continuing calibration verification
- ✓ Laboratory blanks/equipment blanks
- ✓ Surrogate spike recoveries
- ✓ Matrix spike (MS) and matrix spike duplicate (MSD) results
- ✓ Laboratory control sample (LCS) results
- ✗ Field duplicate results
- ✓ Internal standard results
- ✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as qualified and may be used for decision making purposes. Select data points were qualified as estimated due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

The case narrative noted instances of missing collection times. Corrected sample IDs and dates of sample collection were provided to the laboratory by AECOM after the samples were received at the laboratory.



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

Holding Times and Sample Preservation

Sample preservation and analytical holding times were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Instrument Tuning

Instrument tuning results were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Initial Calibration/Initial and Continuing Calibration Verification

Calibration data were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met. Select results were recalculated as part of the Stage 4 validation.

Laboratory Blanks/Equipment Blanks

Laboratory blanks and equipment blanks are evaluated as to whether there are contaminants detected above the method detection limit (MDL).

Target compounds were not detected in the laboratory blanks associated with the samples in this data set. An equipment blank was not submitted with this data set.

Surrogate Spike Recoveries

The surrogate percent recoveries (%Rs) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met. Select surrogate recovery results were recalculated as part of the Stage 4 validation.

MS/MSD Results

The MS/MSD %Rs and relative percent differences (RPDs) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met. Select spike recovery and relative percent difference results were recalculated as part of the Stage 4 validation.

LCS Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met. Select spike recovery results were recalculated as part of the Stage 4 validation.



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Field Duplicate Results

The field duplicate results were reviewed for conformance with the QC acceptance criteria. Nonconformances are summarized below.

Compound	LOQ	LTE00.0-SON01-26-28 (mg/kg)	LTE00.0-SOFD01-26-28 (mg/kg)	RPD
1-Methylnaphthalene	0.0063	0.68	2.1	102
2-Methylnaphthalene	0.0063	0.63	2.20	111
Naphthalene	0.0063	0.29	1.1	116

Compound	LOQ	LTE00.0-SON01-19-21 (mg/kg)	LTE00.0-SOFD01-19-21 (mg/kg)	RPD
1-Methylnaphthalene	0.0071	0.11	0.20	74
2-Methylnaphthalene	0.0071	0.10	0.18	57
Naphthalene	0.0071	0.019	0.044	79

Criteria: RPD \leq 50% (when both sample concentrations are $>$ 5x the LOQ
Absolute difference between concentrations is \leq 2x the LOQ (when one or both sample concentrations are \leq 5x the LOQ)

The positive results for 1-methylnaphthalene, 2-methylnaphthalene and naphthalene in both samples of each field duplicate pair were qualified as estimated (J). Qualified sample results are summarized in Table 1.

Internal Standard Results

Internal standard results were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Sample Results/Reporting Issues

When applicable, compounds detected at concentrations less than the reporting limit (RL) but greater than the method detection limit (MDL) are qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation.

For the samples undergoing Stage 4 validation, detected sample results were reviewed to ensure that all identification criteria are met. Additionally, the chromatograms for samples where all results are nondetect were reviewed to ensure against laboratory reporting of false negative results.

The detected sample results or the limit of detection (LOD) for each target compound met the project screening criteria tabulated below.

Compound	Screening Criteria	Units
1-Methylnaphthalene	4.2	mg/kg
2-Methylnaphthalene	4.1	mg/kg
Naphthalene	4.4	mg/kg



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

Verification of calculations was performed on a subset of the sample results using the provided data. No significant discrepancies were noted.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.

ATTACHMENTS

Attachment A: Qualifier Codes and Explanations

Attachment B: Reason Codes and Explanations



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

Table 1 - Data Validation Summary of Qualified Data

Sample Name	Compound	Result	Units	LOD	LOQ	Validation qualifier	Reason code
HTE00.0-SOFD01-19-21	1-Methylnaphthalene	0.24	mg/Kg	0.0022	0.0072	J	D3
HTE00.0-SOFD01-19-21	2-Methylnaphthalene	0.18	mg/Kg	0.0043	0.0072	J	D3
HTE00.0-SOFD01-19-21	Naphthalene	0.044	mg/Kg	0.0057	0.0072	J	D3
HTE00.0-SON01-19-21	1-Methylnaphthalene	0.11	mg/Kg	0.0021	0.0071	J	D3
HTE00.0-SON01-19-21	2-Methylnaphthalene	0.10	mg/Kg	0.0043	0.0071	J	D3
HTE00.0-SON01-19-21	Naphthalene	0.019	mg/Kg	0.0057	0.0071	J	D3
LTE00.0-SOFD01-26-28	1-Methylnaphthalene	2.1	mg/Kg	0.0017	0.0058	J	D3
LTE00.0-SOFD01-26-28	2-Methylnaphthalene	2.2	mg/Kg	0.0035	0.0058	J	D3
LTE00.0-SOFD01-26-28	Naphthalene	1.1	mg/Kg	0.0046	0.0058	J	D3
LTE00.0-SON01-26-28	1-Methylnaphthalene	0.68	mg/Kg	0.0019	0.0063	J	D3
LTE00.0-SON01-26-28	2-Methylnaphthalene	0.63	mg/Kg	0.0038	0.0063	J	D3
LTE00.0-SON01-26-28	Naphthalene	0.29	mg/Kg	0.0050	0.0063	J	D3



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

Attachment A

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
J-	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a potential low bias.
J+	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a potential high bias.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for but was not detected above the reported sample quantitation limit.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

Attachment B

Reason Codes and Explanations

Data Qualification Reason Codes	
Reason Code	Reason Code Description
A	Serial dilution
A1	Ambient Blank
B	The analyte was found in an associated blank as well as in the sample.
B2	CCB
B3	CCB - Neg
B4	Grinding Blank
C	LCS Recovery
C1	Reference Recovery
C2	Reference Recovery RPD
D	MS RPD
D1	Lab Replicate RPD
D2	No precision available
D3	Field Duplicate RPD
D4	Field Triplicate RSD
D5	Laboratory Triplicate RSD
F	Field Blank
F1	Hydrocarbon pattern does not match standard
G1	Initial Calibration RRF
G2	Initial Calibration RSD/ r^2/r
G3	ICV RRF
H1	Test Hold Time
H2	Prep Hold Time
I	Surrogate recovery outside project limits.
J	CRA/CRI Recovery
K	An analyte (non-common laboratory artifact) was detected in the sample at a concentration less than 5X the concentration detected in the associated method blank.
L	Lab Blank
L1	Lab Blank - Neg
M	MS Recovery
M2	Post Spike
N	Blank - No Action
O	ICS
P	Sample preservation/collection requirement not met.
P1	Column RPD
P2	Improper preparation/extraction
Q	Encore sample holding time exceeded by more than 2X.
Q1	Material Blank
Q2	Encore sample holding time exceeded by less than 2X.
R	Exceeds Linear Calibration Range



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Data Qualification Reason Codes	
Reason Code	Reason Code Description
S	Internal standard
T	Trip Blank
TI	Tentatively Identified Compound
TR	Trace Level Detect
U	Receipt Temperature
V	Equipment Blank
V1	ICV
V2	CCV
V3	CCV RRF
V4	Sample Receipt Condition
V5	Ending Continuing Calibration Verification
V6	Low Level Calibration Verification
V7	Interference Check Sample A
V8	Interference Check Sample AB
V9	Interference Check Sample A - Negative
W	Column breakdown (pesticides/8270)
X	Raised reporting limit
Y	Cooler temperature greater than 10 degrees C.
Y1	False Positive
Y2	Data rejected due to radiological anomalies
Y3	Non-accredited analyte/compound. Accreditation not offered at time of analyses for the analyte/compound by the stated method and matrix.
Y4	Performance Check - Degradation of DDT
Y5	Extracted Internal Standard
Y6	Analyte not confirmed on second column.
Y7	Signal to Noise Ratio not met
Z	LCS RPD
Z1	Non-accredited analyte/compound
Z1	Data rejected, more valid data available.
Z2	Detection Level not met uncertainty greater than DL
Z4	MDA Greater than RDL.
Z5	Ion Ratio
Z6	Samples were analyzed past the 12 hour time period from the Tune or opening CCV.

Laboratory:
Laboratory SDG/Job No:
Validation Level:

Eurofins Seattle
580-111503-1
 Stage 4
 (using Level IV data package)

Client/Site Name: Red Hill Site Characterization
Project Number: 60674414.00.50.01
Date: 5/3/2022

Validator: Paula DiMattei
Reviewer and Date: Robert Kennedy 081722

Number of Samples/Matrix:
Analysis (Include Method #):

10 soils
 SVOCs, SW846 8270E-SIM (Naphthalene, 1-Methylnaphthalene, 2-Methylnaphthalene)

DoD QSM 5.4, DoD Module 1

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Sample Preservation	Yes	No	Cooler -2.0C
Holding Time	Yes	No	
Quantitation Limits	Yes	No	All detected and ND results met the screening limits
Percent Solids (>30%)	Yes	No	
Method Blanks	Yes	No	All MBs: ND for all targets
Other Laboratory Blanks ^{1,2}	NA	NA	Not applicable to these analyses.
Equipment Blanks	NA	NA	None submitted
Initial Calibration	Yes	No	
Initial Calibration Verification	Yes	No	
Continuing Calibration Verification	Yes	No	
DDT degradation	Yes	No	
Matrix Spike	Yes	No	Performed on LTS15.0-SON01-30-31
Matrix Spike Duplicate RPD ²	Yes	No	
Laboratory Duplicate ²	NA	NA	Not applicable to these analyses.
Surrogate Standards ²	Yes	No	
Laboratory Control Standards	Yes	No	
Internal Standards ^{2,3}	Yes	No	
Field Duplicate	No	Yes	see field duplicate tab
GC/MS Tunes ²	Yes	No	
Compound Identification	see comments		No discrepancies noted
Calculation Spot Checks ³	see comments		No significant discrepancies were noted.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

Compound	QL	5x QL	LTE00.0-SON01-26-28 (mg/kg)	LTE00.0-SOFD01-26-28 (mg/kg)	RPD	Abs. Diff	Action
1-Methylnaphthalene	0.0063	0.032	0.68	2.1	102.2	1.4	J
2-Methylnaphthalene	0.0063	0.032	0.63	2.20	111.0	1.6	J
Naphthalene	0.0063	0.032	0.29	1.1	116.5	0.8	J

reason code D3

Compound	QL	5x QL	LTE00.0-SON01-19-21 (mg/kg)	LTE00.0-SOFD01-19-21 (mg/kg)	RPD	Abs. Diff	Action
1-Methylnaphthalene	0.0071	0.036	0.11	0.2	74.3	0.1	J
2-Methylnaphthalene	0.0071	0.036	0.1	0.18	57.1	0.1	J
Naphthalene	0.0071	0.036	0.019	0.044	79.4	0.0	J

reason code D3

RPD limits: $\leq 30\%$ (aqueous) and $\leq 50\%$ (solid) (when both sample concentrations are $> 5x$ the LOQ) or
absolute difference between concentrations are $\leq 2x$ LOQ (when the sample or field duplicate concentrations are $\leq 5x$ LOQ)

Field duplicates were confirmed with P. Schuler.

DFTPP Tuning Relative abundance

Date of tune 1/14/2022
File ID SIM011322b012.D

% relative abundance = area of ion/area of M/z 95 (or m/z 174 or M/z 176)*100

m/z 51
Area of ion 424768
Area of m/z 198 (or 442 or 69, as appropriate) 2490368

AECOM calculated relative abundance = 17.056 %D=
Lab reported relative abundance = 17.1 -0.25477

DDT Breakdown

Date of DFTPP for Breakdown evaluation 1/14/2022 (ICAL)

% DDT breakdown= (DDD area + DDE area)/(DDT area + DDE area + DDD area)*100

DDD area	85436
DDE area	2920
DDT area	5483688
DDD area + DDE area	88356
DDD area + DDE area + DDT area	5572044
AECOM calculated breakdown=	1.59 %D=
Lab reported breakdown =	1.59 -0.27033

Initial Calibration

Relative Response Factor

Date of ICAL	1/14/2022
Standard ID	LVL 2
Compound	Naphthalene

RRF = $A_c * C_i / A_i * C_c$

Ac=	13345
Ai=	170304
Cc	1
Ci	5

AECOM calculated RRF=	0.7835987
Lab reported RRF =	1.1832

Average RRF and %RSD

Date of ICAL	1/14/2022
Compound	Naphthalene
LVL 2 RRF	1.1832
LVL 3 RRF	1.1041
LVL 4 RRF	1.0790
LVL 5 RRF	1.0850
LVL 6 RRF	1.0572
LVL 7 RRF	1.0588
LVL 8 RRF	1.0251
LVL 9 RRF	1.0709
LVL 10 RRF	1.0433
LVL 11 RRF	0.9985
LVL 12 RRF	1.0347
LVL 13 RRF	0.9521

AECOM calculated average RRF =	1.0577	%D=	-0.003939365
AECOM calculated SD =	0.056995206		
AECOM calculated %RSD	5.388810798		
Lab reported average RRF	1.0577	%D=	-0.003939365
Lab reported %RSD	5.4	%D=	-0.207207448

key:

- A=area
- C=concentration
- is=internal standard
- SD=standard deviation
- c=compound
- i=internal standard

Continuing Calibration

Relative Response Factor of CCAL

Date of CCAL	3/22/2022
Standard ID	CCVIS 580-384630/3
Compound	Naphthalene

$RRF = A_c * C_{is}/A_{is} * C_c$

Ac=	96337
Ais=	19936
Cis	100
Cc	500

AECOM calculated RRF=	0.9664627	%D=
Lab reported RRF =	0.9665	-0.00386

$\%D = RRF_{ccal} - RRF_{ical} / RRF_{ical} * 100$

Lab reported average RRF in ICAL=	1.058
AECOM calculated % D=	-8.65192055 %D=
LAB reported %D=	-8.6 0.603727

key:

- A=area
- C=concentration
- c=compound
- is=internal standard
- %D=percent difference

Labeled Compound Percent Recovery

Surrogate

Sample ID LTE00.0-SON01-26-28
 Surrogate compound 2-methylnaphthalene-d10

Surrogate Compound (ug) = $Ac \cdot Cis \cdot DF / Ais \cdot RRFical$

Ac=	92189
Ais=	17623
Cis	100
RRFical	0.592
Dilution factor	1.00

AECOM calculated result (ug) =	884.2419 %D=
Lab reported result (ug) =	884.2 0.004740437

%Recovery of surrogate

$\%R = [\text{surrogate result (ug)} / \text{surrogate spike concentration(ug)}] \cdot 100$

Surrogate Spike Concentration (ug)	1000
------------------------------------	------

AECOM calculated recovery (%)	88.4 %D=
Lab reported recovery (%)	88.40 0.027365944

key:

- A=area
- C=concentration
- RRFical=ical average response factor
- is=internal standard
- c=compound
- DF = dilution factor
- %R = percent recovery

OPR Percent Recovery and RPD

Concentration of LCS Compound

LCS ID LCS 580-384550/2-A
Labeled Compound Naphthalene

Compound (ug/Kg) = $(Ac * Cis * Vex) / (Ais * RRFical * WS)$

Ac=	152392
Ais=	16087
Cis (ng/ml)	100
RRFical	1.0577
Vex= (ml)	10
Weight of solid (g)	10.00

AECOM calculated result (ug/Kg)	895.622
AECOM calculated result (mg/Kg)	0.896 %D=
Lab reported result (mg/Kg) =	0.896 -0.04222

%Recovery of LCS Compound

%R = $(LCS \text{ reported result} / LCS \text{ spike concentration}) * 100$

LCS spike concentration (mg/kg)	1.00
AECOM calculated recovery (%)	89.6 %D=
Lab reported recovery (%)	90 -0.48648

RPD of LCS/LCS duplicate compound

RPD = $(LCS \text{ conc.} - LCS \text{ duplicate conc.}) / ((LCS \text{ conc.} + LCS \text{ duplicate conc.}) / 2) * 100$

Lab reported LCS duplicate spike conc.= NA LCS only

AECOM calculated LCS/LCS duplicate RPD	200.0 %D=
Lab reported LCS/LCS duplicate RPD	#DIV/0!

key:

- A=area
- C=concentration
- RRFical=ical average response factor
- is=internal standard
- c=compound
- Vex= Final extract volume
- %R = percent recovery
- RPD = relative percent difference

MS/MSD

Sample ID LTS15.0-SON01-30-31
Labeled Compound Naphthalene

Compound (ug/Kg) = (Ac* Cis*Vex*DF)/(Ais* RRFical*WS*%solids)

As=	154888
Ais=	17235
Cis (ng/mL)	100
RRFical	1.0577
Vex (ml)	10.000
Weight of solid	10.84
%Solids	0.77
Dilution Factor	1.0

AECOM calculated result (ug/Kg) =	1021.926
AECOM calculated result (mg/Kg) =	1.022 %D=
Lab reported result (mg/Kg) =	1.02 0.188797005

%Recovery of MS or MSD Compound

%R = (MS calculated result - concentration native to sample/MS spike added)*100

Spike added	1.2
Concentration native to sample	0.0092
AECOM calculated recovery (%)	84.39 %D=
Lab reported recovery (%)	84 0.468822366

RPD of MS/MSD compound

RPD = [MS conc. -MSD conc.]/[MS conc. + MSD conc./2]*100

Lab reported MSD concentration =	0.981
AECOM calculated MS/MSD duplicate RPD	4.1 %D=
Lab reported MS/MSD duplicate RPD	4 2.16487024

key:

A=area
C=concentration
RRFical=ical average response factor
is=internal standard
c=compoind
Ws = weight of solid
%R = percent recovery
RPD = relative percent difference
Vex=final extract volume

Sample Calculation

Compound Quantitation

Sample ID	LTW35.0-SON01-34-36
Compound	Naphthalene

$$\text{Compound (ug/Kg)} = (\text{Ac} * \text{Cis} * \text{Vex} * \text{DF}) / (\text{Ais} * \text{RRFical} * \text{WS} * \% \text{solids})$$

As=	507
Ais=	17286
Cis (ng/mL)	100
RRFical	1.0577
Vex (ml)	10.000
Weight of solid	10.86
%Solids	0.67
Dilution Factor	1.0

AECOM calculated result (ug/Kg) =	3.840
AECOM calculated result (mg/Kg) =	0.0038 %D=
Lab reported result (mg/Kg) =	0.0038 1.04524451

LOQ

Low standard concentration	5.00	LOQ is based on the 5.0 standard rather than the lowest standard of the curve which is 2.0
-----------------------------------	------	--

AECOM calculated LOQ (ug/Kg)	6.923
AECOM calculated LOQ (mg/Kg)	0.00692 %D=
Lab reported result (mg/Kg) =	0.0069 0.33892482

key:

- A=area
- C=concentration
- RRFical=ical average response factor
- DF=dilution factor
- Vex=final extract volume
- WS = weight of solid

Memorandum

Project:	Joint Base Pearl Harbor-Hickam, Hawaii Red Hill Bulk Fuel Storage Facility	
	Site Characterization Study	
Laboratory:	Eurofins, Seattle, WA	
Laboratory Number:	580-111503-1	
Analyses/Method:	Total Petroleum Hydrocarbon (TPH)-Gasoline Range Organics (GRO) by SW-846 Method 8260D Total Petroleum Hydrocarbon (TPH)-Diesel Range Organics (DRO)/Oil Range Organics (ORO) by SW-846 Method 8015C	
Validation Level:	Stage 4	
Project Number:	60674414.00.50.01	
Prepared by:	Paula DiMattei/AECOM	Completed on: 07/13/2022
Reviewed by:	Robert Kennedy /AECOM	File Name:580-111503-1_Stage 4_GRO-DRO-ORO_memo

SUMMARY

The samples listed below were collected by AECOM from the Joint Base Pearl Harbor-Hickam, Hawaii site on March 9-11 and 15, 2022.

Sample ID	Lab ID	Matrix/Sample Type
LTE00.0-SON01-26-28	580-111503-1	Soil
LTE00.0SON01-38-40	580-111503-2	Soil
LTE00.0-SOFD01-26-28	580-111503-3	Soil/Field duplicate of LTE00.0-SON01-26-28
HTE00.0-SON01-19-21	580-111503-4	Soil
HTE00.0-SON01-33-35	580-111503-5	Soil
HTE00.0SOFD01-19-21	580-111503-6	Soil/Field duplicate of HTE00.0-SON01-19-21
LTW35.0-SON01-29-31	580-111503-7	Soil
LTW35.0-SON01-34-36	580-111503-8	Soil
LTS15.0-SON01-23-25	580-111503-9	Soil
LTS15.0-SON01-30-31	580-111503-10	Soil
TB01-SO	580-111503-11	Trip blank

Data validation activities were conducted with reference to:

- *SW-846 Method 8260D: Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS) (June 2018)*
- *SW--846 Method 8015D: Nonhalogenated Organics Using GC/FID (June 2003)*
- *Preliminary Site Characterization Plan, Joint Base Pearl Harbor-Hickam, Hawaii (January 2022)*



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- *Site Characterization Plan Addendum – Holding Tank-Leach Tank Phase 2, Joint Base Pearl Harbor-Hickam, Hawaii (March 2022)*
- *Module 1 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC/MS, Department of Defense, Revision 1 (May 2020)*
- *Module 4 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC (March 2021)*
- *General Data Validation Guidelines, Department of Defense, Revision 1 (November 2019)*

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody [COC])/sample integrity
- ✓ Holding times and sample preservation
- NA Instrument tuning (TPH-GRO analysis only)
- ✓ Initial calibration/initial and continuing calibration verification
- ✗ Laboratory blanks/equipment blanks/trip blanks
- ✓ Surrogate spike recoveries
- ✗ Matrix spike (MS) and matrix spike duplicate (MSD) results
- ✓ Laboratory control sample (LCS) results
- ✗ Field duplicate results
- ✓ Internal standard results (TPH-GRO analysis only)
- ✗ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as qualified and may be used for decision making purposes. Select data points were qualified as estimated due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.

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- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

The case narrative noted instances of missing collection times. Corrected sample IDs and dates of sample collection were provided to the laboratory by AECOM after the samples were received at the laboratory.

Holding Times and Sample Preservation

Sample preservation and analytical holding times were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Instrument Tuning (TPH-GRO analysis only)

The relative abundance of specific ions is not applicable to the GRO method since the analysis performed on the GC/MS is based on the total ion chromatograph and not a selected quantitation ion. The qualitative identification of the presence or absence of GRO in the samples is based on defining the retention time window with the analysis of a retention time standard that includes compounds which mark the start and end of the C6-C12 window, and not as the result of comparison to a reference spectrum. Likewise, quantitation is based on the use of an initial calibration which is determined using the total ion chromatograph and not a selected quantitation ion. Therefore, nonconformances noted for the BFB tunes are not applicable and data validation actions are not required.

Initial Calibration/Initial and Continuing Calibration Verification

Calibration data were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met. Select results were recalculated as part of the Stage 4 validation.

Laboratory Blanks/Equipment Blanks/Trip Blanks

Laboratory blanks, equipment blanks and trip blanks are evaluated as to whether there are contaminants detected above the method detection limit (MDL).

Target compounds were not detected in the trip blank associated with the samples in this data set. An equipment blank was not submitted with this data set. TPH-GRO (C6-C12) was detected in the method blank associated with all samples at a concentration (2.38 mg/Kg) below the limit of detection (LOD).

Samples were qualified as follows:



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Actions: (Based on DoD Revised Table A)

Sample		
Result	Validated Result	Validation Qualifier
Non-detect or detect \leq LOD	Report at LOD	U
> LOD but \leq 5x blank	Report at Sample Result	J+
> 5x blank	Report at Sample Result	None
LOD = Limit of Detection		

Qualified sample results are summarized in Table 1.

Surrogate Spike Recoveries

The surrogate percent recoveries (%Rs) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met. Select surrogate recovery results were recalculated as part of the Stage 4 validation.

MS/MSD Results

The MS/MSD %Rs and relative percent differences (RPDs) were reviewed for conformance with the QC acceptance criteria. Nonconformances are summarized below. Select spike recovery and relative percent difference results were recalculated as part of the Stage 4 validation.

Sample ID	Hydrocarbon Range	MS %R	MSD %R	QC Limits
HTE00.0-SOFD01-19-21	TPH-GRO [C6-C12]	283	270	79-122

The positive result for TPH-GRO [C6-C12] in sample HTE00.0-SOFD01-19-21 was qualified as estimated and potentially biased high (J+). Qualified sample results are summarized in Table 1.

LCS Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met. Select spike recovery results were recalculated as part of the Stage 4 validation.

Field Duplicate Results

The field duplicate results were reviewed for conformance with the QC acceptance criteria. Nonconformances are summarized below.



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Hydrocarbon range	LOQ	LTE00.0-SON01-26-28 (mg/kg)	LTE00.0-SOFD1-26-28 (mg/kg)	RPD	Absolute Difference
TPH-GRO [C6-C12]	11	570	57.0	164	--
TPH-DRO [C10-C24]	65	59	620	--	561.0
Hydrocarbon range	LOQ	HTE00.0-SON01-19-21 (mg/kg)	HTE00.0-SOFD01-19-21 (mg/kg)	RPD	Absolute Difference
TPH-DRO [C10-C24]	70	280	490	--	210.0
Criteria: RPD \leq 50% (when both sample concentrations are $>$ 5x the LOQ Absolute difference between concentrations is \leq 2x the LOQ (when one or both sample concentrations are \leq 5x the LOQ)					

The positive results for TPH-GRO [C6-C12] and TPH-DRO [C10-C24] in samples LTE00.0-SON01-26-28 and LTE00.0-SOFD1-26-28 and for TPH-DRO (C10-C24) in samples HTE00.0-SON01-19-21 and HTE00.0-SOFD01-19-21 were qualified as estimated (J). Qualified sample results are summarized in Table 1.

Internal Standard Results (TPH-GRO analysis only)

Internal standard results were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Sample Results/Reporting Issues

When applicable, compounds detected at concentrations less than the reporting limit (RL) but greater than the method detection limit (MDL) are qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation.

When applicable, it should be noted that the bias is considered to be indeterminate in cases where the cumulative nonconformances do not show a consistent bias or in cases of the presence of a conflicting high and low bias.

For the samples undergoing Stage 4 validation, detected sample results were reviewed to ensure that all identification criteria are met. Additionally, the chromatograms for samples where all results are nondetect were reviewed to ensure against laboratory reporting of false negative results.

The laboratory defined the TPH-GRO, TPH-DRO and TPH-ORO hydrocarbon ranges as follows:

TPH-GRO: C6-C12
TPH-DRO: C10-C24
TPH-ORO: C24-C40

The nondetect result for TPH-GRO (C6-C12) in the trip blank TB01-SO was qualified as estimated (UJ) for the following reason. The sample was analyzed on instrument TAC036. The dodecane retention time marker compound in the retention time check (RTC) standard analyzed just prior to this sample eluted at a retention time of 14.51 minutes. However, the end of the retention time window in the continuing calibration verification (CCV) and for this sample was set to 14.36 minutes which is prior to the elution of dodecane. The TPH-GRO (C6-C12) in TB01-SO was qualified since the integration of this



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hydrocarbon range concluded slightly before the end of the C6-C12 range that is established by the RTC standard. Qualified sample results are summarized in Table 1.

It should be noted that the project screening criteria for TPH-GRO that was compared to sample results is based on the hydrocarbon range C5-C11 rather than C6-C12. No data validation actions were taken on this basis. Additionally, a project screening criterion has not been established for the TPH-ORO (C24-C40) hydrocarbon range.

The following detected results exceeded the project screening criteria:

Sample Name	TPH Range	Result	LOD	Screening Criteria	Units
LTE00.0-SON01-26-28	TPH-GRO [C6-C12]	570	8.0	100	mg/kg
LTE00.0-SON01-38-40	TPH-GRO [C6-C12]	210	9.3	100	mg/kg
HTE00.0-SON01-19-21	TPH-GRO [C6-C12]	200	9.1	100	mg/kg
HTE00.0-SOFD01-19-21	TPH-GRO [C6-C12]	200	9.8	100	mg/kg
LTW35.0-SON01-29-31	TPH-GRO [C6-C12]	360	12	100	mg/kg
LTS15.0-SON01-23-25	TPH-GRO [C6-C12]	110	9.4	100	mg/kg
LTE00.0-SOFD01-26-28	TPH-DRO [C10-C24]	620	39	220	mg/kg
HTE00.0-SON01-19-21	TPH-DRO [C10-C24]	280	42	220	mg/kg
HTE00.0-SOFD01-19-21	TPH-DRO [C10-C24]	490	43	220	mg/kg

Verification of calculations was performed on a subset of the sample results using the provided data. No significant discrepancies were noted.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.

ATTACHMENTS

Attachment A: Qualifier Codes and Explanations

Attachment B: Reason Codes and Explanations



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Table 1 - Data Validation Summary of Qualified Data

Sample Name	Compound	Result	Units	LOD	LOQ	Validation qualifier	Reason code
HTE00.0-SOFD01-19-21	C10-C24	490	mg/Kg	43	71	J	D3
HTE00.0-SOFD01-19-21	Gasoline Range Organics (C6-C12)	200	mg/Kg	9.1	13	J+	M
HTE00.0-SOFD01-19-21	1-Methylnaphthalene	0.24	mg/Kg	0.0022	0.0072	J	D3
HTE00.0-SOFD01-19-21	2-Methylnaphthalene	0.18	mg/Kg	0.0043	0.0072	J	D3
HTE00.0-SOFD01-19-21	Naphthalene	0.044	mg/Kg	0.0057	0.0072	J	D3
HTE00.0-SON01-19-21	C10-C24	280	mg/Kg	42	70	J	D3
HTE00.0-SON01-19-21	1-Methylnaphthalene	0.11	mg/Kg	0.0021	0.0071	J	D3
HTE00.0-SON01-19-21	2-Methylnaphthalene	0.10	mg/Kg	0.0043	0.0071	J	D3
HTE00.0-SON01-19-21	Naphthalene	0.019	mg/Kg	0.0057	0.0071	J	D3
HTE00.0-SON01-33-35	Gasoline Range Organics (C6-C12)		mg/Kg	8.8	12	U	L
LTE00.0-SOFD01-26-28	C10-C24	620	mg/Kg	39	65	J	D3
LTE00.0-SOFD01-26-28	Gasoline Range Organics (C6-C12)	57	mg/Kg	8.9	12	J	D3
LTE00.0-SOFD01-26-28	1-Methylnaphthalene	2.1	mg/Kg	0.0017	0.0058	J	D3
LTE00.0-SOFD01-26-28	2-Methylnaphthalene	2.2	mg/Kg	0.0035	0.0058	J	D3
LTE00.0-SOFD01-26-28	Naphthalene	1.1	mg/Kg	0.0046	0.0058	J	D3
LTE00.0-SON01-26-28	C10-C24	59	mg/Kg	39	65	J	D3
LTE00.0-SON01-26-28	Gasoline Range Organics (C6-C12)	570	mg/Kg	8.0	11	J	D3
LTE00.0-SON01-26-28	1-Methylnaphthalene	0.68	mg/Kg	0.0019	0.0063	J	D3
LTE00.0-SON01-26-28	2-Methylnaphthalene	0.63	mg/Kg	0.0038	0.0063	J	D3
LTE00.0-SON01-26-28	Naphthalene	0.29	mg/Kg	0.0050	0.0063	J	D3
LTW35.0-SON01-34-36	Gasoline Range Organics (C6-C12)		mg/Kg	9.6	13	U	L
TB01-SO	Gasoline Range Organics (C6-C12)		mg/L	0.080	0.10	UJ	PJ



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Attachment A

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
J-	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a potential low bias.
J+	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a potential high bias.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for but was not detected above the reported sample quantitation limit.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.



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Attachment B

Reason Codes and Explanations

Data Qualification Reason Codes	
Reason Code	Reason Code Description
A	Serial dilution
A1	Ambient Blank
B	The analyte was found in an associated blank as well as in the sample.
B2	CCB
B3	CCB - Neg
B4	Grinding Blank
C	LCS Recovery
C1	Reference Recovery
C2	Reference Recovery RPD
D	MS RPD
D1	Lab Replicate RPD
D2	No precision available
D3	Field Duplicate RPD
D4	Field Triplicate RSD
D5	Laboratory Triplicate RSD
F	Field Blank
F1	Hydrocarbon pattern does not match standard
G1	Initial Calibration RRF
G2	Initial Calibration RSD/ r^2/r
G3	ICV RRF
H1	Test Hold Time
H2	Prep Hold Time
I	Surrogate recovery outside project limits.
J	CRA/CRI Recovery
K	An analyte (non-common laboratory artifact) was detected in the sample at a concentration less than 5X the concentration detected in the associated method blank.
L	Lab Blank
L1	Lab Blank - Neg
M	MS Recovery
M2	Post Spike
N	Blank - No Action
O	ICS
P	Sample preservation/collection requirement not met.
P1	Column RPD
P2	Improper preparation/extraction
PJ	Professional judgment
Q	Encore sample holding time exceeded by more than 2X.
Q1	Material Blank
Q2	Encore sample holding time exceeded by less than 2X.



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

Data Qualification Reason Codes	
Reason Code	Reason Code Description
R	Exceeds Linear Calibration Range
S	Internal standard
T	Trip Blank
TI	Tentatively Identified Compound
TR	Trace Level Detect
U	Receipt Temperature
V	Equipment Blank
V1	ICV
V2	CCV
V3	CCV RRF
V4	Sample Receipt Condition
V5	Ending Continuing Calibration Verification
V6	Low Level Calibration Verification
V7	Interference Check Sample A
V8	Interference Check Sample AB
V9	Interference Check Sample A - Negative
W	Column breakdown (pesticides/8270)
X	Raised reporting limit
Y	Cooler temperature greater than 10 degrees C.
Y1	False Positive
Y2	Data rejected due to radiological anomalies
Y3	Non-accredited analyte/compound. Accreditation not offered at time of analyses for the analyte/compound by the stated method and matrix.
Y4	Performance Check - Degradation of DDT
Y5	Extracted Internal Standard
Y6	Analyte not confirmed on second column.
Y7	Signal to Noise Ratio not met
Z	LCS RPD
Z1	Non-accredited analyte/compound
Z1	Data rejected, more valid data available.
Z2	Detection Level not met uncertainty greater than DL
Z4	MDA Greater than RDL.
Z5	Ion Ratio
Z6	Samples were analyzed past the 12 hour time period from the Tune or opening CCV.

Laboratory:
Laboratory SDG/Job No:
Validation Level:

Number of Samples/Matrix:
Analysis (Include Method #):

Eurofins Seattle
580-111503-1
 Stage 4
 (using Level IV data package)
 10 soils, 1 TB
 GRO C6-C12 SW-846 8260D

Client/Site Name: Red Hill Site Characterization
Project Number: 60674414.00.50.01
Date: 5/3/2022
Validator: Paula DiMattei
Reviewer and Date: Robert Kennedy 081722

QSM 5.4, DoD Module 4,

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	The lab reported the Gasoline range organics as C6-C12. The screening criteria list the range as C5-C11. No actions other than this notation.
Sample Preservation	Yes	No	Case narrative indicates all samples rec'd properly preserved. Cooler -2.0C
Holding Time	Yes	No	
Quantitation Limits	see comments		The screening limit of 100 mg/kg was exceeded for the following samples: LTE00.0-SON01-26-28: 570 mg/Kg LTE00.0-SON01-38-40 210 mg/Kg HTE00.0-SON01-19-21 200 mg/Kg HTE00.0-SOFD01-19-21 200 mg/Kg LTW35.0-SON01-29-31 360 mg/Kg LTS15.0-SON01-23-25 110 mg/Kg
Percent Solids (>30%)	Yes	No	
Method Blanks	Yes	No	MB 580-384563/1-A [Associated with all soils]: GRO (C6-C12) 2.38 J mg/Kg; Qualify LOD U in HTE00.0-SON01-33-35 & LTW35.0-SON01-34-36. MB 580-384698/5 [Associated with TB]: ND for GRO
Trip/Equipment Blanks	Yes	No	TB01-SO: ND for GRO
Initial Calibration	Yes	No	
Initial Calibration Verification	Yes	No	
Continuing Calibration Verification	Yes	No	
Matrix Spike	No	Yes	Performed on HTE00.0-SOFD01-19-21 GRO 283/270 (79-122) Estimate J+ [reason code M]
Matrix Spike Duplicate RPD ²	No	Yes	
Laboratory Duplicate ²	NA	NA	
Surrogate Standards ²	Yes	No	
Laboratory Control Standards	Yes	No	LCS/LCSD 580-384563/4-A & 5-A [Associated with all soils]: All met LCS/LCSD580-384698/8 & 9 [Associated with TB] All met
Field Duplicate	No	Yes	see field duplicate tab
Internal Standards ^{2,3}	Yes	No	
GC/MS Tunes ²	see comments		Some tunes were missing from the lab report while others were provided. The laboratory responded that tunes are not applicable to thia analysis; therefore, missing tunes are not provided (see tunes tab for further comments by data validator)
Compound Identification	see comments		The GRO result for the trip blank TB01-SO was qualified as estimated (UJ). This sample was analyzed on instrument TAC036. The dodecane RT marker compound in the RTC standard analyzed just prior to this sanple eluted at 14.51 minutes. However, the RTW in the CCV and this sample was set to end at 14.36 minutes which is prior to the elution of dodecane. The sample result was estimated since the integration was concluded slightly before the end of the C6-C12 range that is established by the RTC std.
Calculation Spot Checks ³	Yes	No	The lab confirmed in email 6/7/2022 that the surrogate and IS are subtracted from the GRO range.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

Gasoline Range Organics (C6-C12)
 Diesel Range Organics (C10-C24)
 Oil Range Organics (C24-C40)

Tune ID (date)	Instrument	ion	% Relative abundance	QC limit	Associated samples
580-384698/1002 (3/22/2022)	TAC036	175	9.1	5.0-9.0% of mass 174	TB01-SO
580-384586/1002 (3/21/2022)	TAC041	50	14.4	15.0-40.0% of mass 95	All soils

Actions [\(Note in memo\)](#)

The relative abundance of specific ions is not applicable to the GRO method since the analysis performed on the GC/MS is based on the total ion chromatograph and not a selected quantitation ion. The qualitative identification of the presence or absence of GRO in the samples is based on defining the retention time window with the analysis of a retention time standard that includes compounds which mark the start and end of the C6-C12 window, and not as the result of comparison to a reference spectrum. Quantitation is based on the use of an initial calibration which is determined using the total ion chromatograph and not a selected quantitation ion. Therefore, nonconformances noted for the BFB tunes are not applicable and data validation actions are not required.

Laboratory: Eurofins Seattle
Laboratory SDG/Job No: 580-111503-1
Validation Level: Stage 4
 (using Level IV data package)
Number of Samples/Matrix : 10 soils
Analysis (Include Method #): DRO/ORO SW-846 8015C

Client/Site Name : Red Hill Site Characterization
Project Number: 60674414.00.50.01
Date: 5/3/2022
Validator: Paula DiMattei
Reviewer and Date: Robert Kennedy 081722

QSM 5.4, DoD Module 4,

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	The lab reported the DRO range as C10-C24 and the ORO range as C24-C40. Screening limits are only provided for the DRO range
Sample Preservation	Yes	No	Cooler -2.0C
Holding Time	Yes	No	
Quantitation Limits	see comments		All detects and NDs met the DRO screening limits except the following: LTE00.0-SOFD01-26-28 620 mg/kg HTE00.0-SON01-19-21 280 mg/kg HTE00.0-SOFD01-19-21 490 mg/kg
Percent Solids (>30%)	Yes	No	
Method Blanks	Yes	No	MB 580-384294/1-A [Associated with all soils]: ND for DRO and ORO
Equipment Blanks	NA	NA	None submitted
Initial Calibration	Yes	No	
Initial Calibration Verification	Yes	No	
Continuing Calibration Verification	Yes	No	The RTC standard is used to establish the RTW for each range. The RT listed on the Form 7 notes the RT of the apex of the peak. Therefore, the RTW noted on the subsequent CCV std is slightly different because per the lab response, it is set to mark the start of the peak rather than the apex of the peak for the first marker alkane and the end of the peak rather than the apex for the ending marker alkane. The lab also responded that the start of the range on the quant report for C24-C40 differs from the other C24 ranges (C24-C32 and C24-C36) because they are lesser requested ranges and the RTW has not consistently updated for those other ranges. Going forward, the lab will update them to avoid confusion. (see email 8/2/2022)
Matrix Spike	NA	NA	None performed
Matrix Spike Duplicate RPD ²	NA	NA	
Laboratory Duplicate ²	NA	NA	
Surrogate Standards ²	Yes	No	
Laboratory Control Standards	Yes	No	LCS/LCSD 580-384294/2-A [Associated with all soils] all met note: the lab limits for the DRO range (75-125) are tighter than those in Appendix C. QSM and lab limits were met.
Field Duplicate	No	Yes	see field duplicate tab
Compound Identification	see comments		No discrepancies noted
Calculation Spot Checks ³	see comments		The lab confirmed (in email 6/7/2022) that the surrogate contribution is subtracted from the appropriate DRO/ORO area as applicable.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

Gasoline Range Organics (C6-C12)
 Diesel Range Organics (C10-C24)
 Oil Range Organics (C24-C40)

Compound	QL	5x QL	LTE00.0-SON01-26-28 (mg/kg)	LTE00.0-SOFD1-26-28 (mg/kg)	RPD	2xQL	Abs. Diff	Action	
GRO (C6-C12)	11	55	570	57.0	163.6	22.0	513.0	J	reason code D3
DRO (C10-C24)	65	325	59	620	165.2	130.0	561.0	J	
ORO (C24-C40)	65	325	0	0	NA	130.0	NA		
			HTE00.0-SON01-19-21 (mg/kg)	HTE00.0-SOFD01-19-21 (mg/kg)					
GRO (C6-C12)	13	65	200	200	0.0	26.0	0.0	ok	reason code D3
DRO (C10-C24)	70	350	280	490	54.5	140.0	210.0	J	
ORO (C24-C40)	70	350	35	62	55.7	140.0	27.0	ok	

RPD limits: $\leq 30\%$ (aqueous) and $\leq 50\%$ (solid) (when both sample concentrations are $> 5x$ the LOQ) or
absolute difference between concentrations are $\leq 2x$ LOQ (when the sample or field duplicate concentrations are $\leq 5x$ LOQ)

Field duplicate associations were confirmed with P. Schuler.

Initial Calibration

Relative Response Factor

Date of ICAL	1/14/2022
Standard ID	LVL 2
Compound	Naphthalene

RRF = $A_c * C_i / A_i * C_c$

Ac=	13345
Ai=	170304
Cc	1
Ci	5

AECOM calculated RRF=	0.7835987
Lab reported RRF =	1.1832

Average RRF and %RSD

Date of ICAL	2/22/2022
Compound	GRO (C6-C12)
LVL 1 RRF	1.4556
LVL 2 RRF	1.2182
LVL 3 RRF	1.0866
LVL 4 RRF	1.2944
LVL 5 RRF	1.2775
LVL 6 RRF	1.0895
LVL 7 RRF	1.1116
LVL 8 RRF	0.9928
LVL 9 RRF	0.9305

Instrument :TAC041

AECOM calculated average RRF =	1.1618556
AECOM calculated SD =	0.16429078
AECOM calculated %RSD	14.14037906
Lab reported average RRF	1.1681 %D= -0.534581324
Lab reported %RSD	14.9 %D= -5.098127135

key: A=area
 C=concentration
 is=internal standard
 SD=standard deviation
 c=compound
 i=internal standard

Continuing Calibration

Relative Response Factor of CCAL

Date of CCAL	3/21/2022
Standard ID	CCV580-384586/4
Compound	GRO C6-C12

$RRF = A_c * C_{is}/A_{is} * C_c$

Ac=	22634404
Ais=	161687
Cis	10
Cc	1000

AECOM calculated RRF=	1.3998902	%D=
Lab reported RRF =	1.4000	-0.00785

$\%D = (RRF_{ccal} - RRF_{ical}) / RRF_{ical} * 100$

Lab reported average RRF in ICAL=	1.168
AECOM calculated % D=	19.85360943 %D=
LAB reported %D=	19.8 0.270755

key:

- A=area
- C=concentration
- c=compound
- is=internal standard
- %D=percent difference

Labeled Compound Percent Recovery

Surrogate

Sample ID LTE00.0-SON01-26-28
 Surrogate compound BFB

Surrogate Compound (ug) = $Ac * Cis * DF / Ais * RRFical$

Ac=	66301
Ais=	130123
Cis	10
RRFical	0.513
Dilution factor	1.00

AECOM calculated result (ug) =	9.9323 %D=
Lab reported result (ug) =	9.93 0.0228898

%Recovery of surrogate

$\%R = [\text{surrogate result (ug)} / \text{surrogate spike concentration(ug)}] * 100$

Surrogate Spike Concentration (ug)	10
------------------------------------	----

AECOM calculated recovery (%)	99.3 %D=
Lab reported recovery (%)	99 0.325989466

key:

- A=area
- C=concentration
- RRFical=ical average response factor
- is=internal standard
- c=compound
- DF = dilution factor
- %R = percent recovery

OPR Percent Recovery and RPD

Concentration of LCS Compound

LCS ID	LCS 580-384563/4-A
Labeled Compound	GRO C6-C12
Ac=	19962085
Ais=	142773
Cis=	10
RRFical	1.1681
AECOM calculated result (ug/L)	1196.960 %D=
Lab reported result (ug/L) =	1196.9 0.005048
Weight of solid (g)	10
% solids	1
Extract final volume (ml)	10.00
VOA vial volume (L)	0.043
Amt. of MEOH extract (ml)	1.075
AECOM calculated result (ug/g or mg/kg)	47.878 %D=
Lab reported result (mg/Kg) =	47.9 -0.04506

%Recovery of LCS Compound

%R = (LCS reported result/LCS spike concentration)*100

LCS spike concentration (mg/kg)	40.00
AECOM calculated recovery (%)	119.7 %D=
Lab reported recovery (%)	120 -0.2533

RPD of LCS/LCS duplicate compound

RPD = (LCS conc. -LCS duplicate conc.)/((LCS conc. + LCS duplicate conc.)/2)*100

Lab reported LCS duplicate spike conc.=	46.6
AECOM calculated LCS/LCS duplicate RPD	2.7 %D=
Lab reported LCS/LCS duplicate RPD	3 -9.79125

key:

A=area
 C=concentration
 RRFical=ical average response factor
 is=internal standard
 c=compound

%R = percent recovery
 RPD = relative percent difference

MS/MSD

Sample ID	HTE00.0-SOFD01-19-21	
Labeled Compound	GRO C6-C12	
Ac=	68912242	
Ais=	135495	
Cis=	10	
RRFical	1.1681	
AECOM calculated result (ug/L)	4354.047	%D=
Lab reported result (ug/L) =	4353.9	0.0033702
Weight of solid (g)	5.452	
% solids	0.664	
% moisture	33.6	
Extract final volume (ml)	10.00	
Extract final volume (ml)-miscible solvent corrected	11.83	
VOA vial volume (L)	0.043	
Amt. of MEOH extract (ml)	1.075	
Dilution	1.000	
AECOM calculated result (ug/g or mg/kg)	569.223	%D=
Lab reported result (mg/Kg) =	569	0.0392316

%Recovery of MS or MSD Compound

%R = (MS calculated result - concentration native to sample/MS spike added)*100

Spike added	131.0	
Concentration native to sample	200	
AECOM calculated recovery (%)	281.85	%D=
Lab reported recovery (%)	283	-0.406434

RPD of MS/MSD compound

RPD = [MS conc. -MSD conc.]/[MS conc. + MSD conc./2]*100

Lab reported MSD concentration =	553	
AECOM calculated MS/MSD duplicate RPD	2.9	%D=
Lab reported MS/MSD duplicate RPD	3	-3.624474

key:

A=area
C=concentration
RRFical=ical average response factor
is=internal standard
c=compoiund
Ws = weight of solid
%R = percent recovery
RPD = relative percent difference
Vex=final extract volume

Sample Calculation

Compound Quantitation

Sample ID	LTE00.0-SON01-26-28	
Compound	GRO C6-C12	
Ac=	91375035	
Ais=	145408	
Cis=	10	
RRFical	1.1681	
AECOM calculated result (ug/L)	5379.715	%D=
Lab reported result (ug/L) =	5379.6	0.002129096

Weight of solid (g)	5.977	
% solids	0.730	
% moisture	27.0	
Extract final volume (ml)	10.00	
Extract final volume (ml)-miscible solvent corrected	11.61	
VOA vial volume (L)	0.043	
Amt. of MEOH extract (ml)	1.075	
Dilution	1.000	
AECOM calculated result (ug/g or mg/kg)	572.779	%D=
Lab reported result (mg/Kg) =	570	0.487541248

LOQ

Low standard concentration 100.00 LOQ is based on the 100 standard rather than the lowest standard of the curve which is 50.0

AECOM calculated LOQ (mg/Kg)	10.647	%D=
Lab reported result (mg/Kg) =	11	-3.208959375

key:

- A=area
- C=concentration
- RRFical=ical average response factor
- DF=dilution factor
- Vex=final extract volume
- WS = weight of solid

Facility: RHBFS Site Characterization
 Event: Site Characterization HT-LT Phase 2
 SDG: 5801115031
 Guidance Document: Red Hill Bulk Fuel Storage Facility Site Characterization UFP-QAPP
 Prime Contractor: AECOM, Honolulu, HI
 Project Manager:
 Contract Laboratory(ies): Eurofins Environment Testing TestAmerica, Tacoma, WA
 Data Review Contractor:
 Data Review Level:
 Primary Data Reviewer: ,
 Date Submitted:

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	BNASIM	SW8015D	SW8260	SW8260D
HTE00.0-SOFD01-19-21	580-111503-6	Solid	Field Duplicate/FD	X	X	X	X
HTE00.0-SON01-19-21	580-111503-4	Solid	Field Sample/N	X	X	X	X
HTE00.0-SON01-33-35	580-111503-5	Solid	Field Sample/N	X	X	X	X
LTE00.0-SOFD01-26-28	580-111503-3	Solid	Field Duplicate/FD	X	X	X	X
LTE00.0-SON01-26-28	580-111503-1	Solid	Field Sample/N	X	X	X	X
LTE00.0-SON01-38-40	580-111503-2	Solid	Field Sample/N	X	X	X	X
LTS15.0-SON01-23-25	580-111503-9	Solid	Field Sample/N	X	X	X	X
LTS15.0-SON01-30-31	580-111503-10	Solid	Field Sample/N	X	X	X	X
LTW35.0-SON01-29-31	580-111503-7	Solid	Field Sample/N	X	X	X	X
LTW35.0-SON01-34-36	580-111503-8	Solid	Field Sample/N	X	X	X	X
TB01-SO	580-111503-11	Water	Trip Blank/TB			X	X

Data Validation Report for 5801115031

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Red Hill Bulk Fuel Storage Facility Site Characterization UFP-QAPP and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by AECOM, Honolulu, HI; analyses were performed by Eurofins Environment Testing TestAmerica, Tacoma, WA and were reported under sample delivery group (SDG) 5801115031. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

Continuing Calibration Verification

Field Duplicate RPD

Lab Blank

LCS Recovery

LCS RPD

MS Recovery

MS RPD

Prep Hold Time

Surrogate

Test Hold Time

Trip Blank

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 22 results (17.32%) out of the 127 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Data Validation Report for 5801115031

Narrative Comments

Analytical Method Data Reviewer Comment

Reviewed by , ,

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.



Reviewed by , Senior Scientist,

September 19, 2022

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Data Validation Report for 5801115031

Quality Control Outliers for test method SW8260, Lab Blank

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
MB5803845631A (LB)	C6-C10 Gasoline Range Organics	1.380	< 1.3	< 4	mg/kg	RB/R	L	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the Lab Blank for SW8260

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
HTE00.0-SON01-33-35 580-111503-5	N	C6-C10 Gasoline Range Organics	12.0	12.0 U	12.0 U		mg/kg	L
LTW35.0-SON01-34-36 580-111503-8	N	C6-C10 Gasoline Range Organics	13.0	13.0 U	13.0 U		mg/kg	L

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 5801115031

Quality Control Outliers for test method SW8260, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
HTE00.0-SOFD01-19-21 (MS)	C6-C10 Gasoline Range Organics	227.0	79 - 122	79 - 122	percent	R/R	M	
HTE00.0-SOFD01-19-21 (SD)	C6-C10 Gasoline Range Organics	230.0	79 - 122	79 - 122	percent	R/R	M	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the MS Recovery for SW8260

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
HTE00.0-SOFD01-19-21 580-111503-6	FD	C6-C10 Gasoline Range Organics	13.0	17.0 J1	17.0 J	+	mg/kg	M

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 5801115031

Quality Control Outliers for test method SW8260D, Test Hold Time

Hold times are ascertained based on project requirements. Holding times were determined by comparing the chain of custody records with the dates of analysis found in the electronic data deliverable and laboratory summary forms. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
TB01-SO (TB)		14.11	< 14	< 28	days	R/R	H1	Test Exceeds UWL

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Data Validation Report for 5801115031

Table of All Qualified Results

Test Method: BNASIM		Extraction Method: SW3546						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
HTE00.0-SOFD01-19-21 580-111503-6	FD	1-Methylnaphthalene	0.00720	0.240 M	0.240 J		mg/kg	D3
HTE00.0-SOFD01-19-21 580-111503-6	FD	2-Methylnaphthalene	0.00720	0.180 M	0.180 J		mg/kg	D3
HTE00.0-SOFD01-19-21 580-111503-6	FD	Naphthalene	0.00720	0.0440 M	0.0440 J		mg/kg	D3
HTE00.0-SON01-19-21 580-111503-4	N	1-Methylnaphthalene	0.00710	0.110	0.110 J		mg/kg	D3
HTE00.0-SON01-19-21 580-111503-4	N	2-Methylnaphthalene	0.00710	0.100	0.100 J		mg/kg	D3
HTE00.0-SON01-19-21 580-111503-4	N	Naphthalene	0.00710	0.0190 M	0.0190 J		mg/kg	D3
LTE00.0-SOFD01-26-28 580-111503-3	FD	1-Methylnaphthalene	0.00580	2.10	2.10 J		mg/kg	D3
LTE00.0-SOFD01-26-28 580-111503-3	FD	2-Methylnaphthalene	0.00580	2.20	2.20 J		mg/kg	D3
LTE00.0-SOFD01-26-28 580-111503-3	FD	Naphthalene	0.00580	1.10	1.10 J		mg/kg	D3
LTE00.0-SON01-26-28 580-111503-1	N	1-Methylnaphthalene	0.00630	0.680	0.680 J		mg/kg	D3
LTE00.0-SON01-26-28 580-111503-1	N	2-Methylnaphthalene	0.00630	0.630	0.630 J		mg/kg	D3
LTE00.0-SON01-26-28 580-111503-1	N	Naphthalene	0.00630	0.290	0.290 J		mg/kg	D3

Test Method: SW8015D		Extraction Method: SW3546						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
HTE00.0-SOFD01-19-21 580-111503-6	FD	C10-C24 Petroleum Hydrocarbons	71.0	490	490 J		mg/kg	D3
HTE00.0-SON01-19-21 580-111503-4	N	C10-C24 Petroleum Hydrocarbons	70.0	280	280 J		mg/kg	D3
LTE00.0-SOFD01-26-28 580-111503-3	FD	C10-C24 Petroleum Hydrocarbons	65.0	620	620 J		mg/kg	D3
LTE00.0-SON01-26-28 580-111503-1	N	C10-C24 Petroleum Hydrocarbons	65.0	59.0 J	59.0 J		mg/kg	TR/D3

Test Method: SW8260		Extraction Method: SW5030						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
TB01-SO 580-111503-11	TB	C6-C10 Gasoline Range Organics	100	80.0 U	80.0 UJ		ug/l	F1

Test Method: SW8260		Extraction Method: SW5035						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
HTE00.0-SOFD01-19-21 580-111503-6	FD	C6-C10 Gasoline Range Organics	13.0	17.0 J1	17.0 J	+	mg/kg	M
HTE00.0-SON01-33-35 580-111503-5	N	C6-C10 Gasoline Range Organics	12.0	12.0 U	12.0 U		mg/kg	L
LTE00.0-SOFD01-26-28 580-111503-3	FD	C6-C10 Gasoline Range Organics	12.0	6.30 J	6.30 J		mg/kg	TR/D3

Data Validation Report for 5801115031

Table of All Qualified Results

Test Method: SW8260		Extraction Method: SW5035						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LTE00.0-SON01-26-28 580-111503-1	N	C6-C10 Gasoline Range Organics	11.0	77.0	77.0 J		mg/kg	D3
LTW35.0-SON01-34-36 580-111503-8	N	C6-C10 Gasoline Range Organics	13.0	13.0 U	13.0 U		mg/kg	L

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.

In instances where no LOD is provided, results are reported down to the LOQ.

Trace values are not included in the qualified results table unless additional reason codes are associated.

Data Validation Report for 5801115031

Table of Results with Modified Qualifiers

Modified Qualifiers for test method BNASIM

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
HTE00.0-SOFD01-19-21 580-111503-6	FD	1-Methylnaphthalene	0.00720	0.240 M	0.240	0.240 J	D3
HTE00.0-SOFD01-19-21 580-111503-6	FD	2-Methylnaphthalene	0.00720	0.180 M	0.180	0.180 J	D3
HTE00.0-SOFD01-19-21 580-111503-6	FD	Naphthalene	0.00720	0.0440 M	0.0440	0.0440 J	D3
HTE00.0-SON01-19-21 580-111503-4	N	1-Methylnaphthalene	0.00710	0.110	0.110	0.110 J	D3
HTE00.0-SON01-19-21 580-111503-4	N	2-Methylnaphthalene	0.00710	0.100	0.100	0.100 J	D3
HTE00.0-SON01-19-21 580-111503-4	N	Naphthalene	0.00710	0.0190 M	0.0190	0.0190 J	D3
LTE00.0-SOFD01-26-28 580-111503-3	FD	1-Methylnaphthalene	0.00580	2.10	2.10	2.10 J	D3
LTE00.0-SOFD01-26-28 580-111503-3	FD	2-Methylnaphthalene	0.00580	2.20	2.20	2.20 J	D3
LTE00.0-SOFD01-26-28 580-111503-3	FD	Naphthalene	0.00580	1.10	1.10	1.10 J	D3
LTE00.0-SON01-26-28 580-111503-1	N	1-Methylnaphthalene	0.00630	0.680	0.680	0.680 J	D3
LTE00.0-SON01-26-28 580-111503-1	N	2-Methylnaphthalene	0.00630	0.630	0.630	0.630 J	D3
LTE00.0-SON01-26-28 580-111503-1	N	Naphthalene	0.00630	0.290	0.290	0.290 J	D3

Modified Qualifiers for test method SW8015D

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
HTE00.0-SOFD01-19-21 580-111503-6	FD	C10-C24 Petroleum Hydrocarbons	71.0	490	490	490 J	D3
HTE00.0-SON01-19-21 580-111503-4	N	C10-C24 Petroleum Hydrocarbons	70.0	280	280	280 J	D3
LTE00.0-SOFD01-26-28 580-111503-3	FD	C10-C24 Petroleum Hydrocarbons	65.0	620	620	620 J	D3
LTE00.0-SON01-26-28 580-111503-1	N	C10-C24 Petroleum Hydrocarbons	65.0	59.0 J	59.0 J	59.0 J	TR/D3

Modified Qualifiers for test method SW8260

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
TB01-SO 580-111503-11	TB	C6-C10 Gasoline Range Organics	100	80.0 U	80.0 U	80.0 UJ	F1

Modified Qualifiers for test method SW8260

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
HTE00.0-SOFD01-19-21 580-111503-6	FD	C6-C10 Gasoline Range Organics	13.0	17.0 J1	17.0 R	17.0 J	M
HTE00.0-SON01-19-21 580-111503-4	N	C6-C10 Gasoline Range Organics	12.0	13.0	13.0 R	13.0	
HTE00.0-SON01-33-35 580-111503-5	N	C6-C10 Gasoline Range Organics	12.0	12.0 U	12.0 U	12.0 U	L

Data Validation Report for 5801115031

Table of Results with Modified Qualifiers

Modified Qualifiers for test method SW8260

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
LTE00.0-SOFD01-26-28 580-111503-3	FD	C6-C10 Gasoline Range Organics	12.0	6.30 J	6.30 J	6.30 J	TR/D3
LTE00.0-SON01-26-28 580-111503-1	N	C6-C10 Gasoline Range Organics	11.0	77.0	77.0	77.0 J	D3
LTW35.0-SON01-34-36 580-111503-8	N	C6-C10 Gasoline Range Organics	13.0	13.0 U	13.0 U	13.0 U	L

Modified Qualifiers for test method SW8260D

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
TB01-SO 580-111503-11	TB	Benzene	1.00	0.500 U	0.500 R	0.500 U	
TB01-SO 580-111503-11	TB	Ethylbenzene	1.00	0.800 U	0.800 R	0.800 U	
TB01-SO 580-111503-11	TB	m,p-Xylene	2.00	0.800 U	0.800 R	0.800 U	
TB01-SO 580-111503-11	TB	o-Xylene	1.00	0.800 U	0.800 R	0.800 U	
TB01-SO 580-111503-11	TB	Toluene	1.00	0.800 U	0.800 R	0.800 U	
TB01-SO 580-111503-11	TB	Xylenes, Total	2.00	0.800 U	0.800 R	0.800 U	

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ. Trace values are not included in the qualified results table unless additional reason codes are associated.

Reason Code Definitions

Code	Definition
D3	Field Duplicate RPD
F1	Hydrocarbon pattern does not match standard
H1	Test Hold Time
L	Lab Blank
M	MS Recovery
TR	Trace Level Detect

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Data Validation Report for 5801115031

Bias

-
- | | |
|---|-------------------------------|
| - | The result may be biased low |
| + | The result may be biased high |
-

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Data Validation Report for 5801115031

Review Questions

Memorandum

Project: Joint Base Pearl Harbor-Hickam, Hawaii
 Red Hill Bulk Fuel Storage Facility

Site Characterization Study

Laboratory: Eurofins, Seattle, WA

Laboratory Number: 580-111720-1

Analyses/Method: Volatile Organic Compounds (BTEX) by EPA Method 8260D

Validation Level: Stage 2B

Project Number: 60674414.00.50.01

Prepared by: Jared DeSadier / AECOM Completed on: 05/16/2022

Reviewed by: Kristin Rutherford / AECOM File Name: 580-111720-1_BTEX_memo

SUMMARY

The samples listed below were collected by AECOM from the Joint Base Pearl Harbor-Hickam, Hawaii site on March 16, 2022 and March 17, 2022.

Sample ID	Lab ID	Matrix/Sample Type
LTE15.0-SON01-018.0	580-111720-1	Soil
LTE15.0-SON01-026.0	580-111720-2	Soil
LTN35.0-SON01-016.0	580-111720-3	Soil
LTN35.0-SON01-018.0	580-111720-4	Soil
Trip Blank	580-111720-9	Trip Blank

Data validation activities were conducted with reference to:

- *SW-846 Method 8260D: Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)* (June 2018)
- *Preliminary Site Characterization Plan, Joint Base Pearl Harbor-Hickam, Hawaii* (January 2022)
- *Site Characterization Plan Addendum – Holding Tank-Leach Tank Phase 2, Joint Base Pearl Harbor-Hickam, Hawaii* (March 2022)
- *Module 1 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC/MS, Department of Defense, Revision 1* (May 2020)
- *General Data Validation Guidelines, Department of Defense, Revision 1* (November 2019)
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review* (November 2020).



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody [COC])/sample integrity
- ✓ Holding times and sample preservation
- ✓ Instrument tuning
- ✓ Initial calibration/initial and continuing calibration verification
- ✓ Laboratory blanks/field blanks/equipment blanks
- ✓ Surrogate spike recoveries
- ✓ Matrix spike (MS) and matrix spike duplicate (MSD) results
- ✓ Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
- NA Field duplicate results
- ✓ Internal standard results
- ✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. The symbol (X) indicates that a QC nonconformance resulted in the qualification of data. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as qualified and may be used for decision making purposes. There were no data points qualified as a result of this data review.

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Four samples (LTE15.0-SON01-018.0, LTE15.0-SON01-026.0, LTN35.0-SON01-016.0, and LTN35.0-SON01-018.0) were listed on the COC for BTEX analysis but cancelled as they were improperly preserved, with no methanol included in the VOA vials.



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

Sample Results/Reporting Issues

If applicable, the sample results detected at concentrations less than the Limit of Quantitation (LOQ) but greater than the Detection Limit (DL) are qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation.

Several samples were received with significantly lower sample weights than required by the method (10g). The laboratory limit of detection (LOD) met the screening criteria for all nondetect results.

QUALIFICATION ACTIONS

There were no sample results qualified as a result of this data review.

Laboratory: Eurofins Seattle
Laboratory SDG/Job No: 580-111720-1
Validation Level: Stage 2B
 (using Level IV data package)
Number of Samples/Matrix: 4 soils, 1 TB
Analysis (Include Method #): BTEX SW846 8260D

Client/Site Name: Red Hill Site Characterization
Project Number: 60674414.00.50.01
Date: 05/16/22
Validator: J. DeSadier
Reviewer and Date: K Rutherford 05/24/22

QAPP (QSM 5.4), DoD Module 1, NFG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	Four samples (LTE15.0-SON01-018.0, LTE15.0-SON01-026.0, LTN35.0-SON01-016.0, and LTN35.0-SON01-018.0) were listed on the COC for BTEX analysis but cancelled as they were improperly preserved (not received with methanol). Some sample IDs were revised upon receipt by the lab
Sample Preservation	No	No	-2.1° C, Four samples (LTE15.0-SON01-018.0, LTE15.0-SON01-026.0, LTN35.0-SON01-016.0, and LTN35.0-SON01-018.0) were listed on the COC for BTEX analysis but cancelled as they were improperly preserved.
Holding Time	Yes	No	Collected 3/16/22 - 3/17/22, analyzed within HT
Quantitation Limits	Yes	No	No dilutions. Several samples were received with significantly lower sample weights than required by method (10g). ND results at LOD meet action limits.
Percent Solids (>30%)	Yes	No	
Method Blanks	Yes	No	MB 580-385440/1-A, MB 580-385516/7
Other Laboratory Blanks ^{1,2}	Yes	No	
Trip/Equipment Blanks	Yes	No	Trip Blank was ND for BTEX.
Initial Calibration	Yes	No	03/02/22 Inst TAC113, 03/15/22 Inst TAC041, criteria met
Initial Calibration Verification	Yes	No	ICV 580-383954/12, ICV 580-378299/12 within %D≤20%
Continuing Calibration Verification	Yes	No	CCVIS 580-385448/3, CCVC 580-385448/22, CCVIS 580-385516/2, CCVC 580-385516/15, within criteria.
Matrix Spike	NA	NA	An MS/MSD was not analyzed on a sample in this SDG.
Matrix Spike Duplicate RPD ²	NA	NA	
Laboratory Duplicate ²	NA	NA	Not applicable to these analyses.
Surrogate Standards ²	Yes	No	Surrogate %Rs within QSM limits
Laboratory Control Standards	Yes	No	LCS 580-385440/2-A, LCSD 580-385440/3-A, LCS 580-385516/4, LCSD 580-385516/5: %Rs within QSM limits, RPDs within lab limits.
Internal Standards ^{2,3}	Yes	No	
Field Duplicate	NA	NA	
GC/MS Tunes ²	Yes	No	
Calculation Spot Checks ³	NA	NA	Not a required validation element for this project.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

Note: it may not be appropriate to make a direct quantitative comparison for aqueous field blanks (such as equipment blanks reported as µg/mL) to a solid parent sample (such as a soil sample reported as mg/kg). At best, only a qualitative comparison can be made.

Memorandum

Project: Joint Base Pearl Harbor-Hickam, Hawaii
 Red Hill Bulk Fuel Storage Facility

Site Characterization Study

Laboratory: Eurofins, Seattle, WA

Laboratory Number: 580-111720-1

Analyses/Method: Semivolatile Organic Compounds by EPA Method 8270E-SIM
 (1-Methylnaphthalene, 2-Methylnaphthalene, Naphthalene)

Validation Level: Stage 2B

Project Number: 60674414.00.50.01

Prepared by: Jared DeSadier / AECOM Completed on: 05/17/2022

Reviewed by: Kristin Rutherford /AECOM File Name: 580-111720-1_SVOC SIM_memo

SUMMARY

The samples listed below were collected by AECOM from the Joint Base Pearl Harbor-Hickam, Hawaii site on March 16 and 17, 2022.

Sample ID	Lab ID	Matrix/Sample Type
LTE15.0-SON01-018.0	580-111720-1	Soil
LTE15.0-SON01-026.0	580-111720-2	Soil
LTN35.0-SON01-016.0	580-111720-3	Soil
LTN35.0-SON01-018.0	580-111720-4	Soil
HTN15.0-SON01-006.0	580-111720-5	Soil
HTN15.0-SON01-018.0	580-111720-6	Soil
HTW35.0-SON01-014.0	580-111720-7	Soil
HTW35.0-SON01-016.0	580-111720-8	Soil

Data validation activities were conducted with reference to:

- *SW-846 Method 8270E: Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)* (June 2018)
- *Preliminary Site Characterization Plan, Joint Base Pearl Harbor-Hickam, Hawaii* (January 2022)
- *Site Characterization Plan Addendum – Holding Tank-Leach Tank Phase 2, Joint Base Pearl Harbor-Hickam, Hawaii* (March 2022)
- *Module 1 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC/MS, Department of Defense, Revision 1* (May 2020)
- *General Data Validation Guidelines, Department of Defense, Revision 1* (November 2019)
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review* (November 2020).



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody [COC])/sample integrity
- ✓ Holding times and sample preservation
- ✓ Instrument tuning
- ✓ Initial calibration/initial and continuing calibration verification
- ✓ Laboratory blanks/field blanks/equipment blanks
- ✓ Surrogate spike recoveries
- NA Matrix spike (MS) and matrix spike duplicate (MSD) results
- ✓ Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
- NA Field duplicate results
- ✓ Internal standard results
- ✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. The symbol (X) indicates that a QC nonconformance resulted in the qualification of data. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as qualified and may be used for decision making purposes. There were no data points qualified as a result of this data review.

RESULTS

Sample Results/Reporting Issues

If applicable, the sample results detected at concentrations less than the Limit of Quantitation (LOQ) but greater than the Detection Limit (DL) are qualified by the laboratory as estimated (J). This “J” qualifier is retained during data validation. Laboratory limits of detection (LOD) meet screening criteria for all samples.

The following compounds exceeded the project screening criteria:

Sample Name	Compound	Result	LOD	Screening Criteria	Units
LTE15.0-SON01-018.0	1-Methylnaphthalene	4.8	0.0020	4.2	mg/kg
LTE15.0-SON01-018.0	2-Methylnaphthalene	6.4	0.0041	4.1	mg/kg

QUALIFICATION ACTIONS

There were no sample results qualified as a result of this data review.

Laboratory: Eurofins Seattle **Client/Site Name:** Red Hill Site Characterization
Laboratory SDG/Job No: 580-111720-1 **Project Number:** 60674414.00.50.01
Validation Level: Stage 2B **Date:** 05/17/22
(using Level IV data package) **Validator:** J. DeSadier
Number of Samples/Matrix: 8 soils **Reviewer and Date:** K Rutherford 05/24/22
Analysis (Include Method #): SVOCs, SW846 8270E-SIM (Naphthalene, 1-Methylnaphthalene, 2-Methylnaphthalene)

DoD QSM 5.4, DoD Module 1, NFG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	Some sample IDs were revised by the lab upon receipt.
Sample Preservation	Yes	No	-2.1° C
Holding Time	Yes	No	Collected 3/16/22 - 3/17/22, analyzed within HT
Quantitation Limits	No	No	Sample LTN35.0-SON01-018.0 was analyzed at a 5x dilution.
Percent Solids (>30%)	Yes	No	
Method Blanks	Yes	No	MB 580-385549/1-A, All ND
Other Laboratory Blanks ^{1,2}	NA	NA	Not applicable to these analyses.
Trip/Equipment Blanks	NA	NA	
Initial Calibration	Yes	No	ICAL 3/4/2022, Inst SEA101, criteria met
Initial Calibration Verification	Yes	No	ICV 580-385060/21, within criteria
Continuing Calibration Verification	Yes	No	CCVIS 580-385624/3, CCVC 580-385624/37, within criteria
Matrix Spike	NA	NA	
Matrix Spike Duplicate RPD ²	NA	NA	
Laboratory Duplicate ²	NA	NA	Not applicable to these analyses.
Surrogate Standards ²	Yes	No	%Rs within lab limits (per QSM) for PAH surrogates fluoranthene-d10 and 2-methylnaphthalene-d10
Laboratory Control Standards	Yes	No	LCS 580-385549/2-A
Internal Standards ^{2,3}	Yes	No	
Field Duplicate	NA	NA	
GC/MS Tunes ²	Yes	No	
Calculation Spot Checks ³	NA	NA	Not a required validation element for this project.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

QSM 5.4 C-27 Soils LCS criteria	%R Limits
1-Methylnaphthalene	43-111
2-Methylnaphthalene	39-114
Naphthalene	38-111

Surrogate lab limits

	QC LIMITS
ZMN = 2-methylnaphthalene-d10	40-140
TBP = 2,4,6-Tribromophenol	28-143
FLN10 = Fluoranthene-d10 (Surr)	40-140
TPHL = Terphenyl-d14	58-132

Sample	Compound	Result (mg/kg)	PAL (mg/kg)
LTE15.0-SON01-018.0	1-Methylnaphthalene	4.8	4.2
	2-Methylnaphthalene	6.4	4.1

Memorandum

Project: Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility

Site Characterization Study

Laboratory: Eurofins, Seattle, WA

Laboratory Number: 580-111720-1

Analyses/Method: TPH-Gasoline Range Organics (TPH-g, C6-C10) by EPA Method 8260D
TPH-Diesel Range Organics (TPH-d, C10-C24) by EPA Method 8015D
TPH-Residual Range Organics (TPH-o, C24-C40) by EPA Method 8015D

Validation Level: Stage 2B

Project Number: 60674414.00.50.01

Prepared by: Jared DeSadier / AECOM Completed on: 05/16/2022

Reviewed by: Kristin Rutherford / AECOM File Name: 580-111720-1_GRO_DRO_memo

SUMMARY

The samples listed below were collected by AECOM from the Joint Base Pearl Harbor-Hickam, Hawaii site on March 16, 2022 and March 17, 2022.

Sample ID	Lab ID	Matrix/Sample Type
LTE15.0-SON01-018.0	580-111720-1	Soil
LTE15.0-SON01-026.0	580-111720-2	Soil
LTN35.0-SON01-016.0	580-111720-3	Soil
LTN35.0-SON01-018.0	580-111720-4	Soil
HTN15.0-SON01-006.0	580-111720-5	Soil
HTN15.0-SON01-018.0	580-111720-6	Soil
HTW35.0-SON01-014.0	580-111720-7	Soil
HTW35.0-SON01-016.0	580-111720-8	Soil
Trip Blank	580-111720-9	Trip Blank

Data validation activities were conducted with reference to:

- *SW-846 Method 8260D: Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)* (June 2018)
- *SW-846 Method 8015D: Nonhalogenated Organics Using GC/FID* (June 2003)
- *Preliminary Site Characterization Plan, Joint Base Pearl Harbor-Hickam, Hawaii* (January 2022)
- *Site Characterization Plan Addendum – Holding Tank-Leach Tank Phase 2, Joint Base Pearl Harbor-Hickam, Hawaii* (March 2022)
- *Module 1 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC/MS, Department of Defense, Revision 1* (May 2020)

**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

- *Module 4 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC, Department of Defense, Revision 1 (March 2021)*
- *General Data Validation Guidelines, Department of Defense, Revision 1 (November 2019)*
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review (November 2020).*

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody [COC])/sample integrity
- ✓ Holding times and sample preservation
- ✓ Instrument tuning
- ✓ Initial calibration/initial and continuing calibration verification
- ✓ Laboratory blanks/field blanks/equipment blanks
- ✓ Surrogate spike recoveries
- ✗ Matrix spike (MS) and matrix spike duplicate (MSD) results
- ✓ Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
- ✓ Field duplicate results
- ✓ Internal standard results
- ✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as qualified and may be used for decision making purposes. Select data points were estimated due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.

**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

- Completeness of analyses was verified by comparing the reported results to the COC requests.

Four samples (LTE15.0-SON01-018.0, LTE15.0-SON01-026.0, LTN35.0-SON01-016.0, and LTN35.0-SON01-018.0) were listed on the COC for TPH-g analysis but cancelled as they were improperly preserved, with no methanol included in the sample vials.

MS and MSD Results

The following matrix spike percent recoveries were outside the control limits:

Sample ID	Compound	%MS/MSD Recovery	%Recovery Limits	RPD	RPD Limits
LTN35.0-SON01-016.0	TPH-g	150/178	79-122	15	30
LTE15.0-SON01-018.0	TPH-o	-1/-1	39-106	2	20

The positive result for TPH-g in sample LTN35.0-SON01-016.0 and the positive result for TPH-o in sample LTE15.0-SON01-018.0 were qualified as estimated “J” as shown in Table 1 below.

Sample Results/Reporting Issues

If applicable, the sample results detected at concentrations less than the Limit of Quantitation (LOQ) but greater than the Detection Limit (DL) are qualified by the laboratory as estimated (J). This “J” qualifier is retained during data validation.

Several samples were received with significantly lower sample weights than required by the method (10g). The laboratory limit of detection (LOD) met the screening criteria for TPH-g (100 mg/kg) and TPH-d/TPH-o (220 mg/kg) for all nondetect results.

The following positive results exceeded the site screening criteria:

Sample Name	Analyte	Result	LOD	Screening Criteria	Units
HTN15.0-SON01-006.0	TPH-d	520	30	220	mg/kg
HTN15.0-SON01-006.0	TPH-o	760	30	220	mg/kg
HTN15.0-SON01-018.0	TPH-d	420	28	220	mg/kg
HTN15.0-SON01-018.0	TPH-o	480	28	220	mg/kg
LTE15.0-SON01-018.0	TPH-d	6600	39	220	mg/kg
LTN35.0-SON01-018.0	TPH-d	350	160	220	mg/kg
LTN35.0-SON01-018.0	TPH-o	440	160	220	mg/kg

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.



Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility

Table 1
QA/QC Data Summary Review
Red Hill Site Characterization
Laboratory Group: 580-111720-1

Laboratory Group	Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Units	Final Result	Reason Code
580-111720-1	LTN35.0-SON01-016.0	580-111720-3	8260D	TPH-g	330	mg/kg	330 J	M
580-111720-1	LTE15.0-SON01-018.0	580-111720-1	8015D	TPH-o	39	mg/kg	39 J	M

Laboratory:
Laboratory SDG/Job No:
Validation Level:

Eurofins Seattle
 580-111720-1
 Stage 2B
 (using Level IV data package)
 4 soils, 1 TB
 GRO C6-C10 SW-846 8260D

Client/Site Name: Red Hill Site Characterization
Project Number: 60674414.00.50.01
Date: 05/16/22
Validator: J. DeSadier
Reviewer and Date: K Rutherford 05/24/22

Number of Samples/Matrix:
Analysis (Include Method #):

QSM 5.4, DoD Module 4, NFG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	Four samples (LTE15.0-SON01-018.0, LTE15.0-SON01-026.0, LTN35.0-SON01-016.0, and LTN35.0-SON01-018.0) were listed on the COC for GRO analysis but cancelled as they were improperly preserved. Some sample IDs were revised upon receipt by the lab.
Sample Preservation	No	No	-2.1° C, Four samples (LTE15.0-SON01-018.0, LTE15.0-SON01-026.0, LTN35.0-SON01-016.0, and LTN35.0-SON01-018.0) were listed on the COC for GRO analysis but cancelled as they were improperly preserved (not received in methanol).
Holding Time	Yes	No	Collected 3/16/22 - 3/17/22, analyzed within HT
Quantitation Limits	Yes	No	No dilutions. Several samples were received with significantly lower sample weights than required by the method (10g). Lab LODs for ND results for GRO meet PAL (100 mg/kg).
Percent Solids (>30%)	Yes	No	
Method Blanks	Yes	No	MB 580-385440/1-A, MB 580-385590/1-A were ND.
Trip/Equipment Blanks	Yes	No	Trip blank was ND for GRO.
Initial Calibration	Yes	No	TAC041 02/22/22, TAC041 03/15/22, TAC041 03/29/22, TAC036 03/26/2022, TAC036 03/28/2022
Initial Calibration Verification	Yes	No	ICV 580-385316/14, ICV 580-385488/14, ICV 580-381957/11, 580-383956/12, 580-385570/12, meet criteria.
Continuing Calibration Verification	No	No	CCVIS 580-385581/14, CCV 580-385581/18, CCV 580-385449/15, CCV 580-385449/24, CCV 580-385570/20, meet criteria. GRO was above criteria for batch 580-385449; however, all associated results were ND and no qualification was required.
Matrix Spike	No	Yes	GRO recovered above criteria in the MS and MSD of spiked samples LTE15.0-SON01-018.0 and LTN35.0-SON01-016.0. The nondetected result in LTE15.0-SON01-018.0 did not require qualification since the bias is high. The detected GRO result in LTN35.0-SON01-016.0 was qualified as estimated "J".
Matrix Spike Duplicate RPD ²	Yes	No	
Laboratory Duplicate ²	NA	NA	
Surrogate Standards ²	Yes	No	Surrogate BFB within QSM limits
Laboratory Control Standards	No	No	LCS 580-385440/15-A, LCSD 580-385440/16-A, LCS 580-385581/16, LCSD 580-385581/17, LCS 580-385590/2-A, LCSD 580-385590/3-A. The GRO recovery for 580-385440/15-1 and 580-385440/16-A were above criteria. Associated results in samples LTE15.0-SON01-018.0 and LTE15.0-SON01-026.0 were nondetect; no qualifications required since bias is high.
Field Duplicate	NA	NA	
Internal Standards ^{2,3}	Yes	No	
GC/MS Tunes ²	Yes	No	
Calculation Spot Checks ³	NA	NA	Not a required validation element for this project.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

Gasoline Range Organics (C6-C10)
 Diesel Range Organics (C10-C24)
 Oil Range Organics (C24-C40)

Laboratory: Eurofins Seattle
Laboratory SDG/Job No: 580-111720-1
Validation Level: Stage 2B
 (using Level IV data package)
 8 soils
Number of Samples/Matrix: DRO/ORO SW-846 8015C
Analysis (Include Method #): DRO C10-C24, ORO C24-C40

Client/Site Name: Red Hill Site Characterization
Project Number: 60674414.00.50.01
Date: 05/17/22
Validator: J DeSadier
Reviewer and Date: K Rutherford 05/24/22

QSM 5.4, DoD Module 4, NFG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	Some sample IDs were revised by the lab upon receipt.
Sample Preservation	Yes	No	-2.1° C
Holding Time	Yes	No	Collected 3/16/22 - 3/17/22, analyzed within HT
Quantitation Limits	No	No	DRO and ORO for sample LTN35.0-SON01-018.0 were analyzed at a 5x dilution. LODs for ND results meet PAL (220 mg/kg). Results for DRO and/or ORO were above PALs in some samples - see below.
Percent Solids (>30%)	Yes	No	
Method Blanks	Yes	No	MB 580-385049/1-A, All ND
Equipment Blanks	NA	NA	
Initial Calibration	Yes	No	TAC020 2/7/22
Initial Calibration Verification	Yes	No	ICV 580-380510/14, within criteria
Continuing Calibration Verification	Yes	No	CCVRT 580-385296/3, CCV 580-385296/12, CCV 580-385296/19, CCV 580-385296/31, CCV 580-385296/37, within criteria.
Matrix Spike	No	Yes	DRO and ORO recoveries for the spiked sample LTE15.0-SON01-018.0 were outside of evaluation criteria. The associated DRO result was greater than four times the spike amount and no qualification was required. The associated ORO result was qualified as estimated "J".
Matrix Spike Duplicate RPD ²	Yes	No	
Laboratory Duplicate ²	NA	NA	
Surrogate Standards ²	Yes	No	
Laboratory Control Standards	Yes	No	LCS 580-385049/2-A, LCSD 580-385049/3-A, within limits
Field Duplicate	NA	NA	
Calculation Spot Checks ³	NA	NA	Not a required validation element for this project.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

Gasoline Range Organics (C6-C10)
 Diesel Range Organics (C10-C24)
 Oil Range Organics (C24-C40)

Sample	Compound	Result (mg/kg)	PAL (mg/kg)
HTN15.0-SON01-006.0	C10-C24	520	220
HTN15.0-SON01-006.0	C24-C40	760	220
HTN15.0-SON01-018.0	C10-C24	420	220
HTN15.0-SON01-018.0	C24-C40	480	220
LTE15.0-SON01-018.0	C10-C24	6600	220
LTN35.0-SON01-018.0	C10-C24	350	220
LTN35.0-SON01-018.0	C24-C40	440	220

Facility: RHBFS Site Characterization
 Event: Site Characterization HT-LT Phase 2
 SDG: 5801117201
 Guidance Document: Red Hill Bulk Fuel Storage Facility Site Characterization UFP-QAPP
 Prime Contractor: AECOM, Honolulu, HI
 Project Manager:
 Contract Laboratory(ies): Eurofins Environment Testing TestAmerica, Tacoma, WA
 Data Review Contractor:
 Data Review Level:
 Primary Data Reviewer: ,
 Date Submitted:

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	BNASIM	SW8015D	SW8260	SW8260D
HTN15.0-SON01-006.0	580-111720-5	Solid	Field Sample/N	X	X		
HTN15.0-SON01-018.0	580-111720-6	Solid	Field Sample/N	X	X		
HTW35.0-SON01-014.0	580-111720-7	Solid	Field Sample/N	X	X		
HTW35.0-SON01-016.0	580-111720-8	Solid	Field Sample/N	X	X		
LTE15.0-SON01-018.0	580-111720-1	Solid	Field Sample/N	X	X	X	X
LTE15.0-SON01-026.0	580-111720-2	Solid	Field Sample/N	X	X	X	X
LTN35.0-SON01-016.0	580-111720-3	Solid	Field Sample/N	X	X	X	X
LTN35.0-SON01-018.0	580-111720-4	Solid	Field Sample/N	X	X	X	X
Trip Blank	580-111720-9	Water	Trip Blank/TB			X	X

Data Validation Report for 580117201

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Red Hill Bulk Fuel Storage Facility Site Characterization UFP-QAPP and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by AECOM, Honolulu, HI; analyses were performed by Eurofins Environment Testing TestAmerica, Tacoma, WA and were reported under sample delivery group (SDG) 580117201. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

Continuing Calibration Verification

Lab Blank

LCS Recovery

LCS RPD

MS Recovery

MS RPD

Prep Hold Time

Surrogate

Test Hold Time

Trip Blank

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 2 results (2.67%) out of the 75 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

Data Validation Report for 5801117201

Narrative Comments

Analytical Method Data Reviewer Comment

Reviewed by , ,

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.



Reviewed by , Senior Scientist,

September 28, 2022

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

Data Validation Report for 5801117201

Quality Control Outliers for test method SW8015D, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LTE15.0-SON01-018.0 (MS)	C10-C24 Petroleum Hydrocarbons	-357.0	38 - 132	20 - 132	percent	J/X	M	
LTE15.0-SON01-018.0 (SD)	C10-C24 Petroleum Hydrocarbons	-310.0	38 - 132	20 - 132	percent	J/X	M	
LTE15.0-SON01-018.0 (MS)	C24-C40 Petroleum Hydrocarbons	-1.000	39 - 106	20 - 106	percent	J/X	M	
LTE15.0-SON01-018.0 (SD)	C24-C40 Petroleum Hydrocarbons	-1.000	39 - 106	20 - 106	percent	J/X	M	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the MS Recovery for SW8015D

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LTE15.0-SON01-018.0 580-111720-1	N	C24-C40 Petroleum Hydrocarbons	66.0	39.0 J J1	39.0 J		mg/kg	M/TR

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 5801117201

Quality Control Outliers for test method SW8260, LCS Recovery

The laboratory control sample/laboratory control sample duplicate (LCS/LCSD) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LCS58038544015A (BS)	C6-C10 Gasoline Range Organics	128.0	79 - 122	79 - 122	percent	R/R	C	
LCSD58038544016A (BD)	C6-C10 Gasoline Range Organics	126.0	79 - 122	79 - 122	percent	R/R	C	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

No results associated with this QC element required qualification.

Data Validation Report for 5801117201

Quality Control Outliers for test method SW8260, MS Recovery

Data for matrix spikes/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. These data alone cannot be used to evaluate the precision and accuracy of individual samples. However, when exercising professional judgment, MS/MSD data can be used in conjunction with other available QC information. Reported results were evaluated to determine compliance with the required acceptance criteria, and summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and any associated qualified results, are listed below.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
LTE15.0-SON01-018.0 (MS)	C6-C10 Gasoline Range Organics	144.0	79 - 122	79 - 122	percent	R/R	M	
LTE15.0-SON01-018.0 (SD)	C6-C10 Gasoline Range Organics	131.0	79 - 122	79 - 122	percent	R/R	M	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

Qualified Results associated with the MS Recovery for SW8260

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LTN35.0-SON01-016.0 580-111720-3	N	C6-C10 Gasoline Range Organics	88.0	330 Q	330 J		mg/kg	M

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ.

Data Validation Report for 5801117201

Table of All Qualified Results

Test Method: SW8015D		Extraction Method: SW3546						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LTE15.0-SON01-018.0 580-111720-1	N	C24-C40 Petroleum Hydrocarbons	66.0	39.0 J J1	39.0 J		mg/kg	M/TR

Test Method: SW8260		Extraction Method: SW5035						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LTN35.0-SON01-016.0 580-111720-3	N	C6-C10 Gasoline Range Organics	88.0	330 Q	330 J		mg/kg	M

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.

In instances where no LOD is provided, results are reported down to the LOQ.

Trace values are not included in the qualified results table unless additional reason codes are associated.

Data Validation Report for 5801117201

Table of Results with Modified Qualifiers

Modified Qualifiers for test method SW8015D

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
LTE15.0-SON01-018.0 580-111720-1	N	C10-C24 Petroleum Hydrocarbons	66.0	6600 J1	6600 J	6600	

Modified Qualifiers for test method SW8260

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
LTE15.0-SON01-018.0 580-111720-1	N	C6-C10 Gasoline Range Organics	13.0	9.60 U J1 Q	9.60 R	9.60 U	
LTE15.0-SON01-026.0 580-111720-2	N	C6-C10 Gasoline Range Organics	12.0	9.20 U Q	9.20 R	9.20 U	
LTN35.0-SON01-016.0 580-111720-3	N	C6-C10 Gasoline Range Organics	88.0	330 Q	330 R	330 J	M
LTN35.0-SON01-018.0 580-111720-4	N	C6-C10 Gasoline Range Organics	8.30	62.0 Q	62.0 R	62.0	

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ. Trace values are not included in the qualified results table unless additional reason codes are associated.

Reason Code Definitions

Code	Definition
C	LCS Recovery
M	MS Recovery
TR	Trace Level Detect

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

Data Validation Report for 5801117201

Review Questions

Memorandum

Project: Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility

Site Characterization Study

Laboratory: Eurofins, Seattle, WA

Laboratory Number: 580-112198-2

Analyses/Method: Volatile Organic Compounds (BTEX) by EPA Method 8260D

Validation Level: Stage 2B

Project Number: 60674414.00.50.01

Prepared by: Jared DeSadier / AECOM Completed on: 05/23/2022

Reviewed by: Dani Woitas / AECOM File Name: 580-112198-2_BTEX_memo

SUMMARY

The samples listed below were collected by AECOM from the Joint Base Pearl Harbor-Hickam, Hawaii site on April 1, 2022.

Sample ID	Lab ID	Matrix/Sample Type
HTE00.0-WGN02-031.0	580-112198-7	Groundwater
LTW35.0-WGN02-028.0	580-112198-8	Groundwater
LTW35.0-WGFD02-028.0	580-112198-9	Field duplicate of LTW35.0-WGN02-028.0
LTE00.0-WGN02-030.0	580-112198-10	Groundwater
Trip Blank-1	580-112198-11	Trip blank

Data validation activities were conducted with reference to:

- *SW-846 Method 8260D: Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)* (June 2018)
- *Preliminary Site Characterization Plan, Joint Base Pearl Harbor-Hickam, Hawaii* (January 2022)
- *Site Characterization Plan Addendum – Holding Tank-Leach Tank Phase 2, Joint Base Pearl Harbor-Hickam, Hawaii* (March 2022)
- *Module 1 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC/MS, Department of Defense, Revision 1* (May 2020)
- *General Data Validation Guidelines, Department of Defense, Revision 1* (November 2019)
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review* (November 2020).

REVIEW ELEMENTS



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody [COC])/sample integrity
- ✓ Holding times and sample preservation
- ✓ Instrument tuning
- X Initial calibration/initial and continuing calibration verification
- ✓ Laboratory blanks/field blanks/equipment blanks
- ✓ Surrogate spike recoveries
- NA Matrix spike (MS) and matrix spike duplicate (MSD) results
- ✓ Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
- ✓ Field duplicate results
- ✓ Internal standard results
- ✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. The symbol (X) indicates that a QC nonconformance resulted in the qualification of data. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as qualified and may be used for decision making purposes. Selected data points were estimated due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

LCS/LCSD Results

The following recoveries were outside control limits:

LCS/LCSD ID	Analyte	LCS/LCSD Recoveries	RPD	Recovery Limits/RPD
580-386906/6, 580-386906/7	Toluene	123/123	0	80-121/20

Recovery for Toluene in the LCS and LCSD was above criteria; however, all associated results were nondetect and no qualification of data was required.

Continuing Calibration Verification Results

The opening %D for o-xylene (21%) was above criteria. Associated detections were qualified estimated "J" as shown below in Table 1.

Sample Results/Reporting Issues

If applicable, the sample results detected at concentrations less than the Limit of Quantitation (LOQ) but greater than the Detection Limit (DL) are qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation.

The reporting limits for nondetect results were within the site screening criteria, and no sample results exceeded the site screening limits.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.



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Memorandum

Table 1
QA/QC Data Summary Review
Red Hill Site Characterization
Laboratory Group: 580-112198-2

Laboratory Group	Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Units	Final Result	Reason Code
580-112198-2	LTW35.0-WGN02-028.0	580-112198-8	8260D	o-xylene	0.74	ug/L	0.74 J	V2

Laboratory: Eurofins Seattle
Laboratory SDG/Job No: 580-112198-2
Validation Level: Stage 2B
 (using Level IV data package)
Number of Samples/Matrix: 3 groundwater (including 1 FD), 1 TB
Analysis (Include Method #): BTEX SW846 8260D

Client/Site Name: Red Hill Site Characterization
Project Number: 60674414.00.50.01
Date: 05/23/22
Validator: J. DeSadier
Reviewer and Date: Dani Woitas 5/31/22

QAPP (QSM 5.4), DoD Module 1, NFG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Sample Preservation	Yes	No	1.6 ° C, 2.3 ° C, 4.4 ° C.
Holding Time	Yes	No	Collected 4/1/22, analyzed within HT.
Quantitation Limits	Yes	No	No dilutions. ND results at LOD meet action limits.
Percent Solids (>30%)	NA	NA	
Method Blanks	Yes	No	MB 580-386906/6
Other Laboratory Blanks ^{1,2}	Yes	No	
Trip/Equipment Blanks	Yes	No	Trip blank sample, Trip Blank-1, ND for BTEX.
Initial Calibration	Yes	No	03/30/22 Inst TAC036, criteria met
Initial Calibration Verification	Yes	No	ICV 580-385800/28, criteria met
Continuing Calibration Verification	No	Yes	CCVIS 580-386906/3, CCVC 580-386906/49. The %D for o-xylene (21%) was above criteria. Associated detections were qualified as estimated "J".
Matrix Spike	NA	NA	
Matrix Spike Duplicate RPD ²	NA	NA	An MS/MSD was not analyzed on a sample in this SDG.
Laboratory Duplicate ²	NA	NA	Not applicable to these analyses.
Surrogate Standards ²	Yes	No	
Laboratory Control Standards	No	No	LCS 580-386906/6, LCSD 580-386906/7. Recovery for Toluene in the LCS and LCSD was above criteria; however, all associated results were nondetect and no qualification of data was required
Internal Standards ^{2,3}	Yes	No	
Field Duplicate	Yes	No	LTW35.0-WGN02-028.0 (580-112198-8) and LTW35.0-WGFD02-028.0 (580-112198-2): precision criteria met
GC/MS Tunes ²	Yes	No	
Calculation Spot Checks ³	NA	NA	Not a required validation element for this project.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

Note: it may not be appropriate to make a direct quantitative comparison for aqueous field blanks (such as equipment blanks reported as µg/mL) to a solid parent sample (such as a soil sample reported as mg/kg). At best, only a qualitative comparison can be made.

Compound	QL	5x QL	LTW35.0-WGN02-028.0	LTW35.0-WGFD02-028.0	RPD	Abs. Diff	Action
			580-112198-8	580-112198-9			
Benzene	1	5.00	0.94	0.96	2.1	0.02	Abs diff <2x QL
Toluene	1	5.00	0	0	#DIV/0!	0.00	None both ND
Ethylbenzene	1	5.00	3.2	3.1	3.2	0.10	Abs diff <2x QL
m-Xylene & p-Xylene	2	10.00	0	0	#DIV/0!	0.00	None both ND
o-Xylene	1	5.00	0.74	0	200.0	0.74	Abs diff <2x QL
total xylenes	2	10.00	0.74	0	200.0	0.74	Abs diff <2x QL

RPD limits: $\leq 30\%$ (aqueous) and $\leq 50\%$ (solid)
 (when both sample concentrations are $> 5x$ the
 LOQ) or

absolute difference between concentrations are
 $\leq 2x$ LOQ (when the sample or field duplicate
 concentrations are $\leq 5x$ LOQ)

Memorandum

Project: Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility

Site Characterization Study

Laboratory: Eurofins, Seattle, WA

Laboratory Number: 580-112198-2

Analyses/Method: Semivolatile Organic Compounds by EPA Method 8270E-SIM
(1-Methylnaphthalene, 2-Methylnaphthalene, Naphthalene)

Validation Level: Stage 2B

Project Number: 60674414.00.50.01

Prepared by: Jared DeSadier / AECOM Completed on: 05/23/2022

Reviewed by: Dani Woitas / AECOM File Name: 580-112198-2_SVOC_memo

SUMMARY

The samples listed below were collected by AECOM from the Joint Base Pearl Harbor-Hickam, Hawaii site on April 1, 2022.

Sample ID	Lab ID	Matrix/Sample Type
HTE00.0-WGN02-031.0	580-112198-7	Groundwater
LTW35.0-WGN02-028.0	580-112198-8	Groundwater
LTW35.0-WGFD02-028.0	580-112198-9	Field duplicate of LTW35.0-WGN02-028.0
LTE00.0-WGN02-030.0	580-112198-10	Groundwater

Data validation activities were conducted with reference to:

- *SW-846 Method 8270E: Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)* (June 2018)
- *Preliminary Site Characterization Plan, Joint Base Pearl Harbor-Hickam, Hawaii* (January 2022)
- *Site Characterization Plan Addendum – Holding Tank-Leach Tank Phase 2, Joint Base Pearl Harbor-Hickam, Hawaii* (March 2022)
- *Module 1 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC/MS, Department of Defense, Revision 1* (May 2020)
- *General Data Validation Guidelines, Department of Defense, Revision 1* (November 2019)
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review* (November 2020).

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

- ✓ Data completeness (chain-of-custody [COC])/sample integrity



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

- ✓ Holding times and sample preservation
- ✓ Instrument tuning
- ✓ Initial calibration/initial and continuing calibration verification
- X Laboratory blanks/field blanks/equipment blanks
- ✓ Surrogate spike recoveries
- ✓ Matrix spike (MS) and matrix spike duplicate (MSD) results
- ✓ Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
- ✓ Field duplicate results
- ✓ Internal standard results
- ✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. The symbol (X) indicates that a QC nonconformance resulted in the qualification of data. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as qualified and may be used for decision making purposes. Selected data points were estimated due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.

RESULTS

Method Blank Results

1-methylnaphthalene was detected above the LOD but below the LOQ in the method blank. The detected results for samples HTE00.0-WGN02-031.0 and LTE00.0-WGN02-030.0, both detected at or above the LOQ, were qualified estimated "J", as shown in Table 1, below. Blank concentration was insignificant in comparison to the concentration of the other samples and did not require qualification.

Sample Results/Reporting Issues

If applicable, the sample results detected at concentrations less than the Limit of Quantitation (LOQ) but greater than the Detection Limit (DL) are qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation. Laboratory limits of detection (LOD) meet screening criteria for all samples.

The following analytes exceeded the project screening criteria:

Sample Name	Analyte	Result	LOD	Screening Criteria	Units
LTW35.0-WGFD02-028.0	1-Methylnaphthalene	22	0.034	17	ug/L
LTW35.0-WGN02-028.0	1-Methylnaphthalene	24	0.033	17	ug/L



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Memorandum

Table 1
QA/QC Data Summary Review
Red Hill Site Characterization
Laboratory Group: 580-112198-2

Laboratory Group	Sample ID	Laboratory ID	Method	Analyte	Laboratory Result	Units	Final Result	Reason Code
580-112129-2	HTE00.0-WGN02-031.0	580-112198-7	8270E	1-methylnaphthalene	0.49	ug/L	0.49 J	L
580-112198-2	LTE00.0-WGN02-030.0	580-112198-10	8270E	1-methylnaphthalene	0.10	ug/L	0.10 J	L

Laboratory:	Eurofins Seattle	Client/Site Name: Red Hill Site Characterization
Laboratory SDG/Job No:	580-112198-2	Project Number: 60674414.00.50.01
Validation Level:	Stage 2B	Date: 05/05/22
	(using Level IV data package)	Validator: J. DeSadier
Number of Samples/Matrix:	3 groundwater (including 1 FD)	Reviewer and Date: Dani Woitas 5/31/22
Analysis (Include Method #):	SVOCs, SW846 8270E-SIM (Naphthalene, 1-Methylnaphthalene, 2-Methylnaphthalene)	

DoD QSM 5.4, DoD Module 1, NFG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Sample Preservation	Yes	No	1.6 ° C, 2.3 ° C, 4.4 ° C.
Holding Time	Yes	No	Collected 4/1/22, analyzed within HT.
Quantitation Limits	No	No	One surrogate diluted to 50x. 1-methylnaphthalene exceeded the PAL for two samples as shown below
Percent Solids (>30%)	NA	NA	
Method Blanks	No	Yes	MB 580-386861/1-A. 1-methylnaphthalene was detected above the LOD but below the LOQ. The detected results for samples HTE00.0-WGN02-031.0 and LTE00.0-WGN02-030.0, both detected at or above the LOQ, were qualified as estimated "J".
Other Laboratory Blanks ^{1,2}	NA	NA	Not applicable to these analyses.
Trip/Equipment Blanks	NA	NA	
Initial Calibration	Yes	No	ICAL 03/24/2022 Inst SEA101, criteria met
Initial Calibration Verification	Yes	No	ICV 580-385060/21, criteria met
Continuing Calibration Verification	Yes	No	CCVIS 580-386961/2, CCVC 580-386961/29, criteria met
Matrix Spike	NA	NA	An MS/MSD was not analyzed on a sample in this SDG.
Matrix Spike Duplicate RPD ²	NA	NA	
Laboratory Duplicate ²	NA	NA	Not applicable to these analyses.
Surrogate Standards ²	Yes	No	%Rs within lab limits (per QSM) for PAH surrogates fluoranthene-d10 and 2-methylnaphthalene-d10
Laboratory Control Standards	Yes	No	LCS 580-386864/2-A, LCSd 580-386864/3-A, criteria met
Internal Standards ^{2,3}	Yes	No	
Field Duplicate	Yes	No	LTW35.0-WGN02-028.0 (580-112198-8) and LTW35.0-WGFD02-028.0 (580-112198-2): precision criteria met
GC/MS Tunes ²	Yes	No	
Calculation Spot Checks ³	NA	NA	Not a required validation element for this project.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

Sample	Compound	Result (ug/L)	PAL (ug/L)
LTW35.0-WGFD02-028.0	1-Methylnaphthalene	22	17
LTW35.0-WGN02-028.0	1-Methylnaphthalene	24	17

Compound	QL	5x QL	LTW35.0-WGN02-028.0	LTW35.0-WGFD02-028.0	RPD	Abs. Diff	Action
			580-112198-8	580-112198-9			
1-Methylnaphthalene	0.1100	0.550	24	22	8.7	2.000	
2-Methylnaphthalene	0.2200	1.100	16	14	13.3	2.000	
Naphthalene	0.1100	0.550	14	12	15.4	2.000	

2X QL
0.22
0.44
0.22

RPD limits: $\leq 30\%$ (aqueous) and $\leq 50\%$ (solid) (when both sample concentrations are $> 5x$ the LOQ) or
absolute difference between concentrations are $\leq 2x$ LOQ (when the sample or field duplicate concentrations are $\leq 5x$ LOQ)



**Summary Data Quality Review
 Joint Base Pearl Harbor-Hickam, Hawaii
 Red Hill Bulk Fuel Storage Facility**

Project:	Joint Base Pearl Harbor-Hickam, Hawaii Red Hill Bulk Fuel Storage Facility	
	Site Characterization Study	
Laboratory:	Eurofins, Seattle, WA	
Laboratory Number:	580-112198-2	
Analyses/Method:	TPH-Gasoline Range Organics (TPH-g, C6-C10) by EPA Method 8260D TPH-Diesel Range Organics (TPH-d, C10-C24) by EPA Method 8015D TPH-Residual Range Organics (TPH-o, C24-C40) by EPA Method 8015D	
Validation Level:	Stage 2B	
Project Number:	60674414.00.50.01	
Prepared by:	Jared DeSadier / AECOM	Completed on: 05/23/2022
Reviewed by:	Dani Woitas / AECOM	File Name: 580-112198-2_GRO_DRO_memo

SUMMARY

The samples listed below were collected by AECOM from the Joint Base Pearl Harbor-Hickam, Hawaii site on April 1, 2022.

Sample ID	Lab ID	Matrix/Sample Type
HTE00.0-WGN02-031.0	580-112198-7	Groundwater
LTW35.0-WGN02-028.0	580-112198-8	Groundwater
LTW35.0-WGFD02-028.0	580-112198-9	Field duplicate of LTW35.0-WGN02-028.0
LTE00.0-WGN02-030.0	580-112198-10	Groundwater
Trip Blank-1	580-112198-11	Trip blank

Data validation activities were conducted with reference to:

- *SW-846 Method 8260D: Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)* (June 2018)
- *SW-846 Method 8015D: Nonhalogenated Organics Using GC/FID* (June 2003)
- *Preliminary Site Characterization Plan, Joint Base Pearl Harbor-Hickam, Hawaii* (January 2022)
- *Site Characterization Plan Addendum – Holding Tank-Leach Tank Phase 2, Joint Base Pearl Harbor-Hickam, Hawaii* (March 2022)
- *Module 1 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC/MS, Department of Defense, Revision 1* (May 2020)
- *Module 4 Data Validation Guidelines: Data Validation Procedure for Organic Analysis by GC, Department of Defense, Revision 1* (March 2021)
- *General Data Validation Guidelines, Department of Defense, Revision 1* (November 2019)
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review* (November 2020).

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

- ✓ Data completeness (chain-of-custody [COC])/sample integrity
- ✓ Holding times and sample preservation
- ✓ Instrument tuning
- ✓ Initial calibration/initial and continuing calibration verification
- ✓ Laboratory blanks/field blanks/equipment blanks
- ✓ Surrogate spike recoveries
- NA Matrix spike (MS) and matrix spike duplicate (MSD) results
- ✓ Laboratory control sample (LCS)/laboratory control sample duplicate (LCSD) results
- ✓ Field duplicate results
- ✓ Internal standard results
- ✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. The symbol (X) indicates that a QC nonconformance resulted in the qualification of data. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as qualified and may be used for decision making purposes. There were no data points qualified as a result of this data review.

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Continuing Calibration Verification Results

The closing %D for o-xylene was below 20%. Closing CCVs are permitted up to 50%D and no qualification was required.

Sample Results/Reporting Issues

If applicable, the sample results detected at concentrations less than the Limit of Quantitation (LOQ) but greater than the Detection Limit (DL) are qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation.



**Summary Data Quality Review
Joint Base Pearl Harbor-Hickam, Hawaii
Red Hill Bulk Fuel Storage Facility**

The following results exceeded the site screening criteria:

Sample Name	Analyte	Result	LOD	Screening Criteria	Units
HTE00.0-WGN02-031.0	C10-C24	490	100	400	ug/L
LTW35.0-WGFD02-028.0	C10-C24	3900	100	400	ug/L
LTW35.0-WGN02-028.0	C10-C24	3400	100	400	ug/L
HTE00.0-WGN02-031.0	C24-C40	490	300	400	ug/L
LTW35.0-WGFD02-028.0	C24-C40	820	330	400	ug/L

QUALIFICATION ACTIONS

There were no sample results qualified as a result of this data review.

Laboratory:
Laboratory SDG/Job No:
Validation Level:

Eurofins Seattle
 580-112198-2
 Stage 2B
 (using Level IV data package)
 3 groundwater (including 1 FD), 1 TB
 GRO C6-C10 SW-846 8260D

Client/Site Name: Red Hill Site Characterization
Project Number: 60674414.00.50.01
Date: 05/23/22
Validator: J. DeSadier
Reviewer and Date: Dani Woitas 5/31/22

Number of Samples/Matrix:
Analysis (Include Method #):

QSM 5.4, DoD Module 4, NFG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Sample Preservation	Yes	No	1.6 ° C, 2.3 ° C, 4.4 ° C.
Holding Time	Yes	No	Collected 4/1/22, analyzed within HT.
Quantitation Limits	Yes	No	No dilutions. Lab DLs for ND results meet PAL.
Percent Solids (>30%)	NA	NA	
Method Blanks	Yes	No	MB 580-386909/5
Trip/Equipment Blanks	Yes	No	Trip blank sample, Trip Blank-1, ND for GRO.
Initial Calibration	Yes	No	TAC036 03/28/22, TAC036 03/30/22
Initial Calibration Verification	Yes	No	ICV 580-385488/14, ICV 580-385803/28
Continuing Calibration Verification	No	No	CCVIS 580-386909/4, CCV 580-386909/14, CCV 580-386909/25, CCV 580-386909/30. The closing %D for o-xylene was below 20%D. Closing CCVs are permitted up to 50%D and no qualification was required.
Matrix Spike	NA	NA	An MS/MSD was not performed on a site sample in this data set.
Matrix Spike Duplicate RPD ²	NA	NA	
Laboratory Duplicate ²	NA	NA	
Surrogate Standards ²	Yes	No	
Laboratory Control Standards	Yes	No	LCS 580-386909/8, LCSD 580-386909/9
Field Duplicate	Yes	No	LTW35.0-WGN02-028.0 (580-112198-8) and LTW35.0-WGFD02-028.0 (580-112198-2), within RPD criteria
Internal Standards ^{2,3}	Yes	No	
GC/MS Tunes ²	Yes	No	
Calculation Spot Checks ³	NA	NA	Not a required validation element for this project.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

Gasoline Range Organics (C6-C10)
 Diesel Range Organics (C10-C24)
 Oil Range Organics (C24-C40)

Laboratory:
Laboratory SDG/Job No:
Validation Level:

Eurofins Seattle
 580-112198-2
 Stage 2B
 (using Level IV data package)
 3 groundwater (including 1 FD)
 DRO/ORO SW-846 8015C

Client/Site Name: Red Hill Site Characterization
Project Number: 60674414.00.50.01
Date: 05/05/22
Validator: J. DeSadier
Reviewer and Date: Dani Woitas 5/31/22

Number of Samples/Matrix:
Analysis (Include Method #):

QSM 5.4, DoD Module 4, NFG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Sample Preservation	Yes	No	1.6 ° C, 2.3 ° C, 4.4 ° C.
Holding Time	Yes	No	Collected 4/1/22, analyzed within HT.
Quantitation Limits	No	No	No dilutions. Results for DRO and/or ORO were above PALs in some samples - see below.
Percent Solids (>30%)	NA	NA	
Method Blanks	Yes	No	MB 580-386838/1-A
Equipment Blanks	NA	NA	
Initial Calibration	Yes	No	TAC013 04/01/2022
Initial Calibration Verification	Yes	No	ICV 580-386091/14
Continuing Calibration Verification	Yes	No	CCVRT 580-387300/3, CCV 580-387300/12
Matrix Spike	NA	NA	
Matrix Spike Duplicate RPD ²	NA	NA	An MS/MSD was not performed on a site sample in this data set.
Laboratory Duplicate ²	NA	NA	
Surrogate Standards ²	Yes	No	
Laboratory Control Standards	Yes	No	LCS 580-386838/2-A, LCSD 580-386838/3-A
Field Duplicate	No	Yes	LTW35.0-WGN02-028.0 (580-112198-8) and LTW35.0-WGFD02-028.0 (580-112198-2)
Calculation Spot Checks ³	NA	NA	Not a required validation element for this project.

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only. See full NFG worksheets for details.

Gasoline Range Organics (C6-C10)
 Diesel Range Organics (C10-C24)
 Oil Range Organics (C24-C40)

Sample	Compound	Result (ug/L)	PAL (ug/L)
HTE00.0-WGN02-031.0	C10-C24	490	400
LTW35.0-WGFD02-028.0	C10-C24	3900	400
LTW35.0-WGN02-028.0	C10-C24	3400	400
HTE00.0-WGN02-031.0	C24-C40	490	400
LTW35.0-WGFD02-028.0	C24-C40	820	400

Compound	QL	5x QL	LTW35.0-WGN02-028.0	LTW35.0-WGFD02-028.0	RPD	Abs. Diff	Action
			580-112198-8	580-112198-9			
Gasoline Range Organics (C6-C10)	0.10	1	0	0	#DIV/0!	0.0	NONE both ND
C10-C24	120	600	3400	3900	13.7	500.0	None
C24-C40	390	1950	310	820	90.3	510	NONE, difference is <2x QL.

RPD limits: $\leq 30\%$ (aqueous) and $\leq 50\%$ (solid) (when both sample concentrations are $> 5x$ the LOQ) or

absolute difference between concentrations are $\leq 2x$ LOQ (when the sample or field duplicate concentrations are $\leq 5x$ LOQ)

Data Validation Report for 5801121982

Facility: RHBFS Site Characterization
 Event: Site Characterization HT-LT Phase 2
 SDG: 5801121982
 Guidance Document: Red Hill Bulk Fuel Storage Facility Site Characterization UFP-QAPP
 Prime Contractor: AECOM, Honolulu, HI
 Project Manager:
 Contract Laboratory(ies): Eurofins Environment Testing TestAmerica, Tacoma, WA
 Data Review Contractor:
 Data Review Level:
 Primary Data Reviewer: ,
 Date Submitted:

Field Sample ID	Lab Sample ID	Matrix	Type/Type Code	BNASIM	SW8015D	SW8260	SW8260D
HTE00.0-WGN02-031.0	580-112198-7	Water	Field Sample/N	X	X	X	X
LTE00.0-WGN02-030.0	580-112198-10	Water	Field Sample/N	X	X	X	X
LTW35.0-WGFD02-028.0	580-112198-9	Water	Field Duplicate/FD	X	X	X	X
LTW35.0-WGN02-028.0	580-112198-8	Water	Field Sample/N	X	X	X	X
Trip Blank-1	580-112198-11	Water	Trip Blank/TB			X	X

Data Validation Report for 5801121982

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page at data validation level. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the Red Hill Bulk Fuel Storage Facility Site Characterization UFP-QAPP and the additional guidance documents incorporated by reference to the extent possible. Where definitive guidance is not provided, results have been evaluated in a conservative manner using professional judgment.

Sample collection was managed and directed by AECOM, Honolulu, HI; analyses were performed by Eurofins Environment Testing TestAmerica, Tacoma, WA and were reported under sample delivery group (SDG) 5801121982. Data have been evaluated electronically based on electronic data deliverables (EDDs) provided by the laboratory, and hard copy data summary forms have also been reviewed during this effort and compared to the automated review output by the reviewers whose signatures appear on the following page. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative and throughout this report.

All quality control (QC) elements associated with this SDG have been reviewed by a project chemist in accordance with the requirements defined for the project. This review is documented in the attached Data Review Checklists. The QC elements listed below were supported by the electronic deliverable and were evaluated using ADR processes.

- Continuing Calibration Verification
- Field Duplicate RPD
- Lab Blank
- LCS Recovery
- LCS RPD
- Prep Hold Time
- Surrogate
- Test Hold Time
- Trip Blank

Results of the ADR process were subsequently reviewed and updated as applicable by the data review chemists identified on the signature page. Quality control elements that were not included in the electronic deliverable were reviewed manually and findings are documented within this report. Summaries of findings and associated qualified results are documented throughout this report.

A total of 3 results (5.45%) out of the 55 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected or deemed a serious deficiency (X qualifier). Trace values, defined as results that are qualified as estimated because they fall between the detection limit and the reporting limit/limit of quantitation, are not counted as qualified results in the above count. The qualified results are detailed throughout this report and discussed in the narrative below, where appropriate.

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Narrative Comments

Analytical Method Data Reviewer Comment

Reviewed by , ,

As the First Reviewer, I certify that I have performed a data review process in accordance with the requirements of the project guidance document, and have compared the electronic data to the laboratory's hard copy report and have verified the consistency of the reported sample results and method quality control data between the two deliverables.



Reviewed by , Senior Scientist,

September 28, 2022

As the Second Reviewer, I certify that I have performed a quality assurance review of the report generated by the First Reviewer.

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Quality Control Outliers for test method BNASIM, Lab Blank

The purpose of laboratory blanks is to determine the existence and magnitude of cross-contamination problems resulting from laboratory activities. Reported results were evaluated to determine compliance with the required acceptance criteria. Summary forms were evaluated and compared to electronic data deliverables. Findings of this review, and contaminants found in laboratory blanks are listed below along with any associated qualified results.

Sample ID/ Lab Sample ID	Analyte	Result	Warning Limits	Control Limits	Units	Qualifier	Reason Code	Comment
MB5803868641A (LB)	1- Methylnaphthalene	0.02550	< 0.019	< 0.1	ug/l	U/None*	L	

Where two qualifiers are listed, such as 'J/UJ', the first applies to positive results, and the second to non-detect results. Upper and Lower Warning and Control Limits are abbreviated UWL, LWL, UCL, and LCL in the Comment field.

*Blank flags displayed in the above table identify qualification of the sample result when it is less than or equal to the LOQ/RL. Sample results above the LOQ will be qualified based on the validation type such as J+ at the sample result.

Qualified Results associated with the Lab Blank for BNASIM

FieldSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
HTE00.0-WGN02-031.0 580-112198-7	N	1-Methylnaphthalene	0.110	0.490	0.490 J		ug/l	L
LTE00.0-WGN02-030.0 580-112198-10	N	1-Methylnaphthalene	0.110	0.100 J	0.100 J		ug/l	TR/L

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ.

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Table of All Qualified Results

Test Method: BNASIM		Extraction Method: SW3510						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
HTE00.0-WGN02-031.0 580-112198-7	N	1-Methylnaphthalene	0.110	0.490	0.490 J		ug/l	L
LTE00.0-WGN02-030.0 580-112198-10	N	1-Methylnaphthalene	0.110	0.100 J	0.100 J		ug/l	TR/L

Test Method: SW8260D		Extraction Method: SW5030						
FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	Qualified Result	Bias	Units	Reason
LTW35.0-WGN02-028.0 580-112198-8	N	o-Xylene	1.00	0.740 J Q	0.740 J		ug/l	TR/V2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration.
 In instances where no LOD is provided, results are reported down to the LOQ.
 Trace values are not included in the qualified results table unless additional reason codes are associated.

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Table of Results with Modified Qualifiers

Modified Qualifiers for test method BNASIM

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
HTE00.0-WGN02-031.0 580-112198-7	N	1-Methylnaphthalene	0.110	0.490	0.490	0.490 J	L
LTE00.0-WGN02-030.0 580-112198-10	N	1-Methylnaphthalene	0.110	0.100 J	0.100 J	0.100 J	TR/L

Modified Qualifiers for test method SW8260D

FieldSample ID / LabSample ID	Type	Analyte	LOQ	Lab Result	ADR Result	Modified Result	Reason
LTW35.0-WGN02-028.0 580-112198-8	N	o-Xylene	1.00	0.740 J Q	0.740 J	0.740 J	TR/V2

Analytes not found in project samples are reported as not detected at the limit of detection (LOD) unless blank contamination occurs and then the sample may be reported as not detected at the (LOQ) based on the sample concentration. In instances where no LOD is provided, results are reported down to the LOQ. Trace values are not included in the qualified results table unless additional reason codes are associated.

Reason Code Definitions

Code	Definition
L	Lab Blank
TR	Trace Level Detect
V2	CCV

Flag Code and Definitions

Flag	Definition
J	Estimated Value
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a tentative identification.
NJ	The analyte has been tentatively identified or presumptively as present and the associated numerical value was the estimated concentration in the sample.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.
X	Result may require rejection; PDT attention required

Bias

-	The result may be biased low
+	The result may be biased high

Note - The bias field is a separate field; however, it is an integral part of the final flag (qualifier) on the sample result

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Review Questions
