AP - 111

RCRA LAND TREATMENT UNIT-LTU

2020

From:	Caitlin Fields
To:	Cobrain, Dave, NMENV; Chavez, Carl J, EMNRD
Cc:	Moore, John; gjmccartney@marathonpetroleum.com; Moore, Brian; Heidi Jones; Scott Crouch
Subject:	[EXT] LTU 2018 Sampling Event Report
Date:	Wednesday, September 30, 2020 9:29:40 AM
Attachments:	image001.png 202009_ResponsetoApprovalLTU2018SmpEvent_LTR.pdf

Good Morning,

Please fine the Land Treatment Unit Post-Closure Care 2018 Sampling Event Report in response to NMED's approval dated April 24, 2020. Hard copies and a CD were shipped to NMED yesterday. Please contact John Moore if you have any questions.

Thank you,
Caitlin

Caitlin Fields
Associate Engineer

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www.trihydro.com

Western Refining Southwest, Inc.
A subsidiary of Marathon Petroleum Corporation

September 30, 2020

Mr. Kevin Pierard, Chief
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6303

RE: Response to Approval
Land Treatment Unit Post-Closure Care 2018 Sampling Event
Western Refining Southwest, Inc. – Gallup Refinery
EPA ID # NMD000333211
HWB-WRG-20-007

Dear Mr. Pierard:

Marathon Petroleum Company LP (MPC, dba Western Refining Southwest, Inc.) Gallup Refinery is submitting the enclosed response to your Approval dated April 24, 2020 on the referenced Report. If there are any questions, please call John Moore at 505-722-0205.

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,
Marathon Petroleum Company LP, Gallup Refinery

Robert S. Hanks
Refinery General Manager

Enclosure

cc D. Cobrain, NMED HWB
C. Chavez, NMOCD
J. Moore, Marathon

NMED Comment:
The Permittee conducted the required soil and groundwater sampling and fulfilled the post-closure care requirements pursuant to Permit Section III and Attachment D; however, failed to discuss current site conditions (e.g., water accumulation, odors, soil condition, wind erosion, dike and vegetative cover conditions, warning sign, gates and fences, where applicable). Provide a discussion for the current condition of the LTU in a response letter.

MPC Response:
On August 26, 2020, MPC conducted a visual inspection of the Land Treatment Unit (LTU). The following observations were recorded during the inspection:

1. Warning signs are intact and placed approximately every 40 feet around the perimeter of the LTU.
2. One gate is located on the southeast corner of the southeast cell. The gate is closed and secured.
3. One gate is located on the west end of the north cell. The gate is closed and secured.
4. No water accumulation was observed in any of the three cells.
5. Dirt dikes around the perimeter are intact. The dirt dikes are at least 3 feet high.
6. No stormwater run-off from the LTU was observed.
7. Along the western perimeter – the dirt dike needs to be built back up to prevent stormwater run-on into the LTU along the road.
8. No odor was observed emitting from any of the cells.
9. Natural vegetation covered all areas of the cells inside the LTU.
10. There is no fencing around the LTU.

A work request has been initiated to address the area of concern in Item No. 7.

Land Treatment Unit (LTU) – Inspection

Marathon – Gallup Refinery

Date: August 26, 2020 @ 1300 hours

Visual inspection conducted on the LTU.

1. Warning signs intact and placed approximately every 40 feet around the perimeter of the LTU.
2. 1 gate on the southeast corner of the southeast cell - closed and secured.
3. 1 gate on the west end of the north cell – closed and secured.
4. No water accumulation observed in any of the three cells.
5. Dirt dikes around the perimeter are intact and at least 3 feet high.
6. No stormwater run-off from the LTU was observed.
7. Along the west perimeter – dirt dike needs to be built back up to prevent stormwater run-on into the LTU along the road.
8. No odor was observed emitting from any of the cells.
9. Natural vegetation covered all areas of the cells inside the LTU.
10. No fencing around the LTU.

Cheryl Johnson, HES Professional

08/26/2020

Date

LTU INSPECTION PHOTOS – AUGUST 2020

Figure 1: Looking West

Figure 2: Southeast corner Gate

Figure 3: Looking North

Figure 4: Vegetation inside south cells

Figure 5: North Cell - Gate facing East

Figure 6: North cell - Looking West

Figure 7: North Cell: Looking South along west wall

Figure 8: Signs - placed every 40 feet around perimeter

From:	Martinez, Cynthia, NMENV
To:	JMoore5@Marathonpetroleum.com
Cc:	Pierard, Kevin, NMENV; Cobrain, Dave, NMENV; Suzuki, Michiya, NMENV; Chavez, Carl J, EMNRD; "king.laurie@epa.gov"; BMoore1@Marathonpetroleum.com
Subject:	Letters to Mr. Moore
Date:	Monday, April 27, 2020 1:06:53 PM
Attachments:	WRG2020- HWB-WRG-20-008.pdf WRG 2020- HWB-WRG-20-007.pdf

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Good Afternoon,
Please see attachments.

Cynthia Martinez
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Bldg.1
Santa Fe, New Mexico 87505-6313

NEW MEXICO
ENVIRONMENT DEPARTMENT

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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Michelle Lujan Grisham
Governor

Howie C. Morales
Lt. Governor

James C. Kenney
Cabinet Secretary

Jennifer J. Pruett
Deputy Secretary

APR 2 4 2020

John Moore
Environmental Superintendent
Western Refining, Southwest Inc., Gallup Refinery
92 Giant Crossing Road
Gallup, New Mexico 87301

RE: APPROVAL
LAND TREATMENT UNIT POST-CLOSURE CARE 2018 SAMPLING EVENT
WESTERN REFINING SOUTHWEST INC., GALLUP REFINERY
EPA ID # NMD000333211
HWB-WRG-20-007

Dear Mr. Moore:

The New Mexico Environment Department (NMED) has reviewed the *Land Treatment Unit [LTU] Post-Closure Care 2018 Sampling Event* (Report), dated February 2020, submitted on behalf of Marathon Petroleum Company dba Western Refining Southwest Inc., Gallup Refinery (the Permittee). NMED hereby issues this Approval.

The Permittee conducted the required soil and groundwater sampling and fulfilled the post-closure care requirements pursuant to Permit Section III and Attachment D; however, failed to discuss current site conditions (e.g., water accumulation, odors, soil condition, wind erosion, dike and vegetative cover conditions, warning sign, gates, and fences, where applicable). Provide a discussion for the current conditions of the LTU in a response letter. Submit the response letter no later than **June 30, 2020**.

Next sampling event is scheduled in 2029. The sampling results and the discussion regarding the conditions of the LTU must be submitted to NMED no later than **December 31, 2029**.

This approval is based on the information presented in the document as it relates to the objectives of the work identified by NMED at the time of review. Approval of this document does not constitute agreement with all information or every statement presented in the document.

If you have questions regarding this Approval, please contact Michiya Suzuki of my staff at 505-476-6046.

Sincerely,

Kevin Pierard
Chief
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB
M. Suzuki, NMED HWB
C. Chavez, OCD
L. King, EPA Region 6 (6LCRRC)
B. Moore, WRG

File: Reading File and WRG 2020 File
HWB-WRG-20-007

LAND TREATMENT UNIT
Post-Closure Care 2018 Sampling Event

Marathon Petroleum Company LP

Gallup Refinery
Marathon Petroleum Company
Gallup, New Mexico

EPA ID# NMD000333211

February 2020

Scott Crouch, P.G
DiSorbo Consulting, LLC

DiSorbo
Environmental Consulting Firm

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List of Acronyms

API	American Petroleum Institute
AOCs	areas of concern
BTEX	benzene, toluene, ethylbenzene, and xylene
bgl	below ground level (bgl)
btoc	below top of casing
CFR	Code of Federal Regulations
DRO	diesel range organics
DAF	dilution/attenuation factor
EPA	Environmental Protection Agency
gpm	gallons per minute
HI	hazard index
HSA	hollow-stem auger
IDW	investigation derived waste
LPG	liquefied petroleum gas
LTU	Land Treatment Unit
MADEP	Massachusetts Department of Environmental Protection
MCL	maximum contaminant level
msl	mean sea level
MW	monitoring well
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
RCRA	Resource Conservation and Recovery Act
PID	photoionization detector
PVC	polyvinyl chloride
SPH	separate phase hydrocarbon
SVOC	semi-volatile organic compound
SWMUs	Solid Waste Management Units
TPH	total petroleum hydrocarbon
TVOC	total volatile organic content
TCLP	toxicity characteristic leaching procedure
USCS	unified soil classification system
VOC	volatile organic compound
WQCC	Water Quality Control Commission

Executive Summary

The Gallup Refinery, which is located 17 miles east of Gallup, New Mexico, has been in operation since the 1950s. A hazardous waste Land Treatment Unit (LTU) was operated at the refinery from approximately October 10, 1980 through November 8, 1990. Non-hazardous waste continued to be placed in cells 2 and 3 through February 19, 1994. As part of the post-closure care activities, periodic monitoring of soils and groundwater is conducted to ensure the long-term protection of human health and the environment. This report documents the post-closure sampling activities conducted in 2018 that included the collection and analysis of soil and groundwater samples. These activities were completed in accordance with the requirements of Section III and Attachment D Post-Closure Care Plan of the facility's Resource Conservation and Recovery Act (RCRA) Post-Closure Care Permit ("Permit").

Twelve soil samples were collected from cells 1, 2 and 3, and five groundwater samples were collected from MW-1, MW-2, MW-4, SMW-4, and MW-5. The samples were analyzed for the modified Skinner list of metals, volatile organic compounds, and semi-volatile organic compounds. In addition, the samples were analyzed for total petroleum hydrocarbons (TPH) including gasoline range organics (GRO), diesel range organics (DRO) and motor oil range organics (MRO). The data were evaluated using the methodology specified in Section D.7.a of Attachment D of the Permit to determine if there is a statistically significant difference between the concentrations of constituents in soils in the zone of infiltration (ZOI) and treatment zone (TZ) vs. the background soil samples, and similarly between down-gradient groundwater samples and up-gradient (i.e., background) groundwater samples. Arsenic was found to indicate a statistically significant difference in both soils and groundwater. A review of the arsenic concentrations in comparison to human health screening levels shows that concentrations of arsenic in all soil and groundwater samples are below the screening levels.

In addition to the statistical evaluation, the sample concentrations are compared to the human health screening levels and one constituent in the groundwater samples was found to exceed the screen level. Cobalt was detected at a concentration of 19 ug/l vs a screen level of 6 ug/l in the groundwater sample collected from SMW-4, while all the other groundwater samples were non-detect for cobalt. One soil sample (LTU C2L2 ZOI) has a concentration of 53 mg/kg of cyanide in

comparison to the non-residential screening level of 12.1 mg/kg and concentrations of 5,300 mg/kg DRO and 5,500 mg/kg MRO in comparison to the screening level of 3,800 mg/kg.

Section 1
Introduction

The Gallup Refinery is located approximately 17 miles east of Gallup, New Mexico along the north side of Interstate Highway I-40 in McKinley County. The physical address is I-40, Exit #39 Jamestown, New Mexico 87347. The Gallup Refinery property covers approximately 810 acres. Figure 1 presents the refinery location and the regional vicinity, which is characterized as high desert plain comprised primarily of public lands used for grazing by cattle and sheep.

The Gallup Refinery generally processes crude oil from the Four Corners area transported to the facility by pipeline or tanker truck. Various process units are operated at the facility, including crude distillation, reforming, fluidized catalytic cracking, alkylation, isomerization, sulfur recovery, merox treater, and hydrotreating. Current and past operations have produced gasoline, diesel fuels, jet fuels, kerosene, propane, butane, and residual fuel.

A hazardous waste Land Treatment Unit (LTU) was operated at the refinery from approximately October 10, 1980 through November 8, 1990. Non-hazardous waste continued to be placed in cells 2 and 3 through February 19, 1994. As part of the post-closure care activities, periodic monitoring of soils and groundwater is conducted to ensure the long-term protection of human health and the environment. This report documents the post-closure sampling activities conducted in 2018 that included the collection and analysis of soil and groundwater samples. These activities were completed in accordance with the requirements of Section III and Attachment D Post-Closure Care Plan of the facility's Resource Conservation and Recovery Act (RCRA) Post-Closure Care Permit ("Permit"). The closed RCRA LTU is located on the northwestern portion of the facility as shown on Figure 2.

Section 2 presents background information for the post-closure care sampling conducted at the LTU area, including a brief description of past sampling activities. Section 3 describes the scope of work completed during the recent site sampling activities. A comparison of the chemical analyses to the media screening levels is provided in Section 4. Section 5 of the report presents the statistical evaluation of the sampling results. Section 6 presents the conclusions and Section 7 explains the remaining schedule for post-closure care sampling.

Section 2
Background

The Post-Closure Care Permit for the Gallup Refinery has specific provisions in Part III: Post-Closure Care and Attachment D: Post-Closure Care Plan that require the collection of soil and groundwater samples. The Post-Closure Care Plan requires detection monitoring below the treatment zone and detection monitoring in groundwater at the point of compliance (the aquifer) over the course of the post-closure care period. The treatment zone is defined in the Permit as the top five feet of soil. The LTU is separated into thee cells, Cell 1, Cell 2, and Cell 3 (Figure 3). Cell 3 has not been used for disposal and thus samples collected from this cell are used as "background samples" for the statistical comparison discussed in Section 3.

An initial characterization of the zone of infiltration (ZOI) (i.e., upper 12 inches of the treatment zone) was conducted during a sampling event in 1999. Additional samples from a depth of 3 feet and deeper from below the treatment zone were also collected to help characterize background metals concentrations in soil. Otherwise, sample collection is to be conducted three times during the post-closure care period of 30 years. Event 1 (9th year of post-closure care) sampling was conducted in 2009. Event 2 (19th year of post-closure care care) was completed in 2018 and Event 3 (30th year of post-closure care) is scheduled for 2029.

The Permit specifies that sampling of the "unsaturated" is conducted to determine if migration of hazardous constituents from the treatment zone has occurred and this includes sampling of soils in the ZOI and treatment zone and sampling of groundwater in the Chinle Slope wash. Monitoring well SMW-4 is used to monitor the Chinle Slope wash. Detection monitoring for groundwater is conducted in the Sonsela aquifer and incorporates up-gradient well MW-4 and down-gradient wells MW-1, MW-2, and MW-5 (Figure 3). Soil and groundwater samples are analyzed for the Modified Skinner List constituents and total petroleum hydrocarbons as gasoline range organics and diesel range organics.

The three LTU cells are to be divided into 6 foot by 6-foot grids and a random number generator used to select a minimum of two sample locations from within each cell. ZOI soil samples are to be collected from approximately one foot (12 inches) beneath the topsoil-ZOI surface. The treatment

zone samples are to be taken from the bottom of the treatment zone (approximately five feet below the ground surface). For each monitoring event two samples shall be taken from each boring, one from the ZOI and one from the treatment zone for a total of 12 LTU samples per event.

During the initial characterization sampling event conducted on May 18, 1999, 30 soil samples were collected (Practical Environmental Services, 1999). Eighteen of these samples were collected from within Cells 1 and 2, and the remaining 12 samples were collected from within Cell 3. The soil samples were collected from depths of 1 foot (ZOI sample), 3 feet (3FT sample) and 6 feet (below treatment zone sample). The samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals. The results for the treatment area (Cells 1 and 2) were compared against the results for the background area (Cell 3). A statistical analysis was performed to determine if a "significant" change had occurred. No significant change was detected in subsurface samples. A significant increase in several heavy metals (arsenic, chromium, lead mercury, and nickel) was determined to be present in the treatment area surface soil.

To complete sampling Event 1, In December 2009, two soil samples were collected from each of six soil borings (two within each of the three cells) and submitted to Hall Environmental for analysis of the Modified Skinner List constituents (TriHydro, 2010a). Groundwater samples were previously collected from SMW-4, MW-1, MW-2, MW-4, and MW-5 in July 2009 during the routine sampling event; however, NMED requested that a separate sampling event be conducted for LTU Event 1, thus groundwater samples were collected again in March 2010. Based on the results of the Cochran's approximation to the Behrens's-Fisher Student's T-test, statistically significant increases above background were indicated for seven constituents in the treatment zone (barium, beryllium, chromium, cobalt, lead, nickel, and vanadium) and one constituent in the ZOI (cadmium) (TriHydro, 2010b). Chloride and pH were the only constituents identified as exhibiting a statistically significant increase above background in down-gradient water quality in the Sonsela aquifer.

Section 3
Scope of Activities

3.1 Pre-Sampling Activities

The cell designations (numbers 1 through 3) were taken from Figure 1 of the December 23, 2010 *Land Treatment Unit Nine Year Sampling Event Report* (TriHydro, 2010b) (Appendix A). Cells 1 and 2 were reportedly used for the disposal and treatment of waste, while Cell 3 was not utilized and has been historically sampled as part of the background area. The each of the three cells were divided into 6-foot by 6-foot grids. Pursuant to the Permit, a total of 2 grids per cell were selected for sampling utilizing a random integer generator. A map showing the initial sample locations is provided in Appendix A.

Cell/Location #	Grid Number	Latitude	Longitude
C1L1	702	35°29'42.72"N	108°26'7.76"W
C1L1	1903	35°29'41.85"N	108°26'7.07"W
C2L1	156	35°29'40.83"N	108°26'6.65"W
C2L2	2454	35°29'36.95"N	108°26'4.72"W
C3L1	773	35°29'40.79"N	108°26'4.46"W
C3L2	2741	35°29'38.60"N	108°26'2.08"W

The coordinates of the center each grid were recorded and on December 5, 2018 a NM811 call was placed.

3.1.1 Soil Sample Collection

On December 11, 2018 each randomly selected grid was located using a GPS. Sample locations were staked and field identifications established based on the cell number and location number. For example, Cell 1 has two sample locations and thus the samples are identified as LTU C1L1 and LTU C1L2 (Appendix A). To indicate the sample was collected from the zone of infiltration, ZOI is appended to the end of the sample identification and samples collected from the treatment zone have TZ appended to the end of the sample identification.

The Permit specifies the ZOI samples are to be collected from approximately one foot (12 inches) beneath the topsoil-ZOI interface. The treatment zone samples are to be collected from the bottom of the treatment zone (approximately five feet below the ground surface). The actual sample collection depths are recorded below.

	LTU C1L1	LTU C1L2	LTU C2L1	LTU C2L2	LTU C3L1	LTU C3L2
ZOI Depth	20" – 32"	24" -36"	18" – 30"	20 -32"	20" – 32"	22" -34"
TZ Depth	54" – 62"	54" – 62"	54" – 62"	54" – 62"	54" – 62"	54" – 62"

Discrete soil samples were collected using a 1.5 foot long by 2 inch diameter split-spoon sampler inside hollow-stem augers. Most locations were able to be sampled utilizing only direct push of the split-spoon sampler and the hollow-stem augers were utilized, as necessary. The discrete soil samples were placed directly into the laboratory provide sample containers.

3.1.2 Groundwater Sample Collection

On December 5 and 6, 2018 the five LTU monitor wells (MW-1, MW-2, MW-4, MW-5, and SMW-4) were purged and waste samples were collected for analysis. A submersible bladder pump 2-inch, 115-volt AC to DC converter, Grundfos Redi-flo2 constructed of stainless steel with check valve and ½-inch Teflon tubing, adjustable rate controller powered by a gas generator was used to purge groundwater from these monitor wells. The generator was located downwind and at least 20 feet from the well so that exhaust fumes would not cross-contaminate the samples.

Monitor wells MW-1, MW-2, MW-4, and MW-5 are equipped with dedicated pumps that remain in the wells. A portable pump was used to purge and sample the groundwater from SMW-4. The field methods are discussed in Appendix C. The laboratory reports are provided in Appendix E and the data validation review is summarized in Appendix D.

3.2 Collection and Management of Investigation Derived Waste

The small volume of excess soil that was generated during sample collection was spread on the ground surface and bentonite chips were used to plug the borings. All decontamination water and purge water generated during groundwater sampling was disposed in the refinery wastewater system upstream of the API Separator.

Section 4
Regulatory Criteria

The applicable screening and potential cleanup levels are specified in NMED's *Risk Assessment Guidance for Site Investigations and Remediation* dated March 2019 and in the Environmental Protection Agency's (EPA) Regional Screening Levels dated November 2018.

For non-residential properties (e.g., the Gallup Refinery), the soil screening levels must be protective of commercial/industrial workers throughout the upper one foot of surface soils and construction workers throughout the upper ten feet based on NMED criteria. NMED residential soil screening levels are applied to the upper ten feet and soil screening levels for protection of groundwater apply throughout the vadose zone. EPA soil screening levels for direct contact exposure apply to the upper two feet of the vadose zone. To achieve closure as "corrective action complete without controls," the affected media must meet residential screening levels. Table 1 provides a comparison of the soil sample results to the non-residential soil screening levels (i.e., the lower of the commercial/ industrial or construction worker screening levels). Based on this comparison, only one soil sample collected at C2L2 from the ZOI interval exceeded the non-residential soil screening. Both the diesel range organics (DRO) and motor oil range organics (MRO) petroleum hydrocarbon analyses exceed their respective screening levels. DRO was detected at 5,300 milligram per kilogram (mg/kg) vs. a screening level of 3,800 mg/kg and MRO was detected at 5,500 mg/kg in comparison to the same screening level of 3,800 mg/kg. The maximum concentrations observed during the 1998 and 1995 soil characterization sampling events are also included in Table 1, as well as the background concentrations developed in 1997.

During this initial data review in preparation of Table 1, it was observed that most of the individual organic constituents were not detected; however, total petroleum hydrocarbons (TPH) reported as DRO and MRO were detected in samples collected from cells 2 and 3, but not in cell 1. The data was then evaluated using the statistical methods discussed in Section 5. The results were not as anticipated, assuming that only cells 1 and 2 received waste, while cell 3 was never used. This prompted a review of historical documentation of the initial design and operation of the LTU. While the TriHydro Figure 1 (shown in Appendix A) included in the 2009 LTU sampling report indicated that cell 3 was the southeastern cell, the earlier documents confirmed that cell 3 was actually the northern most cell. The initial Land Treatment Demonstration Engineering Report documents the

placement of the wastes in cells 1 and 2, with these cells being the southernmost two cells with an east-west orientation (excerpts provided in Appendix A) (LAN, 1988). A sampling plan from 1993 was reviewed and it also confirms that cells 1 and 2 were on the south end of the LTU with an east-west orientation, with cell 3 on the north end (Giant, 1993). The map is included in Appendix A. An aerial photo taken in 1997 is included in Appendix A showing a clear berm separating cell 3 on the north from the two southern cells (1 and 2), with no clear indication of any berm between cells 1 and 2. The same view is shown for 2005, in which a clearly visible berm is now constructed running in a northwest/southeast direction, traversing cells 1 and 2. It appears the later construction of the berm in the northwest/southeast direction may have led to the confusion of the location of the individual cells during the sampling conducted in 2009. An interview with Mr. Bill Kingsley (formerly of Precision Engineering, Inc.) who conducted sampling efforts at the LTU in the early 1990s, confirmed the original cell designations to be those indicated in the 1988 and 1993 site documents included in Appendix A. The initial sampling locations for the 2018 sampling event are depicted in the map provide in Appendix A. After the cell areas were corrected, a new figure (Figure 3) was prepared that shows the 2018 sampling locations relative to the actual cell boundaries. All three cells are appropriately covered with two randomly located soil borings in each cell.

The groundwater cleanup levels are based on New Mexico Water Quality Control Commission (WQCC) standards (20.6.2.7 WW NMAC, 20.6.2.3103, and 20.6.2.4103) unless there is a federal maximum contaminant level (MCL), in which case the lower of the two values is selected as the cleanup level. If neither a WCQQ standard nor an MCL is available, then the cleanup level is based on a NMED Tap Water Screening Level. If a NMED Tap Water Screening Level is not available for a constituent, then an EPA Regional Screening Level is used. If an EPA Regional Screening Level is for a carcinogenic compound, then the screening level is multiplied by 10 to bring the risk level to 1E-05 to be consistent with the NMED screening levels. Table 2 presents the groundwater results and the applicable screening levels.

The only groundwater sample to have an exceedance of the screening level was collected from SMW-4, which is completed in the Chinle Slope wash. Cobalt was detected at a concentration of 19 microgram/liter (ug/l) vs a screening level of 6 ug/l.

Section 5
Statistical Evaluation

With the sample locations assigned to the correct cells, as explained above in Section 4, using the ProUCL software Dixon's outlier test was used to evaluate the background soil samples. This includes samples that were collected from Cell 3 on May 18, 1999, December 11, 2009, and December 11, 2018. The test was only performed on constituents that were detected in the soil samples collected from Cells 1 and 2, as constituents that were not detected were not further evaluated to determine if there was a statistically significant difference between the background and treatment area samples. Dixon's outlier test was used to determine if there are any outliers in the data set that should be omitted before performing the statistical test using Coxron's approximate of Behrins t-test. The results are included in Appendix B. Based on this evaluation, it was found that one sample (ZOI-3-135-051899) had numerous metals results that are outliers. This included the results for arsenic (17 mg/kg), barium (3,400 mg/kg), beryllium (11 mg/kg), cobalt (63 mg/kg), lead (120 mg/kg), nickel (130 mg/kg), and vanadium (220 mg/kg). All of these results were removed from the soils background data set. Table 3 shows the constituents retained for the statistical analyses and the background concentrations. For non-detect results, one half of the detection limit was substituted for the non-detect results.

To determine if there is a statistically significant difference between the background soil results and the sample results from the treatment area, the data were analyzed using Cochran's approximation to the Behrens-Fisher Student's T-test. This test shall be used to evaluate soil and groundwater monitoring data for statistically significant differences during the post-closure period pursuant to Section D.7.a of Attachment D to the Permit. Cochran's approximation to the Behrens-Fisher Student's T-test is:

$t^* = (X_a - X_b) / ((S^2_m/N_m)+(S^2_b/N_b))^{1/2}$

Where: t^* = t star
X_a = mean of the sample
X_b = mean of the background
S^2_m = variance of the sample
S^2_b = variance of the background
N_m = number of samples
N_b = number of background samples

$t_c = (W_b t_b + W_m t_m) / (w_b + w_m)$

Where: t_c = comparison t star
W_b = variance / number of background samples
t_b = t-table with (N_b-1) degrees of freedom from the 0.05 level of significance
W_m = variance/number of samples
t_m = t-table with (N_m-1) degrees of freedom at the 0.05 level of significance

The t-star (t*) is compared to the comparison t-star (t_c) using the decision rule: If t* is equal to or greater than t_c, then conclude that there most likely has been a significant increase in this parameter; if t* is less than t, then conclude that there most likely has not been a change in this parameter.

The evaluation of the soil data is summarized in Table 4. Arsenic is shown to have a statistically significant increase in concentrations in the samples collected from Cells 1 and 2 in comparison to the background samples collected from Cell 3.

The groundwater data was similarly evaluated using the Cochran's approximation to the Behrens-Fisher Student's T-test. Only those constituents that were detected in groundwater samples collected at wells MW-1, MW-2, or MW-5 were included in the evaluation. To provide for a more robust evaluation, additional samples collected during routine sampling events under the Facility-Wide Ground Water Monitoring Work Plan in September 2016, September 2017, September 2018 and December 2018 were included in the evaluation. These samples results are summarized in Table 5. The results of the statistical evaluation are presented in Table 6. Arsenic was shown to have a statistically significant increase over the background concentrations.

Section 6
Conclusions

The chemical analyses of soil samples collected from the treatment area (Cells 1 and 2) identified the presence of TPH in one soil sample (C2L2 from the ZOI interval) with concentrations of DRO and MRO exceeding the non-residential soil screening levels. None of the groundwater samples collected from the down-gradient Sonsela monitoring wells (MW-1, MW-2, and MW-4) had concentrations above the groundwater screening levels. The groundwater sample collected from the one down-gradient Chinle Slope wash well (SMW-4) contained cobalt at a concentration above the screening level.

The soil and groundwater monitoring data were evaluated utilizing the methodology (i.e., Cochran's approximation to the Behrens-Fisher Student's T-test) specified in Attachment D of the Permit. Based on this statistical analysis, arsenic was identified in both soil and groundwater as showing a statistically significant difference in comparison to background concentrations. Although arsenic indicates an increase over the background concentrations, the concentrations in both soil and groundwater are below the non-residential screening levels. No changes are recommended to the current post-closure care monitoring schedule.

Section 7
Schedule

The next sampling event (i.e., 30-year post-closure care sampling event) is scheduled for 2029. Soil and groundwater samples will be collected pursuant to Attachment D of the Permit. In addition, groundwater samples are routinely collected on an annual basis at monitoring wells MW-1, MW-2, MW-4, MW-5, and SMW-4 on an annual basis.

Section 8
References

Giant, 1993, Sampling Plan Land Treatment Unit Giant Refining Company Ciniza, p. 31.

Lockwood, Andrews, & Newman, Inc., 1988, Land Treatment Demonstration Volume I – Engineering Report, Giant Refining Company, Gallup New Mexico, p. 54.

NMED, 2019, *Risk Assessment Guidance for Site Investigations and Remediation*, New Mexico Environment Department, p.91.

Practical Environmental Services, Inc., 1999, LTU Soil Sampling and Analysis Report, Giant Ciniza Refinery, p. 7

TriHydro, 2010a, Land Treatment Unit Soil Sampling Report, Western Refining, Gallup Refinery, Gallup, New Mexico. P. 3.

TriHydro, 2010b, Land Treatment Unit Nine Year Sampling Event Report, Western Refining Company, Gallup Refinery, Gallup, New Mexico. P. 19.

Tables

Table 1 - Soil Analytical Data Summary
2018 Sampling Event - RCRA Post-Closure Care Land Treatment Unit
Marathon Petroleum Company - Gallup Refinery

Constituents	Background Concentration (1997)	Maximum Characterization Event Concentration	Non-Residential Soil Screening Level	Cell Number	CELL 1								CELL 2								CELL 3							
				Field ID	LTU C2L2 ZOI		LTU C2L2 TZ		LTU C3L2 ZOI		LTU C3L2 TZ		LTU C2L1 ZOI		LTU C2L1 TZ		LTU C3L1 ZOI		LTU C3L1 TZ		LTU C1L1 ZOI		LTU C1L1 TZ		LTU C1L2 ZOI		LTU C1L2 TZ	
				Lab ID	1812773-008		1812773-009		1812773-012		1812773-013		1812773-006		1812773-007		1812773-010		1812773-011		1812773-001		1812773-002		1812773-003		1812773-004	
				Sample Date	12/11/2018		12/11/2018		12/11/2018		12/11/2018		12/11/2018		12/11/2018		12/11/2018		12/11/2018		12/11/2018		12/11/2018		12/11/2018		12/11/2018	
Metals (mg/kg)																												
Antimony	NA	1.2	1.42E+02	(2)	< 1.8343	u	< 1.8111	u	< 1.7795	u	< 1.8104	u	< 1.8072	u	< 1.8148	u	< 1.7637	u	< 1.8391	u	< 1.7737	u	< 1.7807	u	< 1.84	u	< 1.7759	u
Arsenic	<5	20	3.59E+01	(1)	16	v	7.7	v	< 6.9026	u	< 7.0221	u	< 7.0097	u	< 7.0394	u	< 6.8411	u	< 7.1337	u	< 6.88	u	< 6.9073	u	< 7.1372	u	< 6.8886	u
Barium	310	710	4.39E+03	(2)	350	v	320	v	330	v	350	v	410	v	280	v	360	v	280	v	240	v	230	v	310	v	340	v
Beryllium	NA	1.8	1.48E+02	(2)	1.4	v	1.6	v	1.6	v	1.3	v	1.5	v	1.7	v	1.7	v	1.8	v	1.6	v	1.3	v	1.7	v	1.7	v
Cadmium	<0.5	6	7.21E+01	(2)	< 0.121	u	< 0.1195	u	< 0.1174	u	< 0.1194	u	< 0.1192	u	< 0.1197	u	< 0.1163	u	< 0.1213	u	< 0.117	u	< 0.1175	u	< 0.1214	u	< 0.1171	u
Chromium	13	310	1.34E+02	(2)	92	v	55	v	16	v	12	v	21	v	24	v	95	v	19	v	20	v	18	v	17	v	19	v
Cobalt	NA	9.7	3.67E+01	(2)	8	v	19	v	6.5	v	5.5	v	6.3	v	6.9	v	7.7	v	7	v	7.1	v	8.1	v	6.9	v	7.4	v
Cyanide	NA	NA	1.21E+01	(2)	**53**	v	0.98	v	< 0.269	u	< 0.196	u	1.2	v	0.43	v	0.48	v	< 0.271	u	< 0.22	u	< 0.259	u	< 0.248	u	< 0.254	u
Lead	10	87	8.00E+02	(3)	44	v	19	v	3.9	v	3.6	v	6.6	v	4.8	v	15	v	< 1.2137	u	1.3	v	1.9	v	3	v	2.9	v
Mercury	<0.02	13	2.07E+01	(2)	4.9	v	0.033	v	< 0.0067	u	< 0.0068	u	0.026	v	0.3	v	1.4	v	0.0085	v	< 0.007	u	< 0.007	u	0.0079	v	< 0.007	u
Nickel	NA	54	7.53E+02	(2)	40	v	23	v	16	v	12	v	17	v	18	v	22	v	17	v	18	v	18	v	16	v	18	v
Selenium	<10	10	1.75E+03	(2)	< 6.2586	u	< 6.1792	u	< 6.0717	u	< 6.1768	u	< 6.1658	u	< 6.192	u	< 6.0176	u	< 6.2749	u	< 6.0518	u	< 6.0758	u	< 6.278	u	< 6.0594	u
Silver	NA	<1	1.77E+03	(2)	< 0.1598	u	< 0.1578	u	< 0.155	u	< 0.1577	u	< 0.1574	u	< 0.1581	u	< 0.1537	u	< 0.1602	u	< 0.1545	u	< 0.1551	u	< 0.1603	u	< 0.1547	u
Vanadium	NA	43	6.14E+02	(2)	36	v	33	v	26	v	22	v	27	v	28	v	35	v	31	v	34	v	32	v	28	v	33	v
Zinc	NA	NA	1.06E+05	(2)	390	v	150	v	21	v	18	v	45	v	45	v	230	v	26	v	26	v	31	v	24	v	27	v
Volatiles (mg/kg)																												
1,1,1-Trichloroethane	NA	NA	1.36E+04	(2)	< 0.0043	u	< 0.0041	u	< 0.0044	u	< 0.0043	u	< 0.0044	u	< 0.0043	u	< 0.0045	u	< 0.0044	u	< 0.0045	u	< 0.0043	u	< 0.0043	u	< 0.0043	u
1,1-Dichloroethane	NA	NA	3.83E+02	(1)	< 0.003	u	< 0.0029	u	< 0.0031	u	< 0.0031	u	< 0.0031	u	< 0.0031	u	< 0.0032	u	< 0.0031	u	< 0.0032	u	< 0.0031	u	< 0.0031	u	< 0.0031	u
1,2-Dibromoethane (EDB)	NA	NA	3.31E+00	(1)	< 0.0043	u	< 0.0042	u	< 0.0044	u	< 0.0044	u	< 0.0045	u	< 0.0044	u	< 0.0045	u	< 0.0044	u	< 0.0046	u	< 0.0044	u	< 0.0044	u	< 0.0044	u
1,2-Dichloroethane (EDC)	NA	NA	4.07E+01	(1)	< 0.0049	u	< 0.0047	u	< 0.005	u	< 0.0049	u	< 0.005	u	< 0.0049	u	< 0.0051	u	< 0.005	u	< 0.0051	u	< 0.0049	u	< 0.0049	u	< 0.0049	u
1,3-Dichlorobenzene (V)	NA	NA	-	-	< 0.0041	u	< 0.004	u	< 0.0042	u	< 0.0042	u	< 0.0043	u	< 0.0041	u	< 0.0043	u	< 0.0042	u	< 0.0043	u	< 0.0042	u	< 0.0042	u	< 0.0042	u
1,4-Dioxane	NA	NA	2.40E+01	(3)	<0.13	u	<0.13	u	<0.14	u	<0.13	u	<0.14	u	<0.13	u	<0.14	u	<0.14	u	<0.14	u	<0.13	u	<0.13	u	<0.13	u
2-Butanone (MEK)	NA	NA	9.17E+04	(2)	< 0.0551	u	< 0.053	u	< 0.0562	u	< 0.0556	u	< 0.0569	u	< 0.0552	u	< 0.0573	u	< 0.0562	u	< 0.0578	u	< 0.0556	u	< 0.0557	u	< 0.0557	u
Benzene	NA	<0.025	8.72E+01	(1)	< 0.0039	u	< 0.0037	u	< 0.004	u	< 0.0039	u	< 0.004	u	< 0.0039	u	< 0.0041	u	< 0.004	u	< 0.0041	u	< 0.0039	u	< 0.0039	u	< 0.0039	u
Carbon disulfide	NA	NA	1.62E+03	(2)	< 0.0157	u	< 0.0151	u	< 0.016	u	< 0.0159	u	< 0.0162	u	< 0.0158	u	< 0.0164	u	< 0.016	u	< 0.0165	u	< 0.0159	u	< 0.0159	u	< 0.0159	u
Chlorobenzene	NA	NA	4.12E+02	(2)	< 0.0061	u	< 0.0059	u	< 0.0062	u	< 0.0062	u	< 0.0063	u	< 0.0061	u	< 0.0063	u	< 0.0062	u	< 0.0064	u	< 0.0062	u	< 0.0062	u	< 0.0062	u
Chloroform	NA	NA	2.87E+01	(1)	< 0.0038	u	< 0.0037	u	< 0.0039	u	< 0.0039	u	< 0.004	u	< 0.0038	u	< 0.004	u	< 0.0039	u	< 0.004	u	< 0.0039	u	< 0.0039	u	< 0.0039	u
Ethylbenzene	NA	<0.025	3.68E+02	(1)	< 0.0028	u	< 0.0027	u	< 0.0028	u	< 0.0028	u	< 0.0029	u	< 0.0028	u	< 0.0029	u	< 0.0028	u	< 0.0029	u	< 0.0028	u	< 0.0028	u	< 0.0028	u
Methyl tert-butyl ether (MTBE)	NA	NA	4.82E+03	(1)	< 0.0113	u	< 0.0109	u	< 0.0115	u	< 0.0114	u	< 0.0117	u	< 0.0113	u	< 0.0118	u	< 0.0115	u	< 0.0118	u	< 0.0114	u	< 0.0114	u	< 0.0114	u
Styrene	NA	NA	1.02E+04	(2)	< 0.0037	u	< 0.0036	u	< 0.0038	u	< 0.0038	u	< 0.0039	u	< 0.0037	u	< 0.0039	u	< 0.0038	u	< 0.0039	u	< 0.0038	u	< 0.0038	u	< 0.0038	u
Tetrachloroethene (PCE)	NA	NA	1.20E+02	(2)	< 0.0038	u	< 0.0037	u	< 0.0039	u	< 0.0038	u	< 0.0039	u	< 0.0038	u	< 0.004	u	< 0.0039	u	< 0.004	u	< 0.0038	u	< 0.0038	u	< 0.0038	u
Toluene	NA	<0.025	1.40E+04	(2)	< 0.0046	u	< 0.0044	u	< 0.0046	u	< 0.0046	u	< 0.0047	u	< 0.0046	u	< 0.0047	u	< 0.0046	u	< 0.0048	u	< 0.0046	u	< 0.0046	u	< 0.0046	u
Trichloroethene (TCE)	NA	NA	6.90E+00	(2)	< 0.0055	u	< 0.0053	u	< 0.0056	u	< 0.0056	u	< 0.0057	u	< 0.0055	u	< 0.0057	u	< 0.0056	u	< 0.0058	u	< 0.0056	u	< 0.0056	u	< 0.0056	u
Xylenes, Total	NA	<0.025	7.98E+02	(2)	< 0.012	u	< 0.0116	u	< 0.0122	u	< 0.0121	u	< 0.0124	u	< 0.012	u	< 0.0125	u	< 0.0123	u	< 0.0126	u	< 0.0121	u	< 0.0121	u	< 0.0121	u
Semivolatiles (mg/kg)																												
1,4-Dichlorobenzene	NA	NA	6.73E+03	(1)	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
2,4-Dimethylphenol	NA	<0.5	5.38E+03	(2)	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
2,4-Dinitrophenol	NA	<1.0	5.38E+02	(2)	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
1-Methylnaphthalene	NA	<0.420	8.13E+02	(4)	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
2-Methylphenol	NA	<0.420	4.10E+04	(3)	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
3+4-Methylphenol	NA	<0.420	-	-	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
4-Nitrophenol	NA	<0.5	-	-	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
Acenaphthene	NA	<0.5	1.51E+04	(2)	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
Anthracene	NA	<0.5	7.53E+04	(2)	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
Benz(a)anthracene	NA	<0.5	3.23E+01	(1)	2.7	v	0.65	v	< 0.1	u	< 0.1	u	0.27	v	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
Benzo(a)pyrene	NA	<0.420	2.36E+01	(1)	0.41	v	0.1	v	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
Benzo(b)fluoranthene	NA	<0.5	3.23E+01	(1)	0.51	v	0.11	v	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
Benzo(k)fluoranthene	NA	<0.5	3.23E+02	(1)	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
Bis(2-ethylhexyl)phthalate	NA	<1.0	1.83E+03	(1)	0.32	v	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
Chrysene	NA	<0.420	3.23E+03	(1)	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
Dibenz(a,h)anthracene	NA	<0.5	3.23E+00	(1)	0.62	v	0.12	v	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
Diethyl phthalate	NA	<0.5	2.15E+05	(2)	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
Dimethyl phthalate	NA	<0.5	2.69E+05	(2)	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
Di-n-butyl phthalate	NA	NA	2.69E+04	(2)	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
Fluoranthene	NA	<0.5	1.00E+04	(2)	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
Fluorene	NA	<0.5	1.00E+04	(2)	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
Indeno(1,2,3-cd)pyrene	NA	<0.5	3.23E+01	(1)	0.34	v	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
Naphthalene	NA	<0.5	5.02E+03	(2)	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
Phenanthrene	NA	<0.420	7.53E+03	(2)	0.19	v	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
Phenol	NA	<0.5	7.74E+04	(2)	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
Pyrene	NA	<0.420	7.53E+03	(2)	0.26	v	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
Pyridine	NA	NA	1.20E+03	(3)	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
Quinoline	NA	NA	7.70E-01	(3)	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u	< 0.1	u
TPH (mg/kg)																												
Gasoline Range Organics (GRO)	NA	NA	500	(5)	< 1.4	u	< 1.4	u	< 1.4	u	< 1.4	u	< 1.4	u	< 1.4	u	< 1.4	u	< 1.4	u	< 1.5	u	< 1.4	u	< 1.4	u	< 1.4	u
Diesel Range Organics (DRO)	NA	NA	3800	(5)	**5300**	v	1100	v	< 2	u	< 2	u	51	v	55	v	61	v	< 1.9	u	< 1.9	u	< 2	u	< 2	u	< 1.9	u
Motor Oil Range Organics (MRO)	NA	NA	3800	(5)	**5500**	v	850	v	< 49.7	u	< 48.7	u	< 49.4	u	78	v	84	v	< 47.6	u	< 48.2	u	< 49.7	u	< 49.9	u	< 48	u

- No screening level or analytical result available
NMED - Risk Assessment Guidance for Site Investigations and Remediation (March 2019)
EPA - Regional Screening Levels (Nov 2018)
(1) NMED Industrial Occupational Screening Level
(2) NMED Construction Worker Screening Level
(3) EPA Industrial - Screening Levels

Table 1 - Soil Analytical Data Summary
2018 Sampling Event - RCRA Post-Closure Care Land Treatment Unit
Marathon Petroleum Company - Gallup Refinery

Constituents	Background Concentration (1997)	Maximum Characterization Event Concentration	Non-Residential Soil Screening Level	Cell Number	CELL 1				CELL 2				CELL 3			
				Field ID	LTU C2L2 ZOI	LTU C2L2 TZ	LTU C3L2 ZOI	LTU C3L2 TZ	LTU C2L1 ZOI	LTU C2L1 TZ	LTU C3L1 ZOI	LTU C3L1 TZ	LTU C1L1 ZOI	LTU C1L1 TZ	LTU C1L2 ZOI	LTU C1L2 TZ
				Lab ID	1812773-008	1812773-009	1812773-012	1812773-013	1812773-006	1812773-007	1812773-010	1812773-011	1812773-001	1812773-002	1812773-003	1812773-004
				Sample Date	12/11/2018	12/11/2018	12/11/2018	12/11/2018	12/11/2018	12/11/2018	12/11/2018	12/11/2018	12/11/2018	12/11/2018	12/11/2018	12/11/2018

(4) EPA Industrial - Screening Levels multiplied by 10 pursuant to Section IV.D.2 of the Oct. 31, 2013 RCRA Post-Closure Permit because the constituent is listed as carcinogenic
(5) NMED Table 6-2 TPH Soil Screening Levels
"unknown oil" for DRO and MRO, "gasoline" for GRO
Bold value exceeds Non-Residential Screening Level
NA - not analyzed
v = reportable detection above the Practical quantitation limit (PQL)
u - result is not detected at method detection limit (MDL)
j - estimated result at concentration above MDL but less than PQL

Pyridine constituents with all non-detect results

Table 2 - Groundwater Analytical Data Summary
2018 Sampling Event - RCRA Post-Closure Care Land Treatment Unit
Marathon Petroleum Company, Gallup Refinery

Constituents	Screening Levels	Source	MW-1		MW-2		MW-4		SMW-4		MW-5	
		Lab ID	1812373-003		1812373-004		1812373-007		1812373-006		1812373-005	
	Sample Date		12/6/2018		12/6/2018		12/6/2018		12/6/2018		12/6/2018	
Metals (ug/l) TOTAL												
Antimony	6	(2)	<0.5	u	<0.5	u	<0.5	u	<0.5	u	< 0.001	u
Arsenic	10	(2)	1.1	v	1.1	v	0.75	J	2.9	v	1	v
Barium	2000	(2)	<20	u	<20	u	21	v	32	v	<20	u
Beryllium	4	(2)	<0.44	u	<0.44	u	<0.44	u	<0.44	u	<0.44	u
Cadmium	5	(2)	<0.99	u	<0.99	u	<0.99	u	<0.99	u	<0.99	u
Chromium	50	(3)	<1.08	u	<1.08	u	<1.08	u	11	v	<1.08	u
Cobalt	6	(4)	<0.98	u	<0.98	u	<0.98	u	**19**	v	<0.98	u
Cyanide	200	(2)	<10	u	<10	u	<10	u	<10	u	<10	u
Lead	15	(2)	<0.5	u	<0.5	u	<0.5	u	1	v	<0.5	u
Mercury	2	(3)	0.1	J	0.09	J	0.09	J	0.09	J	0.09	J
Nickel	372	(4)	<2.69	u	<2.69	u	<2.69	u	9.5	J	<2.69	u
Selenium	50	(2)	<0.5	u	<0.5	u	<0.5	u	0.53	J	<0.5	u
Silver	81.2	(4)	<1.76	u	<1.76	u	<1.76	u	<1.76	u	<1.76	u
Vanadium	63.1	(4)	<2.27	u	<2.27	u	<2.27	u	50	v	<2.27	u
Zinc	10000	(3)	<3.3	u	<3.3	u	<3.3	u	7.2	J	<3.3	u
Volatiles (ug/l)												
1,1,1-Trichloroethane	200	(3)	<0.16	u	<0.16	u	<0.16	u	<0.16	u	<0.16	u
1,1-Dichloroethane	25	(3)	<0.18	u	<0.18	u	<0.18	u	<0.18	u	<0.18	u
1,2-Dibromoethane (EDB)	0.05	(3)	<0.23	u	<0.23	u	<0.23	u	<0.23	u	<0.23	u
1,2-Dichloroethane (EDC)	5	(3)	<0.19	u	<0.19	u	<0.19	u	<0.19	u	<0.19	u
1,4-Dioxane	4.6	(4)	<40	u	<40	u	<40	u	<40	u	<40	u
2-Butanone	5565	(4)	<1.41	u	<1.41	u	<1.41	u	<1.41	u	<1.41	u
Benzene	5	(3)	<0.17	u	<0.17	u	<0.17	u	<0.17	u	<0.17	u
Carbon disulfide	810	(4)	<0.39	u	<0.39	u	<0.39	u	<0.39	u	<0.39	u
Chlorobenzene	100	(2)	<0.29	u	<0.29	u	<0.29	u	<0.29	u	<0.29	u
Chloroform	100	(3)	<0.24	u	<0.24	u	<0.24	u	<0.24	u	<0.24	u
Ethylbenzene	700	(3)	<0.22	u	<0.22	u	<0.22	u	<0.22	u	<0.22	u

Table 2 - Groundwater Analytical Data Summary
2018 Sampling Event - RCRA Post-Closure Care Land Treatment Unit
Marathon Petroleum Company, Gallup Refinery

Constituents	Screening Levels	Source	MW-1		MW-2		MW-4		SMW-4		MW-5	
		Lab ID	1812373-003		1812373-004		1812373-007		1812373-006		1812373-005	
	Sample Date		12/6/2018		12/6/2018		12/6/2018		12/6/2018		12/6/2018	
Methyl tert-butyl ether (MTBE)	100	(3)	<0.46	u	<0.46	u	<0.46	u	<0.46	u	<0.46	u
Styrene	100	(3)	<0.25	u	<0.25	u	<0.25	u	<0.25	u	<0.25	u
Tetrachloroethene (PCE)	5	(3)	<0.15	u	<0.15	u	<0.15	u	<0.15	u	<0.15	u
Toluene	1000	(3)	<0.17	u	<0.17	u	<0.17	u	<0.17	u	<0.17	u
Trichloroethene (TCE)	5	(3)	<0.26	u	<0.26	u	<0.26	u	<0.26	u	<0.26	u
Xylenes, Total	620	(3)	<0.64	u	<0.64	u	<0.64	u	<0.64	u	<0.64	u
Semi-volatiles (ug/l)												
1,2-Dichlorobenzene	600	(2)	<0.31	u	<0.31	u	<0.31	u	<0.31	u	<0.31	u
1,3-Dichlorobenzene	-		<0.31	u	< 0.313	u	<0.31	u	<0.31	u	<0.31	u
1,4-Dichlorobenzene	75	(2)	< 0.288	u	<0.29	u	<0.29	u	<0.29	u	<0.29	u
1-Methylnaphthalene	1.1	(5)	< 0.336	u	<0.34	u	<0.34	u	<0.34	u	<0.34	u
2,4-Dimethylphenol	353.9	(4)	<0.5	u	<0.5	u	<0.5	u	<0.5	u	<0.5	u
2,4-Dinitrophenol	38.7	(4)	<0.5	u	<0.5	u	<0.5	u	<0.5	u	<0.5	u
2-Methylphenol	930	(1)	<0.5	u	<0.5	u	<0.5	u	<0.5	u	<0.5	u
3+4-Methylphenol	930	(1)	<0.5	u	<0.5	u	<0.5	u	<0.5	u	<0.5	u
4-Nitrophenol	-		<0.5	u	<0.5	u	<0.5	u	<0.5	u	<0.5	u
Acenaphthene	535	(4)	<0.5	u	<0.5	u	<0.5	u	<0.5	u	<0.5	u
Anthracene	1720	(4)	<0.5	u	<0.5	u	<0.5	u	<0.5	u	<0.5	u
Benzenethiol	17	(1)	<0.5	u	<0.5	u	<0.5	u	<0.5	u	<0.5	u
Benz(a)anthracene	0.12	(4)	<0.5	u	<0.5	u	<0.5	u	<0.5	u	<0.5	u
Benzo(a)pyrene	0.2	(3)	<0.5	u	<0.5	u	<0.5	u	<0.5	u	<0.5	u
Benzo(b)fluoranthene	0.343	(4)	<0.5	u	<0.5	u	<0.5	u	<0.5	u	<0.5	u
Benzo(k)fluoranthene	3.43	(4)	<0.5	u	<0.5	u	<0.5	u	<0.5	u	<0.5	u
Bis(2-ethylhexyl)phthalate	6	(2)	<0.5	u	<0.5	u	<0.5	u	<0.5	u	1.1	v
Chrysene	34.3	(4)	<0.5	u	<0.5	u	<0.5	u	<0.5	u	<0.5	u
Dibenz(a,h)acridine	-		<0.5	u	<0.5	u	<0.5	u	<0.5	u	<0.5	u
Dibenz(a,h)anthracene	0.0343	(4)	<0.5	u	<0.5	u	<0.5	u	< 0.5	u	<0.5	u
Diethyl phthalate	14800	(4)	<0.5	u	<0.5	u	<0.5	u	<0.5	u	<0.5	u

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2018 Sampling Event - RCRA Post-Closure Care Land Treatment Unit
Marathon Petroleum Company, Gallup Refinery

Constituents	Screening Levels	Source	MW-1		MW-2		MW-4		SMW-4		MW-5	
		Lab ID	1812373-003		1812373-004		1812373-007		1812373-006		1812373-005	
		Sample Date	12/6/2018		12/6/2018		12/6/2018		12/6/2018		12/6/2018	
Dimethyl phthalate	-		<0.5	u	<0.5	u	<0.5	u	< 0.5	u	<0.5	u
Di-n-butyl phthalate	885	(4)	<0.5	u	<0.5	u	<0.5	u	<0.5	u	<0.5	u
Fluoranthene	802	(4)	<0.5	u	<0.5	u	<0.5	u	<0.5	u	<0.5	u
Fluorene	288	(4)	<0.5	u	<0.5	u	<0.5	u	<0.5	u	<0.5	u
Indeno(1,2,3-cd)pyrene	0.343	(4)	<0.5	u	<0.5	u	<0.5	u	<0.5	u	<0.5	u
Quinoline	0.024	(1)	<0.5	u	<0.5	u	<0.5	u	<0.5	u	<0.5	u
Naphthalene	1.65	(4)	<0.29	u	<0.29	u	<0.29	u	<0.29	u	<0.29	u
Phenanthrene	170	(4)	<0.5	u	<0.5	u	<0.5	u	<0.5	u	<0.5	u
Phenol	5760	(4)	<0.5	u	<0.5	u	<0.5	u	<0.5	u	<0.5	u
Pyrene	117	(4)	<0.5	u	<0.5	u	<0.5	u	<0.5	u	<0.5	u
Pyridine	20	(1)	<0.5	u	<0.5	u	<0.5	u	<0.5	u	<0.5	u
TPH (mg/l)												
Gasoline Range Organics (GRO)	0.0398	(6)	<0.0245	u	<0.0245	u	<0.0245	u	<0.0245	u	<0.0245	u
Diesel Range Organics (DRO)	0.0398	(6)	<0.630	u	<0.630	u	<0.630	u	<0.630	u	<0.630	u
Motor Oil Range Organics (MRO)	0.0398	(6)	<5.0	u	<5.0	u	<5.0	u	<5.0	u	<5.0	u

- No screening level or analytical result available

450 - bolded value exceeds screening level

(1) EPA - Regional Screening Levels (November 2018) - Tap Water

(2) EPA - Regional Screening Levels (November 2018) - MCL

(3) NMED WQCC standards - Title 20 Chapter 6, Part 2, - 20.6.2.3101 updated Dec. 2018

(4) NMED Tap Water Screening Level - Risk Assessment Guidance for Site Investigations and Remediation (March 2019)

(5) EPA Screening Level - Tap Water x 10 for carcinogenic compounds

(6) NMED groundwater screening level for unknown oil

v = reportable detection above the Practical quantitation limit (PQL)

u - result is not detected at method detection limit (MDL)

j - estimated result at concentration above MDL but less than PQL

z - concentration exceeds MCL

Table 3 - Soil Background Concentrations
2018 Sampling Event - RCRA Post-Closure Care Land Treatment Unit
Marathon Petroleum Company - Gallup Refinery

Sample ID	Sample Date	Arsenic	Barium	Beryllium	Chromium	Cobalt	Lead	Mercury	Nickel	Vanadium	Zinc	Cyanide	Benz(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Bis(2-ethylhexyl) phthalate	Dibenz(a,h) anthracene	Indeno(1,2,3-cd) pyrene	Phenanthrene	Pyrene	Diesel Range Organics (DRO)	Motor Oil Range Organics (MRO)
ZOI-3-38-051899	5/18/1999	3.9	340	**0.6**	190.0	5.1	21.0	0.9	11.0	16.0	NA	NA	**0.199**	**0.199**	**0.199**	**0.199**	**0.199**	**0.199**	**0.199**	0.618	NA	NA
3FT-3-38-051899	5/18/1999	1.5	200	1.4	8.9	5.0	11.0	**0.05**	9.8	18.0	NA	NA	**0.103**	**0.103**	**0.103**	**0.103**	**0.103**	**0.103**	**0.103**	**0.103**	NA	NA
BTZ-3-38-051899	5/18/1999	2.4	300	1.4	25.0	8.6	12.0	**0.05**	20.0	43.0	NA	NA	**0.0995**	**0.0995**	**0.0995**	**0.0995**	**0.0995**	**0.0995**	**0.0995**	**0.0995**	NA	NA
ZOI-3-97-051899	5/18/1999	1.6	360	1.4	24.0	7.0	12.0	**0.05**	14.0	30.0	NA	NA	**0.0995**	**0.0995**	**0.0995**	**0.0995**	**0.0995**	**0.0995**	**0.0995**	**0.0995**	NA	NA
3FT-3-97-051899	5/18/1999	1.6	310	1.8	27.0	8.8	13.0	**0.05**	19.0	40	NA	NA	**0.0995**	**0.0995**	**0.0995**	**0.0995**	**0.0995**	**0.0995**	**0.0995**	**0.0995**	NA	NA
BTZ-3-97-051899	5/18/1999	1.6	330	1.2	10.0	5.3	9.1	**0.05**	11.0	22.0	NA	NA	**0.096**	**0.096**	**0.096**	**0.096**	**0.096**	**0.096**	**0.096**	**0.096**	NA	NA
ZOI-3-135-051899	5/18/1999	17.0	3400	11.0	130.0	63.0	120.0	**0.05**	130.0	220.0	NA	NA	**0.097**	**0.097**	**0.097**	**0.097**	**0.097**	**0.097**	**0.097**	**0.097**	NA	NA
3FT-3-135-051899	5/18/1999	1.7	360	1.5	24.0	8.4	12.0	**0.05**	18.0	36.0	NA	NA	**0.096**	**0.096**	**0.096**	**0.096**	**0.096**	**0.096**	**0.096**	**0.096**	NA	NA
BTZ-3-135-051899	5/18/1999	1.4	330	1.6	6.2	4.1	10.0	**0.05**	7.6	16.0	NA	NA	**0.097**	**0.097**	**0.097**	**0.097**	**0.097**	**0.097**	**0.097**	**0.097**	NA	NA
ZOI-3-152-051899	5/18/1999	1.5	350	1.5	8.5	5.3	10.0	**0.05**	11.0	17.0	NA	NA	**0.097**	**0.097**	**0.097**	**0.097**	**0.097**	**0.097**	**0.097**	**0.097**	NA	NA
3FT-3-152-051899	5/18/1999	1.4	370	1.4	17.0	7.0	11.0	**0.05**	15.0	27.0	NA	NA	**0.096**	**0.096**	**0.096**	**0.096**	**0.096**	**0.096**	**0.096**	**0.096**	NA	NA
BTZ-3-152-051899	5/18/1999	1.1	430	**0.6**	7.8	4.7	8.5	**0.05**	8.8	18.0	NA	NA	**0.093**	**0.093**	**0.093**	**0.093**	**0.093**	**0.093**	**0.093**	**0.093**	NA	NA
ZOI-1-2521-120909	12/9/2009	1.56	389.00	1.73	26.40	8.99	15.50	**0.00025**	19.50	30.80	30.10	**0.5**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**5**	**25**
ZOI-1-371-120809	12/8/2009	1.71	314.00	1.51	26.10	8.54	13.60	**0.0025**	18.90	29.00	32.40	**1**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**0.025**	**5**	**25**
TZ-1-2521-121109	12/11/2009	1.72	281.00	1.70	29.60	9.54	14.60	**0.0025**	22.80	35.70	36.80	**0.25**	**0.025**	**0.025**	**0.025**	0.101	**0.025**	**0.025**	**0.025**	**0.025**	**5**	**25**
TZ-1-371-121109	12/11/2009	1.49	275.00	1.50	22.10	8.01	13.30	**0.0025**	16.10	29.60	25.40	**0.25**	**0.025**	**0.025**	**0.025**	0.082	**0.025**	**0.025**	**0.025**	**0.025**	**5**	**25**
LTU C1L1 ZOI	12/11/2018	**3.44**	240	1.6	20	7.1	1.3	**0.0035**	18	34	26	**0.11**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**1**	**24.1**
LTU C1L1 TZ	12/11/2018	**3.45**	230	1.3	18	8.1	1.9	**0.0035**	18	32	31	**0.13**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**1**	**24.85**
LTU C1L2 ZOI	12/11/2018	**3.55**	310	1.7	17	6.9	3	0.0079	16	28	24	**0.112**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**1**	**24.95**
LTU C1L2 TZ	12/11/2018	**3.44**	340	1.7	19	7.4	2.9	**0.0035**	18	33	27	**0.127**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**1**	**24**

3400	outlier removed from calculations
3.44	bold values represent 1/2 the value of the detection limit for non-detect results
NA	not analyzed

Table 4 - Soil Data Statistical Evaluation
2018 Sampling Event - RCRA Post-Closure Care Land Treatment Unit
Marathon Petroleum Company - Gallup Refinery

Constituent	X_a	X_b	S^2_m	S^2_b	N_m	N_b	W_b	t_b	W_m	t_m	t*	t_c	Is t* > or = t_c
Arsenic	5.58125	2.10842	19.89301	0.85639	8	19	0.045073	1.734	2.486627	1.895	2.182616	1.892134	YES
Barium	335.00000	318.89474	1857.14286	3195.54386	8	19	168.1865	1.734	232.1429	1.895	0.804932	1.827361	NO
Beryllium	1.57500	1.42842	0.02786	0.10976	8	19	0.005777	1.734	0.003482	1.895	1.523322	1.79455	NO
Chromium	41.75000	33.04000	1192.50000	2026.98989	8	20	101.3495	1.729	149.0625	1.895	0.550415	1.827815	NO
Cobalt	8.36250	7.04632	19.09125	2.77792	8	19	0.146207	1.734	2.386406	1.895	0.827051	1.885706	NO
Lead	12.18838	10.30000	204.09808	25.62889	8	19	1.348889	1.734	25.51226	1.895	0.364356	1.886915	NO
Mercury	0.83428	0.07148	2.92768	0.03858	8	20	0.001929	1.729	0.36596	1.895	1.257625	1.89413	NO
Nickel	20.62500	15.39474	73.12500	18.98830	8	19	0.999384	1.734	9.140625	1.895	1.642496	1.879132	NO
Vanadium	29.75000	28.16316	23.35714	68.34357	8	19	3.59703	1.734	2.919643	1.895	0.621614	1.806132	NO
Zinc	115.62500	29.08750	18005.41071	18.35839	8	8	2.294799	1.895	2250.676	1.895	1.823167	1.895	NO
Cyanide	7.05725	0.30988	344.77479	0.09493	8	8	0.011866	1.895	43.09685	1.895	1.027667	1.895	NO
Benz(a) anthracene	0.48375	0.07058	0.84654	0.00100	8	18	5.57E-05	1.74	0.105818	1.895	1.26979	1.894918	NO
Benzo(a) pyrene	0.10125	0.07058	0.01587	0.00100	8	18	5.57E-05	1.74	0.001984	1.895	0.679068	1.890766	NO
Benzo(b) fluoranthene	0.11500	0.07058	0.02591	0.00100	8	18	5.57E-05	1.74	0.003239	1.895	0.773781	1.892379	NO
Bis(2-ethylhexyl) phthalate	0.08375	0.07797	0.00911	0.00076	8	18	4.24E-05	1.74	0.001139	1.895	0.168095	1.889441	NO
Dibenz(a,h) anthracene	0.13000	0.07058	0.03980	0.00100	8	18	5.57E-05	1.74	0.004975	1.895	0.83771	1.893283	NO
Indeno(1,2,3-cd) pyrene	0.08625	0.07058	0.01051	0.00100	8	18	5.57E-05	1.74	0.001314	1.895	0.423303	1.888696	NO
Phenanthrene	0.06750	0.07058	0.00245	0.00100	8	18	5.57E-05	1.74	0.000306	1.895	-0.16206	1.871142	NO
Pyrene	0.07625	0.07058	0.00551	0.00100	8	18	5.57E-05	1.74	0.000689	1.895	0.207642	1.883405	NO
Diesel Range Organics (DRO)	821.24375	3.00000	3416259.93246	4.57143	8	8	0.571429	1.74	427032.5	1.74	1.252137	1.74	NO
Motor Oil Range Organics (MRO)	826.21250	24.73750	3646715.74482	0.18339	8	8	0.022924	1.74	455839.5	1.74	1.187091	1.74	NO

X_a = mean of the sample
X_b = mean of the background
S^2_m - variance of the sample
S^2_b = variance of the background
N_m = number of samples
N_b = number of background samples
W_b = variance / number of background samples
t_b = t-table with (Nb-1) degrees of freedom from the 0.05 level of significance
W_m = variance / number of samples
t_m = t-table with (Nm-1) degrees of freedom at the 0.05 level of significance
$t^* = (X_a - X_b) / (S^2_m / N_m) + (S^2_b / N_b))^{1/2}$
$tc = (W_b t_b + W_m t_m) / (W_b + W_m)$

Table 5 - Groundwater Data Set for Statistical Evaluation
2018 Sampling Event - RCRA Post-Closure Care Land Treatment Unit
Marathon Petroleum Company - Gallup Refinery

	Down-Gradient Wells												Background Well			
	MW-1				MW-2				MW-5				MW-4			
Sample Date	12/6/2018	09/13/18	09/20/17	09/07/16	12/6/2018	09/13/18	09/20/17	09/07/16	12/6/2018	09/17/18	09/11/17	09/07/16	12/6/2018	09/13/18	09/21/17	09/07/16
Metals (ug/l) TOTAL																
Arsenic	1.1	1.3	0.97	1.5000	1.1	0.99	0.73	1.3000	1	1.1	1	1.2000	0.75	0.76	0.84	0.98000
Barium	**10**	13	15	12	**10**	17	22	20	**10**	21	20	41	21	20	20	22
Chromium	**0.54**	1.8	7.4	**3**	**0.54**	**3**	**3**	**3**	**0.54**	**3**	**3**	**3**	**0.54**	**3**	**3**	**3**
Lead	**0.25**	1.3	1.6	0.14000	**0.25**	**0.25**	0.55	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	**0.25**	0.17	0.17000
Mercury	0.1	NA	**0.1**	0.056	0.09	NA	0.04	0.056000	0.09	0.096	**0.1**	0.055000	0.09	NA	**0.1**	**0.1**
Selenium	**0.25**	**0.5**	**0.5**	0.53000	**0.25**	**0.5**	**0.5**	0.58000	**0.25**	**0.5**	**0.5**	0.38000	**0.25**	**0.5**	**0.5**	0.65000
Semi-volatiles (ug/l)																
Bis(2-ethylhexyl) phthalate	**0.25**	**0.005**	**0.005**	0.004	**0.25**	**0.005**	0.006	0.0038	1.1	**0.005**	0.0057	0.0033	**0.25**	**0.005**	0.0051	0.0035

0.25 Bolded values equal 1/2 reporting limit for non-detect results

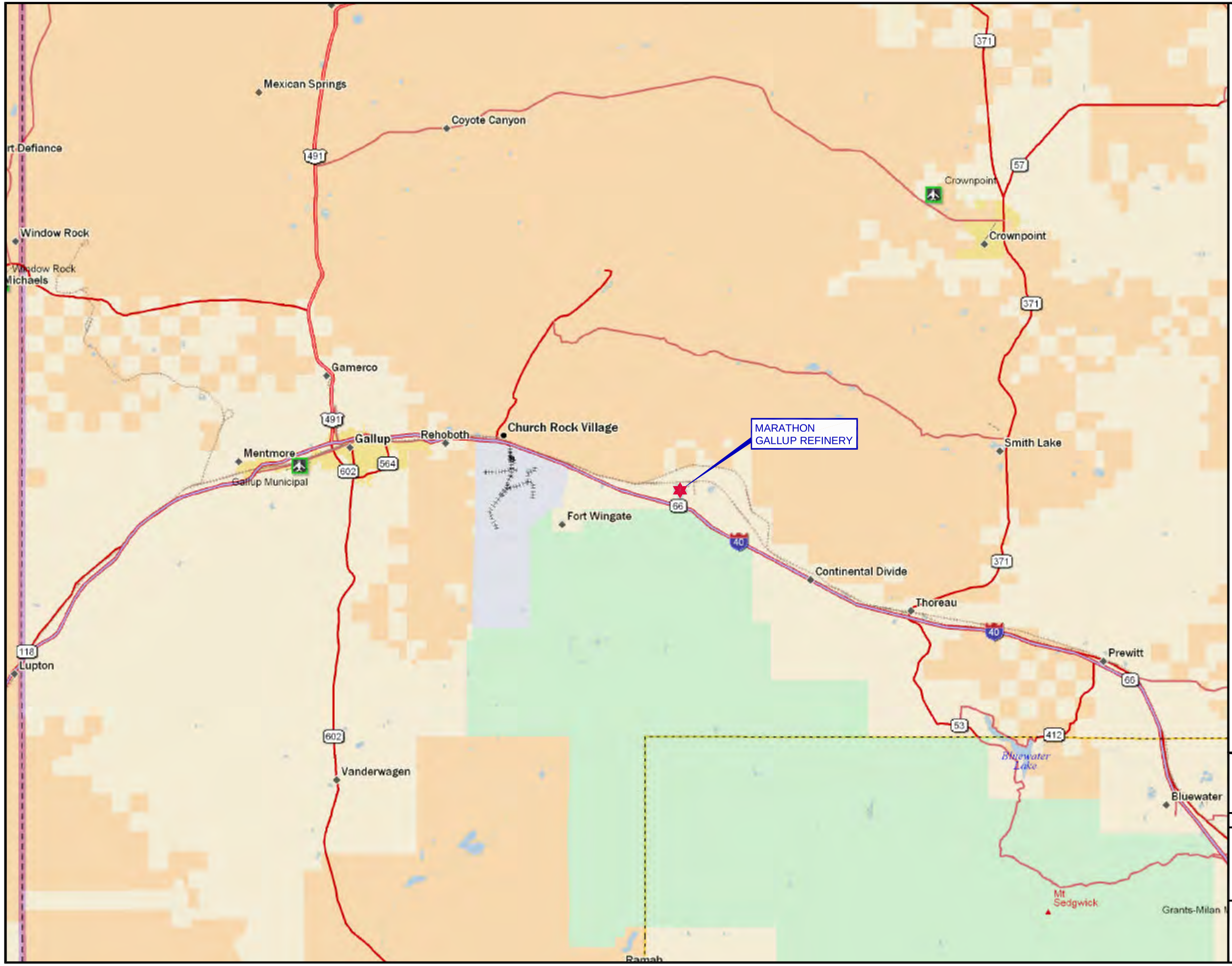
Table 6 - Groundwater Data Statistical Evaluation
2018 Sampling Event - RCRA Post-Closure Care Land Treatment Unit
Marathon Petroleum Company - Gallup Refinery

Constituent	X_a	X_b	S^2_m	S^2_b	N_m	N_b	W_b	t_b	W_m	t_m	t*	t_c	Is t* > or = t_c
Arsenic	1.10750	0.83250	0.03957	0.01129	12	4	0.002823	1.796	0.003297	2.353	3.515234	2.096081	YES
Barium	17.58333	20.75000	74.81061	0.91667	12	4	0.229167	1.796	6.234217	2.353	-1.24558	2.333251	NO
Chromium	2.65167	2.38500	3.40898	1.51290	12	4	0.378225	1.796	0.284082	2.353	0.327672	2.034913	NO
Lead	0.46583	0.21000	0.22437	0.00213	12	4	0.000533	1.796	0.018698	2.353	1.844829	2.337553	NO
Mercury	0.07830	0.09667	0.00056	0.00003	12	3	1.11E-05	1.796	0.00005	2.92	-2.42328	2.702595	NO
Selenium	0.43667	0.47500	0.01464	0.02750	12	4	0.006875	1.796	0.00122	2.353	-0.42605	1.879957	NO
Bis(2-ethylhexyl) phthalate	0.13690	0.06590	0.10094	0.01506	12	4	0.003766	1.796	0.008411	2.353	0.643399	2.180742	NO

X_a = mean of the sample
X_b = mean of the background
S^2_m - variance of the sample
S^2_b = variance of the background
N_m = number of samples
N_b = number of background samples
W_b = variance / number of background samples
t_b = t-table with (Nb-1) degrees of freedom from the 0.05 level of significance
W_m = variance / number of samples
t_m = t-table with (Nm-1) degrees of freedom at the 0.05 level of significance
$t^* = (X_a - X_b) / (S^2_m / N_m) + (S^2_b / N_b))^{1/2}$
$tc = (W_b t_b + W_m t_m) / (W_b + W_m)$

Figures

Map Source: DeLorme Street Atlas USA 2007 Plus.



0 5
SCALE IN MILES

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 12/09/18 | FILE: Mathon–dB206

FIGURE 1
SITE LOCATION MAP
GALLUP REFINERY

DiSorbo
Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759

Map Source: Google Earth Aerial, 03/18/2016.

N

0 800

SCALE IN FEET

NEW MEXICO

SITE LOCATION

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon	DATE: 09/17/19	FILE: Mathon-dA168

FIGURE 2
LOCATION OF
LAND TREATMENT UNIT

DiSorbo
Environmental Consulting Firm

8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759

Map Source: Google Earth Aerial, 03/18/2016.

N

0 200

SCALE IN FEET

LEGEND

C2L2 SOIL BORING LOCATION AND IDENTIFICATION NUMBER

SMW-4 MONITORING WELL LOCATION (CHINLE / ALLUVIAL) AND IDENTIFICATION NUMBER

MW-4 MONITORING WELL LOCATION (SONSELA) AND IDENTIFICATION NUMBER

NEW MEXICO

SITE LOCATION

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

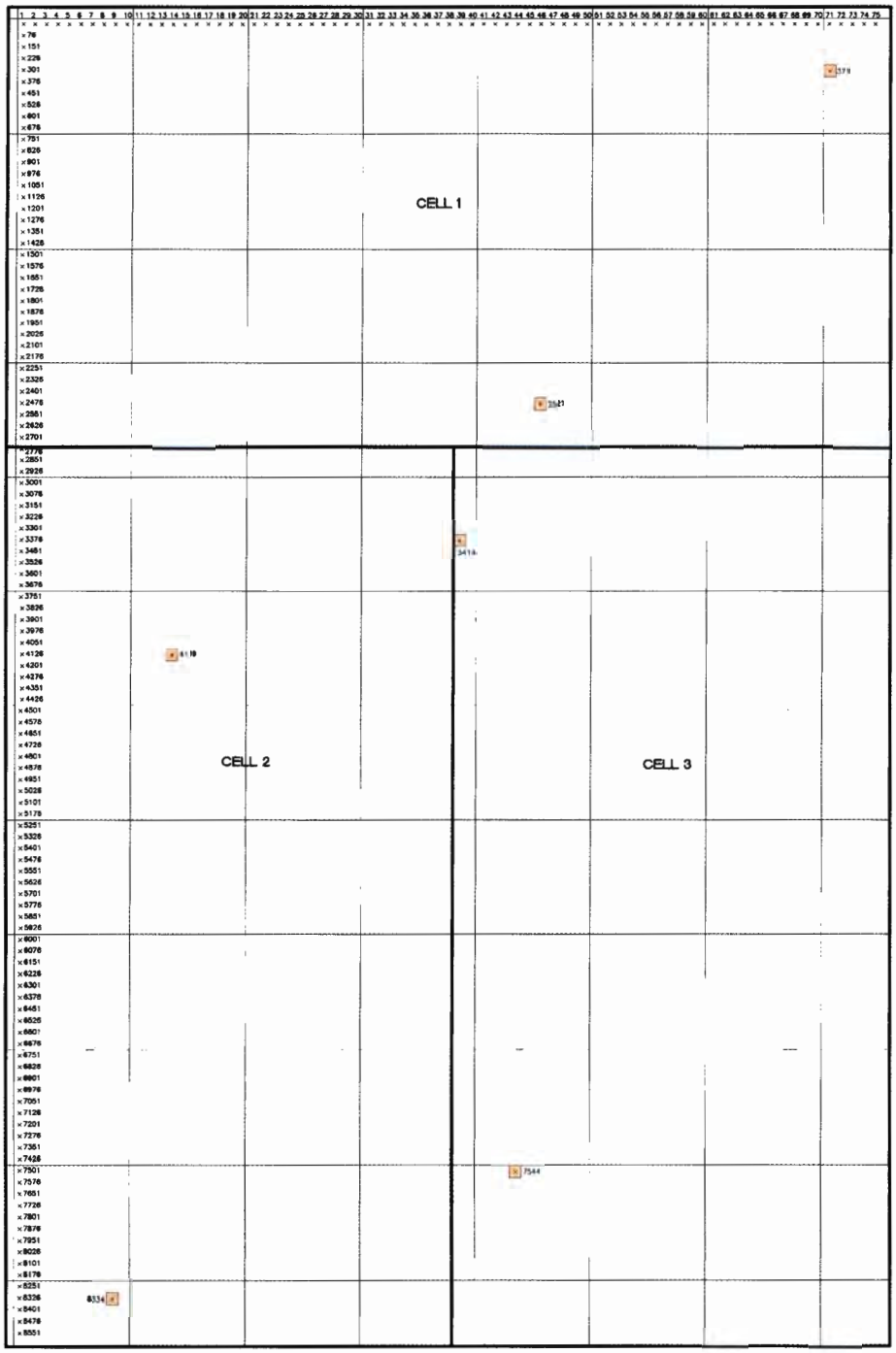
PROJ. NO.: Marathon | DATE: 09/17/19 | FILE: Mathon-dA169

FIGURE 3
LAND TREATMENT UNIT
SAMPLE LOCATIONS

DiSorbo Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759

Appendix A

Historical Sample Location Information



EXPLANATION

- APPROXIMATE LAND TREATMENT UNIT BOUNDARY
- MAJOR GRID
- MINOR GRID
- 6'X6' GRID
- 6'X6' GRID TO BE SAMPLED

NOTES:

1. GRIDS TO BE SAMPLED WERE DETERMINED USING RANDOM.ORG RANDOM INTEGER GENERATOR.
2. PARTIAL 6'X6' GRIDS WERE NOT INCLUDED IN THE SAMPLE LOCATION SELECTION.

N

0 ~40' ~80'

Trihydro CORPORATION
1252 Commerce Drive
Laramie, Wyoming 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

DRAFT

FIGURE 1

LTU RCRA SOIL SAMPLING LOCATIONS (DECEMBER 2009)

WESTERN REFINING COMPANY L.L.C.
GALLUP REFINERY
GALLUP, NEW MEXICO

Drawn By: REP	Checked By: GP	Scale: 1" = ~40'	Date: 11/30/09	File: 697036-LTU-SOIL-20091130

Map Source: Google Earth Aerial, 03/18/2016.

SITE LOCATION

N

0 200

SCALE IN FEET

LEGEND

C2L2 ⊗ SOIL BORING LOCATION AND IDENTIFICATION NUMBER

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.: Marathon | DATE: 09/17/19 | FILE: Mathon-dA170

INITIAL SAMPLE LAYOUT FOR 2018 SAMPLING EVENT

DiSorbo Environmental Consulting Firm
8501 N. MoPac Expy.
Suite 300
Austin, Texas 78759

Lockwood, Andrews
& Newnam, Inc.
Engineering · Architecture · Planning · Project Management

GIANT REFINING COMPANY

GALLUP, NEW MEXICO

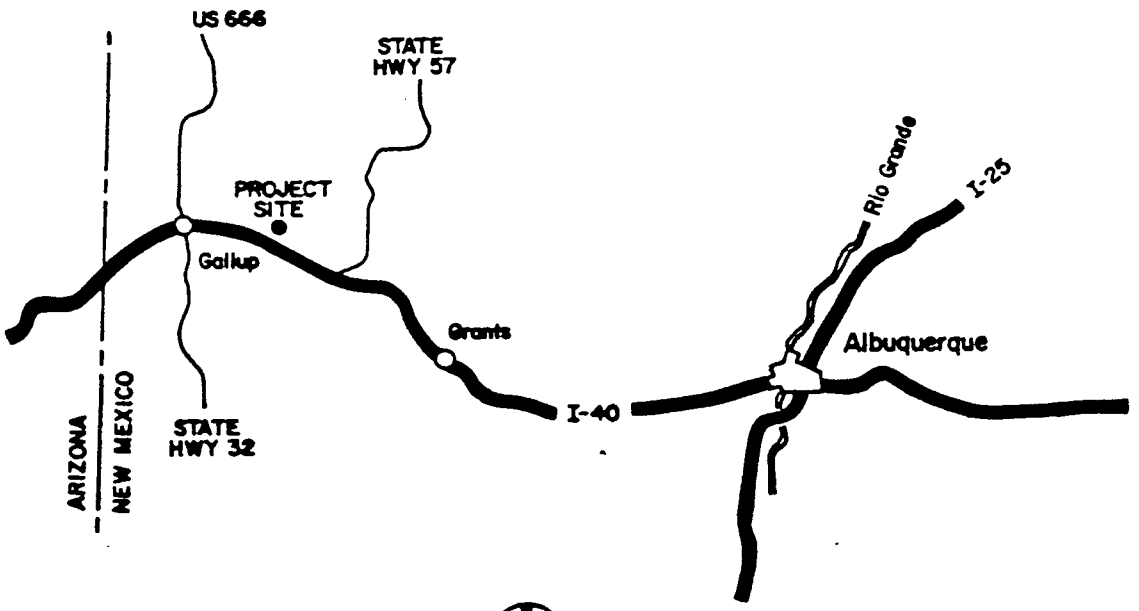
LAND TREATMENT DEMONSTRATION
VOLUME I - ENGINEERING REPORT

PRESENTED TO
NEW MEXICO HEALTH AND ENVIRONMENT DEPARTMENT
BY
APPLIED EARTH SCIENCES, INC.
MAY 1988

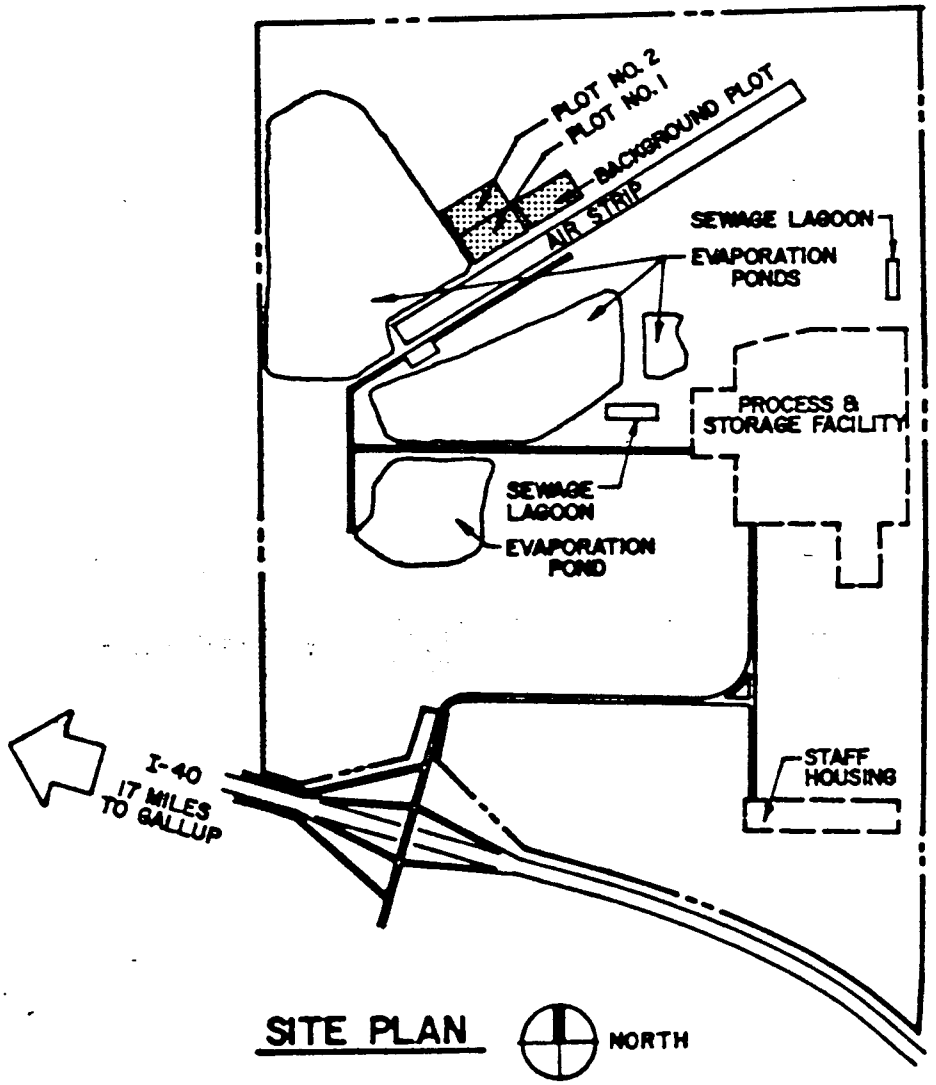
2.0 PROJECT DESCRIPTION

Based on the Demonstration Permit (NMD000333211-1) and the Permit Application Report (June 1986, Appendix A), a Land Treatment Demonstration was conducted to show treatment capabilities for refinery waste generated by Giant Refining Company. The demonstration occurred on Giant Refining Company land, approximately 17 miles east of Gallup, New Mexico, north of Interstate 40 (see Figure 2.0) utilizing the existing land treatment facility. The demonstration period lasted from April 1987 through March 1988.

The demonstration permit allowed the application of five types of waste. These waste types are listed in Table 2.0. Three of the original five designated wastes were applied to and incorporated into the treatment areas, Plots 1 and 2. On each 2.4-acre plot, the following wastes were placed: slop oil solids, API separator sludge and heat exchanger sludge. Cooling tower sludge has been eliminated from the waste stream, due to process changes that eliminated chromate in cooling water, and leaded tank bottoms are dumped at a frequency of about once every two years. The treatment area was then tilled after each waste application. The plots are surrounded by a dike. Adjacent to the treatment area is a background plot with no dikes or waste application. The background plot was monitored for any natural variations that could then be compared to the treatment plots' characteristics.



VICINITY MAP NORTH



SITE PLAN NORTH

FIGURE 2.0

GIANT REFINING COMPANY - GALLUP, NM
LAND TREATMENT DEMONSTRATION
VICINITY & SITE PLAN

Lockwood, Andrews & Newnam, Inc.

3.2 SAMPLING

Pre-demonstration samples in all the plots were taken on April 28 and 29, 1987 to determine the existing soil constituents. Six soil borings were made in the background plot as well as twelve borings in each of the two treatment plots. Sample points in the treatment plots are shown in Figure 3.1 and in the background plot are shown in Figure 3.2.

Quarterly samples were then taken in September, 1987, December, 1987 and March, 1988, and the sample locations are shown in Figures 3.3, 3.4 and 3.5 respectively. The post demonstration sampling was taken in April, 1988 and the sample locations are shown in Figures 3.6 and 3.7.

Boring sites were chosen by generating random coordinates within each plot. Samples were then taken and organized relative to each plot, set of borings and depth interval. Table 3.3 shows the interval spacing and the number of borings composited per sample.

Interval one samples were composites of three borings from the same plot. Interval two through five were composites of the same six borings from the same plot. Interval six samples were not composited and are therefore individual samples from each boring.

Interval (Vertical)	Composite Range
One (0' to 1')	3 borings* composited
Two (1' to 2')	6 borings* composited
Three (2' to 3')	6 borings* composited
Four (3' to 4')	6 borings* composited
Five (4' to 5')	6 borings* composited
Six (5' to 6')	Each boring is sampled separately.

* Borings were located within the same plot.

TABLE 3.3 VERTICAL SAMPLE INTERVAL SPACING

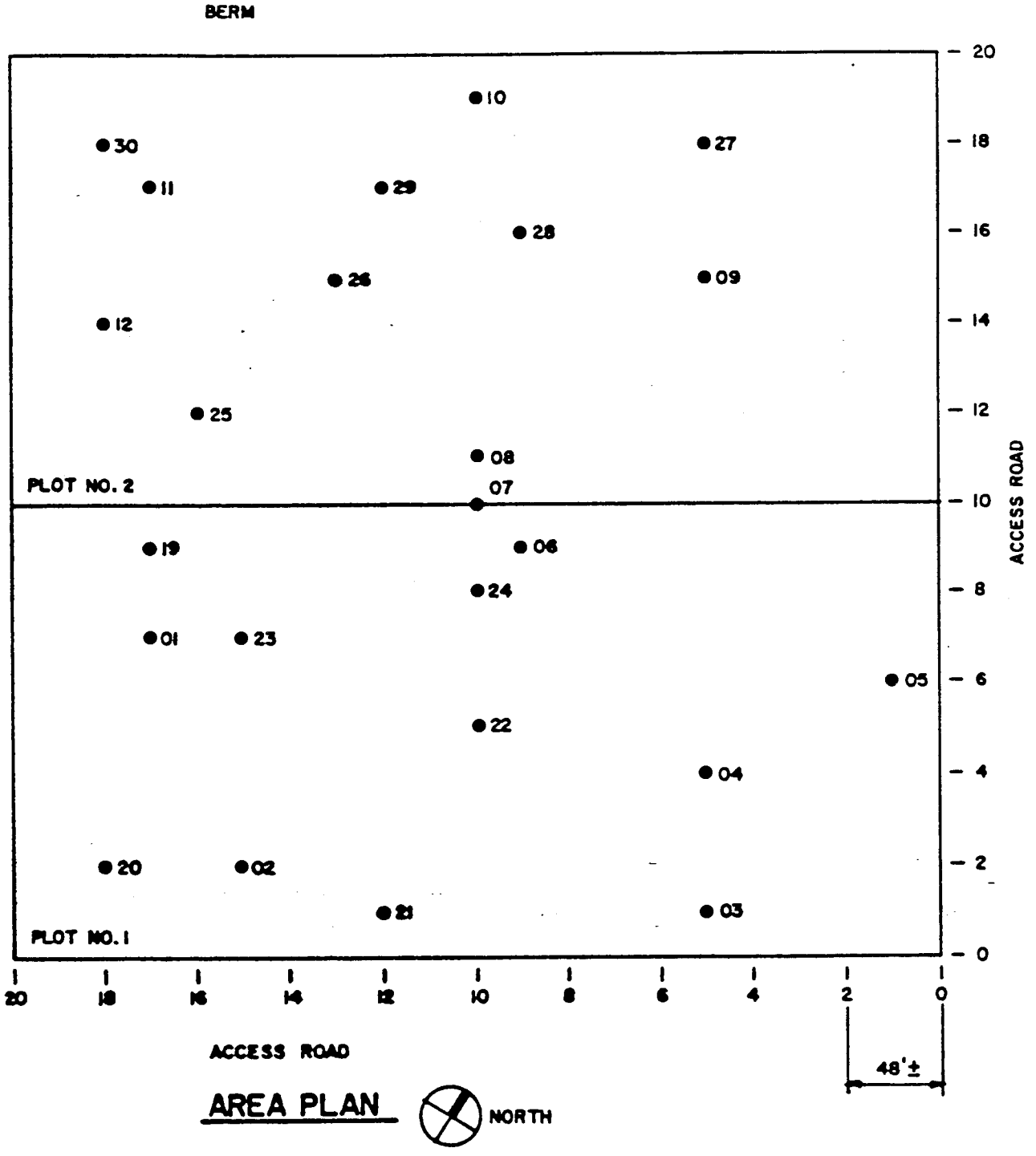
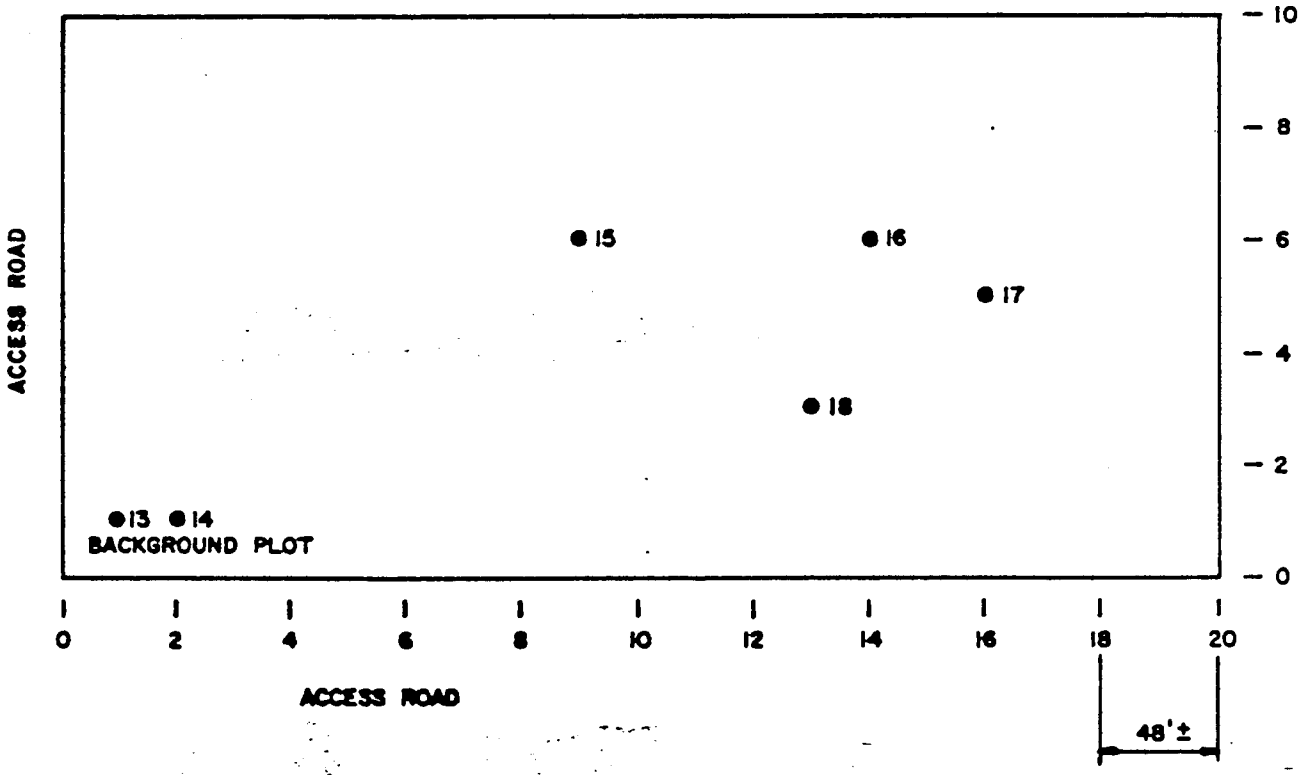


FIGURE 3.1

GIANT REFINING COMPANY - GALLUP, NM
LAND TREATMENT DEMONSTRATION
SAMPLE LOCATIONS - EVENT NO. 1, APRIL '87

Lockwood, Andrew & Newnam, Inc.



AREA PLAN

FIGURE 3.2

GIANT REFINING COMPANY - GALLUP, NM
LAND TREATMENT DEMONSTRATION
SAMPLE LOCATIONS - PRE DEMO EVENT, APR '87

Lockwood, Andrews & Newnam, Inc.

SAMPLING PLAN

LAND TREATMENT UNIT
GIANT REFINING COMPANY
CINIZA

MAY 19, 1993

PREPARED BY:

LYNN SHELTON

FIGURE 1

LAND TREATMENT UNIT

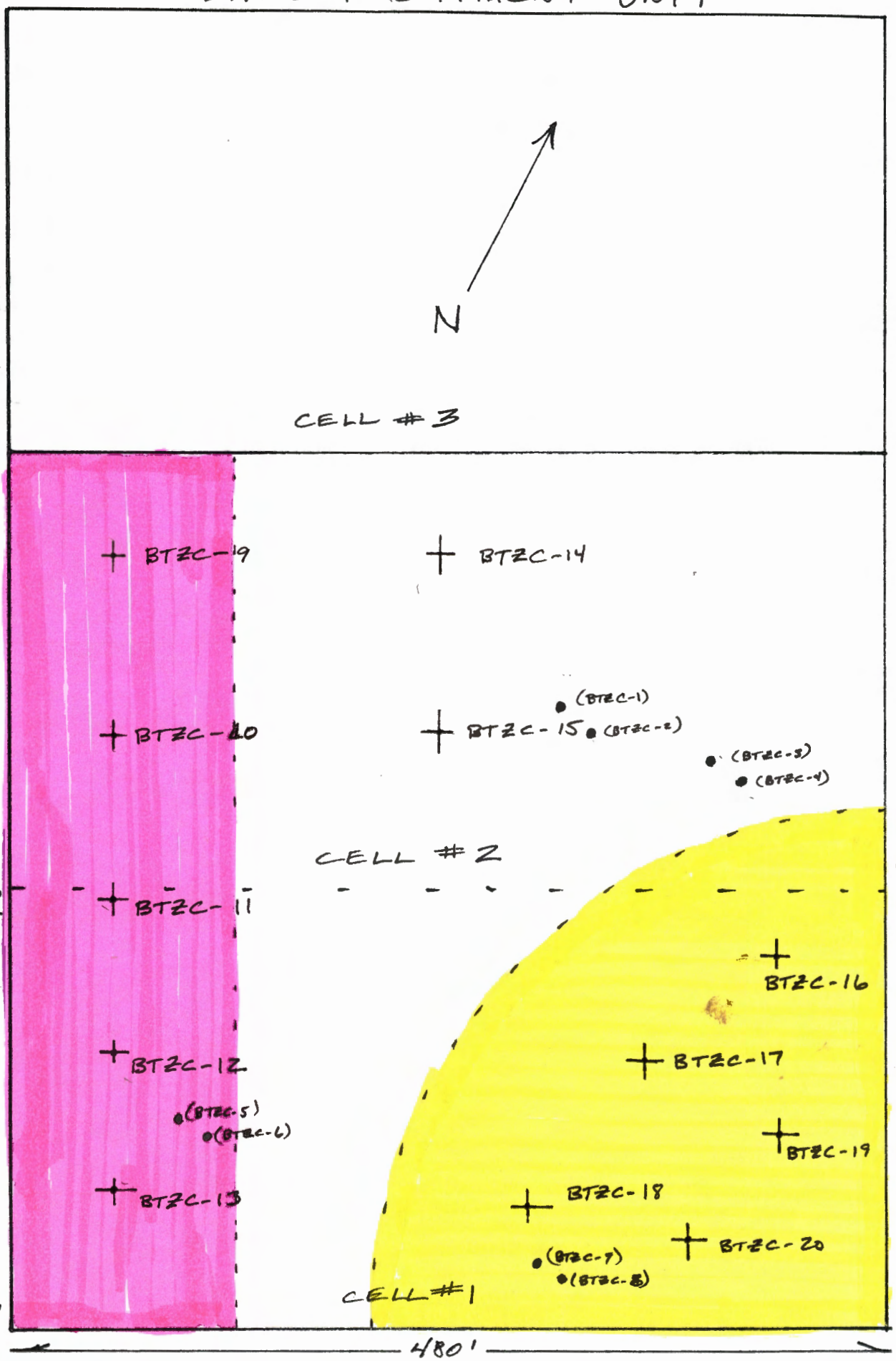
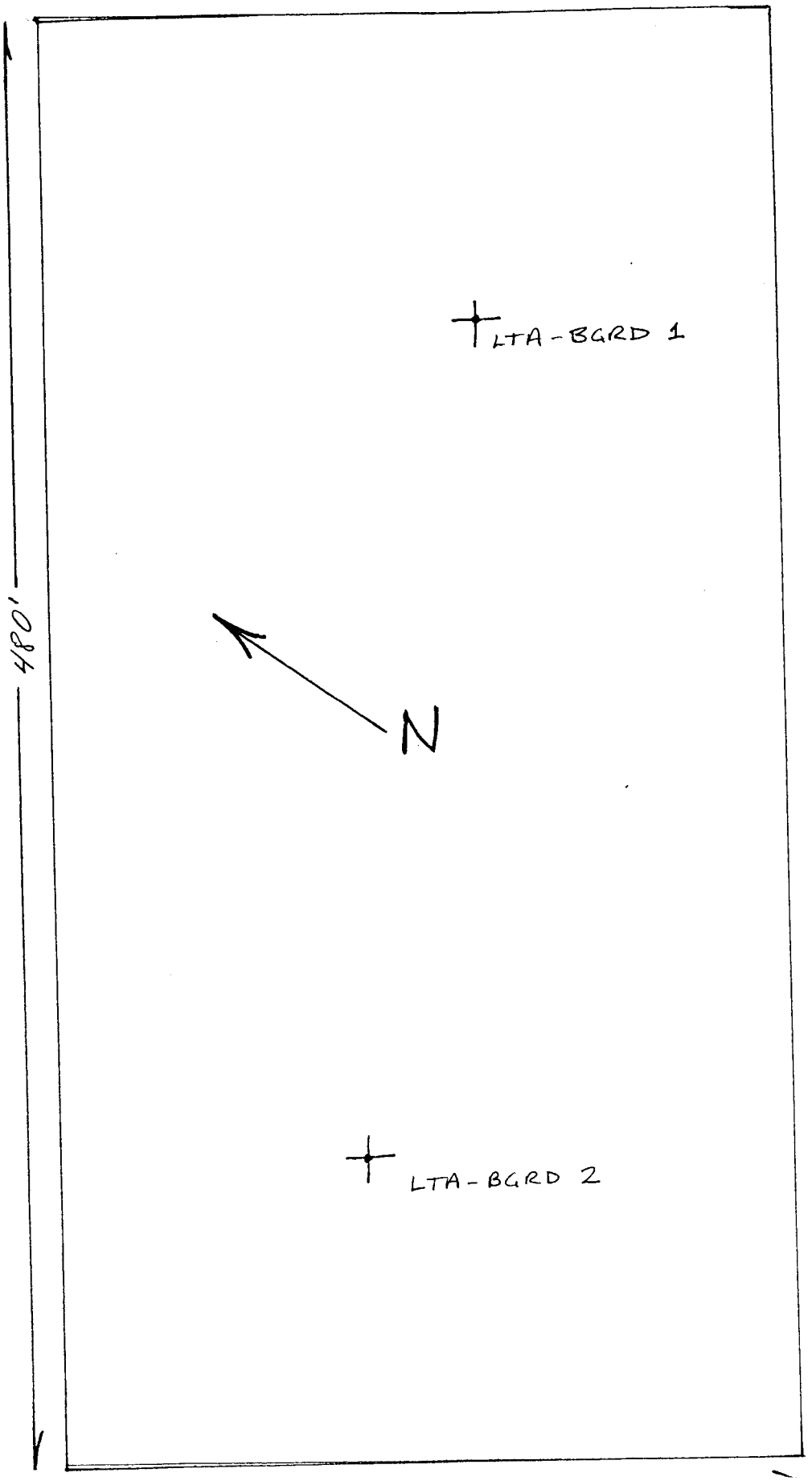


FIGURE 2

LTU BACKGROUND PLOT



TLS-5-95

1997 Image of LTU

Write a description for your map.

Legend

- SWMU 13
- Untitled Placemark
- Untitled Placemark

OCD Landfarm

Untitled Placemark
SWMU 13 Ditch
Untitled Placemark
Untitled Placemark
Untitled Placemark
Untitled Placemark
Untitled Placemark
SWMU 13 overflow pond
Untitled Placemark
Untitled Placemark
Untitled Placemark

Google Earth

Image U.S. Geological Survey

N

400 ft


2005 Image of LTU
Write a description for your map.
Legend
Feature 1
Untitled Placemark
Untitled Placemark
OCD Landfarm
SB-FD-1
SWMU 13-Ditch
Untitled Placemark
Untitled Placemark
N
700 ft
Google Earth
Image NMRGIS

Appendix B

Outlier Analysis

	A	B	C	D	E	F	G	H	I	J	K
1					**Outlier Tests for Selected Uncensored Variables**						
2				**User Selected Options**							
3				Date/Time of Computation	ProUCL 5.17/3/2019 2:00:22 PM						
4					From File WorkSheet.xls						
5					Full Precision OFF						
6											
7											
8					**Dixon's Outlier Test for Arsenic**						
9											
10	Number of Observations = 20										
11	10% critical value: 0.401										
12	5% critical value: 0.45										
13	1% critical value: 0.535										
14											
15	**1. Observation Value 17 is a Potential Outlier (Upper Tail)?**										
16											
17	Test Statistic: 0.840										
18											
19	For 10% significance level, 17 is an outlier.										
20	For 5% significance level, 17 is an outlier.										
21	For 1% significance level, 17 is an outlier.										
22											
23	**2. Observation Value 1.1 is a Potential Outlier (Lower Tail)?**										
24											
25	Test Statistic: 0.107										
26											
27	For 10% significance level, 1.1 is not an outlier.										
28	For 5% significance level, 1.1 is not an outlier.										
29	For 1% significance level, 1.1 is not an outlier.										
30											
31											
32					**Dixon's Outlier Test for Barium**						
33											
34	Number of Observations = 20										
35	10% critical value: 0.401										
36	5% critical value: 0.45										
37	1% critical value: 0.535										
38											
39	**1. Observation Value 3400 is a Potential Outlier (Upper Tail)?**										
40											
41	Test Statistic: 0.955										
42											
43	For 10% significance level, 3400 is an outlier.										
44	For 5% significance level, 3400 is an outlier.										
45	For 1% significance level, 3400 is an outlier.										
46											
47	**2. Observation Value 200 is a Potential Outlier (Lower Tail)?**										
48											
49	Test Statistic: 0.415										
50											
51	For 10% significance level, 200 is an outlier.										
52	For 5% significance level, 200 is not an outlier.										

	A	B	C	D	E	F	G	H	I	J	K
53	For 1% significance level, 200 is not an outlier.										
54											
55											
56	**Dixon's Outlier Test for Beryllium**										
57											
58	Number of Observations = 20										
59	10% critical value: 0.401										
60	5% critical value: 0.45										
61	1% critical value: 0.535										
62											
63	**1. Observation Value 11 is a Potential Outlier (Upper Tail)?**										
64											
65	Test Statistic: 0.929										
66											
67	For 10% significance level, 11 is an outlier.										
68	For 5% significance level, 11 is an outlier.										
69	For 1% significance level, 11 is an outlier.										
70											
71	**2. Observation Value 0.6 is a Potential Outlier (Lower Tail)?**										
72											
73	Test Statistic: 0.417										
74											
75	For 10% significance level, 0.6 is an outlier.										
76	For 5% significance level, 0.6 is not an outlier.										
77	For 1% significance level, 0.6 is not an outlier.										
78											
79											
80	**Dixon's Outlier Test for Chromium**										
81											
82	Number of Observations = 20										
83	10% critical value: 0.401										
84	5% critical value: 0.45										
85	1% critical value: 0.535										
86											
87	**1. Observation Value 190 is a Potential Outlier (Upper Tail)?**										
88											
89	Test Statistic: 0.331										
90											
91	For 10% significance level, 190 is not an outlier.										
92	For 5% significance level, 190 is not an outlier.										
93	For 1% significance level, 190 is not an outlier.										
94											
95	**2. Observation Value 6.2 is a Potential Outlier (Lower Tail)?**										
96											
97	Test Statistic: 0.019										
98											
99	For 10% significance level, 6.2 is not an outlier.										
100	For 5% significance level, 6.2 is not an outlier.										
101	For 1% significance level, 6.2 is not an outlier.										
102											
103											
104	**Dixon's Outlier Test for Cobalt**										

	A	B	C	D	E	F	G	H	I	J	K
105											
106	Number of Observations = 20										
107	10% critical value: 0.401										
108	5% critical value: 0.45										
109	1% critical value: 0.535										
110											
111	**1. Observation Value 63 is a Potential Outlier (Upper Tail)?**										
112											
113	Test Statistic: 0.915										
114											
115	For 10% significance level, 63 is an outlier.										
116	For 5% significance level, 63 is an outlier.										
117	For 1% significance level, 63 is an outlier.										
118											
119	**2. Observation Value 4.1 is a Potential Outlier (Lower Tail)?**										
120											
121	Test Statistic: 0.154										
122											
123	For 10% significance level, 4.1 is not an outlier.										
124	For 5% significance level, 4.1 is not an outlier.										
125	For 1% significance level, 4.1 is not an outlier.										
126											
127											
128	**Dixon's Outlier Test for Lead**										
129											
130	Number of Observations = 20										
131	10% critical value: 0.401										
132	5% critical value: 0.45										
133	1% critical value: 0.535										
134											
135	**1. Observation Value 120 is a Potential Outlier (Upper Tail)?**										
136											
137	Test Statistic: 0.830										
138											
139	For 10% significance level, 120 is an outlier.										
140	For 5% significance level, 120 is an outlier.										
141	For 1% significance level, 120 is an outlier.										
142											
143	**2. Observation Value 0.6 is a Potential Outlier (Lower Tail)?**										
144											
145	Test Statistic: 0.143										
146											
147	For 10% significance level, 0.6 is not an outlier.										
148	For 5% significance level, 0.6 is not an outlier.										
149	For 1% significance level, 0.6 is not an outlier.										
150											
151											
152	**Dixon's Outlier Test for Mercury**										
153											
154	Number of Observations = 20										
155	10% critical value: 0.401										
156	5% critical value: 0.45										

	A	B	C	D	E	F	G	H	I	J	K
157	1% critical value: 0.535										
158											
159	**1. Observation Value 1.4 is a Potential Outlier (Upper Tail)?**										
160											
161	Test Statistic: 0.359										
162											
163	For 10% significance level, 1.4 is not an outlier.										
164	For 5% significance level, 1.4 is not an outlier.										
165	For 1% significance level, 1.4 is not an outlier.										
166											
167	**2. Observation Value 0.0034 is a Potential Outlier (Lower Tail)?**										
168											
169	Test Statistic: 0.006										
170											
171	For 10% significance level, 0.0034 is not an outlier.										
172	For 5% significance level, 0.0034 is not an outlier.										
173	For 1% significance level, 0.0034 is not an outlier.										
174											
175											
176	**Dixon's Outlier Test for Nickel**										
177											
178	Number of Observations = 20										
179	10% critical value: 0.401										
180	5% critical value: 0.45										
181	1% critical value: 0.535										
182											
183	**1. Observation Value 130 is a Potential Outlier (Upper Tail)?**										
184											
185	Test Statistic: 0.880										
186											
187	For 10% significance level, 130 is an outlier.										
188	For 5% significance level, 130 is an outlier.										
189	For 1% significance level, 130 is an outlier.										
190											
191	**2. Observation Value 7.6 is a Potential Outlier (Lower Tail)?**										
192											
193	Test Statistic: 0.133										
194											
195	For 10% significance level, 7.6 is not an outlier.										
196	For 5% significance level, 7.6 is not an outlier.										
197	For 1% significance level, 7.6 is not an outlier.										
198											
199											
200	**Dixon's Outlier Test for Vanadium**										
201											
202	Number of Observations = 20										
203	10% critical value: 0.401										
204	5% critical value: 0.45										
205	1% critical value: 0.535										
206											
207	**1. Observation Value 220 is a Potential Outlier (Upper Tail)?**										
208											

	A	B	C	D	E	F	G	H	I	J	K
209	Test Statistic: 0.882										
210											
211	For 10% significance level, 220 is an outlier.										
212	For 5% significance level, 220 is an outlier.										
213	For 1% significance level, 220 is an outlier.										
214											
215	**2. Observation Value 16 is a Potential Outlier (Lower Tail)?**										
216											
217	Test Statistic: 0.040										
218											
219	For 10% significance level, 16 is not an outlier.										
220	For 5% significance level, 16 is not an outlier.										
221	For 1% significance level, 16 is not an outlier.										
222											
223											
224	**Dixon's Outlier Test for Zinc**										
225											
226	Number of Observations = 8										
227	10% critical value: 0.479										
228	5% critical value: 0.554										
229	1% critical value: 0.683										
230											
231	**1. Observation Value 235 is a Potential Outlier (Upper Tail)?**										
232											
233	Test Statistic: 0.023										
234											
235	For 10% significance level, 235 is not an outlier.										
236	For 5% significance level, 235 is not an outlier.										
237	For 1% significance level, 235 is not an outlier.										
238											
239	**2. Observation Value 18 is a Potential Outlier (Lower Tail)?**										
240											
241	Test Statistic: 0.014										
242											
243	For 10% significance level, 18 is not an outlier.										
244	For 5% significance level, 18 is not an outlier.										
245	For 1% significance level, 18 is not an outlier.										
246											
247											
248	**Dixon's Outlier Test for Cyanide**										
249											
250	Number of Observations = 8										
251	10% critical value: 0.479										
252	5% critical value: 0.554										
253	1% critical value: 0.683										
254											
255	**1. Observation Value 6.74 is a Potential Outlier (Upper Tail)?**										
256											
257	Test Statistic: 0.226										
258											
259	For 10% significance level, 6.74 is not an outlier.										
260	For 5% significance level, 6.74 is not an outlier.										

	A	B	C	D	E	F	G	H	I	J	K
261	For 1% significance level, 6.74 is not an outlier.										
262											
263	**2. Observation Value 0.025 is a Potential Outlier (Lower Tail)?**										
264											
265	Test Statistic: 0.000										
266											
267	For 10% significance level, 0.025 is not an outlier.										
268	For 5% significance level, 0.025 is not an outlier.										
269	For 1% significance level, 0.025 is not an outlier.										
270											

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Appendix C
Field Methods

Field Methods

Decontamination Procedures

The pump, tubing, and electrical line is decontaminated with soap and potable water in a clean 55-gallon drum. The drum is filled with the soap and water mixture and is pumped out of the drum and discharged to the refinery's sewer system upstream of the NAPIS. The pump, tubing, and electrical line is then lowered to a clean 55-gallon drum filled with potable water. The potable water is pumped out of the drum through the pump and tubing and discharged to the sewer system. The purge water from each well is pumped directly from the well into a clean, plastic chemical tote located at each well. The water from each tote is removed via vacuum truck and discharged to sewer system.

The following procedures were followed during sample collection:

- Protective eye was worn during purging and sampling;
- Nitrile gloves were worn when collecting samples. New disposable gloves were used to collect samples at each sample point;
- All samples collected for chemical analysis were transferred into clean sample containers supplied by the analytical laboratory. Sample containers were clearly marked and labeled;
- Samples were labeled, sealed, placed in cooler with ice until they are shipped via courier or personally delivered to the analytical laboratory; and
- Standard COC procedures were followed for all samples collected. The COC form and sample request form were shipped inside the sealed storage container to be delivered to the laboratory, signed and dated.

A field blank and trip blank were obtained for quality assurance during sampling activities. The trip blank accompanied laboratory sample bottles and shipping and storage containers intended for volatile organic compound (VOC) analyses. The trip blank consisted of a sample of analyte free de-ionized water placed in an appropriate sample container. One field duplicate (DUPLICATE) was collected at monitor well MW-4.

In order to prevent cross-contamination, field equipment that came into contact with water or soil was decontaminated before each sampling event. Any equipment that came in contact with each well, such as the water level meter, was decontaminated with a detergent water

mixture and rinsed with distilled water before each use. Decontamination of equipment when feasible is done at the bundle pad where decontamination water is drained into the sewer system. Decontamination water from field work was caught in an appropriate container and drained into the sewer system upstream of the NAPIS.

The groundwater samples and QA/QC samples were analyzed for the following:

- Volatile Organic Compounds (Method 8260B);
- 1,2-Dibromethane (Method 8011);
- DRO/MRO/GRO (Method 8015);
- Mercury (Method 7470); and
- Metals (Methods 6010B and 6020).

The drilling equipment (e.g., hollow-stem augers) was decontaminated between each borehole using a high-pressure potable water wash. The sampling equipment coming in direct contact with the samples (e.g., hand augers and split-spoon samplers) were decontaminated using a brush, as necessary, to remove larger particulate matter followed by a rinse with potable water, wash with non-phosphate detergent, rinse with potable water, and double rinse with deionized water.

Fluid Level Measurements

The depth to separate phase hydrocarbon, if present, and groundwater was measured prior to purging the wells of potentially stagnant groundwater. A Geotech Interface Probe was used to measure fluid levels to 0.01 foot.

Well Development/Purging

Each monitor well was gauged for depth to water (DTW), and total depth, to determine the amount of water to purge. A minimum of three well volumes were purged from MW-2, MW-4 and MW-5. In monitor wells MW-1 and SMW-4 the groundwater failed to recharge during the purging and the pump lost suction before three volumes were purged.

The following table summarizes the purging and sampling data. The purge volumes are calculated as follows:

Volume (gallons) = water column thickness (ft) x 3.14 x radius of well casing^2 (ft) x 7.48 (gals/ft).

Well	Depth to Water (ftbtoc)	Depth to Bottom (ftbtoc)	Calculated 3 Wells Volumes (gals)	Purge Date - Time	Purge Volume (gals)	Sample Date - Time
MW-1	7.36	130.83	378	12/5/18 - 1032	225	12/6/18 - 0810
MW-2	16.63	137.48	370	12/5/18 - 1315	375	12/6/18 – 0837
MW-4	7.83	121.72	348	12/6/18 - 1005	350	12/6/18 – 1300
MW-5	16.80	130.83	253	12/5/18 - 1605	255	12/6/18 – 0918
SMW-4	29.25	69.68	20	12/6/18 - 0950	11.5	12/6/18 - 1345

Ftbtoc – feet below top of casing

Field water quality measurements were recorded prior to sampling each well. A YSI Model 556 MPS Multi Probe System, which simultaneously measures DO, conductivity, temperature, pH and ORP (Oxidation Reduction Potential) was used to collect the measurements. A minimum of three consecutive readings were taken at 2-minute intervals, within the following limits before sampling began: dissolved oxygen (DO) (10%), specific conductance (10%), temperature (10%), and pH (10%).

The following water quality data was collected immediately before sampling.

Well	pH	Temp (°C)	Cond. (mS/cm)	TDS (g/L)	Salinity (ppt)	DO (%)	ORP (mv)
MW-1	9.07	11.55	0.826	0.723	0.56	10.4	5.5
MW-2	9.09	11.48	0.829	0.727	0.56	17.0	2.9
MW-4	8.94	12.42	0.890	0.763	0.59	11.4	9.1
MW-5	9.15	11.90	0.852	0.738	0.57	9.1	7.5
SMW-4	8.73	12.49	0.941	0.804	0.62	19.2	11.9

mS/cm – milli-siemens/centimeter g/L – grams / liter C - Celsius
ppt – parts per trillions DO – dissolved oxygen
ORP – oxidation/reduction potential mv - millivolts

Groundwater samples were obtained from each well within 24 hours of the completion of well purging. Well sampling was performed using sampling pumps. The samples were transferred to an appropriate, clean, laboratory-prepared containers provided by the analytical laboratory. Sample collection methods have been documented in the field monitoring reports. Weather conditions, the volume of groundwater purged, description of water, the instruments used, and the water quality readings obtained at each interval were recorded on the field-monitoring log.

Soil Sample Collection and Handling Procedures

Soil samples were collected using split-spoon samplers. The selected portion of the sample interval was placed in pre-cleaned, laboratory-prepared sample containers for laboratory chemical analysis. Three soil samples were collected for VOC analysis in the following manner:

- Two sample aliquots were collected using a syringe for low-level VOC analysis pursuant to EPA method 5035. For these "Terracore" kits, 4- 5 grams (4cc) of soil was injected into each vial using the syringe. The syringes were disposed after soil collection.
- Two sample aliquots were collected using a syringe for preservation with methanol. For the methanol preserved kits, 10 grams (10 cc) of soil was injected into each methanol vial using the syringe. The syringes were disposed after soil collection.
- The third sample aliquot was placed in an 8-ounce glass jar, which was filled to the top to minimize any head space.

Two additional soil samples were collected in 8-ounce glass jars for semivolatile and metals analyses.

Equipment Calibration

The instruments used to measure groundwater stabilization parameters included an YSI Professional Series Data Logger and YSI Quatro Sonde. The calibration solutions used at the beginning of each day are as follows:

- pH solution;
- 7.0 pH solution;
- 10.0 pH solution; and
- 1.413 mS/cm conductivity solution.

Appendix D
Analytical Data Validation

DATA VALIDATION INTRODUCTION

This summary presents data validation results for soil and groundwater samples collected from soil boring and monitoring wells during the 2018 Land Treatment Unit (LTU) sampling effort at the Gallup Refinery. The data review was performed in accordance with Provision IV.J.3.b (Review of Field and Laboratory QA/QC Data) of the RCRA Permit issued by NMED in October 2013, USEPA Functional Guidelines for Organic and Inorganic Data Review, and quality assurance and control parameters set by the project laboratory Hall Environmental Analysis Laboratory, Inc. (HEAL).

Three laboratory data packages (numbers 1812373, 1812764, and 1812773) including a total of 12 soil samples and five groundwater samples (excluding QA samples) were collected from December 6, 2018 through December 11, 2018 in accordance Attachment D of the Permit. Soil and groundwater samples were submitted to HEAL for the following analyses:

- Volatile organic compounds (VOCs) by USEPA Method 8260B or 8011/504.1;
- Semi-volatile organic compounds (SVOCs) by USEPA Method 8270D;
- Gasoline, diesel, and motor oil range organics by SW-846 Method 8015B;
- Metals (antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, lead, nickel, selenium, silver, vanadium, and zinc) by EPA Methods 6010B and 6020;
- Cyanide by EPA 335.4 for water samples; and
- Mercury by EPA Method 7471 for soil samples and Method 7470 for water samples.

Additionally, seven quality assurance samples consisting of trip blanks, equipment rinsate blanks, field blanks, and field duplicates were collected and analyzed. Table A-1 presents a summary of the field sample identifications, laboratory sample identifications, and sample collection dates.

QUALITY CONTROL PARAMETERS REVIEWED

Sample results were subject to a Level II data review that includes an evaluation of the following quality control (QC) parameters:

- Chain-of-Custody;
- Sample Preservation and Temperature Upon Laboratory Receipt;
- Holding Times;
- Blank Contamination (method blanks, trip blanks, field blanks, and equipment rinsate blanks);

- Surrogate Recovery (for organic parameters);
- Laboratory Control Sample (LCS) Recovery and Relative Percent Difference (RPD);
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recovery and RPD;
- Duplicates (field duplicate, laboratory duplicate); and
- Other Applicable QC Parameters.

The data qualifiers used to qualify the analytical results associated with QC parameters outside of the established data quality objectives are defined below:

J+	The analyte was positively identified; however, the result should be considered an estimated value with a potential high bias.
J-	The analyte was positively identified; however, the result should be considered an estimated value with a potential low bias.
UJ	The reporting limit for a constituent that was not detected is considered an estimated value.
R	Quality control indicates that the data is not usable.

Results qualified as "J+", "J-", or "UJ" are of acceptable data quality and may be used quantitatively to fulfill the objectives of the analytical program, per EPA guidelines. Results for the performance monitoring events that required qualification based on the data verification are summarized in Table A-2.

CHAIN-OF-CUSTODY

The chain-of-custody documentation associated with project samples was found to be complete. Chain-of-custodies included sample identifications, date and time of collection, requested parameters, and relinquished/received signatures.

SAMPLE PRESERVATION AND TEMPERATURE UPON LABORATORY RECEIPT

Samples collected were received preserved and intact by HEAL. Samples were received by the laboratory at a temperature of 6.0 degrees Celsius or lower.

HOLDING TIMES

All samples were extracted and analyzed within method-specified holding time limits.

BLANK CONTAMINATION

Method Blank

Method blanks were analyzed at the appropriate frequency. Target compounds were not detected in the method blanks, with the exception of the following:

HEAL Report 1812764

- 2-butanone was detected in the blank for Batch ID A56506 at a concentration 1.5 micrograms per liter (ug/l). No qualifications were required.
- 1-methylnaphthalene (0.42 ug/l) and 2-methylnaphthalene (0.43 ug/l) were detected in the method blank for Batch ID A56506 below quantitation limits of 4.0 ug/l. One sample was qualified in Table A-2 based on the detection of 1-methylnaphthalene.
- Mercury was detected in the method blank for Batch ID 48182 below quantitation limits (0.071 ug/l vs. 2 ug/l. No samples are qualified because the detected concentrations are already "j-flagged" due to being reported at values below the reporting limits.
- Zinc was detected in the method blank (Batch ID 42228) at 6.4 ug/l, which is below the quantitation limit of 20 ug/l.). No samples are qualified because the detected concentrations are already "j-flagged" due to being reported at values below the reporting limits.

HEAL Report 1812373

- Mercury was detected in the method blank (0.094 ug/L) for Batch ID 42012 below the quantitation limit (0.2 ug/l). No samples are qualified because the detected concentrations are already "j-flagged" due to being reported at values below the reporting limits.
- Zinc was detected in the method blank (Batch ID 41991) at 4.9 ug/l, which is below the quantitation limit of 20 ug/l). No samples are qualified because the detected concentrations are already "j-flagged" due to being reported at values below the reporting limits.

HEAL Report 11812773

- Barium was detected in the method blank (0.024 milligrams per kilogram (mg/kg) for Batch ID 42119 below the quantitation limit (0.1 mg/kg). No samples are qualified because the detected concentrations are all significantly higher than the concentration reported in the method blank.

- Zinc was detected in the method blank (Batch ID 42119) at 0.54 mg/kg, which is below the quantitation limit of 2.5 mg/kg. No samples are qualified because the detected concentrations are well above the concentration reported in the method blank.

Trip Blank

Target compounds were not detected in the trip blanks with the following exceptions:

HEAL Report 1812764

- Acetone was reported at 1.1 ug/l in the trip blank, but there were no detections of acetone in the associated soil samples in lab report 1812773.

HEAL Report 1812373 – The following VOCs were detected in the sample Trip Blank (HEAL Sample ID 1610355-004A):

- Acetone was reported at 3.3 ug/l in the trip blank, which is less than the reporting limit of 10 ug/l; none of the associated samples are qualified.

Field Blanks/Equipment Rinsate Blank

The following constituents were detected in field or equipment rinsate blanks:

LTU FB01 (HEAL Report 1812746)

- Mercury, zinc, and acetone were detected at low concentrations, all below their respective reporting limits. Acetone was not detected in any of the associated soil samples in lab report 1812773. While mercury was detected in some of the associated soil samples, where it was detected, it was reported at significantly higher concentrations that the concentration in the field blank; no qualifications. Zinc was reported in all associated samples at significantly higher concentrations; no qualifications.

LTU EB01 (HEAL Report 1812746)

- Mercury, zinc, and acetone were also detected in this sample at similar concentrations as reported in LTU FB01. Based on the same criteria, none of the associated sample results are qualified.

Field Blank - HEAL Sample ID 1812373-001

- Acetone, benzene, and toluene were all reported at low concentrations (3.8 ug/l, 0.21 ug/l, and 0.29 ug/l, respectively) that fall below their reporting limits. Neither benzene or toluene were detected in any of the associated groundwater samples, but acetone was detected at similarly low concentrations in samples collected at MW-1, MW-2, SMW-4, and MW-4, which are all qualified in Table A-2.

SURROGATE RECOVERY

Surrogate recoveries for the organic and inorganic analyses were performed at the required frequency and were within laboratory acceptance limits, with the following exceptions:

HEAL Report 1812773

- Surrogate recovery for DNOP (Method 8015) was low for field samples LTU C2L2 ZOI and LTU C2L2 TZ due to dilution of the samples by a factor of 10. All other associated quality control samples are within standards and the two related analyses for diesel range organics (DRO) and motor oil range organics (MRO) are not qualified.

LCS RECOVERY AND RELATIVE PERCENT DIFFERENCE

Laboratory control samples (LCS)/LCS duplicates were performed at the required frequency and were evaluated based on the following criteria:

- If the analyte recovery was above acceptance limits for the LCS or LCS duplicate, but the analyte was not detected in the associated batch, then data qualification was not required.
- If the analyte recovery was above acceptance limits for the LCS or LCS duplicate and the analyte was detected in the associated batch, then the analyte results were qualified "J+" to account for a potential high bias.
- If the analyte recovery was below acceptance limits for LCS or LCS duplicate then the analyte results in the associated analytical batch were qualified ("UJ" for non-detects and "J-" for detected results) to account for a potential low bias.

LCS/LCSD percent recoveries and relative percent differences (RPDs) were within acceptance limits and no qualification was required.

MS/MSD RECOVERY AND RELATIVE PERCENT DIFFERENCE

Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples were performed at the required frequency and were evaluated by the following criteria:

- If the MS or MSD recovery for an analyte was above acceptance limits but the analyte was not detected in the associated analytical batch, then data qualification was not required.; If the MS or MSD recovery for an analyte was above acceptance limits and the analyte was detected in the associated analytical batch, then analyte results were qualified "J+" to account for a potential high bias; and
- Low MS/MSD recoveries for organic or inorganic parameters result in sample qualification of the associated analytical batch with a "J-".

MS/MSD percent recoveries and RPDs were within acceptance limits except for the following:

HEAL Report 1812773

- The MS and MSD recoveries for barium were above the high acceptance limit in Batch ID 42119. The associated results are qualified in Table A-2.

- The MS and MSD recoveries for silver were below the low acceptance limit in Batch ID 42119. The associated results are qualified in Table A-2.

DUPLICATES

Field Duplicates

The RPDs between the field duplicate and its associated sample were calculated and are presented in Table A-3. The field duplicates were evaluated by the following criteria:

- If an analyte was detected at a concentration greater than five times the method reporting limit, the RPD should be less than 35 percent for soil and 25 percent for groundwater samples.
- If an analyte was detected at a concentration that is less than five times the method reporting limit, then the difference between the sample and the field duplicate should not exceed the method reporting limit.
- Duplicate RPDs are calculated by dividing the difference of the concentrations by the average of the concentrations.

Field duplicate RPDs were within acceptance limits for both the soil and groundwater duplicate samples. See Table A-3 for a field duplicate summaries.

COMPLETENESS SUMMARY

The following equation was used to calculate the technical completeness:

$$\% \text{ Technical Completeness} = \left(\frac{\text{Number of usable results}}{\text{Number of reported results}}\right) \times 100$$

The technical completeness attained for Investigation activities was 100 percent. The completeness results are provided in Table A-4. The analytical results for the required analytes per the approved Work Plan were considered usable for the intended purposes and the project DQOs have been met.

Table A-1 - Sample Identification
2018 Sampling Event - RCRA Post-Closure Care LTU
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Sample ID	Lab ID	Date Collected	Sample Type
LTU C1L1 TZ	1812773-002	12/11/2018	N
LTU C1L1 ZOI	1812773-001	12/11/2018	N
LTU C1L2 TZ	1812773-004	12/11/2018	N
LTU C1L2 ZOI	1812773-003	12/11/2018	N
LTU C2L1 TZ	1812773-007	12/11/2018	N
LTU C2L1 ZOI	1812773-006	12/11/2018	N
LTU C2L2 TZ	1812773-009	12/11/2018	N
LTU C2L2 ZOI	1812773-008	12/11/2018	N
LTU C3L1 TZ	1812773-011	12/11/2018	N
LTU C3L1 ZOI	1812773-010	12/11/2018	N
LTU C3L2 TZ	1812773-013	12/11/2018	N
LTU C3L2 ZOI	1812773-012	12/11/2018	N
LTU ZOI DUP	1812773-005	12/11/18	FD
LUT FB01	1812764-001	12/11/18	FB
TRIP BLANK	1812764-002	12/11/18	TB
LTU EB01	1812764-003	12/11/18	EB
MW-1	1812373-003	12/6/2018	GW
MW-2	1812373-004	12/6/2018	GW
MW-4	1812373-007	12/6/2018	GW
SMW-4	1812373-006	12/6/2018	GW
MW-5	1812373-005	12/6/2018	GW
FIELD BLANK	1812373-001	12/6/2018	FB
TRIP BLANK	1812373-002	12/06/18	TB
DUPLICATE	1812373-008	12/06/18	FD

Notes:

N=Normal field soil sample
FD = Field duplicate
FB = Field blank
NA = Not applicable
TB = Trip blank
EB = Equipment blank
GW = Groundwater sample
MB = Methanol blank

Table A-2 Qualified Data
2018 Sampling Event - RCRA Post-Closure Care LTU
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Sample ID	Lab Sample ID	Date Collected	Parameter Name	Result	Units	Matrix	Qualifier	Comments
MW-1	1812373-003	12/6/2018	acetone	3.6	ug/l	water	J+	Analyte detected below quantitation limits and is biased high as method blank contained 3.8 ug/l
MW-2	1812373-004	12/6/2018	acetone	9.2	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 3.8 ug/l
SMW-4	1812373-006	12/6/2018	acetone	2.9	mg/kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 3.8 ug/l
MW-4	1812373-007	12/6/2018	acetone	3.7	µg/Kg	Soil	J+	Analyte detected below quantitation limits and is biased high as method blank contained 3.8 ug/l
LTU C1L1 ZOI	1812773-001	12/11/18	barium	240	mg/kg	Soil	J+	MS/MSD recoveries above control limits
LTU C1L1 ZOI	1812773-001	12/11/18	silver	<1.2	mg/kg	Soil	J-	MS/MSD recoveries below control limits
LTU C1L1 TZ	1812773-002	12/11/18	barium	230	mg/kg	Soil	J+	MS/MSD recoveries above control limits
LTU C1L1 TZ	1812773-002	12/11/18	silver	<1.2	mg/kg	Soil	J-	MS/MSD recoveries below control limits
LTU C1L2 ZOI	1812773-003	12/11/18	barium	310	mg/kg	Soil	J+	MS/MSD recoveries above control limits
LTU C1L2 ZOI	1812773-003	12/11/18	silver	<1.2	mg/kg	Soil	J-	MS/MSD recoveries below control limits
LTU C1L2 TZ	1812773-004	12/11/18	barium	340	mg/kg	Soil	J+	MS/MSD recoveries above control limits
LTU C1L2 TZ	1812773-004	12/11/18	silver	<1.2	mg/kg	Soil	J-	MS/MSD recoveries below control limits
LTU C2L1 ZOI	1812773-006	12/11/18	barium	410	mg/kg	Soil	J+	MS/MSD recoveries above control limits
LTU C2L1 ZOI	1812773-006	12/11/18	silver	<1.2	mg/kg	Soil	J-	MS/MSD recoveries below control limits
LTU C2L1 TZ	1812773-007	12/11/18	barium	280	mg/kg	Soil	J+	MS/MSD recoveries above control limits
LTU C2L1 TZ	1812773-007	12/11/18	silver	<1.2	mg/kg	Soil	J-	MS/MSD recoveries below control limits
LTU C2L2 ZOI	1812773-008	12/11/18	barium	350	mg/kg	Soil	J+	MS/MSD recoveries above control limits
LTU C2L2 ZOI	1812773-008	12/11/18	silver	<1.2	mg/kg	Soil	J-	MS/MSD recoveries below control limits
LTU C2L2 TZ	1812773-009	12/11/18	barium	320	mg/kg	Soil	J+	MS/MSD recoveries above control limits
LTU C2L2 TZ	1812773-009	12/11/18	silver	<1.2	mg/kg	Soil	J-	MS/MSD recoveries below control limits
LTU C3L1 ZOI	1812773-010	12/11/18	barium	360	mg/kg	Soil	J+	MS/MSD recoveries above control limits
LTU C3L1 ZOI	1812773-010	12/11/18	silver	<1.2	mg/kg	Soil	J-	MS/MSD recoveries below control limits
LTU C3L1 TZ	1812773-011	12/11/18	barium	280	mg/kg	Soil	J+	MS/MSD recoveries above control limits
LTU C3L1 TZ	1812773-011	12/11/18	silver	<1.2	mg/kg	Soil	J-	MS/MSD recoveries below control limits
LTU C3L2 ZOI	1812773-012	12/11/18	barium	330	mg/kg	Soil	J+	MS/MSD recoveries above control limits
LTU C3L2 ZOI	1812773-012	12/11/18	silver	<1.2	mg/kg	Soil	J-	MS/MSD recoveries below control limits
LTU C3L2 TZ	1812773-013	12/11/18	barium	350	mg/kg	Soil	J+	MS/MSD recoveries above control limits
LTU C3L2 TZ	1812773-013	12/11/18	silver	<1.2	mg/kg	Soil	J-	MS/MSD recoveries below control limits

The analyte was positively identified; however, the result should be considered an estimated value with a potential high bias.
The analyte was positively identified; however, the result should be considered an estimated value with a potential low bias.

Table A-3 - Field Duplicate Summary
2018 Sampling Event - RCRA Post-Closure Care LTU
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Parameter	MW-4		DUPLICATE		RPD
	1812373-007		1812373-008		
	12/6/2018		12/6/2018		%
Metals (ug/l)					
Antimony	<0.5	u	<0.5	u	NC
Arsenic	0.75	J	0.78	J	1.0
Barium	21	v	21	v	0.0
Beryllium	<0.44	u	<0.44	u	NC
Cadmium	<0.99	u	<0.99	u	NC
Chromium	<1.08	u	<1.08	u	NC
Cobalt	<0.98	u	<0.98	u	NC
Cyanide	<10	u	<10	u	NC
Lead	<0.5	u	<0.5	u	NC
Mercury	0.09	J	0.09	J	0.0
Nickel	<2.69	u	<2.69	u	NC
Selenium	<0.5	u	<0.5	u	NC
Silver	<1.76	u	<1.76	u	NC
Vanadium	<2.27	u	<2.27	u	NC
Zinc	<3.3	u	5.8	J	NC
Volatiles (ug/l)					
1,1,1-Trichloroethane	<0.16	u	<0.16	u	NC
1,1-Dichloroethane	<0.18	u	<0.18	u	NC
1,2-Dibromoethane (EDB)	<0.23	u	<0.23	u	NC
1,2-Dichloroethane (EDC)	<0.19	u	<0.19	u	NC
1,4-Dioxane	<40	u	<40	u	NC
2-Butanone	<1.41	u	<1.41	u	NC
Benzene	<0.17	u	<0.17	u	NC
Carbon disulfide	<0.39	u	<0.39	u	NC
Chlorobenzene	<0.29	u	<0.29	u	NC
Chloroform	<0.24	u	<0.24	u	NC
Ethylbenzene	<0.22	u	< 0.223	u	NC
Methyl tert-butyl ether (MTBE)	<0.46	u	<0.46	u	NC
Styrene	<0.25	u	<0.25	u	NC
Tetrachloroethene (PCE)	<0.15	u	<0.15	u	NC
Toluene	<0.17	u	<0.17	u	NC
Trichloroethene (TCE)	<0.26	u	<0.26	u	NC
Xylenes, Total	<0.64	u	< 0.641	u	NC
Semi-volatiles (ug/l)					
1,2-Dichlorobenzene	<0.31	u	<0.31	u	NC
1,3-Dichlorobenzene	<0.31	u	<0.31	u	NC
1,4-Dichlorobenzene	<0.29	u	<0.29	u	NC
1-Methylnaphthalene	<0.34	u	<0.34	u	NC
2,4-Dimethylphenol	<0.5	u	<0.5	u	NC
2,4-Dinitrophenol	<0.5	u	<0.5	u	NC
2-Methylphenol	<0.5	u	<0.5	u	NC
3+4-Methylphenol	<0.5	u	<0.5	u	NC
4-Nitrophenol	<0.5	u	<0.5	u	NC
Acenaphthene	<0.5	u	<0.5	u	NC

Table A-3 - Field Duplicate Summary
2018 Sampling Event - RCRA Post-Closure Care LTU
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Parameter	MW-4		DUPLICATE		RPD
	1812373-007		1812373-008		
	12/6/2018		12/6/2018		%
Anthracene	<0.5	u	<0.5	u	NC
Benzenethiol	<0.5	u	<0.5	u	NC
Benz(a)anthracene	<0.5	u	<0.5	u	NC
Benzo(a)pyrene	<0.5	u	<0.5	u	NC
Benzo(b)fluoranthene	<0.5	u	<0.5	u	NC
Benzo(k)fluoranthene	<0.5	u	<0.5	u	NC
Bis(2-ethylhexyl)phthalate	<0.5	u	<0.5	u	NC
Chrysene	<0.5	u	<0.5	u	NC
Dibenz(a,h)acridine	<0.5	u	<0.5	u	NC
Dibenz(a,h)anthracene	<0.5	u	<0.5	u	NC
Diethyl phthalate	<0.5	u	<0.5	u	NC
Dimethyl phthalate	<0.5	u	<0.5	u	NC
Di-n-butyl phthalate	<0.5	u	<0.5	u	NC
Fluoranthene	<0.5	u	<0.5	u	NC
Fluorene	<0.5	u	<0.5	u	NC
Indeno(1,2,3-cd)pyrene	<0.5	u	<0.5	u	NC
Quinoline	<0.5	u	<0.5	u	NC
Naphthalene	<0.29	u	<0.29	u	NC
Phenanthrene	<0.5	u	<0.5	u	NC
Phenol	<0.5	u	<0.5	u	NC
Pyrene	<0.5	u	<0.5	u	NC
Pyridine	<0.5	u	<0.5	u	NC
TPH (mg/l)					
Gasoline Range Organics (GRO)	<0.0245	u	<0.0245	u	NC
Diesel Range Organics (DRO)	<0.630	u	<0.630	u	NC
Motor Oil Range Organics (MRO)	<5.0	u	<5.0	u	NC

NC - not calculated due to one or both results being non-detect
RPD = ((result - duplicate value) / ((result + duplicate value)/2)) x 100

Table A-3 - Field Duplicate Summary
2018 Sampling Event - RCRA Post-Closure Care LTU
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Parameter	LTU C1L2 TZ		LTU ZOI DUP		RPD
	1812773-004		1812773-005		
	12/11/2018		12/11/2018		%
Metals (mg/kg)					
Antimony	< 1.7759	u	< 1.7787	u	NC
Arsenic	< 6.8886	u	< 6.8993	u	NC
Barium	340	v	270	v	5.7
Beryllium	1.7	v	1.7	v	0.0
Cadmium	< 0.1171	u	< 0.1173	u	NC
Chromium	19	v	20	v	1.3
Cobalt	7.4	v	7.4	v	0.0
Cyanide	< 0.254	u	< 0.278	u	NC
Lead	2.9	v	1.7	v	13.0
Mercury	< 0.007	u	< 0.0068	u	NC
Nickel	18	v	19	v	1.4
Selenium	< 6.0594	u	< 6.0687	u	NC
Silver	< 0.1547	u	< 0.155	u	NC
Vanadium	33	v	33	v	0.0
Zinc	27	v	28	v	0.9
Volatiles (mg/kg)					
1,1,1-Trichloroethane	< 0.0043	u	< 0.0044	u	NC
1,1-Dichloroethane	< 0.0031	u	< 0.0031	u	NC
1,2-Dibromoethane (EDB)	< 0.0044	u	< 0.0044	u	NC
1,2-Dichloroethane (EDC)	< 0.0049	u	< 0.0049	u	NC
1,3-Dichlorobenzene (V)	< 0.0042	u	< 0.0042	u	NC
1,4-Dioxane	<0.13	u	<0.14	u	NC
2-Butanone (MEK)	< 0.0557	u	< 0.0559	u	NC
Benzene	< 0.0039	u	< 0.004	u	NC
Carbon disulfide	< 0.0159	u	< 0.016	u	NC
Chlorobenzene	< 0.0062	u	< 0.0062	u	NC
Chloroform	< 0.0039	u	< 0.0039	u	NC
Ethylbenzene	< 0.0028	u	< 0.0028	u	NC
Methyl tert-butyl ether (MTBE)	< 0.0114	u	< 0.0115	u	NC
Styrene	< 0.0038	u	< 0.0038	u	NC
Tetrachloroethene (PCE)	< 0.0038	u	< 0.0039	u	NC
Toluene	< 0.0046	u	< 0.0046	u	NC
Trichloroethene (TCE)	< 0.0056	u	< 0.0056	u	NC
Xylenes, Total	< 0.0121	u	< 0.0122	u	NC
Semi-volatiles (mg/kg)					
1,4-Dichlorobenzene	< 0.1	u	< 0.1	u	NC
2,4-Dimethylphenol	< 0.1	u	< 0.1	u	NC
2,4-Dinitrophenol	< 0.1	u	< 0.1	u	NC
1-Methylnaphthalene	< 0.1	u	< 0.1	u	NC
2-Methylphenol	< 0.1	u	< 0.1	u	NC
3+4-Methylphenol	< 0.1	u	< 0.1	u	NC
4-Nitrophenol	< 0.1	u	< 0.1	u	NC

Table A-3 - Field Duplicate Summary
2018 Sampling Event - RCRA Post-Closure Care LTU
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Parameter	LTU C1L2 TZ		LTU ZOI DUP		RPD
	1812773-004		1812773-005		
	12/11/2018		12/11/2018		%
Acenaphthene	< 0.1	u	< 0.1	u	NC
Anthracene	< 0.1	u	< 0.1	u	NC
Benz(a)anthracene	< 0.1	u	< 0.1	u	NC
Benzo(a)pyrene	< 0.1	u	< 0.1	u	NC
Benzo(b)fluoranthene	< 0.1	u	< 0.1	u	NC
Benzo(k)fluoranthene	< 0.1	u	< 0.1	u	NC
Bis(2-ethylhexyl)phthalate	< 0.1	u	< 0.1	u	NC
Chrysene	< 0.1	u	< 0.1	u	NC
Dibenz(a,h)anthracene	< 0.1	u	< 0.1	u	NC
Diethyl phthalate	< 0.1	u	< 0.1	u	NC
Dimethyl phthalate	< 0.1	u	< 0.1	u	NC
Di-n-butyl phthalate	< 0.1	u	< 0.1	u	NC
Fluoranthene	< 0.1	u	< 0.1	u	NC
Fluorene	< 0.1	u	< 0.1	u	NC
Indeno(1,2,3-cd)pyrene	< 0.1	u	< 0.1	u	NC
Naphthalene	< 0.1	u	< 0.1	u	NC
Phenanthrene	< 0.1	u	< 0.1	u	NC
Phenol	< 0.1	u	< 0.1	u	NC
Pyrene	< 0.1	u	< 0.1	u	NC
Pyridine	< 0.1	u	< 0.1	u	NC
Quinoline	< 0.1	u	< 0.1	u	NC
Total Petroleum Hydrocarbons (mg/kg)					
Gasoline Range Organics (GRO)	< 1.4	u	< 1.4016	u	NC
Diesel Range Organics (DRO)	< 1.9	u	< 1.9512	u	NC
Motor Oil Range Organics (MRO)	< 48	u	< 48.7805	u	NC

NC - not calculated due to one or both results being non-detect
RPD = ((result - duplicate value) / ((result + duplicate value)/2)) x 100

Table A-4 - Completeness Summary
2018 Sampling Event - RCRA Post-Closure Care LTU
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

	Parameter	Total Number of Results	Number of Usable Results	Percent Technical Compliance
TPH :	Diesel Range Organics (DRO)	17	17	100
	Motor Oil Range Organics (MRO)	17	17	100
	Gasoline Range Organics (GRO)	17	17	100
VOCs:	All VOC Analytes	17	17	100
SVOCs:	All SVOC Analytes	17	17	100
Metals	All Metal Analytes	17	17	100

Notes:
Number of samples used in completeness calculations includes soil samples and groundwater samples, excludes additional QC samples
Percent Technial Compliance = (Number of usable results / Number of reported results) * 100

Appendix E

Analytical Data Reports

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

September 24, 2019

Brian Moore

Marathon
92 Giant Crossing Rd
Gallup, NM 87301
TEL: (505) 722-3833
FAX

RE: 2018 Post Closure Sampling LTU OrderNo.: 1812373

Dear Brian Moore:

Hall Environmental Analysis Laboratory received 8 sample(s) on 12/6/2018 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued January 04, 2019.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman

Laboratory Manager

4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: Field Blank
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 7:00:00 AM
Lab ID: 1812373-001
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **AG**	
Benzene	0.21	0.17	1.0	J	µg/L	1	12/11/2018 6:26:34 PM	D56250
Toluene	0.29	0.17	1.0	J	µg/L	1	12/11/2018 6:26:34 PM	D56250
Ethylbenzene	ND	0.22	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
Methyl tert-butyl ether (MTBE)	ND	0.46	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
1,2,4-Trimethylbenzene	ND	0.25	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
1,3,5-Trimethylbenzene	ND	0.23	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
1,2-Dichloroethane (EDC)	ND	0.19	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
1,2-Dibromoethane (EDB)	ND	0.23	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
Naphthalene	ND	0.29	2.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
1-Methylnaphthalene	ND	0.34	4.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
2-Methylnaphthalene	ND	0.35	4.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
Acetone	3.8	0.76	10	J	µg/L	1	12/11/2018 6:26:34 PM	D56250
Bromobenzene	ND	0.32	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
Bromodichloromethane	ND	0.28	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
Bromoform	ND	0.32	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
Bromomethane	ND	0.27	3.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
2-Butanone	ND	1.4	10		µg/L	1	12/11/2018 6:26:34 PM	D56250
Carbon disulfide	ND	0.39	10		µg/L	1	12/11/2018 6:26:34 PM	D56250
Carbon Tetrachloride	ND	0.14	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
Chlorobenzene	ND	0.29	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
Chloroethane	ND	0.16	2.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
Chloroform	ND	0.24	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
Chloromethane	ND	0.32	3.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
2-Chlorotoluene	ND	0.25	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
4-Chlorotoluene	ND	0.28	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
cis-1,2-DCE	ND	0.38	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
cis-1,3-Dichloropropene	ND	0.30	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
1,2-Dibromo-3-chloropropane	ND	0.47	2.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
Dibromochloromethane	ND	0.24	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
Dibromomethane	ND	0.32	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
1,2-Dichlorobenzene	ND	0.31	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
1,3-Dichlorobenzene	ND	0.31	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
1,4-Dichlorobenzene	ND	0.29	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
Dichlorodifluoromethane	ND	0.26	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
1,1-Dichloroethane	ND	0.18	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
1,1-Dichloroethene	ND	0.12	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
1,2-Dichloropropane	ND	0.17	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
1,3-Dichloropropane	ND	0.27	1.0		µg/L	1	12/11/2018 6:26:34 PM	D56250
2,2-Dichloropropane	ND	0.23	2.0		µg/L	1	12/11/2018 6:26:34 PM	D56250

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: Field Blank
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 7:00:00 AM
Lab ID: 1812373-001
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **AG**	
1,1-Dichloropropene	ND	0.16	1.0		µg/L	1	12/11/2018 6:26:34 PM	D5625C
Hexachlorobutadiene	ND	0.39	1.0		µg/L	1	12/11/2018 6:26:34 PM	D5625C
2-Hexanone	ND	0.91	10		µg/L	1	12/11/2018 6:26:34 PM	D5625C
Isopropylbenzene	ND	0.22	1.0		µg/L	1	12/11/2018 6:26:34 PM	D5625C
4-Isopropyltoluene	ND	0.24	1.0		µg/L	1	12/11/2018 6:26:34 PM	D5625C
4-Methyl-2-pentanone	ND	0.45	10		µg/L	1	12/11/2018 6:26:34 PM	D5625C
Methylene Chloride	ND	0.21	3.0		µg/L	1	12/11/2018 6:26:34 PM	D5625C
n-Butylbenzene	ND	0.25	3.0		µg/L	1	12/11/2018 6:26:34 PM	D5625C
n-Propylbenzene	ND	0.24	1.0		µg/L	1	12/11/2018 6:26:34 PM	D5625C
sec-Butylbenzene	ND	0.20	1.0		µg/L	1	12/11/2018 6:26:34 PM	D5625C
Styrene	ND	0.25	1.0		µg/L	1	12/11/2018 6:26:34 PM	D5625C
tert-Butylbenzene	ND	0.22	1.0		µg/L	1	12/11/2018 6:26:34 PM	D5625C
1,1,1,2-Tetrachloroethane	ND	0.25	1.0		µg/L	1	12/11/2018 6:26:34 PM	D5625C
1,1,2,2-Tetrachloroethane	ND	0.33	2.0		µg/L	1	12/11/2018 6:26:34 PM	D5625C
Tetrachloroethene (PCE)	ND	0.15	1.0		µg/L	1	12/11/2018 6:26:34 PM	D5625C
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	12/11/2018 6:26:34 PM	D5625C
trans-1,3-Dichloropropene	ND	0.28	1.0		µg/L	1	12/11/2018 6:26:34 PM	D5625C
1,2,3-Trichlorobenzene	ND	0.28	1.0		µg/L	1	12/11/2018 6:26:34 PM	D5625C
1,2,4-Trichlorobenzene	ND	0.27	1.0		µg/L	1	12/11/2018 6:26:34 PM	D5625C
1,1,1-Trichloroethane	ND	0.16	1.0		µg/L	1	12/11/2018 6:26:34 PM	D5625C
1,1,2-Trichloroethane	ND	0.23	1.0		µg/L	1	12/11/2018 6:26:34 PM	D5625C
Trichloroethene (TCE)	ND	0.26	1.0		µg/L	1	12/11/2018 6:26:34 PM	D5625C
Trichlorofluoromethane	ND	0.14	1.0		µg/L	1	12/11/2018 6:26:34 PM	D5625C
1,2,3-Trichloropropane	ND	0.57	2.0		µg/L	1	12/11/2018 6:26:34 PM	D5625C
Vinyl chloride	ND	0.12	1.0		µg/L	1	12/11/2018 6:26:34 PM	D5625C
Xylenes, Total	ND	0.64	1.5		µg/L	1	12/11/2018 6:26:34 PM	D5625C
1,4-Dioxane	ND	40	50		µg/L	1	12/13/2018 6:13:28 PM	A56304
Surr: 1,2-Dichloroethane-d4	101	0	70-130		%Rec	1	12/11/2018 6:26:34 PM	D5625C
Surr: 4-Bromofluorobenzene	96.6	0	70-130		%Rec	1	12/11/2018 6:26:34 PM	D5625C
Surr: Dibromofluoromethane	101	0	70-130		%Rec	1	12/11/2018 6:26:34 PM	D5625C
Surr: Toluene-d8	102	0	70-130		%Rec	1	12/11/2018 6:26:34 PM	D5625C

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: Trip Blank
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 7:00:00 AM
Lab ID: 1812373-002
Matrix: TRIP BLANK
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **AG**	
Benzene	ND	0.17	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
Toluene	ND	0.17	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
Ethylbenzene	ND	0.22	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
Methyl tert-butyl ether (MTBE)	ND	0.46	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
1,2,4-Trimethylbenzene	ND	0.25	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
1,3,5-Trimethylbenzene	ND	0.23	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
1,2-Dichloroethane (EDC)	ND	0.19	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
1,2-Dibromoethane (EDB)	ND	0.23	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
Naphthalene	ND	0.29	2.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
1-Methylnaphthalene	ND	0.34	4.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
2-Methylnaphthalene	ND	0.35	4.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
Acetone	3.3	0.76	10	J	µg/L	1	12/11/2018 7:52:23 PM	D56250
Bromobenzene	ND	0.32	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
Bromodichloromethane	ND	0.28	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
Bromoform	ND	0.32	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
Bromomethane	ND	0.27	3.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
2-Butanone	ND	1.4	10		µg/L	1	12/11/2018 7:52:23 PM	D56250
Carbon disulfide	ND	0.39	10		µg/L	1	12/11/2018 7:52:23 PM	D56250
Carbon Tetrachloride	ND	0.14	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
Chlorobenzene	ND	0.29	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
Chloroethane	ND	0.16	2.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
Chloroform	ND	0.24	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
Chloromethane	ND	0.32	3.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
2-Chlorotoluene	ND	0.25	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
4-Chlorotoluene	ND	0.28	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
cis-1,2-DCE	ND	0.38	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
cis-1,3-Dichloropropene	ND	0.30	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
1,2-Dibromo-3-chloropropane	ND	0.47	2.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
Dibromochloromethane	ND	0.24	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
Dibromomethane	ND	0.32	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
1,2-Dichlorobenzene	ND	0.31	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
1,3-Dichlorobenzene	ND	0.31	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
1,4-Dichlorobenzene	ND	0.29	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
Dichlorodifluoromethane	ND	0.26	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
1,1-Dichloroethane	ND	0.18	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
1,1-Dichloroethene	ND	0.12	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
1,2-Dichloropropane	ND	0.17	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
1,3-Dichloropropane	ND	0.27	1.0		µg/L	1	12/11/2018 7:52:23 PM	D56250
2,2-Dichloropropane	ND	0.23	2.0		µg/L	1	12/11/2018 7:52:23 PM	D56250

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: Trip Blank
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 7:00:00 AM
Lab ID: 1812373-002
Matrix: TRIP BLANK
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **AG**	
1,1-Dichloropropene	ND	0.16	1.0		µg/L	1	12/11/2018 7:52:23 PM	D5625C
Hexachlorobutadiene	ND	0.39	1.0		µg/L	1	12/11/2018 7:52:23 PM	D5625C
2-Hexanone	ND	0.91	10		µg/L	1	12/11/2018 7:52:23 PM	D5625C
Isopropylbenzene	ND	0.22	1.0		µg/L	1	12/11/2018 7:52:23 PM	D5625C
4-Isopropyltoluene	ND	0.24	1.0		µg/L	1	12/11/2018 7:52:23 PM	D5625C
4-Methyl-2-pentanone	ND	0.45	10		µg/L	1	12/11/2018 7:52:23 PM	D5625C
Methylene Chloride	ND	0.21	3.0		µg/L	1	12/11/2018 7:52:23 PM	D5625C
n-Butylbenzene	ND	0.25	3.0		µg/L	1	12/11/2018 7:52:23 PM	D5625C
n-Propylbenzene	ND	0.24	1.0		µg/L	1	12/11/2018 7:52:23 PM	D5625C
sec-Butylbenzene	ND	0.20	1.0		µg/L	1	12/11/2018 7:52:23 PM	D5625C
Styrene	ND	0.25	1.0		µg/L	1	12/11/2018 7:52:23 PM	D5625C
tert-Butylbenzene	ND	0.22	1.0		µg/L	1	12/11/2018 7:52:23 PM	D5625C
1,1,1,2-Tetrachloroethane	ND	0.25	1.0		µg/L	1	12/11/2018 7:52:23 PM	D5625C
1,1,2,2-Tetrachloroethane	ND	0.33	2.0		µg/L	1	12/11/2018 7:52:23 PM	D5625C
Tetrachloroethene (PCE)	ND	0.15	1.0		µg/L	1	12/11/2018 7:52:23 PM	D5625C
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	12/11/2018 7:52:23 PM	D5625C
trans-1,3-Dichloropropene	ND	0.28	1.0		µg/L	1	12/11/2018 7:52:23 PM	D5625C
1,2,3-Trichlorobenzene	ND	0.28	1.0		µg/L	1	12/11/2018 7:52:23 PM	D5625C
1,2,4-Trichlorobenzene	ND	0.27	1.0		µg/L	1	12/11/2018 7:52:23 PM	D5625C
1,1,1-Trichloroethane	ND	0.16	1.0		µg/L	1	12/11/2018 7:52:23 PM	D5625C
1,1,2-Trichloroethane	ND	0.23	1.0		µg/L	1	12/11/2018 7:52:23 PM	D5625C
Trichloroethene (TCE)	ND	0.26	1.0		µg/L	1	12/11/2018 7:52:23 PM	D5625C
Trichlorofluoromethane	ND	0.14	1.0		µg/L	1	12/11/2018 7:52:23 PM	D5625C
1,2,3-Trichloropropane	ND	0.57	2.0		µg/L	1	12/11/2018 7:52:23 PM	D5625C
Vinyl chloride	ND	0.12	1.0		µg/L	1	12/11/2018 7:52:23 PM	D5625C
Xylenes, Total	ND	0.64	1.5		µg/L	1	12/11/2018 7:52:23 PM	D5625C
1,4-Dioxane	ND	40	50		µg/L	1	12/13/2018 6:42:39 PM	A56304
Surr: 1,2-Dichloroethane-d4	99.8	0	70-130		%Rec	1	12/11/2018 7:52:23 PM	D5625C
Surr: 4-Bromofluorobenzene	95.4	0	70-130		%Rec	1	12/11/2018 7:52:23 PM	D5625C
Surr: Dibromofluoromethane	99.0	0	70-130		%Rec	1	12/11/2018 7:52:23 PM	D5625C
Surr: Toluene-d8	102	0	70-130		%Rec	1	12/11/2018 7:52:23 PM	D5625C

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Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: MW-1
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 8:10:00 AM
Lab ID: 1812373-003
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8011/504.1: EDB							Analyst: **JME**	
1,2-Dibromoethane	ND	0.0049	0.0096		µg/L	1	12/17/2018 11:08:28 P	42092
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **lrm**	
Diesel Range Organics (DRO)	ND	0.63	1.0		mg/L	1	12/12/2018 8:44:47 PM	42033
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	12/12/2018 8:44:47 PM	42033
Surr: DNOP	109	0	76.7-135		%Rec	1	12/12/2018 8:44:47 PM	42033
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.024	0.050		mg/L	1	12/11/2018 11:47:13 A	G56246
Surr: BFB	82.8	0	72.8-125		%Rec	1	12/11/2018 11:47:13 A	G56246
EPA METHOD 6020: TOTAL METALS							Analyst: **DBK**	
Antimony	ND	0.00050	0.0010		mg/L	1	12/17/2018 3:52:47 PM	42079
Arsenic	0.0011	0.00050	0.0010		mg/L	1	12/17/2018 3:52:47 PM	42079
Lead	ND	0.00050	0.0010		mg/L	1	12/17/2018 3:52:47 PM	42079
Selenium	ND	0.00050	0.0010		mg/L	1	12/17/2018 3:52:47 PM	42079
EPA METHOD 7470: MERCURY							Analyst: **pmf**	
Mercury	0.000096	0.000038	0.00020	J	mg/L	1	12/11/2018 5:51:48 PM	42021
EPA 6010B: TOTAL RECOVERABLE METALS							Analyst: **rde**	
Barium	ND	0.020	0.020		mg/L	1	12/14/2018 9:44:53 AM	41991
Beryllium	ND	0.00044	0.0030		mg/L	1	12/14/2018 9:44:53 AM	41991
Cadmium	ND	0.00099	0.0020		mg/L	1	12/14/2018 9:44:53 AM	41991
Chromium	ND	0.0011	0.0060		mg/L	1	12/14/2018 9:44:53 AM	41991
Cobalt	ND	0.00098	0.0060		mg/L	1	12/14/2018 9:44:53 AM	41991
Nickel	ND	0.0027	0.010		mg/L	1	12/14/2018 9:44:53 AM	41991
Silver	ND	0.0018	0.0050		mg/L	1	12/14/2018 9:44:53 AM	41991
Vanadium	ND	0.0023	0.050		mg/L	1	12/14/2018 9:44:53 AM	41991
Zinc	ND	0.0033	0.020		mg/L	1	12/14/2018 9:44:53 AM	41991
EPA METHOD 8260B: VOLATILES							Analyst: **AG**	
Benzene	ND	0.17	1.0		µg/L	1	12/11/2018 8:20:57 PM	D56250
Toluene	ND	0.17	1.0		µg/L	1	12/11/2018 8:20:57 PM	D56250
Ethylbenzene	ND	0.22	1.0		µg/L	1	12/11/2018 8:20:57 PM	D56250
Methyl tert-butyl ether (MTBE)	ND	0.46	1.0		µg/L	1	12/11/2018 8:20:57 PM	D56250
1,2,4-Trimethylbenzene	ND	0.25	1.0		µg/L	1	12/11/2018 8:20:57 PM	D56250
1,3,5-Trimethylbenzene	ND	0.23	1.0		µg/L	1	12/11/2018 8:20:57 PM	D56250
1,2-Dichloroethane (EDC)	ND	0.19	1.0		µg/L	1	12/11/2018 8:20:57 PM	D56250
1,2-Dibromoethane (EDB)	ND	0.23	1.0		µg/L	1	12/11/2018 8:20:57 PM	D56250
Naphthalene	ND	0.29	2.0		µg/L	1	12/11/2018 8:20:57 PM	D56250
1-Methylnaphthalene	ND	0.34	4.0		µg/L	1	12/11/2018 8:20:57 PM	D56250

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Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: MW-1
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 8:10:00 AM
Lab ID: 1812373-003
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **AG**	
2-Methylnaphthalene	ND	0.35	4.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
Acetone	3.6	0.76	10	J	µg/L	1	12/11/2018 8:20:57 PM	D5625C
Bromobenzene	ND	0.32	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
Bromodichloromethane	ND	0.28	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
Bromoform	ND	0.32	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
Bromomethane	ND	0.27	3.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
2-Butanone	ND	1.4	10		µg/L	1	12/11/2018 8:20:57 PM	D5625C
Carbon disulfide	ND	0.39	10		µg/L	1	12/11/2018 8:20:57 PM	D5625C
Carbon Tetrachloride	ND	0.14	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
Chlorobenzene	ND	0.29	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
Chloroethane	ND	0.16	2.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
Chloroform	ND	0.24	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
Chloromethane	ND	0.32	3.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
2-Chlorotoluene	ND	0.25	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
4-Chlorotoluene	ND	0.28	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
cis-1,2-DCE	ND	0.38	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
cis-1,3-Dichloropropene	ND	0.30	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
1,2-Dibromo-3-chloropropane	ND	0.47	2.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
Dibromochloromethane	ND	0.24	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
Dibromomethane	ND	0.32	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
1,2-Dichlorobenzene	ND	0.31	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
1,3-Dichlorobenzene	ND	0.31	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
1,4-Dichlorobenzene	ND	0.29	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
Dichlorodifluoromethane	ND	0.26	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
1,1-Dichloroethane	ND	0.18	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
1,1-Dichloroethene	ND	0.12	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
1,2-Dichloropropane	ND	0.17	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
1,3-Dichloropropane	ND	0.27	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
2,2-Dichloropropane	ND	0.23	2.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
1,1-Dichloropropene	ND	0.16	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
Hexachlorobutadiene	ND	0.39	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
2-Hexanone	ND	0.91	10		µg/L	1	12/11/2018 8:20:57 PM	D5625C
Isopropylbenzene	ND	0.22	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
4-Isopropyltoluene	ND	0.24	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
4-Methyl-2-pentanone	ND	0.45	10		µg/L	1	12/11/2018 8:20:57 PM	D5625C
Methylene Chloride	ND	0.21	3.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
n-Butylbenzene	ND	0.25	3.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
n-Propylbenzene	ND	0.24	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C
sec-Butylbenzene	ND	0.20	1.0		µg/L	1	12/11/2018 8:20:57 PM	D5625C

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: MW-1
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 8:10:00 AM
Lab ID: 1812373-003
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **AG**	
Styrene	ND	0.25	1.0		µg/L	1	12/11/2018 8:20:57 PM	D56250
tert-Butylbenzene	ND	0.22	1.0		µg/L	1	12/11/2018 8:20:57 PM	D56250
1,1,1,2-Tetrachloroethane	ND	0.25	1.0		µg/L	1	12/11/2018 8:20:57 PM	D56250
1,1,2,2-Tetrachloroethane	ND	0.33	2.0		µg/L	1	12/11/2018 8:20:57 PM	D56250
Tetrachloroethene (PCE)	ND	0.15	1.0		µg/L	1	12/11/2018 8:20:57 PM	D56250
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	12/11/2018 8:20:57 PM	D56250
trans-1,3-Dichloropropene	ND	0.28	1.0		µg/L	1	12/11/2018 8:20:57 PM	D56250
1,2,3-Trichlorobenzene	ND	0.28	1.0		µg/L	1	12/11/2018 8:20:57 PM	D56250
1,2,4-Trichlorobenzene	ND	0.27	1.0		µg/L	1	12/11/2018 8:20:57 PM	D56250
1,1,1-Trichloroethane	ND	0.16	1.0		µg/L	1	12/11/2018 8:20:57 PM	D56250
1,1,2-Trichloroethane	ND	0.23	1.0		µg/L	1	12/11/2018 8:20:57 PM	D56250
Trichloroethene (TCE)	ND	0.26	1.0		µg/L	1	12/11/2018 8:20:57 PM	D56250
Trichlorofluoromethane	ND	0.14	1.0		µg/L	1	12/11/2018 8:20:57 PM	D56250
1,2,3-Trichloropropane	ND	0.57	2.0		µg/L	1	12/11/2018 8:20:57 PM	D56250
Vinyl chloride	ND	0.12	1.0		µg/L	1	12/11/2018 8:20:57 PM	D56250
Xylenes, Total	ND	0.64	1.5		µg/L	1	12/11/2018 8:20:57 PM	D56250
1,4-Dioxane	ND	40	50		µg/L	1	12/13/2018 7:11:55 PM	A56304
Surr: 1,2-Dichloroethane-d4	103	0	70-130		%Rec	1	12/11/2018 8:20:57 PM	D56250
Surr: 4-Bromofluorobenzene	95.8	0	70-130		%Rec	1	12/11/2018 8:20:57 PM	D56250
Surr: Dibromofluoromethane	99.8	0	70-130		%Rec	1	12/11/2018 8:20:57 PM	D56250
Surr: Toluene-d8	101	0	70-130		%Rec	1	12/11/2018 8:20:57 PM	D56250
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**	
Benzenethiol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Dibenz(a,h)acridine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,2,4-Trichlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,2-Dichlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,2-Diphenylhydrazine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,3-Dichlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,4-Dichlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1-Methylnaphthalene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,3,4,6-Tetrachlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,3,5,6-Tetrachlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4,5-Trichlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4,6-Trichlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4-Dichlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4-Dimethylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4-Dinitrophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4-Dinitrotoluene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,6-Dinitrotoluene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056

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Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
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P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: MW-1
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 8:10:00 AM
Lab ID: 1812373-003
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**	
2-Chloronaphthalene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Chlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Methylnaphthalene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Methylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Nitroaniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Nitrophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
3,3´-Dichlorobenzidine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
3+4-Methylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
3-Nitroaniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4,6-Dinitro-2-methylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Bromophenyl phenyl ether	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Chloro-3-methylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Chloroaniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Chlorophenyl phenyl ether	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Nitroaniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Nitrophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Acenaphthene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Acenaphthylene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Aniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Anthracene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzidine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzo(g,h,i)perylene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
7,12-Dimethylbenz(a)anthracene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benz(a)anthracene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzo(a)pyrene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzo(b)fluoranthene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzo(k)fluoranthene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzyl alcohol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Bis(2-chloroethoxy)methane	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Bis(2-chloroethyl)ether	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Bis(2-chloroisopropyl)ether	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Bis(2-ethylhexyl)phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Butyl benzyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Carbazole	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Chrysene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Dibenz(a,h)anthracene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Dibenzofuran	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Diethyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Dimethyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: MW-1
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 8:10:00 AM
Lab ID: 1812373-003
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**	
Di-n-butyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Di-n-octyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Fluoranthene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Fluorene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Hexachlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Hexachlorobutadiene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Hexachlorocyclopentadiene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Hexachloroethane	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Indeno(1,2,3-cd)pyrene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Isophorone	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Naphthalene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Nitrobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
N-Nitrosodimethylamine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
N-Nitrosodi-n-propylamine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
N-Nitrosodiphenylamine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Pentachlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Phenanthrene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Phenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Pyrene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Pyridine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Quinoline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
EPA 335.4: TOTAL CYANIDE SUBBED							Analyst: **SUB**	
Cyanide	ND	0.0100	0.0100		mg/L	1	12/13/2018	R57056

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Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: MW-2
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 8:37:00 AM
Lab ID: 1812373-004
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8011/504.1: EDB							Analyst: **JME**	
1,2-Dibromoethane	ND	0.0049	0.0095		µg/L	1	12/17/2018 11:23:15 P	42092
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **lrm**	
Diesel Range Organics (DRO)	ND	0.63	1.0		mg/L	1	12/12/2018 9:06:43 PM	42033
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	12/12/2018 9:06:43 PM	42033
Surr: DNOP	108	0	76.7-135		%Rec	1	12/12/2018 9:06:43 PM	42033
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.024	0.050		mg/L	1	12/11/2018 12:09:55 P	G56246
Surr: BFB	87.9	0	72.8-125		%Rec	1	12/11/2018 12:09:55 P	G56246
EPA METHOD 6020: TOTAL METALS							Analyst: **DBK**	
Antimony	ND	0.00050	0.0010		mg/L	1	12/17/2018 3:57:08 PM	42079
Arsenic	0.0011	0.00050	0.0010		mg/L	1	12/17/2018 3:57:08 PM	42079
Lead	ND	0.00050	0.0010		mg/L	1	12/17/2018 3:57:08 PM	42079
Selenium	ND	0.00050	0.0010		mg/L	1	12/17/2018 3:57:08 PM	42079
EPA METHOD 7470: MERCURY							Analyst: **pmf**	
Mercury	0.000091	0.000038	0.00020	J	mg/L	1	12/11/2018 6:00:52 PM	42021
EPA 6010B: TOTAL RECOVERABLE METALS							Analyst: **rde**	
Barium	ND	0.020	0.020		mg/L	1	12/14/2018 9:50:37 AM	41991
Beryllium	ND	0.00044	0.0030		mg/L	1	12/14/2018 9:50:37 AM	41991
Cadmium	ND	0.00099	0.0020		mg/L	1	12/14/2018 9:50:37 AM	41991
Chromium	ND	0.0011	0.0060		mg/L	1	12/14/2018 9:50:37 AM	41991
Cobalt	ND	0.00098	0.0060		mg/L	1	12/14/2018 9:50:37 AM	41991
Nickel	ND	0.0027	0.010		mg/L	1	12/14/2018 9:50:37 AM	41991
Silver	ND	0.0018	0.0050		mg/L	1	12/14/2018 9:50:37 AM	41991
Vanadium	ND	0.0023	0.050		mg/L	1	12/14/2018 9:50:37 AM	41991
Zinc	ND	0.0033	0.020		mg/L	1	12/14/2018 9:50:37 AM	41991
EPA METHOD 8260B: VOLATILES							Analyst: **AG**	
Benzene	ND	0.17	1.0		µg/L	1	12/11/2018 8:49:32 PM	D56250
Toluene	ND	0.17	1.0		µg/L	1	12/11/2018 8:49:32 PM	D56250
Ethylbenzene	ND	0.22	1.0		µg/L	1	12/11/2018 8:49:32 PM	D56250
Methyl tert-butyl ether (MTBE)	ND	0.46	1.0		µg/L	1	12/11/2018 8:49:32 PM	D56250
1,2,4-Trimethylbenzene	ND	0.25	1.0		µg/L	1	12/11/2018 8:49:32 PM	D56250
1,3,5-Trimethylbenzene	ND	0.23	1.0		µg/L	1	12/11/2018 8:49:32 PM	D56250
1,2-Dichloroethane (EDC)	ND	0.19	1.0		µg/L	1	12/11/2018 8:49:32 PM	D56250
1,2-Dibromoethane (EDB)	ND	0.23	1.0		µg/L	1	12/11/2018 8:49:32 PM	D56250
Naphthalene	ND	0.29	2.0		µg/L	1	12/11/2018 8:49:32 PM	D56250
1-Methylnaphthalene	ND	0.34	4.0		µg/L	1	12/11/2018 8:49:32 PM	D56250

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Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: MW-2
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 8:37:00 AM
Lab ID: 1812373-004
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **AG**	
2-Methylnaphthalene	ND	0.35	4.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
Acetone	9.2	0.76	10	J	µg/L	1	12/11/2018 8:49:32 PM	D5625C
Bromobenzene	ND	0.32	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
Bromodichloromethane	ND	0.28	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
Bromoform	ND	0.32	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
Bromomethane	ND	0.27	3.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
2-Butanone	ND	1.4	10		µg/L	1	12/11/2018 8:49:32 PM	D5625C
Carbon disulfide	ND	0.39	10		µg/L	1	12/11/2018 8:49:32 PM	D5625C
Carbon Tetrachloride	ND	0.14	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
Chlorobenzene	ND	0.29	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
Chloroethane	ND	0.16	2.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
Chloroform	ND	0.24	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
Chloromethane	ND	0.32	3.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
2-Chlorotoluene	ND	0.25	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
4-Chlorotoluene	ND	0.28	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
cis-1,2-DCE	ND	0.38	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
cis-1,3-Dichloropropene	ND	0.30	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
1,2-Dibromo-3-chloropropane	ND	0.47	2.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
Dibromochloromethane	ND	0.24	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
Dibromomethane	ND	0.32	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
1,2-Dichlorobenzene	ND	0.31	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
1,3-Dichlorobenzene	ND	0.31	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
1,4-Dichlorobenzene	ND	0.29	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
Dichlorodifluoromethane	ND	0.26	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
1,1-Dichloroethane	ND	0.18	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
1,1-Dichloroethene	ND	0.12	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
1,2-Dichloropropane	ND	0.17	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
1,3-Dichloropropane	ND	0.27	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
2,2-Dichloropropane	ND	0.23	2.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
1,1-Dichloropropene	ND	0.16	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
Hexachlorobutadiene	ND	0.39	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
2-Hexanone	ND	0.91	10		µg/L	1	12/11/2018 8:49:32 PM	D5625C
Isopropylbenzene	ND	0.22	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
4-Isopropyltoluene	ND	0.24	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
4-Methyl-2-pentanone	ND	0.45	10		µg/L	1	12/11/2018 8:49:32 PM	D5625C
Methylene Chloride	ND	0.21	3.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
n-Butylbenzene	ND	0.25	3.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
n-Propylbenzene	ND	0.24	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C
sec-Butylbenzene	ND	0.20	1.0		µg/L	1	12/11/2018 8:49:32 PM	D5625C

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: MW-2
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 8:37:00 AM
Lab ID: 1812373-004
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **AG**	
Styrene	ND	0.25	1.0		µg/L	1	12/11/2018 8:49:32 PM	D56250
tert-Butylbenzene	ND	0.22	1.0		µg/L	1	12/11/2018 8:49:32 PM	D56250
1,1,1,2-Tetrachloroethane	ND	0.25	1.0		µg/L	1	12/11/2018 8:49:32 PM	D56250
1,1,2,2-Tetrachloroethane	ND	0.33	2.0		µg/L	1	12/11/2018 8:49:32 PM	D56250
Tetrachloroethene (PCE)	ND	0.15	1.0		µg/L	1	12/11/2018 8:49:32 PM	D56250
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	12/11/2018 8:49:32 PM	D56250
trans-1,3-Dichloropropene	ND	0.28	1.0		µg/L	1	12/11/2018 8:49:32 PM	D56250
1,2,3-Trichlorobenzene	ND	0.28	1.0		µg/L	1	12/11/2018 8:49:32 PM	D56250
1,2,4-Trichlorobenzene	ND	0.27	1.0		µg/L	1	12/11/2018 8:49:32 PM	D56250
1,1,1-Trichloroethane	ND	0.16	1.0		µg/L	1	12/11/2018 8:49:32 PM	D56250
1,1,2-Trichloroethane	ND	0.23	1.0		µg/L	1	12/11/2018 8:49:32 PM	D56250
Trichloroethene (TCE)	ND	0.26	1.0		µg/L	1	12/11/2018 8:49:32 PM	D56250
Trichlorofluoromethane	ND	0.14	1.0		µg/L	1	12/11/2018 8:49:32 PM	D56250
1,2,3-Trichloropropane	ND	0.57	2.0		µg/L	1	12/11/2018 8:49:32 PM	D56250
Vinyl chloride	ND	0.12	1.0		µg/L	1	12/11/2018 8:49:32 PM	D56250
Xylenes, Total	ND	0.64	1.5		µg/L	1	12/11/2018 8:49:32 PM	D56250
1,4-Dioxane	ND	40	50		µg/L	1	12/13/2018 7:41:06 PM	A56304
Surr: 1,2-Dichloroethane-d4	99.3	0	70-130		%Rec	1	12/11/2018 8:49:32 PM	D56250
Surr: 4-Bromofluorobenzene	100	0	70-130		%Rec	1	12/11/2018 8:49:32 PM	D56250
Surr: Dibromofluoromethane	98.9	0	70-130		%Rec	1	12/11/2018 8:49:32 PM	D56250
Surr: Toluene-d8	101	0	70-130		%Rec	1	12/11/2018 8:49:32 PM	D56250
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**	
Benzenethiol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Dibenz(a,h)acridine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,2,4-Trichlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,2-Dichlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,2-Diphenylhydrazine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,3-Dichlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,4-Dichlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1-Methylnaphthalene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,3,4,6-Tetrachlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,3,5,6-Tetrachlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4,5-Trichlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4,6-Trichlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4-Dichlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4-Dimethylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4-Dinitrophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4-Dinitrotoluene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,6-Dinitrotoluene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
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RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: MW-2
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 8:37:00 AM
Lab ID: 1812373-004
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**	
2-Chloronaphthalene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Chlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Methylnaphthalene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Methylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Nitroaniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Nitrophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
3,3´-Dichlorobenzidine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
3+4-Methylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
3-Nitroaniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4,6-Dinitro-2-methylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Bromophenyl phenyl ether	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Chloro-3-methylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Chloroaniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Chlorophenyl phenyl ether	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Nitroaniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Nitrophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Acenaphthene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Acenaphthylene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Aniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Anthracene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzidine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzo(g,h,i)perylene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
7,12-Dimethylbenz(a)anthracene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benz(a)anthracene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzo(a)pyrene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzo(b)fluoranthene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzo(k)fluoranthene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzyl alcohol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Bis(2-chloroethoxy)methane	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Bis(2-chloroethyl)ether	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Bis(2-chloroisopropyl)ether	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Bis(2-ethylhexyl)phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Butyl benzyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Carbazole	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Chrysene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Dibenz(a,h)anthracene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Dibenzofuran	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Diethyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Dimethyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: MW-2
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 8:37:00 AM
Lab ID: 1812373-004
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**	
Di-n-butyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Di-n-octyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Fluoranthene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Fluorene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Hexachlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Hexachlorobutadiene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Hexachlorocyclopentadiene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Hexachloroethane	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Indeno(1,2,3-cd)pyrene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Isophorone	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Naphthalene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Nitrobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
N-Nitrosodimethylamine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
N-Nitrosodi-n-propylamine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
N-Nitrosodiphenylamine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Pentachlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Phenanthrene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Phenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Pyrene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Pyridine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Quinoline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
EPA 335.4: TOTAL CYANIDE SUBBED							Analyst: **SUB**	
Cyanide	ND	0.0100	0.0100		mg/L	1	12/13/2018	R57056

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Qualifiers:

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D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: MW-5
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 9:18:00 AM
Lab ID: 1812373-005
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8011/504.1: EDB							Analyst: **JME**	
1,2-Dibromoethane	ND	0.0049	0.0095		µg/L	1	12/17/2018 11:38:02 P	42092
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **lrm**	
Diesel Range Organics (DRO)	ND	0.63	1.0		mg/L	1	12/12/2018 9:28:29 PM	42033
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	12/12/2018 9:28:29 PM	42033
Surr: DNOP	111	0	76.7-135		%Rec	1	12/12/2018 9:28:29 PM	42033
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.024	0.050		mg/L	1	12/11/2018 12:32:40 P	G56246
Surr: BFB	85.5	0	72.8-125		%Rec	1	12/11/2018 12:32:40 P	G56246
EPA METHOD 6020: TOTAL METALS							Analyst: **DBK**	
Antimony	ND	0.00050	0.0010		mg/L	1	12/17/2018 4:01:29 PM	42079
Arsenic	0.0010	0.00050	0.0010		mg/L	1	12/17/2018 4:01:29 PM	42079
Lead	ND	0.00050	0.0010		mg/L	1	12/17/2018 4:01:29 PM	42079
Selenium	ND	0.00050	0.0010		mg/L	1	12/17/2018 4:01:29 PM	42079
EPA METHOD 7470: MERCURY							Analyst: **pmf**	
Mercury	0.000089	0.000038	0.00020	J	mg/L	1	12/11/2018 6:04:18 PM	42021
EPA 6010B: TOTAL RECOVERABLE METALS							Analyst: **rde**	
Barium	ND	0.020	0.020		mg/L	1	12/14/2018 9:52:35 AM	41991
Beryllium	ND	0.00044	0.0030		mg/L	1	12/14/2018 9:52:35 AM	41991
Cadmium	ND	0.00099	0.0020		mg/L	1	12/14/2018 9:52:35 AM	41991
Chromium	ND	0.0011	0.0060		mg/L	1	12/14/2018 9:52:35 AM	41991
Cobalt	ND	0.00098	0.0060		mg/L	1	12/14/2018 9:52:35 AM	41991
Nickel	ND	0.0027	0.010		mg/L	1	12/14/2018 9:52:35 AM	41991
Silver	ND	0.0018	0.0050		mg/L	1	12/14/2018 9:52:35 AM	41991
Vanadium	ND	0.0023	0.050		mg/L	1	12/14/2018 9:52:35 AM	41991
Zinc	ND	0.0033	0.020		mg/L	1	12/14/2018 9:52:35 AM	41991
EPA METHOD 8260B: VOLATILES							Analyst: **AG**	
Benzene	ND	0.17	1.0		µg/L	1	12/11/2018 9:18:10 PM	D56250
Toluene	ND	0.17	1.0		µg/L	1	12/11/2018 9:18:10 PM	D56250
Ethylbenzene	ND	0.22	1.0		µg/L	1	12/11/2018 9:18:10 PM	D56250
Methyl tert-butyl ether (MTBE)	ND	0.46	1.0		µg/L	1	12/11/2018 9:18:10 PM	D56250
1,2,4-Trimethylbenzene	ND	0.25	1.0		µg/L	1	12/11/2018 9:18:10 PM	D56250
1,3,5-Trimethylbenzene	ND	0.23	1.0		µg/L	1	12/11/2018 9:18:10 PM	D56250
1,2-Dichloroethane (EDC)	ND	0.19	1.0		µg/L	1	12/11/2018 9:18:10 PM	D56250
1,2-Dibromoethane (EDB)	ND	0.23	1.0		µg/L	1	12/11/2018 9:18:10 PM	D56250
Naphthalene	ND	0.29	2.0		µg/L	1	12/11/2018 9:18:10 PM	D56250
1-Methylnaphthalene	ND	0.34	4.0		µg/L	1	12/11/2018 9:18:10 PM	D56250

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Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: MW-5
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 9:18:00 AM
Lab ID: 1812373-005
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **AG**	
2-Methylnaphthalene	ND	0.35	4.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
Acetone	ND	0.76	10		µg/L	1	12/11/2018 9:18:10 PM	D5625(
Bromobenzene	ND	0.32	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
Bromodichloromethane	ND	0.28	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
Bromoform	ND	0.32	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
Bromomethane	ND	0.27	3.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
2-Butanone	ND	1.4	10		µg/L	1	12/11/2018 9:18:10 PM	D5625(
Carbon disulfide	ND	0.39	10		µg/L	1	12/11/2018 9:18:10 PM	D5625(
Carbon Tetrachloride	ND	0.14	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
Chlorobenzene	ND	0.29	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
Chloroethane	ND	0.16	2.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
Chloroform	ND	0.24	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
Chloromethane	ND	0.32	3.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
2-Chlorotoluene	ND	0.25	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
4-Chlorotoluene	ND	0.28	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
cis-1,2-DCE	ND	0.38	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
cis-1,3-Dichloropropene	ND	0.30	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
1,2-Dibromo-3-chloropropane	ND	0.47	2.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
Dibromochloromethane	ND	0.24	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
Dibromomethane	ND	0.32	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
1,2-Dichlorobenzene	ND	0.31	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
1,3-Dichlorobenzene	ND	0.31	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
1,4-Dichlorobenzene	ND	0.29	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
Dichlorodifluoromethane	ND	0.26	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
1,1-Dichloroethane	ND	0.18	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
1,1-Dichloroethene	ND	0.12	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
1,2-Dichloropropane	ND	0.17	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
1,3-Dichloropropane	ND	0.27	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
2,2-Dichloropropane	ND	0.23	2.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
1,1-Dichloropropene	ND	0.16	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
Hexachlorobutadiene	ND	0.39	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
2-Hexanone	ND	0.91	10		µg/L	1	12/11/2018 9:18:10 PM	D5625(
Isopropylbenzene	ND	0.22	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
4-Isopropyltoluene	ND	0.24	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
4-Methyl-2-pentanone	ND	0.45	10		µg/L	1	12/11/2018 9:18:10 PM	D5625(
Methylene Chloride	ND	0.21	3.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
n-Butylbenzene	ND	0.25	3.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
n-Propylbenzene	ND	0.24	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(
sec-Butylbenzene	ND	0.20	1.0		µg/L	1	12/11/2018 9:18:10 PM	D5625(

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Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: MW-5
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 9:18:00 AM
Lab ID: 1812373-005
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **AG**	
Styrene	ND	0.25	1.0		µg/L	1	12/11/2018 9:18:10 PM	D56250
tert-Butylbenzene	ND	0.22	1.0		µg/L	1	12/11/2018 9:18:10 PM	D56250
1,1,1,2-Tetrachloroethane	ND	0.25	1.0		µg/L	1	12/11/2018 9:18:10 PM	D56250
1,1,2,2-Tetrachloroethane	ND	0.33	2.0		µg/L	1	12/11/2018 9:18:10 PM	D56250
Tetrachloroethene (PCE)	ND	0.15	1.0		µg/L	1	12/11/2018 9:18:10 PM	D56250
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	12/11/2018 9:18:10 PM	D56250
trans-1,3-Dichloropropene	ND	0.28	1.0		µg/L	1	12/11/2018 9:18:10 PM	D56250
1,2,3-Trichlorobenzene	ND	0.28	1.0		µg/L	1	12/11/2018 9:18:10 PM	D56250
1,2,4-Trichlorobenzene	ND	0.27	1.0		µg/L	1	12/11/2018 9:18:10 PM	D56250
1,1,1-Trichloroethane	ND	0.16	1.0		µg/L	1	12/11/2018 9:18:10 PM	D56250
1,1,2-Trichloroethane	ND	0.23	1.0		µg/L	1	12/11/2018 9:18:10 PM	D56250
Trichloroethene (TCE)	ND	0.26	1.0		µg/L	1	12/11/2018 9:18:10 PM	D56250
Trichlorofluoromethane	ND	0.14	1.0		µg/L	1	12/11/2018 9:18:10 PM	D56250
1,2,3-Trichloropropane	ND	0.57	2.0		µg/L	1	12/11/2018 9:18:10 PM	D56250
Vinyl chloride	ND	0.12	1.0		µg/L	1	12/11/2018 9:18:10 PM	D56250
Xylenes, Total	ND	0.64	1.5		µg/L	1	12/11/2018 9:18:10 PM	D56250
1,4-Dioxane	ND	40	50		µg/L	1	12/13/2018 8:10:17 PM	A56304
Surr: 1,2-Dichloroethane-d4	102	0	70-130		%Rec	1	12/11/2018 9:18:10 PM	D56250
Surr: 4-Bromofluorobenzene	101	0	70-130		%Rec	1	12/11/2018 9:18:10 PM	D56250
Surr: Dibromofluoromethane	97.7	0	70-130		%Rec	1	12/11/2018 9:18:10 PM	D56250
Surr: Toluene-d8	103	0	70-130		%Rec	1	12/11/2018 9:18:10 PM	D56250
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**	
Benzenethiol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Dibenz(a,h)acridine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,2,4-Trichlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,2-Dichlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,2-Diphenylhydrazine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,3-Dichlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,4-Dichlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1-Methylnaphthalene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,3,4,6-Tetrachlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,3,5,6-Tetrachlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4,5-Trichlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4,6-Trichlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4-Dichlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4-Dimethylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4-Dinitrophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4-Dinitrotoluene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,6-Dinitrotoluene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: MW-5
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 9:18:00 AM
Lab ID: 1812373-005
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**	
2-Chloronaphthalene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Chlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Methylnaphthalene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Methylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Nitroaniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Nitrophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
3,3´-Dichlorobenzidine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
3+4-Methylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
3-Nitroaniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4,6-Dinitro-2-methylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Bromophenyl phenyl ether	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Chloro-3-methylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Chloroaniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Chlorophenyl phenyl ether	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Nitroaniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Nitrophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Acenaphthene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Acenaphthylene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Aniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Anthracene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzidine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzo(g,h,i)perylene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
7,12-Dimethylbenz(a)anthracene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benz(a)anthracene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzo(a)pyrene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzo(b)fluoranthene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzo(k)fluoranthene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzyl alcohol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Bis(2-chloroethoxy)methane	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Bis(2-chloroethyl)ether	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Bis(2-chloroisopropyl)ether	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Bis(2-ethylhexyl)phthalate	1.1	0.50	0.50		µg/L	1	12/14/2018	R57056
Butyl benzyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Carbazole	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Chrysene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Dibenz(a,h)anthracene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Dibenzofuran	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Diethyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Dimethyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056

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Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: MW-5
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 9:18:00 AM
Lab ID: 1812373-005
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**	
Di-n-butyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Di-n-octyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Fluoranthene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Fluorene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Hexachlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Hexachlorobutadiene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Hexachlorocyclopentadiene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Hexachloroethane	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Indeno(1,2,3-cd)pyrene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Isophorone	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Naphthalene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Nitrobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
N-Nitrosodimethylamine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
N-Nitrosodi-n-propylamine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
N-Nitrosodiphenylamine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Pentachlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Phenanthrene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Phenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Pyrene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Pyridine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Quinoline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
EPA 335.4: TOTAL CYANIDE SUBBED							Analyst: **SUB**	
Cyanide	ND	0.0100	0.0100		mg/L	1	12/13/2018	R57056

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B	Analyte detected in the associated Method Blank
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J	Analyte detected below quantitation limits
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RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: SMW-4
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 1:45:00 PM
Lab ID: 1812373-006
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8011/504.1: EDB							Analyst: **JME**	
1,2-Dibromoethane	ND	0.0049	0.0095		µg/L	1	12/17/2018 11:52:50 P	42092
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **lrm**	
Diesel Range Organics (DRO)	ND	0.63	1.0		mg/L	1	12/12/2018 9:50:14 PM	42033
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	12/12/2018 9:50:14 PM	42033
Surr: DNOP	115	0	76.7-135		%Rec	1	12/12/2018 9:50:14 PM	42033
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.024	0.050		mg/L	1	12/11/2018 12:55:14 P	G56246
Surr: BFB	91.5	0	72.8-125		%Rec	1	12/11/2018 12:55:14 P	G56246
EPA METHOD 6020: TOTAL METALS							Analyst: **DBK**	
Antimony	ND	0.00050	0.0010		mg/L	1	12/17/2018 4:05:50 PM	42079
Arsenic	0.0029	0.00050	0.0010		mg/L	1	12/17/2018 4:05:50 PM	42079
Lead	0.0010	0.00050	0.0010		mg/L	1	12/17/2018 4:05:50 PM	42079
Selenium	0.00053	0.00050	0.0010	J	mg/L	1	12/17/2018 4:05:50 PM	42079
EPA METHOD 7470: MERCURY							Analyst: **pmf**	
Mercury	0.000091	0.000038	0.00020	J	mg/L	1	12/11/2018 6:07:45 PM	42021
EPA 6010B: TOTAL RECOVERABLE METALS							Analyst: **rde**	
Barium	0.032	0.020	0.020		mg/L	1	12/14/2018 9:54:32 AM	41991
Beryllium	ND	0.00044	0.0030		mg/L	1	12/14/2018 9:54:32 AM	41991
Cadmium	ND	0.00099	0.0020		mg/L	1	12/14/2018 9:54:32 AM	41991
Chromium	0.011	0.0011	0.0060		mg/L	1	12/14/2018 9:54:32 AM	41991
Cobalt	0.019	0.00098	0.0060		mg/L	1	12/14/2018 9:54:32 AM	41991
Nickel	0.0095	0.0027	0.010	J	mg/L	1	12/14/2018 9:54:32 AM	41991
Silver	ND	0.0018	0.0050		mg/L	1	12/14/2018 9:54:32 AM	41991
Vanadium	0.050	0.0023	0.050		mg/L	1	12/14/2018 9:54:32 AM	41991
Zinc	0.0072	0.0033	0.020	J	mg/L	1	12/14/2018 9:54:32 AM	41991
EPA METHOD 8260B: VOLATILES							Analyst: **AG**	
Benzene	ND	0.17	1.0		µg/L	1	12/11/2018 9:46:47 PM	D56250
Toluene	ND	0.17	1.0		µg/L	1	12/11/2018 9:46:47 PM	D56250
Ethylbenzene	ND	0.22	1.0		µg/L	1	12/11/2018 9:46:47 PM	D56250
Methyl tert-butyl ether (MTBE)	ND	0.46	1.0		µg/L	1	12/11/2018 9:46:47 PM	D56250
1,2,4-Trimethylbenzene	ND	0.25	1.0		µg/L	1	12/11/2018 9:46:47 PM	D56250
1,3,5-Trimethylbenzene	ND	0.23	1.0		µg/L	1	12/11/2018 9:46:47 PM	D56250
1,2-Dichloroethane (EDC)	ND	0.19	1.0		µg/L	1	12/11/2018 9:46:47 PM	D56250
1,2-Dibromoethane (EDB)	ND	0.23	1.0		µg/L	1	12/11/2018 9:46:47 PM	D56250
Naphthalene	ND	0.29	2.0		µg/L	1	12/11/2018 9:46:47 PM	D56250
1-Methylnaphthalene	ND	0.34	4.0		µg/L	1	12/11/2018 9:46:47 PM	D56250

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Qualifiers:

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H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
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J	Analyte detected below quantitation limits
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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: SMW-4
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 1:45:00 PM
Lab ID: 1812373-006
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **AG**	
2-Methylnaphthalene	ND	0.35	4.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
Acetone	2.9	0.76	10	J	µg/L	1	12/11/2018 9:46:47 PM	D5625C
Bromobenzene	ND	0.32	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
Bromodichloromethane	ND	0.28	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
Bromoform	ND	0.32	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
Bromomethane	ND	0.27	3.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
2-Butanone	ND	1.4	10		µg/L	1	12/11/2018 9:46:47 PM	D5625C
Carbon disulfide	ND	0.39	10		µg/L	1	12/11/2018 9:46:47 PM	D5625C
Carbon Tetrachloride	ND	0.14	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
Chlorobenzene	ND	0.29	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
Chloroethane	ND	0.16	2.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
Chloroform	ND	0.24	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
Chloromethane	ND	0.32	3.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
2-Chlorotoluene	ND	0.25	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
4-Chlorotoluene	ND	0.28	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
cis-1,2-DCE	ND	0.38	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
cis-1,3-Dichloropropene	ND	0.30	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
1,2-Dibromo-3-chloropropane	ND	0.47	2.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
Dibromochloromethane	ND	0.24	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
Dibromomethane	ND	0.32	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
1,2-Dichlorobenzene	ND	0.31	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
1,3-Dichlorobenzene	ND	0.31	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
1,4-Dichlorobenzene	ND	0.29	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
Dichlorodifluoromethane	ND	0.26	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
1,1-Dichloroethane	ND	0.18	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
1,1-Dichloroethene	ND	0.12	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
1,2-Dichloropropane	ND	0.17	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
1,3-Dichloropropane	ND	0.27	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
2,2-Dichloropropane	ND	0.23	2.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
1,1-Dichloropropene	ND	0.16	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
Hexachlorobutadiene	ND	0.39	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
2-Hexanone	ND	0.91	10		µg/L	1	12/11/2018 9:46:47 PM	D5625C
Isopropylbenzene	ND	0.22	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
4-Isopropyltoluene	ND	0.24	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
4-Methyl-2-pentanone	ND	0.45	10		µg/L	1	12/11/2018 9:46:47 PM	D5625C
Methylene Chloride	ND	0.21	3.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
n-Butylbenzene	ND	0.25	3.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
n-Propylbenzene	ND	0.24	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C
sec-Butylbenzene	ND	0.20	1.0		µg/L	1	12/11/2018 9:46:47 PM	D5625C

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Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: SMW-4
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 1:45:00 PM
Lab ID: 1812373-006
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **AG**	
Styrene	ND	0.25	1.0		µg/L	1	12/11/2018 9:46:47 PM	D56250
tert-Butylbenzene	ND	0.22	1.0		µg/L	1	12/11/2018 9:46:47 PM	D56250
1,1,1,2-Tetrachloroethane	ND	0.25	1.0		µg/L	1	12/11/2018 9:46:47 PM	D56250
1,1,2,2-Tetrachloroethane	ND	0.33	2.0		µg/L	1	12/11/2018 9:46:47 PM	D56250
Tetrachloroethene (PCE)	ND	0.15	1.0		µg/L	1	12/11/2018 9:46:47 PM	D56250
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	12/11/2018 9:46:47 PM	D56250
trans-1,3-Dichloropropene	ND	0.28	1.0		µg/L	1	12/11/2018 9:46:47 PM	D56250
1,2,3-Trichlorobenzene	ND	0.28	1.0		µg/L	1	12/11/2018 9:46:47 PM	D56250
1,2,4-Trichlorobenzene	ND	0.27	1.0		µg/L	1	12/11/2018 9:46:47 PM	D56250
1,1,1-Trichloroethane	ND	0.16	1.0		µg/L	1	12/11/2018 9:46:47 PM	D56250
1,1,2-Trichloroethane	ND	0.23	1.0		µg/L	1	12/11/2018 9:46:47 PM	D56250
Trichloroethene (TCE)	ND	0.26	1.0		µg/L	1	12/11/2018 9:46:47 PM	D56250
Trichlorofluoromethane	ND	0.14	1.0		µg/L	1	12/11/2018 9:46:47 PM	D56250
1,2,3-Trichloropropane	ND	0.57	2.0		µg/L	1	12/11/2018 9:46:47 PM	D56250
Vinyl chloride	ND	0.12	1.0		µg/L	1	12/11/2018 9:46:47 PM	D56250
Xylenes, Total	ND	0.64	1.5		µg/L	1	12/11/2018 9:46:47 PM	D56250
1,4-Dioxane	ND	40	50		µg/L	1	12/13/2018 8:39:22 PM	A56304
Surr: 1,2-Dichloroethane-d4	97.9	0	70-130		%Rec	1	12/11/2018 9:46:47 PM	D56250
Surr: 4-Bromofluorobenzene	96.4	0	70-130		%Rec	1	12/11/2018 9:46:47 PM	D56250
Surr: Dibromofluoromethane	96.4	0	70-130		%Rec	1	12/11/2018 9:46:47 PM	D56250
Surr: Toluene-d8	104	0	70-130		%Rec	1	12/11/2018 9:46:47 PM	D56250
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**	
Benzenethiol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Dibenz(a,h)acridine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,2,4-Trichlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,2-Dichlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,2-Diphenylhydrazine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,3-Dichlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,4-Dichlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1-Methylnaphthalene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,3,4,6-Tetrachlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,3,5,6-Tetrachlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4,5-Trichlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4,6-Trichlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4-Dichlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4-Dimethylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4-Dinitrophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4-Dinitrotoluene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,6-Dinitrotoluene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056

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E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: SMW-4
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 1:45:00 PM
Lab ID: 1812373-006
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**	
2-Chloronaphthalene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Chlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Methylnaphthalene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Methylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Nitroaniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Nitrophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
3,3´-Dichlorobenzidine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
3+4-Methylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
3-Nitroaniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4,6-Dinitro-2-methylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Bromophenyl phenyl ether	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Chloro-3-methylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Chloroaniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Chlorophenyl phenyl ether	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Nitroaniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Nitrophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Acenaphthene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Acenaphthylene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Aniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Anthracene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzidine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzo(g,h,i)perylene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
7,12-Dimethylbenz(a)anthracene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benz(a)anthracene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzo(a)pyrene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzo(b)fluoranthene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzo(k)fluoranthene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzyl alcohol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Bis(2-chloroethoxy)methane	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Bis(2-chloroethyl)ether	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Bis(2-chloroisopropyl)ether	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Bis(2-ethylhexyl)phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Butyl benzyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Carbazole	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Chrysene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Dibenz(a,h)anthracene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Dibenzofuran	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Diethyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Dimethyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: SMW-4
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 1:45:00 PM
Lab ID: 1812373-006
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**	
Di-n-butyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Di-n-octyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Fluoranthene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Fluorene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Hexachlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Hexachlorobutadiene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Hexachlorocyclopentadiene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Hexachloroethane	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Indeno(1,2,3-cd)pyrene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Isophorone	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Naphthalene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Nitrobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
N-Nitrosodimethylamine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
N-Nitrosodi-n-propylamine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
N-Nitrosodiphenylamine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Pentachlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Phenanthrene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Phenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Pyrene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Pyridine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Quinoline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
EPA 335.4: TOTAL CYANIDE SUBBED							Analyst: **SUB**	
Cyanide	ND	0.0100	0.0100		mg/L	1	12/13/2018	R57056

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H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
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J	Analyte detected below quantitation limits
P	Sample pH Not In Range
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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: MW-4
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 1:00:00 PM
Lab ID: 1812373-007
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8011/504.1: EDB							Analyst: **JME**	
1,2-Dibromoethane	ND	0.0049	0.0096		µg/L	1	12/18/2018 12:07:39 A	42092
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **lrm**	
Diesel Range Organics (DRO)	ND	0.63	1.0		mg/L	1	12/12/2018 10:12:04 P	42033
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	12/12/2018 10:12:04 P	42033
Surr: DNOP	114	0	76.7-135		%Rec	1	12/12/2018 10:12:04 P	42033
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.024	0.050		mg/L	1	12/11/2018 1:18:03 PM	G56246
Surr: BFB	87.9	0	72.8-125		%Rec	1	12/11/2018 1:18:03 PM	G56246
EPA METHOD 6020: TOTAL METALS							Analyst: **DBK**	
Antimony	ND	0.00050	0.0010		mg/L	1	12/17/2018 4:10:11 PM	42079
Arsenic	0.00075	0.00050	0.0010	J	mg/L	1	12/17/2018 4:10:11 PM	42079
Lead	ND	0.00050	0.0010		mg/L	1	12/17/2018 4:10:11 PM	42079
Selenium	ND	0.00050	0.0010		mg/L	1	12/17/2018 4:10:11 PM	42079
EPA METHOD 7470: MERCURY							Analyst: **pmf**	
Mercury	0.000087	0.000038	0.00020	J	mg/L	1	12/11/2018 6:11:10 PM	42021
EPA 6010B: TOTAL RECOVERABLE METALS							Analyst: **rde**	
Barium	0.021	0.020	0.020		mg/L	1	12/14/2018 9:56:17 AM	41991
Beryllium	ND	0.00044	0.0030		mg/L	1	12/14/2018 9:56:17 AM	41991
Cadmium	ND	0.00099	0.0020		mg/L	1	12/14/2018 9:56:17 AM	41991
Chromium	ND	0.0011	0.0060		mg/L	1	12/14/2018 9:56:17 AM	41991
Cobalt	ND	0.00098	0.0060		mg/L	1	12/14/2018 9:56:17 AM	41991
Nickel	ND	0.0027	0.010		mg/L	1	12/14/2018 9:56:17 AM	41991
Silver	ND	0.0018	0.0050		mg/L	1	12/14/2018 9:56:17 AM	41991
Vanadium	ND	0.0023	0.050		mg/L	1	12/14/2018 9:56:17 AM	41991
Zinc	ND	0.0033	0.020		mg/L	1	12/14/2018 9:56:17 AM	41991
EPA METHOD 8260B: VOLATILES							Analyst: **AG**	
Benzene	ND	0.17	1.0		µg/L	1	12/11/2018 10:15:21 P	D56250
Toluene	ND	0.17	1.0		µg/L	1	12/11/2018 10:15:21 P	D56250
Ethylbenzene	ND	0.22	1.0		µg/L	1	12/11/2018 10:15:21 P	D56250
Methyl tert-butyl ether (MTBE)	ND	0.46	1.0		µg/L	1	12/11/2018 10:15:21 P	D56250
1,2,4-Trimethylbenzene	ND	0.25	1.0		µg/L	1	12/11/2018 10:15:21 P	D56250
1,3,5-Trimethylbenzene	ND	0.23	1.0		µg/L	1	12/11/2018 10:15:21 P	D56250
1,2-Dichloroethane (EDC)	ND	0.19	1.0		µg/L	1	12/11/2018 10:15:21 P	D56250
1,2-Dibromoethane (EDB)	ND	0.23	1.0		µg/L	1	12/11/2018 10:15:21 P	D56250
Naphthalene	ND	0.29	2.0		µg/L	1	12/11/2018 10:15:21 P	D56250
1-Methylnaphthalene	ND	0.34	4.0		µg/L	1	12/11/2018 10:15:21 P	D56250

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Qualifiers:

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D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: MW-4
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 1:00:00 PM
Lab ID: 1812373-007
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **AG**	
2-Methylnaphthalene	ND	0.35	4.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
Acetone	3.7	0.76	10	J	µg/L	1	12/11/2018 10:15:21 P	D5625C
Bromobenzene	ND	0.32	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
Bromodichloromethane	ND	0.28	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
Bromoform	ND	0.32	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
Bromomethane	ND	0.27	3.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
2-Butanone	ND	1.4	10		µg/L	1	12/11/2018 10:15:21 P	D5625C
Carbon disulfide	ND	0.39	10		µg/L	1	12/11/2018 10:15:21 P	D5625C
Carbon Tetrachloride	ND	0.14	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
Chlorobenzene	ND	0.29	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
Chloroethane	ND	0.16	2.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
Chloroform	ND	0.24	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
Chloromethane	ND	0.32	3.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
2-Chlorotoluene	ND	0.25	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
4-Chlorotoluene	ND	0.28	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
cis-1,2-DCE	ND	0.38	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
cis-1,3-Dichloropropene	ND	0.30	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
1,2-Dibromo-3-chloropropane	ND	0.47	2.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
Dibromochloromethane	ND	0.24	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
Dibromomethane	ND	0.32	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
1,2-Dichlorobenzene	ND	0.31	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
1,3-Dichlorobenzene	ND	0.31	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
1,4-Dichlorobenzene	ND	0.29	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
Dichlorodifluoromethane	ND	0.26	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
1,1-Dichloroethane	ND	0.18	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
1,1-Dichloroethene	ND	0.12	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
1,2-Dichloropropane	ND	0.17	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
1,3-Dichloropropane	ND	0.27	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
2,2-Dichloropropane	ND	0.23	2.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
1,1-Dichloropropene	ND	0.16	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
Hexachlorobutadiene	ND	0.39	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
2-Hexanone	ND	0.91	10		µg/L	1	12/11/2018 10:15:21 P	D5625C
Isopropylbenzene	ND	0.22	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
4-Isopropyltoluene	ND	0.24	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
4-Methyl-2-pentanone	ND	0.45	10		µg/L	1	12/11/2018 10:15:21 P	D5625C
Methylene Chloride	ND	0.21	3.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
n-Butylbenzene	ND	0.25	3.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
n-Propylbenzene	ND	0.24	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C
sec-Butylbenzene	ND	0.20	1.0		µg/L	1	12/11/2018 10:15:21 P	D5625C

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Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: MW-4
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 1:00:00 PM
Lab ID: 1812373-007
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **AG**	
Styrene	ND	0.25	1.0		µg/L	1	12/11/2018 10:15:21 P	D56250
tert-Butylbenzene	ND	0.22	1.0		µg/L	1	12/11/2018 10:15:21 P	D56250
1,1,1,2-Tetrachloroethane	ND	0.25	1.0		µg/L	1	12/11/2018 10:15:21 P	D56250
1,1,2,2-Tetrachloroethane	ND	0.33	2.0		µg/L	1	12/11/2018 10:15:21 P	D56250
Tetrachloroethene (PCE)	ND	0.15	1.0		µg/L	1	12/11/2018 10:15:21 P	D56250
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	12/11/2018 10:15:21 P	D56250
trans-1,3-Dichloropropene	ND	0.28	1.0		µg/L	1	12/11/2018 10:15:21 P	D56250
1,2,3-Trichlorobenzene	ND	0.28	1.0		µg/L	1	12/11/2018 10:15:21 P	D56250
1,2,4-Trichlorobenzene	ND	0.27	1.0		µg/L	1	12/11/2018 10:15:21 P	D56250
1,1,1-Trichloroethane	ND	0.16	1.0		µg/L	1	12/11/2018 10:15:21 P	D56250
1,1,2-Trichloroethane	ND	0.23	1.0		µg/L	1	12/11/2018 10:15:21 P	D56250
Trichloroethene (TCE)	ND	0.26	1.0		µg/L	1	12/11/2018 10:15:21 P	D56250
Trichlorofluoromethane	ND	0.14	1.0		µg/L	1	12/11/2018 10:15:21 P	D56250
1,2,3-Trichloropropane	ND	0.57	2.0		µg/L	1	12/11/2018 10:15:21 P	D56250
Vinyl chloride	ND	0.12	1.0		µg/L	1	12/11/2018 10:15:21 P	D56250
Xylenes, Total	ND	0.64	1.5		µg/L	1	12/11/2018 10:15:21 P	D56250
1,4-Dioxane	ND	40	50		µg/L	1	12/13/2018 9:08:28 PM	A56304
Surr: 1,2-Dichloroethane-d4	103	0	70-130		%Rec	1	12/11/2018 10:15:21 P	D56250
Surr: 4-Bromofluorobenzene	97.7	0	70-130		%Rec	1	12/11/2018 10:15:21 P	D56250
Surr: Dibromofluoromethane	99.8	0	70-130		%Rec	1	12/11/2018 10:15:21 P	D56250
Surr: Toluene-d8	104	0	70-130		%Rec	1	12/11/2018 10:15:21 P	D56250
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**	
Benzenethiol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Dibenz(a,h)acridine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,2,4-Trichlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,2-Dichlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,2-Diphenylhydrazine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,3-Dichlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,4-Dichlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1-Methylnaphthalene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,3,4,6-Tetrachlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,3,5,6-Tetrachlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4,5-Trichlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4,6-Trichlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4-Dichlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4-Dimethylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4-Dinitrophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4-Dinitrotoluene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,6-Dinitrotoluene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056

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Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: MW-4
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 1:00:00 PM
Lab ID: 1812373-007
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**	
2-Chloronaphthalene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Chlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Methylnaphthalene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Methylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Nitroaniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Nitrophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
3,3´-Dichlorobenzidine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
3+4-Methylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
3-Nitroaniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4,6-Dinitro-2-methylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Bromophenyl phenyl ether	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Chloro-3-methylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Chloroaniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Chlorophenyl phenyl ether	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Nitroaniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Nitrophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Acenaphthene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Acenaphthylene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Aniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Anthracene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzidine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzo(g,h,i)perylene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
7,12-Dimethylbenz(a)anthracene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benz(a)anthracene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzo(a)pyrene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzo(b)fluoranthene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzo(k)fluoranthene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzyl alcohol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Bis(2-chloroethoxy)methane	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Bis(2-chloroethyl)ether	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Bis(2-chloroisopropyl)ether	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Bis(2-ethylhexyl)phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Butyl benzyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Carbazole	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Chrysene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Dibenz(a,h)anthracene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Dibenzofuran	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Diethyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Dimethyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056

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Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: MW-4
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 1:00:00 PM
Lab ID: 1812373-007
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**	
Di-n-butyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Di-n-octyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Fluoranthene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Fluorene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Hexachlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Hexachlorobutadiene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Hexachlorocyclopentadiene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Hexachloroethane	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Indeno(1,2,3-cd)pyrene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Isophorone	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Naphthalene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Nitrobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
N-Nitrosodimethylamine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
N-Nitrosodi-n-propylamine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
N-Nitrosodiphenylamine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Pentachlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Phenanthrene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Phenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Pyrene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Pyridine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Quinoline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
EPA 335.4: TOTAL CYANIDE SUBBED							Analyst: **SUB**	
Cyanide	ND	0.0100	0.0100		mg/L	1	12/13/2018	R57056

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PQL	Practical Quanitative Limit
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B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: DUPLICATE
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 1:10:00 PM
Lab ID: 1812373-008
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8011/504.1: EDB							Analyst: **JME**	
1,2-Dibromoethane	ND	0.0050	0.0096		µg/L	1	12/18/2018 12:22:30 A	42092
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **lrm**	
Diesel Range Organics (DRO)	ND	0.63	1.0		mg/L	1	12/12/2018 10:34:01 P	42033
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	12/12/2018 10:34:01 P	42033
Surr: DNOP	112	0	76.7-135		%Rec	1	12/12/2018 10:34:01 P	42033
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.024	0.050		mg/L	1	12/11/2018 1:40:50 PM	G56246
Surr: BFB	87.4	0	72.8-125		%Rec	1	12/11/2018 1:40:50 PM	G56246
EPA METHOD 6020: TOTAL METALS							Analyst: **DBK**	
Antimony	ND	0.00050	0.0010		mg/L	1	12/17/2018 4:14:32 PM	42079
Arsenic	0.00078	0.00050	0.0010	J	mg/L	1	12/17/2018 4:14:32 PM	42079
Lead	ND	0.00050	0.0010		mg/L	1	12/17/2018 4:14:32 PM	42079
Selenium	ND	0.00050	0.0010		mg/L	1	12/17/2018 4:14:32 PM	42079
EPA METHOD 7470: MERCURY							Analyst: **pmf**	
Mercury	0.000090	0.000038	0.00020	J	mg/L	1	12/11/2018 6:27:18 PM	42021
EPA 6010B: TOTAL RECOVERABLE METALS							Analyst: **rde**	
Barium	0.021	0.020	0.020		mg/L	1	12/14/2018 9:58:15 AM	41991
Beryllium	ND	0.00044	0.0030		mg/L	1	12/14/2018 9:58:15 AM	41991
Cadmium	ND	0.00099	0.0020		mg/L	1	12/14/2018 9:58:15 AM	41991
Chromium	ND	0.0011	0.0060		mg/L	1	12/14/2018 9:58:15 AM	41991
Cobalt	ND	0.00098	0.0060		mg/L	1	12/14/2018 9:58:15 AM	41991
Nickel	ND	0.0027	0.010		mg/L	1	12/14/2018 9:58:15 AM	41991
Silver	ND	0.0018	0.0050		mg/L	1	12/14/2018 9:58:15 AM	41991
Vanadium	ND	0.0023	0.050		mg/L	1	12/14/2018 9:58:15 AM	41991
Zinc	0.0058	0.0033	0.020	J	mg/L	1	12/14/2018 9:58:15 AM	41991
EPA METHOD 8260B: VOLATILES							Analyst: **AG**	
Benzene	ND	0.17	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
Toluene	ND	0.17	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
Ethylbenzene	ND	0.22	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
Methyl tert-butyl ether (MTBE)	ND	0.46	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
1,2,4-Trimethylbenzene	ND	0.25	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
1,3,5-Trimethylbenzene	ND	0.23	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
1,2-Dichloroethane (EDC)	ND	0.19	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
1,2-Dibromoethane (EDB)	ND	0.23	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
Naphthalene	ND	0.29	2.0		µg/L	1	12/12/2018 11:47:56 A	R56282
1-Methylnaphthalene	ND	0.34	4.0		µg/L	1	12/12/2018 11:47:56 A	R56282

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

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D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: DUPLICATE
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 1:10:00 PM
Lab ID: 1812373-008
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **AG**	
2-Methylnaphthalene	ND	0.35	4.0		µg/L	1	12/12/2018 11:47:56 A	R56282
Acetone	8.8	0.76	10	J	µg/L	1	12/12/2018 11:47:56 A	R56282
Bromobenzene	ND	0.32	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
Bromodichloromethane	ND	0.28	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
Bromoform	ND	0.32	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
Bromomethane	ND	0.27	3.0		µg/L	1	12/12/2018 11:47:56 A	R56282
2-Butanone	ND	1.4	10		µg/L	1	12/12/2018 11:47:56 A	R56282
Carbon disulfide	ND	0.39	10		µg/L	1	12/12/2018 11:47:56 A	R56282
Carbon Tetrachloride	ND	0.14	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
Chlorobenzene	ND	0.29	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
Chloroethane	ND	0.16	2.0		µg/L	1	12/12/2018 11:47:56 A	R56282
Chloroform	ND	0.24	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
Chloromethane	ND	0.32	3.0		µg/L	1	12/12/2018 11:47:56 A	R56282
2-Chlorotoluene	ND	0.25	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
4-Chlorotoluene	ND	0.28	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
cis-1,2-DCE	ND	0.38	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
cis-1,3-Dichloropropene	ND	0.30	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
1,2-Dibromo-3-chloropropane	ND	0.47	2.0		µg/L	1	12/12/2018 11:47:56 A	R56282
Dibromochloromethane	ND	0.24	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
Dibromomethane	ND	0.32	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
1,2-Dichlorobenzene	ND	0.31	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
1,3-Dichlorobenzene	ND	0.31	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
1,4-Dichlorobenzene	ND	0.29	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
Dichlorodifluoromethane	ND	0.26	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
1,1-Dichloroethane	ND	0.18	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
1,1-Dichloroethene	ND	0.12	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
1,2-Dichloropropane	ND	0.17	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
1,3-Dichloropropane	ND	0.27	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
2,2-Dichloropropane	ND	0.23	2.0		µg/L	1	12/12/2018 11:47:56 A	R56282
1,1-Dichloropropene	ND	0.16	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
Hexachlorobutadiene	ND	0.39	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
2-Hexanone	ND	0.91	10		µg/L	1	12/12/2018 11:47:56 A	R56282
Isopropylbenzene	ND	0.22	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
4-Isopropyltoluene	ND	0.24	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
4-Methyl-2-pentanone	ND	0.45	10		µg/L	1	12/12/2018 11:47:56 A	R56282
Methylene Chloride	ND	0.21	3.0		µg/L	1	12/12/2018 11:47:56 A	R56282
n-Butylbenzene	ND	0.25	3.0		µg/L	1	12/12/2018 11:47:56 A	R56282
n-Propylbenzene	ND	0.24	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
sec-Butylbenzene	ND	0.20	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282

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Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: DUPLICATE
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 1:10:00 PM
Lab ID: 1812373-008
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **AG**	
Styrene	ND	0.25	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
tert-Butylbenzene	ND	0.22	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
1,1,1,2-Tetrachloroethane	ND	0.25	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
1,1,2,2-Tetrachloroethane	ND	0.33	2.0		µg/L	1	12/12/2018 11:47:56 A	R56282
Tetrachloroethene (PCE)	ND	0.15	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
trans-1,3-Dichloropropene	ND	0.28	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
1,2,3-Trichlorobenzene	ND	0.28	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
1,2,4-Trichlorobenzene	ND	0.27	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
1,1,1-Trichloroethane	ND	0.16	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
1,1,2-Trichloroethane	ND	0.23	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
Trichloroethene (TCE)	ND	0.26	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
Trichlorofluoromethane	ND	0.14	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
1,2,3-Trichloropropane	ND	0.57	2.0		µg/L	1	12/12/2018 11:47:56 A	R56282
Vinyl chloride	ND	0.12	1.0		µg/L	1	12/12/2018 11:47:56 A	R56282
Xylenes, Total	ND	0.64	1.5		µg/L	1	12/12/2018 11:47:56 A	R56282
1,4-Dioxane	ND	40	50		µg/L	1	12/13/2018 9:37:30 PM	A56304
Surr: 1,2-Dichloroethane-d4	101	0	70-130		%Rec	1	12/12/2018 11:47:56 A	R56282
Surr: 4-Bromofluorobenzene	98.5	0	70-130		%Rec	1	12/12/2018 11:47:56 A	R56282
Surr: Dibromofluoromethane	101	0	70-130		%Rec	1	12/12/2018 11:47:56 A	R56282
Surr: Toluene-d8	105	0	70-130		%Rec	1	12/12/2018 11:47:56 A	R56282
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**	
Benzenethiol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,2,4-Trichlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,2-Dichlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,2-Diphenylhydrazine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,3-Dichlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1,4-Dichlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
1-Methylnaphthalene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,3,4,6-Tetrachlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,3,5,6-Tetrachlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4,5-Trichlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4,6-Trichlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4-Dichlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4-Dimethylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4-Dinitrophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,4-Dinitrotoluene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2,6-Dinitrotoluene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Chloronaphthalene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056

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Qualifiers:

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ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: DUPLICATE
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 1:10:00 PM
Lab ID: 1812373-008
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**	
2-Chlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Methylnaphthalene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Methylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Nitroaniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
2-Nitrophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
3,3´-Dichlorobenzidine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
3+4-Methylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
3-Nitroaniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4,6-Dinitro-2-methylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Bromophenyl phenyl ether	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Chloro-3-methylphenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Chloroaniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Chlorophenyl phenyl ether	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Nitroaniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
4-Nitrophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Acenaphthene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Acenaphthylene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Aniline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Anthracene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzidine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzo(g,h,i)perylene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
7,12-Dimethylbenz(a)anthracene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benz(a)anthracene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzo(a)pyrene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzo(b)fluoranthene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzo(k)fluoranthene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Benzyl alcohol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Bis(2-chloroethoxy)methane	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Bis(2-chloroethyl)ether	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Bis(2-chloroisopropyl)ether	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Bis(2-ethylhexyl)phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Butyl benzyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Carbazole	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Chrysene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Dibenz(a,h)anthracene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Dibenzofuran	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Diethyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Dimethyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Di-n-butyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: DUPLICATE
Project: 2018 Post Closure Sampling LTU
Collection Date: 12/6/2018 1:10:00 PM
Lab ID: 1812373-008
Matrix: AQUEOUS
Received Date: 12/6/2018 5:08:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA 8270C: SEMIVOLATILES/MOD							Analyst: **SUB**	
Di-n-octyl phthalate	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Fluoranthene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Fluorene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Hexachlorobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Hexachlorobutadiene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Hexachlorocyclopentadiene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Hexachloroethane	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Indeno(1,2,3-cd)pyrene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Isophorone	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Naphthalene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Nitrobenzene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
N-Nitrosodimethylamine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
N-Nitrosodi-n-propylamine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
N-Nitrosodiphenylamine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Pentachlorophenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Phenanthrene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Phenol	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Pyrene	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Pyridine	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
Quinoline	ND	0.50	0.50		µg/L	1	12/14/2018	R57056
EPA 335.4: TOTAL CYANIDE SUBBED							Analyst: **SUB**	
Cyanide	ND	0.0100	0.0100		mg/L	1	12/13/2018	R57056

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181212072
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1812373
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	181212072-001	**Sampling Date**	12/6/2018	**Date/Time Received**	12/12/20112:05 PM
Client Sample ID	1812373-003E/MW-1	**Sampling Time**	8:10 AM	**Extraction Date**	12/12/2018
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
1,2,4-Trichlorobenzene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
1,2-Dichlorobenzene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
1,2-Diphenyl hydrazine	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
1,3-Dichlorobenzene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
1,4-Dichlorobenzene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
1-Methylnaphthalene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
2,3,4,6-Tetrachlorophenol	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
2,3,5,6-Tetrachlorophenol	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
2,4,5-Trichlorophenol	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
2,4,6-Trichlorophenol	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
2,4-Dichlorophenol	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
2,4-Dimethylphenol	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
2,4-Dinitrophenol	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
2,4-Dinitrotoluene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
2,6-Dinitrotoluene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
2-Chloronaphthalene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
2-Chlorophenol	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
2-Methylnaphthalene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
2-Methylphenol	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
2-Nitroaniline	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
2-Nitrophenol	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
3,3'-Dichlorobenzidine	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
3+4-Methylphenol	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
3-Nitroaniline	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
4,6-Dinitro-2-methylphenol	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
4-Bromophenyl-phenylether	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
4-Chloro-3-methylphenol	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
4-Chloroaniline	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
4-Chlorophenyl-phenylether	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
4-Nitroaniline	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
4-Nitrophenol	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Acenaphthene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Acenaphthylene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Aniline	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181212072
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1812373
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	181212072-001	**Sampling Date**	12/6/2018	**Date/Time Received**	12/12/20112:05 PM
Client Sample ID	1812373-003E/MW-1	**Sampling Time**	8:10 AM	**Extraction Date**	12/12/2018
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Anthracene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Benzidine	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Benzo(ghi)perylene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Benzo[a]anthracene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Benzo[a]pyrene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Benzo[b]fluoranthene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Benzo[k]fluoranthene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Benzyl alcohol	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
bis(2-Chloroethoxy)methane	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
bis(2-Chloroethyl)ether	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
bis(2-chloroisopropyl)ether	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
bis(2-Ethylhexyl)phthalate	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Butylbenzylphthalate	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Carbazole	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Chrysene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Dibenz[a,h]anthracene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Dibenzofuran	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Diethylphthalate	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Dimethylphthalate	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Di-n-butylphthalate	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Di-n-octylphthalate	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Fluoranthene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Fluorene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Hexachlorobenzene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Hexachlorobutadiene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Hexachlorocyclopentadiene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Hexachloroethane	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Indeno[1,2,3-cd]pyrene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Isophorone	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Naphthalene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Nitrobenzene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Nitrosodimethylamine	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
n-Nitroso-di-n-propylamine	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
n-Nitrosodiphenylamine	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Pentachlorophenol	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181212072
Project Name: 1812373

Analytical Results Report

Sample Number	181212072-001	**Sampling Date**	12/6/2018	**Date/Time Received**	12/12/2011 2:05 PM
Client Sample ID	1812373-003E/MW-1	**Sampling Time**	8:10 AM	**Extraction Date**	12/12/2018
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Phenanthrene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Phenol	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Pyrene	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	
Pyridine	ND	ug/L	0.5	12/14/2018 1:46:00 AM	HSW	EPA 8270D	

Surrogate Data

Sample Number 181212072-001

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270D	98.6	43-120
2-Fluorobiphenyl	EPA 8270D	90.8	55-127
2-Fluorophenol	EPA 8270D	90.4	41-119
Nitrobenzene-d5	EPA 8270D	100.8	55-120
Phenol-d5	EPA 8270D	97.6	52-115
Terphenyl-d14	EPA 8270D	126.0	22-133

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181212072
Project Name: 1812373

Analytical Results Report

Sample Number 181212072-003
Client Sample ID 1812373-004E/MW-2
Matrix Water
Comments

Sampling Date 12/6/2018
Sampling Time 8:37 AM

Date/Time Received 12/12/2018 12:05 PM
Extraction Date 12/12/2018

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
1,2,4-Trichlorobenzene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
1,2-Dichlorobenzene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
1,2-Diphenyl hydrazine	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
1,3-Dichlorobenzene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
1,4-Dichlorobenzene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
1-Methylnaphthalene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
2,3,4,6-Tetrachlorophenol	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
2,3,5,6-Tetrachlorophenol	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
2,4,5-Trichlorophenol	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
2,4,6-Trichlorophenol	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
2,4-Dichlorophenol	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
2,4-Dimethylphenol	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
2,4-Dinitrophenol	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
2,4-Dinitrotoluene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
2,6-Dinitrotoluene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
2-Chloronaphthalene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
2-Chlorophenol	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
2-Methylnaphthalene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
2-Methylphenol	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
2-Nitroaniline	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
2-Nitrophenol	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
3,3'-Dichlorobenzidine	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
3+4-Methylphenol	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
3-Nitroaniline	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
4,6-Dinitro-2-methylphenol	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
4-Bromophenyl-phenylether	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
4-Chloro-3-methylphenol	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
4-Chloroaniline	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
4-Chlorophenyl-phenylether	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
4-Nitroaniline	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
4-Nitrophenol	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Acenaphthene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Acenaphthylene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Aniline	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Anthracene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181212072
Project Name: 1812373

Analytical Results Report

Sample Number 181212072-003
Client Sample ID 1812373-004E/MW-2
Matrix Water
Comments

Sampling Date 12/6/2018
Sampling Time 8:37 AM

Date/Time Received 12/12/20112:05 PM
Extraction Date 12/12/2018

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Benzidine	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Benzo(ghi)perylene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Benzo[a]anthracene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Benzo[a]pyrene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Benzo[b]fluoranthene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Benzo[k]fluoranthene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Benzyl alcohol	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
bis(2-Chloroethoxy)methane	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
bis(2-Chloroethyl)ether	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
bis(2-chloroisopropyl)ether	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
bis(2-Ethylhexyl)phthalate	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Butylbenzylphthalate	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Carbazole	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Chrysene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Dibenz[a,h]anthracene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Dibenzofuran	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Diethylphthalate	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Dimethylphthalate	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Di-n-butylphthalate	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Di-n-octylphthalate	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Fluoranthene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Fluorene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Hexachlorobenzene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Hexachlorobutadiene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Hexachlorocyclopentadiene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Hexachloroethane	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Indeno[1,2,3-cd]pyrene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Isophorone	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Naphthalene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Nitrobenzene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Nitrosodimethylamine	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
n-Nitroso-di-n-propylamine	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
n-Nitrosodiphenylamine	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Pentachlorophenol	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Phenanthrene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181212072
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1812373
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	181212072-003	**Sampling Date**	12/6/2018	**Date/Time Received**	12/12/20112:05 PM
Client Sample ID	1812373-004E/MW-2	**Sampling Time**	8:37 AM	**Extraction Date**	12/12/2018
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Phenol	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Pyrene	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	
Pyridine	ND	ug/L	0.5	12/14/2018 2:14:00 AM	HSW	EPA 8270D	

Surrogate Data

Sample Number 181212072-003

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270D	90.4	43-120
2-Fluorobiphenyl	EPA 8270D	89.6	55-127
2-Fluorophenol	EPA 8270D	83.2	41-119
Nitrobenzene-d5	EPA 8270D	93.6	55-120
Phenol-d5	EPA 8270D	87.8	52-115
Terphenyl-d14	EPA 8270D	123.2	22-133

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181212072
Project Name: 1812373

Analytical Results Report

Sample Number 181212072-005
Client Sample ID 1812373-005E/MW-5
Matrix Water
Comments

Sampling Date 12/6/2018
Sampling Time 9:18 AM

Date/Time Received 12/12/2018 12:05 PM
Extraction Date 12/12/2018

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
1,2,4-Trichlorobenzene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
1,2-Dichlorobenzene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
1,2-Diphenyl hydrazine	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
1,3-Dichlorobenzene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
1,4-Dichlorobenzene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
1-Methylnaphthalene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
2,3,4,6-Tetrachlorophenol	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
2,3,5,6-Tetrachlorophenol	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
2,4,5-Trichlorophenol	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
2,4,6-Trichlorophenol	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
2,4-Dichlorophenol	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
2,4-Dimethylphenol	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
2,4-Dinitrophenol	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
2,4-Dinitrotoluene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
2,6-Dinitrotoluene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
2-Chloronaphthalene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
2-Chlorophenol	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
2-Methylnaphthalene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
2-Methylphenol	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
2-Nitroaniline	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
2-Nitrophenol	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
3,3'-Dichlorobenzidine	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
3+4-Methylphenol	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
3-Nitroaniline	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
4,6-Dinitro-2-methylphenol	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
4-Bromophenyl-phenylether	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
4-Chloro-3-methylphenol	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
4-Chloroaniline	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
4-Chlorophenyl-phenylether	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
4-Nitroaniline	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
4-Nitrophenol	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Acenaphthene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Acenaphthylene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Aniline	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Anthracene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181212072
Project Name: 1812373

Analytical Results Report

Sample Number 181212072-005
Client Sample ID 1812373-005E/MW-5
Matrix Water
Comments

Sampling Date 12/6/2018
Sampling Time 9:18 AM

Date/Time Received 12/12/20112:05 PM
Extraction Date 12/12/2018

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Benzidine	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Benzo(ghi)perylene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Benzo[a]anthracene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Benzo[a]pyrene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Benzo[b]fluoranthene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Benzo[k]fluoranthene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Benzyl alcohol	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
bis(2-Chloroethoxy)methane	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
bis(2-Chloroethyl)ether	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
bis(2-chloroisopropyl)ether	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
bis(2-Ethylhexyl)phthalate	1.12	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Butylbenzylphthalate	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Carbazole	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Chrysene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Dibenz[a,h]anthracene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Dibenzofuran	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Diethylphthalate	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Dimethylphthalate	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Di-n-butylphthalate	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Di-n-octylphthalate	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Fluoranthene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Fluorene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Hexachlorobenzene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Hexachlorobutadiene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Hexachlorocyclopentadiene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Hexachloroethane	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Indeno[1,2,3-cd]pyrene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Isophorone	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Naphthalene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Nitrobenzene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Nitrosodimethylamine	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
n-Nitroso-di-n-propylamine	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
n-Nitrosodiphenylamine	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Pentachlorophenol	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Phenanthrene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181212072
Project Name: 1812373

Analytical Results Report

Sample Number	181212072-005	**Sampling Date**	12/6/2018	**Date/Time Received**	12/12/20112:05 PM
Client Sample ID	1812373-005E/MW-5	**Sampling Time**	9:18 AM	**Extraction Date**	12/12/2018
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Phenol	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Pyrene	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	
Pyridine	ND	ug/L	0.5	12/14/2018 3:09:00 AM	HSW	EPA 8270D	

Surrogate Data

Sample Number 181212072-005

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270D	80.8	43-120
2-Fluorobiphenyl	EPA 8270D	94.0	55-127
2-Fluorophenol	EPA 8270D	79.4	41-119
Nitrobenzene-d5	EPA 8270D	93.6	55-120
Phenol-d5	EPA 8270D	83.6	52-115
Terphenyl-d14	EPA 8270D	126.8	22-133

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181212072
Project Name: 1812373

Analytical Results Report

Sample Number 181212072-007
Client Sample ID 1812373-006E/SMW-4
Matrix Water
Comments

Sampling Date 12/6/2018
Sampling Time 1:45 PM

Date/Time Received 12/12/2018 12:05 PM
Extraction Date 12/12/2018

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
1,2,4-Trichlorobenzene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
1,2-Dichlorobenzene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
1,2-Diphenyl hydrazine	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
1,3-Dichlorobenzene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
1,4-Dichlorobenzene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
1-Methylnaphthalene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
2,3,4,6-Tetrachlorophenol	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
2,3,5,6-Tetrachlorophenol	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
2,4,5-Trichlorophenol	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
2,4,6-Trichlorophenol	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
2,4-Dichlorophenol	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
2,4-Dimethylphenol	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
2,4-Dinitrophenol	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
2,4-Dinitrotoluene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
2,6-Dinitrotoluene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
2-Chloronaphthalene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
2-Chlorophenol	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
2-Methylnaphthalene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
2-Methylphenol	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
2-Nitroaniline	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
2-Nitrophenol	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
3,3'-Dichlorobenzidine	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
3+4-Methylphenol	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
3-Nitroaniline	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
4,6-Dinitro-2-methylphenol	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
4-Bromophenyl-phenylether	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
4-Chloro-3-methylphenol	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
4-Chloroaniline	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
4-Chlorophenyl-phenylether	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
4-Nitroaniline	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
4-Nitrophenol	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Acenaphthene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Acenaphthylene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Aniline	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Anthracene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181212072
Project Name: 1812373

Analytical Results Report

Sample Number 181212072-007
Client Sample ID 1812373-006E/SMW-4
Matrix Water
Comments

Sampling Date 12/6/2018
Sampling Time 1:45 PM

Date/Time Received 12/12/20112:05 PM
Extraction Date 12/12/2018

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Benzidine	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Benzo(ghi)perylene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Benzo[a]anthracene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Benzo[a]pyrene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Benzo[b]fluoranthene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Benzo[k]fluoranthene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Benzyl alcohol	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
bis(2-Chloroethoxy)methane	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
bis(2-Chloroethyl)ether	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
bis(2-chloroisopropyl)ether	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
bis(2-Ethylhexyl)phthalate	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Butylbenzylphthalate	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Carbazole	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Chrysene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Dibenz[a,h]anthracene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Dibenzofuran	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Diethylphthalate	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Dimethylphthalate	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Di-n-butylphthalate	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Di-n-octylphthalate	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Fluoranthene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Fluorene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Hexachlorobenzene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Hexachlorobutadiene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Hexachlorocyclopentadiene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Hexachloroethane	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Indeno[1,2,3-cd]pyrene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Isophorone	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Naphthalene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Nitrobenzene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Nitrosodimethylamine	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
n-Nitroso-di-n-propylamine	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
n-Nitrosodiphenylamine	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Pentachlorophenol	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Phenanthrene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181212072
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1812373
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	181212072-007	**Sampling Date**	12/6/2018	**Date/Time Received**	12/12/20112:05 PM
Client Sample ID	1812373-006E/SMW-4	**Sampling Time**	1:45 PM	**Extraction Date**	12/12/2018
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Phenol	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Pyrene	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	
Pyridine	ND	ug/L	0.5	12/14/2018 3:37:00 AM	HSW	EPA 8270D	

Surrogate Data

Sample Number 181212072-007

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270D	90.4	43-120
2-Fluorobiphenyl	EPA 8270D	88.4	55-127
2-Fluorophenol	EPA 8270D	83.0	41-119
Nitrobenzene-d5	EPA 8270D	95.2	55-120
Phenol-d5	EPA 8270D	86.0	52-115
Terphenyl-d14	EPA 8270D	106.0	22-133

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181212072
Project Name: 1812373

Analytical Results Report

Sample Number 181212072-009
Client Sample ID 1812373-007E/MW-4
Matrix Water
Comments

Sampling Date 12/6/2018
Sampling Time 1:00 PM

Date/Time Received 12/12/20112:05 PM
Extraction Date 12/12/2018

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
1,2,4-Trichlorobenzene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
1,2-Dichlorobenzene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
1,2-Diphenyl hydrazine	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
1,3-Dichlorobenzene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
1,4-Dichlorobenzene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
1-Methylnaphthalene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
2,3,4,6-Tetrachlorophenol	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
2,3,5,6-Tetrachlorophenol	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
2,4,5-Trichlorophenol	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
2,4,6-Trichlorophenol	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
2,4-Dichlorophenol	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
2,4-Dimethylphenol	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
2,4-Dinitrophenol	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
2,4-Dinitrotoluene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
2,6-Dinitrotoluene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
2-Chloronaphthalene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
2-Chlorophenol	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
2-Methylnaphthalene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
2-Methylphenol	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
2-Nitroaniline	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
2-Nitrophenol	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
3,3'-Dichlorobenzidine	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
3+4-Methylphenol	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
3-Nitroaniline	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
4,6-Dinitro-2-methylphenol	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
4-Bromophenyl-phenylether	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
4-Chloro-3-methylphenol	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
4-Chloroaniline	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
4-Chlorophenyl-phenylether	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
4-Nitroaniline	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
4-Nitrophenol	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Acenaphthene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Acenaphthylene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Aniline	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Anthracene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181212072
Project Name: 1812373

Analytical Results Report

Sample Number	181212072-009	**Sampling Date**	12/6/2018	**Date/Time Received**	12/12/20112:05 PM
Client Sample ID	1812373-007E/MW-4	**Sampling Time**	1:00 PM	**Extraction Date**	12/12/2018
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Benzidine	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Benzo(ghi)perylene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Benzo[a]anthracene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Benzo[a]pyrene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Benzo[b]fluoranthene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Benzo[k]fluoranthene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Benzyl alcohol	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
bis(2-Chloroethoxy)methane	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
bis(2-Chloroethyl)ether	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
bis(2-chloroisopropyl)ether	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
bis(2-Ethylhexyl)phthalate	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Butylbenzylphthalate	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Carbazole	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Chrysene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Dibenz[a,h]anthracene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Dibenzofuran	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Diethylphthalate	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Dimethylphthalate	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Di-n-butylphthalate	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Di-n-octylphthalate	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Fluoranthene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Fluorene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Hexachlorobenzene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Hexachlorobutadiene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Hexachlorocyclopentadiene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Hexachloroethane	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Indeno[1,2,3-cd]pyrene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Isophorone	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Naphthalene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Nitrobenzene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Nitrosodimethylamine	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
n-Nitroso-di-n-propylamine	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
n-Nitrosodiphenylamine	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Pentachlorophenol	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Phenanthrene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181212072
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1812373
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	181212072-009	**Sampling Date**	12/6/2018	**Date/Time Received**	12/12/2018 12:05 PM
Client Sample ID	1812373-007E/MW-4	**Sampling Time**	1:00 PM	**Extraction Date**	12/12/2018
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Phenol	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Pyrene	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	
Pyridine	ND	ug/L	0.5	12/14/2018 4:05:00 AM	HSW	EPA 8270D	

Surrogate Data

Sample Number 181212072-009

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270D	87.4	43-120
2-Fluorobiphenyl	EPA 8270D	89.6	55-127
2-Fluorophenol	EPA 8270D	84.8	41-119
Nitrobenzene-d5	EPA 8270D	94.8	55-120
Phenol-d5	EPA 8270D	88.8	52-115
Terphenyl-d14	EPA 8270D	117.2	22-133

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181212072
Project Name: 1812373

Analytical Results Report

Sample Number 181212072-011
Client Sample ID 1812373-008E/DUPLICATE
Matrix Water
Comments

Sampling Date 12/6/2018
Sampling Time 1:10 PM

Date/Time Received 12/12/20112:05 PM
Extraction Date 12/12/2018

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
1,2,4-Trichlorobenzene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
1,2-Dichlorobenzene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
1,2-Diphenyl hydrazine	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
1,3-Dichlorobenzene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
1,4-Dichlorobenzene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
1-Methylnaphthalene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
2,3,4,6-Tetrachlorophenol	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
2,3,5,6-Tetrachlorophenol	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
2,4,5-Trichlorophenol	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
2,4,6-Trichlorophenol	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
2,4-Dichlorophenol	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
2,4-Dimethylphenol	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
2,4-Dinitrophenol	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
2,4-Dinitrotoluene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
2,6-Dinitrotoluene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
2-Chloronaphthalene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
2-Chlorophenol	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
2-Methylnaphthalene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
2-Methylphenol	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
2-Nitroaniline	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
2-Nitrophenol	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
3,3'-Dichlorobenzidine	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
3+4-Methylphenol	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
3-Nitroaniline	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
4,6-Dinitro-2-methylphenol	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
4-Bromophenyl-phenylether	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
4-Chloro-3-methylphenol	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
4-Chloroaniline	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
4-Chlorophenyl-phenylether	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
4-Nitroaniline	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
4-Nitrophenol	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Acenaphthene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Acenaphthylene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Aniline	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Anthracene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181212072
Project Name: 1812373

Analytical Results Report

Sample Number	181212072-011	**Sampling Date**	12/6/2018	**Date/Time Received**	12/12/20112:05 PM
Client Sample ID	1812373-008E/DUPLICATE	**Sampling Time**	1:10 PM	**Extraction Date**	12/12/2018
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Benzidine	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Benzo(ghi)perylene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Benzo[a]anthracene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Benzo[a]pyrene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Benzo[b]fluoranthene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Benzo[k]fluoranthene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Benzyl alcohol	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
bis(2-Chloroethoxy)methane	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
bis(2-Chloroethyl)ether	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
bis(2-chloroisopropyl)ether	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
bis(2-Ethylhexyl)phthalate	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Butylbenzylphthalate	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Carbazole	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Chrysene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Dibenz[a,h]anthracene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Dibenzofuran	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Diethylphthalate	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Dimethylphthalate	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Di-n-butylphthalate	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Di-n-octylphthalate	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Fluoranthene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Fluorene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Hexachlorobenzene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Hexachlorobutadiene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Hexachlorocyclopentadiene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Hexachloroethane	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Indeno[1,2,3-cd]pyrene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Isophorone	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Naphthalene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Nitrobenzene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Nitrosodimethylamine	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
n-Nitroso-di-n-propylamine	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
n-Nitrosodiphenylamine	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Pentachlorophenol	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Phenanthrene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181212072
Project Name: 1812373

Analytical Results Report

Sample Number	181212072-011	**Sampling Date**	12/6/2018	**Date/Time Received**	12/12/2018 12:05 PM
Client Sample ID	1812373-008E/DUPLICATE	**Sampling Time**	1:10 PM	**Extraction Date**	12/12/2018
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Phenol	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Pyrene	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	
Pyridine	ND	ug/L	0.5	12/14/2018 4:33:00 AM	HSW	EPA 8270D	

Surrogate Data

Sample Number 181212072-011

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270D	81.6	43-120
2-Fluorobiphenyl	EPA 8270D	84.0	55-127
2-Fluorophenol	EPA 8270D	77.4	41-119
Nitrobenzene-d5	EPA 8270D	90.0	55-120
Phenol-d5	EPA 8270D	85.0	52-115
Terphenyl-d14	EPA 8270D	102.8	22-133

Authorized Signature

Todd Taruscio, Lab Manager

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

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Attn: ANDY FREEMAN

Batch #: 181212072
Project Name: 1812373

Analytical Results Report

Sample Number 181212072-001
Client Sample ID 1812373-003E/MW-1
Matrix Water
Comments

Sampling Date 12/6/2018
Sampling Time 8:10 AM

Date/Time Received 12/12/2018 12:05 PM
Extraction Date 12/12/2018

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Benzenethiole	ND	ug/L	0.5	12/15/2018 12:55:00 AM	HSW	EPA 8270D	
Benzo(j)fluoranthene	ND	ug/L	0.5	12/15/2018 12:55:00 AM	HSW	EPA 8270D	
Dibenz(a,j)acridine	ND	ug/L	0.5	12/15/2018 12:55:00 AM	HSW	EPA 8270D	
Quinoline	ND	ug/L	0.5	12/15/2018 12:55:00 AM	HSW	EPA 8270D	
7,12-Dimethylbenz(a)anthracene	ND	ug/L	0.5	1/2/2019 6:12:00 PM	TGT	EPA 8270D	

Surrogate Data

Sample Number 181212072-001

Surrogate Standard	Method	Percent Recovery	Control Limits
Terphenyl-d14	EPA 8270D	97.6	22-133
Terphenyl-d14	EPA 8270D	104.4	20-133

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181212072
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1812373
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	181212072-003	**Sampling Date**	12/6/2018	**Date/Time Received**	12/12/20112:05 PM
Client Sample ID	1812373-004E/MW-2	**Sampling Time**	8:37 AM	**Extraction Date**	12/12/2018
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Benzenethiole	ND	ug/L	0.5	12/15/2018 1:24:00 AM	HSW	EPA 8270D	
Benzo(j)fluoranthene	ND	ug/L	0.5	12/15/2018 1:24:00 AM	HSW	EPA 8270D	
Dibenz(a,j)acridine	ND	ug/L	0.5	12/15/2018 1:24:00 AM	HSW	EPA 8270D	
Quinoline	ND	ug/L	0.5	12/15/2018 1:24:00 AM	HSW	EPA 8270D	
7,12-Dimethylbenz(a)anthracene	ND	ug/L	0.5	1/2/2019 6:39:00 PM	TGT	EPA 8270D	

Surrogate Data

Sample Number 181212072-003

Surrogate Standard	Method	Percent Recovery	Control Limits
Terphenyl-d14	EPA 8270D	110.8	22-133
Terphenyl-d14	EPA 8270D	117.6	20-133

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Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181212072
Project Name: 1812373

Analytical Results Report

Sample Number 181212072-005
Client Sample ID 1812373-005E/MW-5
Matrix Water
Comments

Sampling Date 12/6/2018
Sampling Time 9:18 AM

Date/Time Received 12/12/20112:05 PM
Extraction Date 12/12/2018

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Benzenethiole	ND	ug/L	0.5	12/15/2018 2:21:00 AM	HSW	EPA 8270D	
Benzo(j)fluoranthene	ND	ug/L	0.5	12/15/2018 2:21:00 AM	HSW	EPA 8270D	
Dibenz(a,j)acridine	ND	ug/L	0.5	12/15/2018 2:21:00 AM	HSW	EPA 8270D	
Quinoline	ND	ug/L	0.5	12/15/2018 2:21:00 AM	HSW	EPA 8270D	
7,12-Dimethylbenz(a)anthracene	ND	ug/L	0.5	1/2/2019 7:33:00 PM	TGT	EPA 8270D	

Surrogate Data

Sample Number 181212072-005

Surrogate Standard	Method	Percent Recovery	Control Limits
Terphenyl-d14	EPA 8270D	105.6	22-133
Terphenyl-d14	EPA 8270D	115.6	20-133

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181212072
Project Name: 1812373

Analytical Results Report

Sample Number	181212072-007	**Sampling Date**	12/6/2018	**Date/Time Received**	12/12/20112:05 PM
Client Sample ID	1812373-006E/SMW-4	**Sampling Time**	1:45 PM	**Extraction Date**	12/12/2018
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Benzenethiole	ND	ug/L	0.5	12/15/2018 2:50:00 AM	HSW	EPA 8270D	
Benzo(j)fluoranthene	ND	ug/L	0.5	12/15/2018 2:50:00 AM	HSW	EPA 8270D	
Dibenz(a,j)acridine	ND	ug/L	0.5	12/15/2018 2:50:00 AM	HSW	EPA 8270D	
Quinoline	ND	ug/L	0.5	12/15/2018 2:50:00 AM	HSW	EPA 8270D	
7,12-Dimethylbenz(a)anthracene	ND	ug/L	0.5	1/2/2019 8:01:00 PM	TGT	EPA 8270D	

Surrogate Data

Sample Number 181212072-007

Surrogate Standard	Method	Percent Recovery	Control Limits
Terphenyl-d14	EPA 8270D	109.2	22-133
Terphenyl-d14	EPA 8270D	100.8	20-133

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ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181212072
Project Name: 1812373

Analytical Results Report

Sample Number 181212072-009
Client Sample ID 1812373-007E/MW-4
Matrix Water
Comments

Sampling Date 12/6/2018
Sampling Time 1:00 PM

Date/Time Received 12/12/20112:05 PM
Extraction Date 12/12/2018

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Benzenethiole	ND	ug/L	0.5	12/15/2018 3:18:00 AM	HSW	EPA 8270D	
Benzo(j)fluoranthene	ND	ug/L	0.5	12/15/2018 3:18:00 AM	HSW	EPA 8270D	
Dibenz(a,j)acridine	ND	ug/L	0.5	12/15/2018 3:18:00 AM	HSW	EPA 8270D	
Quinoline	ND	ug/L	0.5	12/15/2018 3:18:00 AM	HSW	EPA 8270D	
7,12-Dimethylbenz(a)anthracene	ND	ug/L	0.5	1/2/2019 8:28:00 PM	TGT	EPA 8270D	

Surrogate Data

Sample Number 181212072-009

Surrogate Standard	Method	Percent Recovery	Control Limits
Terphenyl-d14	EPA 8270D	94.4	22-133
Terphenyl-d14	EPA 8270D	107.6	20-133

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Batch #: 181212072
Project Name: 1812373

Analytical Results Report

Sample Number	181212072-011	**Sampling Date**	12/6/2018	**Date/Time Received**	12/12/20112:05 PM
Client Sample ID	1812373-008E/DUPLICATE	**Sampling Time**	1:10 PM	**Extraction Date**	12/12/2018
Matrix	Water				
Comments					

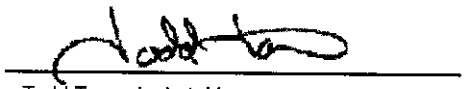
Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Benzenethiole	ND	ug/L	0.5	12/15/2018 3:46:00 AM	HSW	EPA 8270D	
Benzo(j)fluoranthene	ND	ug/L	0.5	12/15/2018 3:46:00 AM	HSW	EPA 8270D	
Dibenz(a,j)acridine	ND	ug/L	0.5	12/15/2018 3:46:00 AM	HSW	EPA 8270D	
Quinoline	ND	ug/L	0.5	12/15/2018 3:46:00 AM	HSW	EPA 8270D	
7,12-Dimethylbenz(a)anthracene	ND	ug/L	0.5	1/2/2019 8:55:00 PM	TGT	EPA 8270D	

Surrogate Data

Sample Number 181212072-011

Surrogate Standard	Method	Percent Recovery	Control Limits
Terphenyl-d14	EPA 8270D	104.4	22-133
Terphenyl-d14	EPA 8270D	103.2	20-133

Authorized Signature



Todd Taruscio, Lab Manager

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

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Attn: ANDY FREEMAN

Batch #: 181212072
Project Name: 1812373

Analytical Results Report

Quality Control Data

Lab Control Sample

Parameter	LCS Result	Units	LCS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
Pyrene	5.12	ug/L	5	102.4	45-139	12/12/2018	12/13/2018
Phenol	4.77	ug/L	5	95.4	45-134	12/12/2018	12/13/2018
Pentachlorophenol	4.89	ug/L	5	97.8	22-138	12/12/2018	12/13/2018
n-Nitroso-di-n-propylamine	4.51	ug/L	5	90.2	46-135	12/12/2018	12/13/2018
bis(2-Ethylhexyl)phthalate	5.43	ug/L	5	108.6	51-149	12/12/2018	12/13/2018
Acenaphthene	4.88	ug/L	5	97.6	45-129	12/12/2018	12/13/2018
4-Nitrophenol	4.28	ug/L	5	85.6	19-141	12/12/2018	12/13/2018
4-Chloro-3-methylphenol	4.84	ug/L	5	96.8	42-139	12/12/2018	12/13/2018
2-Chlorophenol	4.45	ug/L	5	89.0	50-131	12/12/2018	12/13/2018
2,4-Dinitrotoluene	5.04	ug/L	5	100.8	42-143	12/12/2018	12/13/2018
1,4-Dichlorobenzene	3.77	ug/L	5	75.4	28-108	12/12/2018	12/13/2018
1,2,4-Trichlorobenzene	4.06	ug/L	5	81.2	33-109	12/12/2018	12/13/2018

Lab Control Sample Duplicate

Parameter	LCSD Result	Units	LCSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Pyrene	4.99	ug/L	5	99.8	2.6	0-16	12/12/2018	12/13/2018
Phenol	4.85	ug/L	5	97.0	1.7	0-25	12/12/2018	12/13/2018
Pentachlorophenol	5.00	ug/L	5	100.0	2.2	0-39	12/12/2018	12/13/2018
n-Nitroso-di-n-propylamine	4.96	ug/L	5	99.2	9.5	0-25	12/12/2018	12/13/2018
bis(2-Ethylhexyl)phthalate	5.22	ug/L	5	104.4	3.9	0-43	12/12/2018	12/13/2018
Acenaphthene	4.80	ug/L	5	96.0	1.7	0-22	12/12/2018	12/13/2018
4-Nitrophenol	4.81	ug/L	5	96.2	11.7	0-51	12/12/2018	12/13/2018
4-Chloro-3-methylphenol	4.95	ug/L	5	99.0	2.2	0-20	12/12/2018	12/13/2018
2-Chlorophenol	4.48	ug/L	5	89.6	0.7	0-24	12/12/2018	12/13/2018
2,4-Dinitrotoluene	5.18	ug/L	5	103.6	2.7	0-20	12/12/2018	12/13/2018
1,4-Dichlorobenzene	3.50	ug/L	5	70.0	7.4	0-31	12/12/2018	12/13/2018
1,2,4-Trichlorobenzene	3.62	ug/L	5	72.4	11.5	0-33	12/12/2018	12/13/2018

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
1,2,4-Trichlorobenzene	ND	ug/L	0.5	12/12/2018	12/13/2018
1,2-Dichlorobenzene	ND	ug/L	0.5	12/12/2018	12/13/2018

Comments:

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Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181212072
Project Name: 1812373

Analytical Results Report

Quality Control Data

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
1,2-Diphenyl hydrazine	ND	ug/L	0.5	12/12/2018	12/13/2018
1,3-Dichlorobenzene	ND	ug/L	0.5	12/12/2018	12/13/2018
1,4-Dichlorobenzene	ND	ug/L	0.5	12/12/2018	12/13/2018
1-Methylnaphthalene	ND	ug/L	0.5	12/12/2018	12/13/2018
2,3,4,6-Tetrachlorophenol	ND	ug/L	0.5	12/12/2018	12/13/2018
2,3,5,6-Tetrachlorophenol	ND	ug/L	0.5	12/12/2018	12/13/2018
2,4,5-Trichlorophenol	ND	ug/L	0.5	12/12/2018	12/13/2018
2,4,6-Trichlorophenol	ND	ug/L	0.5	12/12/2018	12/13/2018
2,4-Dichlorophenol	ND	ug/L	0.5	12/12/2018	12/13/2018
2,4-Dimethylphenol	ND	ug/L	0.5	12/12/2018	12/13/2018
2,4-Dinitrophenol	ND	ug/L	0.5	12/12/2018	12/13/2018
2,4-Dinitrotoluene	ND	ug/L	0.5	12/12/2018	12/13/2018
2,6-Dinitrotoluene	ND	ug/L	0.5	12/12/2018	12/13/2018
2-Chloronaphthalene	ND	ug/L	0.5	12/12/2018	12/13/2018
2-Chlorophenol	ND	ug/L	0.5	12/12/2018	12/13/2018
2-Methylnaphthalene	ND	ug/L	0.5	12/12/2018	12/13/2018
2-Methylphenol	ND	ug/L	0.5	12/12/2018	12/13/2018
2-Nitroaniline	ND	ug/L	0.5	12/12/2018	12/13/2018
2-Nitrophenol	ND	ug/L	0.5	12/12/2018	12/13/2018
3,3'-Dichlorobenzidine	ND	ug/L	0.5	12/12/2018	12/13/2018
3+4-Methylphenol	ND	ug/L	0.5	12/12/2018	12/13/2018
3-Nitroaniline	ND	ug/L	0.5	12/12/2018	12/13/2018
4,6-Dinitro-2-methylphenol	ND	ug/L	0.5	12/12/2018	12/13/2018
4-Bromophenyl-phenylether	ND	ug/L	0.5	12/12/2018	12/13/2018
4-Chloro-3-methylphenol	ND	ug/L	0.5	12/12/2018	12/13/2018
4-Chloroaniline	ND	ug/L	0.5	12/12/2018	12/13/2018
4-Chlorophenyl-phenylether	ND	ug/L	0.5	12/12/2018	12/13/2018
4-Nitroaniline	ND	ug/L	0.5	12/12/2018	12/13/2018
4-Nitrophenol	ND	ug/L	0.5	12/12/2018	12/13/2018
7,12-Dimethylbenz(a)anthracene	ND	ug/L	0.5	12/12/2018	1/2/2019
Acenaphthene	ND	ug/L	0.5	12/12/2018	12/13/2018
Acenaphthylene	ND	ug/L	0.5	12/12/2018	12/13/2018
Aniline	ND	ug/L	0.5	12/12/2018	12/13/2018
Anthracene	ND	ug/L	0.5	12/12/2018	12/13/2018
Benzenethiole	ND	ug/L	0.5	12/12/2018	12/15/2018
Benzidine	ND	ug/L	0.5	12/12/2018	12/13/2018
Benzo(ghi)perylene	ND	ug/L	0.5	12/12/2018	12/13/2018

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013;NV:ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

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Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181212072
Project Name: 1812373

Analytical Results Report

Quality Control Data

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Benzo(j)fluoranthene	ND	ug/L	0.5	12/12/2018	12/15/2018
Benzo[a]anthracene	ND	ug/L	0.5	12/12/2018	12/13/2018
Benzo[a]pyrene	ND	ug/L	0.5	12/12/2018	12/13/2018
Benzo[b]fluoranthene	ND	ug/L	0.5	12/12/2018	12/13/2018
Benzo[k]fluoranthene	ND	ug/L	0.5	12/12/2018	12/13/2018
Benzyl alcohol	ND	ug/L	0.5	12/12/2018	12/13/2018
bis(2-Chloroethoxy)methane	ND	ug/L	0.5	12/12/2018	12/13/2018
bis(2-Chloroethyl)ether	ND	ug/L	0.5	12/12/2018	12/13/2018
bis(2-chloroisopropyl)ether	ND	ug/L	0.5	12/12/2018	12/13/2018
bis(2-Ethylhexyl)phthalate	ND	ug/L	0.5	12/12/2018	12/13/2018
Butylbenzylphthalate	ND	ug/L	0.5	12/12/2018	12/13/2018
Carbazole	ND	ug/L	0.5	12/12/2018	12/13/2018
Chrysene	ND	ug/L	0.5	12/12/2018	12/13/2018
Dibenz(a,j)acridine	ND	ug/L	0.5	12/12/2018	12/15/2018
Dibenz[a,h]anthracene	ND	ug/L	0.5	12/12/2018	12/13/2018
Dibenzofuran	ND	ug/L	0.5	12/12/2018	12/13/2018
Diethylphthalate	ND	ug/L	0.5	12/12/2018	12/13/2018
Dimethylphthalate	ND	ug/L	0.5	12/12/2018	12/13/2018
Di-n-butylphthalate	ND	ug/L	0.5	12/12/2018	12/13/2018
Di-n-octylphthalate	ND	ug/L	0.5	12/12/2018	12/13/2018
Fluoranthene	ND	ug/L	0.5	12/12/2018	12/13/2018
Fluorene	ND	ug/L	0.5	12/12/2018	12/13/2018
Hexachlorobenzene	ND	ug/L	0.5	12/12/2018	12/13/2018
Hexachlorobutadiene	ND	ug/L	0.5	12/12/2018	12/13/2018
Hexachlorocyclopentadiene	ND	ug/L	0.5	12/12/2018	12/13/2018
Hexachloroethane	ND	ug/L	0.5	12/12/2018	12/13/2018
Indeno[1,2,3-cd]pyrene	ND	ug/L	0.5	12/12/2018	12/13/2018
Isophorone	ND	ug/L	0.5	12/12/2018	12/13/2018
Naphthalene	ND	ug/L	0.5	12/12/2018	12/13/2018
Nitrobenzene	ND	ug/L	0.5	12/12/2018	12/13/2018
Nitrosodimethylamine	ND	ug/L	0.5	12/12/2018	12/13/2018
n-Nitroso-di-n-propylamine	ND	ug/L	0.5	12/12/2018	12/13/2018
n-Nitrosodiphenylamine	ND	ug/L	0.5	12/12/2018	12/13/2018
Pentachlorophenol	ND	ug/L	0.5	12/12/2018	12/13/2018
Phenanthrene	ND	ug/L	0.5	12/12/2018	12/13/2018
Phenol	ND	ug/L	0.5	12/12/2018	12/13/2018
Pyrene	ND	ug/L	0.5	12/12/2018	12/13/2018

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013;NV:ID00013; OR:ID200001-002; WA:C595
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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181212072
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1812373
Attn:	ANDY FREEMAN		

Analytical Results Report

Quality Control Data

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Pyridine	ND	ug/L	0.5	12/12/2018	12/13/2018
Quinoline	ND	ug/L	0.5	12/12/2018	12/15/2018

AR	Acceptable Range
ND	Not Detected
PQL	Practical Quantitation Limit
RPD	Relative Percentage Difference

Comments:

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Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181212072
Project Name: 1812373

Analytical Results Report

Sample Number 181212072-002 **Sampling Date** 12/6/2018 **Date/Time Received** 12/12/2018 12:05 PM
Client Sample ID 1812373-003F/MW-1 **Sampling Time** 8:10 AM
Matrix Water
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/L	0.01	12/13/2018 2:40:00 PM	BKP	EPA 335.4	

Sample Number 181212072-004 **Sampling Date** 12/6/2018 **Date/Time Received** 12/12/2018 12:05 PM
Client Sample ID 1812373-004F/MW-2 **Sampling Time** 8:37 AM
Matrix Water
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/L	0.01	12/13/2018 2:40:00 PM	BKP	EPA 335.4	

Sample Number 181212072-006 **Sampling Date** 12/6/2018 **Date/Time Received** 12/12/2018 12:05 PM
Client Sample ID 1812373-005F/MW-5 **Sampling Time** 9:18 AM
Matrix Water
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/L	0.01	12/13/2018 2:40:00 PM	BKP	EPA 335.4	

Sample Number 181212072-008 **Sampling Date** 12/6/2018 **Date/Time Received** 12/12/2018 12:05 PM
Client Sample ID 1812373-006F/SMW-4 **Sampling Time** 1:45 PM
Matrix Water
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/L	0.01	12/13/2018 2:40:00 PM	BKP	EPA 335.4	

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013;NV:ID00013; OR:ID200001-002; WA:C595
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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181212072
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1812373
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	181212072-010	**Sampling Date**	12/6/2018	**Date/Time Received**	12/12/2018 12:05 PM
Client Sample ID	1812373-007F/MW-4	**Sampling Time**	1:00 PM		
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/L	0.01	12/13/2018 2:40:00 PM	BKP	EPA 335.4	

Sample Number	181212072-012	**Sampling Date**	12/6/2018	**Date/Time Received**	12/12/2018 12:05 PM
Client Sample ID	1812373-008F/DUPLICATE	**Sampling Time**	1:10 PM		
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/L	0.01	12/13/2018 2:40:00 PM	BKP	EPA 335.4	

Authorized Signature

Todd Taruscio, Lab Manager

MCL	EPA's Maximum Contaminant Level
ND	Not Detected
PQL	Practical Quantitation Limit

The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

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Address: 4901 HAWKINS NE SUITE D
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Attn: ANDY FREEMAN

Batch #: 181212072
Project Name: 1812373

Analytical Results Report

Quality Control Data

Lab Control Sample

Parameter	LCS Result	Units	LCS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
Cyanide	0.504	mg/L	0.5	100.8	90-110	12/13/2018	12/13/2018

Matrix Spike

Sample Number	Parameter	Sample Result	MS Result	Units	MS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
181212073-001	Cyanide	ND	0.484	mg/L	0.5	96.8	80-120	12/13/2018	12/13/2018

Matrix Spike Duplicate

Parameter	MSD Result	Units	MSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Cyanide	0.484	mg/L	0.5	96.8	0.0	0-20	12/13/2018	12/13/2018

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Cyanide	ND	mg/L	0.01	12/13/2018	12/13/2018

AR	Acceptable Range
ND	Not Detected
PQL	Practical Quantitation Limit
RPD	Relative Percentage Difference

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013;NV:ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1812373**
24-Sep-19

Client: Marathon
Project: 2018 Post Closure Sampling LTU

Sample ID: **MB-42092** SampType: **MBLK** TestCode: **EPA Method 8011/504.1: EDB**
Client ID: **PBW** Batch ID: **42092** RunNo: **56419**
Prep Date: **12/17/2018** Analysis Date: **12/17/2018** SeqNo: **1886382** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,2-Dibromoethane	ND	0.010								

Sample ID: **LCS-42092** SampType: **LCS** TestCode: **EPA Method 8011/504.1: EDB**
Client ID: **LCSW** Batch ID: **42092** RunNo: **56419**
Prep Date: **12/17/2018** Analysis Date: **12/17/2018** SeqNo: **1886389** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,2-Dibromoethane	0.10	0.010	0.1000	0	100	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1812373**
24-Sep-19

Client: Marathon
Project: 2018 Post Closure Sampling LTU

Sample ID: **MB-42079** SampType: **MBLK** TestCode: **EPA Method 6020: Total Metals**
Client ID: **PBW** Batch ID: **42079** RunNo: **56395**
Prep Date: **12/13/2018** Analysis Date: **12/17/2018** SeqNo: **1885196** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	0.0010								
Arsenic	ND	0.0010								
Lead	ND	0.0010								
Selenium	ND	0.0010								

Sample ID: **LLLCS-42079** SampType: **LCSLL** TestCode: **EPA Method 6020: Total Metals**
Client ID: **BatchQC** Batch ID: **42079** RunNo: **56395**
Prep Date: **12/13/2018** Analysis Date: **12/17/2018** SeqNo: **1885197** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.00097	0.0010	0.001000	0	96.5	70	130			J
Arsenic	0.0010	0.0010	0.001000	0	101	70	130			
Lead	0.0011	0.0010	0.001000	0	108	70	130			
Selenium	0.0012	0.0010	0.001000	0	121	70	130			

Sample ID: **LCS-42079** SampType: **LCS** TestCode: **EPA Method 6020: Total Metals**
Client ID: **LCSW** Batch ID: **42079** RunNo: **56395**
Prep Date: **12/13/2018** Analysis Date: **12/17/2018** SeqNo: **1885198** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.053	0.0010	0.05000	0	106	80	120			
Arsenic	0.049	0.0010	0.05000	0	98.7	80	120			
Lead	0.050	0.0010	0.05000	0	100	80	120			
Selenium	0.050	0.0010	0.05000	0	100	80	120			

Sample ID: **1812373-008DMS** SampType: **MS** TestCode: **EPA Method 6020: Total Metals**
Client ID: **DUPLICATE** Batch ID: **42079** RunNo: **56395**
Prep Date: **12/13/2018** Analysis Date: **12/17/2018** SeqNo: **1885205** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.055	0.0010	0.05000	0	111	75	125			
Arsenic	0.053	0.0010	0.05000	0.0007786	105	75	125			
Lead	0.050	0.0010	0.05000	0	99.9	75	125			
Selenium	0.050	0.0010	0.05000	0	101	75	125			

Sample ID: **1812373-008DMSD** SampType: **MSD** TestCode: **EPA Method 6020: Total Metals**
Client ID: **DUPLICATE** Batch ID: **42079** RunNo: **56395**
Prep Date: **12/13/2018** Analysis Date: **12/17/2018** SeqNo: **1885208** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1812373**
24-Sep-19

Client: Marathon
Project: 2018 Post Closure Sampling LTU

Sample ID: **1812373-008DMSD** SampType: **MSD** TestCode: **EPA Method 6020: Total Metals**
Client ID: **DUPLICATE** Batch ID: **42079** RunNo: **56395**
Prep Date: **12/13/2018** Analysis Date: **12/17/2018** SeqNo: **1885208** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.056	0.0010	0.05000	0	112	75	125	1.23	20	
Arsenic	0.052	0.0010	0.05000	0.0007786	102	75	125	2.60	20	
Lead	0.050	0.0010	0.05000	0	99.5	75	125	0.345	20	
Selenium	0.051	0.0010	0.05000	0	103	75	125	1.84	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1812373**
24-Sep-19

Client: Marathon
Project: 2018 Post Closure Sampling LTU

Sample ID: **LCS-42033**	SampType: **LCS**	TestCode: **EPA Method 8015M/D: Diesel Range**							
Client ID: **LCSW**	Batch ID: **42033**	RunNo: **56237**							
Prep Date: **12/11/2018**	Analysis Date: **12/12/2018**	SeqNo: **1881629**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.8	1.0	5.000	0	116	70	130			
Surr: DNOP	0.55		0.5000		110	76.7	135			

Sample ID: **MB-42033**	SampType: **MBLK**	TestCode: **EPA Method 8015M/D: Diesel Range**							
Client ID: **PBW**	Batch ID: **42033**	RunNo: **56237**							
Prep Date: **12/11/2018**	Analysis Date: **12/12/2018**	SeqNo: **1881630**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	1.0								
Motor Oil Range Organics (MRO)	ND	5.0								
Surr: DNOP	1.0		1.000		101	76.7	135			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1812373**
24-Sep-19

Client: Marathon
Project: 2018 Post Closure Sampling LTU

Sample ID: **RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **G56246**	RunNo: **56246**
Prep Date:	Analysis Date: **12/11/2018**	SeqNo: **1879269** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	18		20.00		90.1	72.8	125			

Sample ID: **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **G56246**	RunNo: **56246**
Prep Date:	Analysis Date: **12/11/2018**	SeqNo: **1879270** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.46	0.050	0.5000	0	91.9	77.7	130			
Surr: BFB	22		20.00		112	72.8	125			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1812373**
24-Sep-19

Client: Marathon
Project: 2018 Post Closure Sampling LTU

Sample ID: **100ng lcs** SampType: **LCS** TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW** Batch ID: **D56250** RunNo: **56250**
Prep Date: Analysis Date: **12/11/2018** SeqNo: **1879426** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	95.0	70	130			
Toluene	19	1.0	20.00	0	96.4	70	130			
Chlorobenzene	20	1.0	20.00	0	101	70	130			
1,1-Dichloroethene	19	1.0	20.00	0	97.3	70	130			
Trichloroethene (TCE)	17	1.0	20.00	0	87.0	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		101	70	130			
Surr: 4-Bromofluorobenzene	9.6		10.00		96.4	70	130			
Surr: Dibromofluoromethane	9.8		10.00		97.8	70	130			
Surr: Toluene-d8	10		10.00		100	70	130			

Sample ID: **1812373-001ams** SampType: **MS** TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **Field Blank** Batch ID: **D56250** RunNo: **56250**
Prep Date: Analysis Date: **12/11/2018** SeqNo: **1879429** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0.2096	94.3	70	130			
Toluene	19	1.0	20.00	0.2904	91.7	70	130			
Chlorobenzene	19	1.0	20.00	0	95.2	70	130			
1,1-Dichloroethene	19	1.0	20.00	0	94.0	67.6	130			
Trichloroethene (TCE)	17	1.0	20.00	0	86.8	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		101	70	130			
Surr: 4-Bromofluorobenzene	9.8		10.00		97.6	70	130			
Surr: Dibromofluoromethane	10		10.00		102	70	130			
Surr: Toluene-d8	9.7		10.00		96.9	70	130			

Sample ID: **1812373-001amsd** SampType: **MSD** TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **Field Blank** Batch ID: **D56250** RunNo: **56250**
Prep Date: Analysis Date: **12/11/2018** SeqNo: **1879430** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	1.0	20.00	0.2096	90.2	70	130	4.47	20	
Toluene	19	1.0	20.00	0.2904	94.1	70	130	2.52	20	
Chlorobenzene	20	1.0	20.00	0	97.7	70	130	2.52	20	
1,1-Dichloroethene	18	1.0	20.00	0	88.9	67.6	130	5.59	20	
Trichloroethene (TCE)	17	1.0	20.00	0	83.2	70	130	4.21	20	
Surr: 1,2-Dichloroethane-d4	9.7		10.00		97.3	70	130	0	0	
Surr: 4-Bromofluorobenzene	9.4		10.00		94.4	70	130	0	0	
Surr: Dibromofluoromethane	9.7		10.00		97.2	70	130	0	0	
Surr: Toluene-d8	10		10.00		101	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1812373**
24-Sep-19

Client: Marathon
Project: 2018 Post Closure Sampling LTU

Sample ID: **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **D56250**	RunNo: **56250**
Prep Date:	Analysis Date: **12/11/2018**	SeqNo: **1879451** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1812373**
24-Sep-19

Client: Marathon
Project: 2018 Post Closure Sampling LTU

Sample ID: **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **D56250**	RunNo: **56250**
Prep Date:	Analysis Date: **12/11/2018**	SeqNo: **1879451** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.8		10.00		98.4	70	130			
Surr: 4-Bromofluorobenzene	9.6		10.00		95.6	70	130			
Surr: Dibromofluoromethane	9.7		10.00		97.1	70	130			
Surr: Toluene-d8	10		10.00		101	70	130			

Sample ID: **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **R56282**	RunNo: **56282**
Prep Date:	Analysis Date: **12/12/2018**	SeqNo: **1880658** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	97.9	70	130			
Toluene	19	1.0	20.00	0	93.7	70	130			
Chlorobenzene	20	1.0	20.00	0	102	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1812373**
24-Sep-19

Client: Marathon
Project: 2018 Post Closure Sampling LTU

Sample ID: **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **R56282**	RunNo: **56282**
Prep Date:	Analysis Date: **12/12/2018**	SeqNo: **1880658** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloroethene	20	1.0	20.00	0	97.8	70	130			
Trichloroethene (TCE)	19	1.0	20.00	0	93.3	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		101	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130			
Surr: Dibromofluoromethane	10		10.00		101	70	130			
Surr: Toluene-d8	9.8		10.00		98.4	70	130			

Sample ID: **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R56282**	RunNo: **56282**
Prep Date:	Analysis Date: **12/12/2018**	SeqNo: **1880668** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1812373**
24-Sep-19

Client: Marathon
Project: 2018 Post Closure Sampling LTU

Sample ID: **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R56282**	RunNo: **56282**
Prep Date:	Analysis Date: **12/12/2018**	SeqNo: **1880668** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	10		10.00		99.8	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1812373**
24-Sep-19

Client: Marathon
Project: 2018 Post Closure Sampling LTU

Sample ID: **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**							
Client ID: **PBW**	Batch ID: **R56282**	RunNo: **56282**							
Prep Date:	Analysis Date: **12/12/2018**	SeqNo: **1880668**	Units: **µg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	9.7		10.00		96.6	70	130			
Surr: Dibromofluoromethane	9.8		10.00		98.4	70	130			
Surr: Toluene-d8	10		10.00		102	70	130			

Sample ID: **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**							
Client ID: **PBW**	Batch ID: **A56304**	RunNo: **56304**							
Prep Date:	Analysis Date: **12/13/2018**	SeqNo: **1882423**	Units: **%Rec**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	10		10.00		100	70	130			
Surr: 4-Bromofluorobenzene	9.6		10.00		96.1	70	130			
Surr: Dibromofluoromethane	11		10.00		106	70	130			
Surr: Toluene-d8	9.6		10.00		95.8	70	130			

Sample ID: **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**							
Client ID: **LCSW**	Batch ID: **A56304**	RunNo: **56304**							
Prep Date:	Analysis Date: **12/13/2018**	SeqNo: **1882424**	Units: **%Rec**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	9.8		10.00		97.9	70	130			
Surr: 4-Bromofluorobenzene	9.6		10.00		95.7	70	130			
Surr: Dibromofluoromethane	10		10.00		105	70	130			
Surr: Toluene-d8	9.3		10.00		93.4	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1812373**
24-Sep-19

Client: Marathon
Project: 2018 Post Closure Sampling LTU

Sample ID: **MB-R57056**	SampType: **MBLK**	TestCode: **EPA 335.4: Total Cyanide Subbed**
Client ID: **PBW**	Batch ID: **R57056**	RunNo: **57056**
Prep Date:	Analysis Date: **12/13/2018**	SeqNo: **1908689** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cyanide	ND	0.0100								

Sample ID: **LCS-R57056**	SampType: **LCS**	TestCode: **EPA 335.4: Total Cyanide Subbed**
Client ID: **LCSW**	Batch ID: **R57056**	RunNo: **57056**
Prep Date:	Analysis Date: **12/13/2018**	SeqNo: **1908690** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cyanide	0.504		0.5000	0	101	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1812373**
24-Sep-19

Client: Marathon
Project: 2018 Post Closure Sampling LTU

Sample ID: **MB-42021**	SampType: **MBLK**	TestCode: **EPA Method 7470: Mercury**							
Client ID: **PBW**	Batch ID: **42021**	RunNo: **56262**							
Prep Date: **12/10/2018**	Analysis Date: **12/11/2018**	SeqNo: **1879715**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.000094	0.00020								J

Sample ID: **LCS-42021**	SampType: **LCS**	TestCode: **EPA Method 7470: Mercury**							
Client ID: **LCSW**	Batch ID: **42021**	RunNo: **56262**							
Prep Date: **12/10/2018**	Analysis Date: **12/11/2018**	SeqNo: **1879716**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0052	0.00020	0.005000	0	104	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1812373**
24-Sep-19

Client: Marathon
Project: 2018 Post Closure Sampling LTU

Sample ID: **MB-41991** SampType: **MBLK** TestCode: **EPA 6010B: Total Recoverable Metals**
Client ID: **PBW** Batch ID: **41991** RunNo: **56358**
Prep Date: **12/8/2018** Analysis Date: **12/14/2018** SeqNo: **1887700** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	0.020								
Beryllium	ND	0.0030								
Cadmium	ND	0.0020								
Chromium	ND	0.0060								
Cobalt	ND	0.0060								
Nickel	ND	0.010								
Silver	ND	0.0050								
Vanadium	ND	0.050								
Zinc	0.0049	0.020								J

Sample ID: **LCS-41991** SampType: **LCS** TestCode: **EPA 6010B: Total Recoverable Metals**
Client ID: **LCSW** Batch ID: **41991** RunNo: **56358**
Prep Date: **12/8/2018** Analysis Date: **12/14/2018** SeqNo: **1887701** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.50	0.020	0.5000	0	99.4	80	120			
Beryllium	0.51	0.0030	0.5000	0	103	80	120			
Cadmium	0.50	0.0020	0.5000	0	100	80	120			
Chromium	0.50	0.0060	0.5000	0	99.2	80	120			
Cobalt	0.48	0.0060	0.5000	0	95.7	80	120			
Nickel	0.48	0.010	0.5000	0	96.4	80	120			
Silver	0.10	0.0050	0.1000	0	101	80	120			
Vanadium	0.51	0.050	0.5000	0	102	80	120			
Zinc	0.49	0.020	0.5000	0	97.9	80	120			

Sample ID: **1812373-003DMS** SampType: **MS** TestCode: **EPA 6010B: Total Recoverable Metals**
Client ID: **MW-1** Batch ID: **41991** RunNo: **56358**
Prep Date: **12/8/2018** Analysis Date: **12/14/2018** SeqNo: **1887711** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.52	0.020	0.5000	0	104	75	125			
Beryllium	0.53	0.0030	0.5000	0	106	75	125			
Cadmium	0.51	0.0020	0.5000	0	101	75	125			
Chromium	0.51	0.0060	0.5000	0	102	75	125			
Cobalt	0.49	0.0060	0.5000	0	97.5	75	125			
Nickel	0.49	0.010	0.5000	0	98.9	75	125			
Silver	0.10	0.0050	0.1000	0	104	75	125			
Vanadium	0.52	0.050	0.5000	0	104	75	125			
Zinc	0.51	0.020	0.5000	0	102	75	125			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1812373**
24-Sep-19

Client: Marathon
Project: 2018 Post Closure Sampling LTU

Sample ID: **1812373-003DMSD** SampType: **MSD** TestCode: **EPA 6010B: Total Recoverable Metals**
Client ID: **MW-1** Batch ID: **41991** RunNo: **56358**
Prep Date: **12/8/2018** Analysis Date: **12/14/2018** SeqNo: **1887712** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.51	0.020	0.5000	0	102	75	125	1.92	20	
Beryllium	0.52	0.0030	0.5000	0	104	75	125	2.35	20	
Cadmium	0.50	0.0020	0.5000	0	99.6	75	125	1.81	20	
Chromium	0.50	0.0060	0.5000	0	99.8	75	125	2.12	20	
Cobalt	0.48	0.0060	0.5000	0	96.1	75	125	1.52	20	
Nickel	0.49	0.010	0.5000	0	97.4	75	125	1.48	20	
Silver	0.10	0.0050	0.1000	0	102	75	125	1.97	20	
Vanadium	0.51	0.050	0.5000	0	102	75	125	1.75	20	
Zinc	0.51	0.020	0.5000	0	101	75	125	0.869	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: **MARATHON GALLUP** Work Order Number: **1812373** RcptNo: **1**

Received By: **Andy Freeman** **12/6/2018 5:08:00 PM** Andy Freeman

Completed By: **Jazzmine Burkhead** **12/7/2018 8:38:10 AM** Jazzmine Burkhead

Reviewed By: ENM 12/7/18

Labeled by: JU 12.7.18

Chain of Custody

1. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2. How was the sample delivered?	Client		

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
8. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
9. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: 12 6 (<2 or >12 unless noted)

Adjusted? No

Checked by: JU 12.7.18

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date:

By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

16. Additional remarks: Received 6 dissolved bottles for Metal. Call client to confirm if they need.

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.6	Good	Yes			
2	4.8	Good	Yes			

Chain-of-Custody Record

Client:	Marathon Petroleum
	GALLUP REFINERY
Mailing Address:	92 GIANT CROSSING ROAD, GALLUP, NM 87301
Phone #:	505-722-3833
Email or Fax#:	505-863-0930
QA/QC Package:	☐ Standard X Level 4 (Full Validation)
Accreditation:	☐ NELAP ☐ Other
☐ EDD (Type)	

Turn-Around Time:	X Standard ☐ Rush
Project Name:	2018 POST CLOSURE SAMPLING - LTU
	MW/SMW WELLS
Project Manager:	~~CJOHNSON~~ Brian Moore
	(CAJohnson1@Marathonpetroleum.com)
Sampler:	C. JOHNSON
On Ice:	X Yes ☐ No
Sample Temperature:	2.6° 4.8 c

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1812373	Analysis Request: 8260 (Skinner List)	8015D EXTENDED(DRO/MRO/GRO)	8270 + Phenols (Skinner List)	Metals - Skinner List	CYANIDE	Air Bubbles (Y or N)
12/6/2018	700	AQUEOUS	Field Blank	3-40ml VOAs	HCL	001	X					
12/6/2018	700	AQUEOUS	Trip Blank	3-40ml VOAs	HCL	002	X					
12/6/2018	810	AQUEOUS	MW-1	MISC	MISC	003	X	X	X	X	X	
12/6/2018	837	AQUEOUS	MW-2	MISC	MISC	004	X	X	2	X	X	
12/6/2018	918	AQUEOUS	MW-5	MISC	MISC	005	X	X	X	X	X	
12/6/2018	1345	AQUEOUS	SMW-4	MISC	MISC	006	X	X	X	X	X	
12/6/2018	1300	AQUEOUS	MW-4	MISC	MISC	007	X	X	X	X	X	
12/6/2018	1310	AQUEOUS	DUPLICATE	MISC	MISC	008	X	X	X	X	X	

Date: 12/6/18	Time: 1508	Relinquished by:	Received by:	Date: 12/6/18	Time: 1510
Date: 12/6/18	Time: 1708	Relinquished by:	Received by:	Date: 12/6/18	Time: 1708

Remarks: WQCC METALS TO INCLUDE RCRA 8 METALS MINUS URANIUM, INCLUDES MERCURY (See Attached Skinner List)

2 coolers : 2.6 c, 4.8 c

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Table 2A. Modified Skinner List 8260 Volatile Organics and PHCs[a]

Parameter	EPA Method SW-846	Description	Containers	Preservative	Holding Time/Days	Liquid Reporting[c] Limit (µg/L)	Soil Reporting[c] Limit (mg/kg)
Benzene	8260	GC/MS	G	4°C	14	5	0.67
2-Butanone (MEK)	8260	GC/MS	G	4°C	14	1900	7000
Carbon Disulfide	8260	GC/MS	G	4°C	14	1000	350
Chlorobenzene	8260	GC/MS	G	4°C	14	39	54
Chloroform	8260	GC/MS	G	4°C	14	0.16	0.24
Chloromethane	8260	GC/MS	G	4°C	14	1.5	1.2
1,1 Dichloroethane	8260	GC/MS	G	4°C	14	25	580
1,2 Dichloroethane	8260	GC/MS	G	4°C	14	5	0.34
1,1 Dichloroethene	8260	GC/MS	G	4°C	14	5.0	0.053
trans-1,2-Dichloroethene	8260	GC/MS	G	4°C	14	100	63
1,4-Dioxane	8260	GC/MS	G	4°C	14	6.1	44
Ethylbenzene[a]	8260	GC/MS	G	4°C	14	700	230
Methylene Chloride	8260	GC/MS	G	4°C	14	4.3	8.6
Styrene	8260	GC/MS	G	4°C	14	100	1700
1,1,2,2-Tetrachloroethane[b]	8260	GC/MS	G	4°C	14	0.055	0.37
Tetrachloroethene[b]	8260	GC/MS	G	4°C	14	5	4.9
Toluene	8260	GC/MS	G	4°C	14	750	1000
1,1,1-Trichloroethane	8260	GC/MS	G	4°C	14	60	200
Trichloroethene	8260	GC/MS	G	4°C	14	5	2.7
Total Xylene[a, d]	8260	GC/MS	G	4°C	14	620	860
Ethylene Dibromide[b]	8260	GC/MS	G	4°C	14	0.1	0.005
Acetone	8260	GC/MS	G	4°C	14	610	1500

[a]Principal hazardous constituent identified in Ciniza Hazardous Waste Facility Permit.
[b]Additional constituents.
[c]Based on EPA Region 6, Human Health Medium-Specific Screening Levels (1999) and NM WQCC Regulations (1996). Analytical detection limits are required to be lower than reporting limits.
[d]Regulatory limits for individual isomers combined into a 'total' limit for these compounds.

mg/kg = milligrams per kilogram
µg/L = microgram per liter
G = glass with Teflon-lined lid
GC/MS = gas chromatography/mass spectrometry

Table 2B. Modified Skinner List 8270 Semivolatile Organics Including TPH and PHCs[a]

Parameter	EPA Method SW-846	Description	Container	Preservative	Holding Time/Days	Liquid Reporting Limit (µg/L)[c]	Soil Reporting Limit (mg/kg)[c]
Anthracene	8270	GC/MS	G	4°C	14	1800	16000
Acenaphthene	8270	GC/MS	G	4°C	14	370	2800
Benzo(a)Anthracene	8270	GC/MS	G	4°C	14	0.09	0.62
Benzo(b)Fluoranthene	8270	GC/MS	G	4°C	14	0.09	0.62
Benzo(k)Fluoranthene	8270	GC/MS	G	4°C	14	0.9	6.2
Benzo(a)Pyrene[a]	8270	GC/MS	G	4°C	14	0.0007	0.062
Butyl Benzyl Phthalate	8270	GC/MS	G	4°C	14	7300	240
Chrysene[a]	8270	GC/MS	G	4°C	14	9.2	62
Diethyl Phthalate	8270	GC/MS	G	4°C	14	29000	49000
7,12-Dimethylbenz(a)-Anthracene	8270	GC/MS	G	4°C	14	[e]	[e]
Dimethyl Phthalate	8270	GC/MS	G	4°C	14	370000	100000
Di-n-Octyl Phthalate	8270	GC/MS	G	4°C	14	730	1200
Fluoranthene	8270	GC/MS	G	4°C	14	1500	2300
Fluorene	8270	GC/MS	G	4°C	14	240	2000
Indeno(1,2,3-cd)Pyrene	8270	GC/MS	G	4°C	14	0.09	0.62
2-Methylnaphthalene[a]	8270	GC/MS	G	4°C	14	30	660
2-Methylphenol (Cresol)	8270	GC/MS	G	4°C	14	1800	3000
3/4-Methylphenol (Cresol)	8270	GC/MS	G	4°C	14	1980	3300
Naphthalene[g]	8270	GC/MS	G	4°C	14	30	55
Nitrobenzene	8270	GC/MS	G	4°C	14	3.4	17
4-Nitrophenol	8270	GC/MS	G	4°C	14	2300	3800
Phenanthrene[a]	8270	GC/MS	G	4°C	14	[e]	[e]
Pyrene[a]	8270	GC/MS	G	4°C	14	180	1700
Pyridine	8270	GC/MS	G	4°C	14	37	61
Quinoline	8270	GC/MS	G	4°C	14	0.0056	0.04
Benzenethiole	8270	GC/MS	G	4°C	14	[e]	[e]
Phenol	8270	GC/MS	G	4°C	14	5	36000
Bis(2-Ethylhexyl)phthalate[b]	8270	GC/MS	G	4°C	14	6.0	35
Dibenz(a,j)acridine[b]	8270	GC/MS	G	4°C	14	[e]	[e]
Dibenz(a,h)-anthracene	8270	GC/MS	G	4°C	14	0.0092	0.062
Dichlorobenzene[b, f]	8270	GC/MS	G	4°C	14	675	410
Methyl Naphthalene	8270	GC/MS	G	4°C	14	30	[e]
2,4-Dimethylphenol	8270	GC/MS	G	4°C	14	730	1200
2,4-Dinitrotoluene	8270	GC/MS	G	4°C	14	73	120

Table 2B. Modified Skinner List 8270 Semivolatile Organics Including TPH and PHCs[a] (Continued)

Parameter	EPA Method SW-846	Description	Container	Preservative	Holding Time/Days	Liquid Reporting Limit (µg/L)[c]	Soil Reporting Limit (mg/kg)[c]
2,4-Dinitrophenol[b]	8270	GC/MS	G	4°C	14	73	120
Benzo(j)Fluoranthene	8270	GC/MS	G	4°C	14	[e]	[e]
2-Chlorophenol	8270	GC/MS	G	4°C	14	30	61
2,4,6-Trichlorophenol	8270	GC/MS	G	4°C	14	6.1	44
Di-n-Butyl Phthalate	8270	GC/MS	G	4°C	14	3700	6100
Benzyl Alcohol[b]	8270	GC/MS	G	4°C	14	11000	18000
Methyl Chrysene	8270	GC/MS	G	4°C	14	[e]	[e]
Total Cresol[g, f]	8270	GC/MS	G	4°C	14	3780	6300
TPH[h]	8015m	GS	G	4°C	7	—	1000

[a]Principal hazardous constituent identified in Ciniza Hazardous Waste Facility Permit.
[b]Additional constituents.
[c]Based on EPA Region 6, Human Health Medium-Specific Screening Levels (1999) and NM WQCC Regulations (1996). Analytical detection limits are required to be lower than reporting limits.
[e]No regulatory limit provided. Laboratory detection limit will be used.
[f]Regulatory limits for individual isomers combined into a 'total' limit for these compounds.
[g]Total naphthalene plus monomethylnaphthalenes regulatory limit is < 30µg/L for aqueous samples.
[h]Total Petroleum Hydrocarbon as Gasoline Range Organics and Diesel Range Organics
µg/L = microgram per liter
mg/kg = milligram per kilogram
G = glass with Teflon-lined lid
GC/MS = gas chromatography/mass spectrometry
GC = gas chromatography

Table 2C. Modified Skinner List Metals and PHCs[a]

Parameter	EPA Method SW-846	Description	Container	Preservative [b]	Holding Time/Days	Aqueous Reporting Limit (µg/L)[c]	Soil Reporting Limit (mg/kg)[c]
Antimony	7060(aq), 6010	GFAA/ICP	P or G	4°C	180	6.0	31
Arsenic	6010	ICP-AES	P or G	4°C	180	50	22
Barium	6010	ICP-AES	P or G	4°C	180	2000	5400
Beryllium	6010	ICP-AES	P or G	4°C	180	4.0	150
Cadmium	6010	ICP-AES	P or G	4°C	180	5.0	39
Chromium[a]	6010	ICP-AES	P or G	4°C	180	50	210
Cobalt	6010	ICP-AES	P or G	4°C	180	50	3400
Lead[a]	6010	ICP-AES	P or G	4°C	180	15	400
Nickel	6010	ICP-AES	P or G	4°C	180	100	1600
Selenium	6010	ICP-AES	P or G	4°C	180	50	390
Silver	6010	ICP-AES	P or G	4°C	180	50	390
Vanadium	6010	ICP-AES	P or G	4°C	180	260	550
Zinc	6010	ICP-AES	P or G	4°C	180	10000	23000

[a]Principal hazardous constituent identified in Ciniza Hazardous Waste Facility Permit.
[b]Aqueous samples are field acidified to pH < 2 with HNO_3 and must not be refrigerated. Non-aqueous samples are cooled to 4°C.
[c]Based on EPA Region 6, Human Health Medium-Specific Screening Levels (1999) and NM WQCC Regulations (1996). Analytical detection limits are required to be lower than reporting limits.

µg/l = microgram per liter
mg/kg = milligram per kilogram
ICP-AES = Inductively Coupled Plasma - Atomic Emission Spectroscopy
G = glass
P = linear polyethylene, polypropylene, or Teflon

Table 2D. Mercury[a] and Cyanide

Parameter	EPA Method SW-846	Description	Container	Preservative	Holding Time/Days	Aqueous Reporting Limit (µg/L)[c]	Soil Reporting Limit (mg/kg)[c]
Mercury[a]	7470/7471	CVAA	P or G	4°C[b]	28	2.0	23.
Cyanide	335.3/ 9010, 9014	Colorimetry	P or G	4°C[d]	14	200	1200

[a]Principal hazardous constituent identified in Ciniza Hazardous Waste Facility Permit.

[b]Aqueous samples are field acidified to pH < 2 with HNO_3 and must not be refrigerated. Non-aqueous samples are cooled to 4°C.

[c]Based on EPA Region 6, Human Health Medium-Specific Screening Levels and NM WQCC Regulations (1996). Analytical detection limits are required to be lower than reporting limits.

[d]Aqueous samples are field adjusted to pH >12 with NaOH and refrigerated. Non-aqueous samples are cooled to 4°C.

µg/l	=	microgram per liter
mg/kg	=	milligram per kilogram
CVAA	=	cold vapor atomic absorption
G	=	glass
P	=	linear polyethylene, polypropylene, or Teflon

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

January 08, 2019

Brian Moore

Marathon
92 Giant Crossing Rd
Gallup, NM 87301
TEL: (505) 722-3833
FAX

RE: Land Treatment Unit OrderNo.: 1812764

Dear Brian Moore:

Hall Environmental Analysis Laboratory received 3 sample(s) on 12/13/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1812764**
Date Reported: **1/8/2019**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU FB01
Project: Land Treatment Unit
Collection Date: 12/11/2018 3:45:00 PM
Lab ID: 1812764-001
Matrix: AQUEOUS
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **JME**	
Diesel Range Organics (DRO)	ND	0.63	1.0		mg/L	1	12/14/2018 11:16:56 A	42095
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	12/14/2018 11:16:56 A	42095
Surr: DNOP	91.9	0	76.7-135		%Rec	1	12/14/2018 11:16:56 A	42095
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.024	0.050		mg/L	1	12/17/2018 10:52:38 A	G56381
Surr: BFB	84.4	0	72.8-125		%Rec	1	12/17/2018 10:52:38 A	G56381
EPA METHOD 6020: TOTAL METALS							Analyst: **DBK**	
Antimony	ND	0.00050	0.0010		mg/L	1	12/28/2018 4:23:55 PM	42270
Arsenic	ND	0.00050	0.0010		mg/L	1	12/28/2018 4:23:55 PM	42270
Lead	ND	0.00050	0.0010		mg/L	1	12/27/2018 3:35:45 PM	42270
Selenium	ND	0.00050	0.0010		mg/L	1	12/28/2018 4:23:55 PM	42270
EPA METHOD 7470: MERCURY							Analyst: **pmf**	
Mercury	0.000072	0.000038	0.00020	J	mg/L	1	12/19/2018 11:59:44 A	42182
EPA 6010B: TOTAL RECOVERABLE METALS							Analyst: **rde**	
Barium	ND	0.020	0.020		mg/L	1	12/26/2018 1:39:43 PM	42228
Beryllium	ND	0.00044	0.0030		mg/L	1	12/26/2018 1:39:43 PM	42228
Cadmium	ND	0.00099	0.0020		mg/L	1	12/26/2018 1:39:43 PM	42228
Chromium	ND	0.0011	0.0060		mg/L	1	12/28/2018 11:55:34 A	42228
Cobalt	ND	0.00098	0.0060		mg/L	1	12/28/2018 11:55:34 A	42228
Nickel	ND	0.0027	0.010		mg/L	1	12/28/2018 11:55:34 A	42228
Silver	ND	0.0018	0.0050		mg/L	1	12/26/2018 1:39:43 PM	42228
Vanadium	ND	0.0023	0.050		mg/L	1	12/26/2018 1:39:43 PM	42228
Zinc	0.0080	0.0033	0.020	J	mg/L	1	1/3/2019 12:35:16 PM	42228
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.17	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
Toluene	ND	0.17	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
Ethylbenzene	ND	0.22	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
Methyl tert-butyl ether (MTBE)	ND	0.46	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
1,2,4-Trimethylbenzene	ND	0.25	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
1,3,5-Trimethylbenzene	ND	0.23	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
1,2-Dichloroethane (EDC)	ND	0.19	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
1,2-Dibromoethane (EDB)	ND	0.23	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
Naphthalene	ND	0.29	2.0		µg/L	1	12/20/2018 12:39:42 P	A56506
1-Methylnaphthalene	ND	0.34	4.0		µg/L	1	12/20/2018 12:39:42 P	A56506
2-Methylnaphthalene	ND	0.35	4.0		µg/L	1	12/20/2018 12:39:42 P	A56506
Acetone	5.3	0.76	10	J	µg/L	1	12/20/2018 12:39:42 P	A56506
Bromobenzene	ND	0.32	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU FB01
Project: Land Treatment Unit
Collection Date: 12/11/2018 3:45:00 PM
Lab ID: 1812764-001
Matrix: AQUEOUS
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Bromodichloromethane	ND	0.28	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
Bromoform	ND	0.32	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
Bromomethane	ND	0.27	3.0		µg/L	1	12/20/2018 12:39:42 P	A56506
2-Butanone	ND	1.4	10		µg/L	1	12/20/2018 12:39:42 P	A56506
Carbon disulfide	ND	0.39	10		µg/L	1	12/20/2018 12:39:42 P	A56506
Carbon Tetrachloride	ND	0.14	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
Chlorobenzene	ND	0.29	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
Chloroethane	ND	0.16	2.0		µg/L	1	12/20/2018 12:39:42 P	A56506
Chloroform	ND	0.24	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
Chloromethane	ND	0.32	3.0		µg/L	1	12/20/2018 12:39:42 P	A56506
2-Chlorotoluene	ND	0.25	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
4-Chlorotoluene	ND	0.28	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
cis-1,2-DCE	ND	0.38	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
cis-1,3-Dichloropropene	ND	0.30	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
1,2-Dibromo-3-chloropropane	ND	0.47	2.0		µg/L	1	12/20/2018 12:39:42 P	A56506
Dibromochloromethane	ND	0.24	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
Dibromomethane	ND	0.32	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
1,2-Dichlorobenzene	ND	0.31	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
1,3-Dichlorobenzene	ND	0.31	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
1,4-Dichlorobenzene	ND	0.29	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
Dichlorodifluoromethane	ND	0.26	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
1,1-Dichloroethane	ND	0.18	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
1,1-Dichloroethene	ND	0.12	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
1,2-Dichloropropane	ND	0.17	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
1,3-Dichloropropane	ND	0.27	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
2,2-Dichloropropane	ND	0.23	2.0		µg/L	1	12/20/2018 12:39:42 P	A56506
1,1-Dichloropropene	ND	0.16	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
Hexachlorobutadiene	ND	0.39	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
2-Hexanone	ND	0.91	10		µg/L	1	12/20/2018 12:39:42 P	A56506
Isopropylbenzene	ND	0.22	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
4-Isopropyltoluene	ND	0.24	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
4-Methyl-2-pentanone	ND	0.45	10		µg/L	1	12/20/2018 12:39:42 P	A56506
Methylene Chloride	ND	0.21	3.0		µg/L	1	12/20/2018 12:39:42 P	A56506
n-Butylbenzene	ND	0.25	3.0		µg/L	1	12/20/2018 12:39:42 P	A56506
n-Propylbenzene	ND	0.24	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
sec-Butylbenzene	ND	0.20	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
Styrene	ND	0.25	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
tert-Butylbenzene	ND	0.22	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
1,1,1,2-Tetrachloroethane	ND	0.25	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU FB01
Project: Land Treatment Unit
Collection Date: 12/11/2018 3:45:00 PM
Lab ID: 1812764-001
Matrix: AQUEOUS
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
1,1,2,2-Tetrachloroethane	ND	0.33	2.0		µg/L	1	12/20/2018 12:39:42 P	A56506
Tetrachloroethene (PCE)	ND	0.15	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
trans-1,3-Dichloropropene	ND	0.28	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
1,2,3-Trichlorobenzene	ND	0.28	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
1,2,4-Trichlorobenzene	ND	0.27	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
1,1,1-Trichloroethane	ND	0.16	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
1,1,2-Trichloroethane	ND	0.23	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
Trichloroethene (TCE)	ND	0.26	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
Trichlorofluoromethane	ND	0.14	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
1,2,3-Trichloropropane	ND	0.57	2.0		µg/L	1	12/20/2018 12:39:42 P	A56506
Vinyl chloride	ND	0.12	1.0		µg/L	1	12/20/2018 12:39:42 P	A56506
Xylenes, Total	ND	0.64	1.5		µg/L	1	12/20/2018 12:39:42 P	A56506
1,4-Dioxane	ND	2.3	10		µg/L	1	12/20/2018 12:39:42 P	A56506
Surr: 1,2-Dichloroethane-d4	99.9	0	70-130		%Rec	1	12/20/2018 12:39:42 P	A56506
Surr: 4-Bromofluorobenzene	96.8	0	70-130		%Rec	1	12/20/2018 12:39:42 P	A56506
Surr: Dibromofluoromethane	107	0	70-130		%Rec	1	12/20/2018 12:39:42 P	A56506
Surr: Toluene-d8	103	0	70-130		%Rec	1	12/20/2018 12:39:42 P	A56506

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Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: Trip Blank
Project: Land Treatment Unit
Collection Date:
Lab ID: 1812764-002
Matrix: TRIP BLANK
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.17	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
Toluene	ND	0.17	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
Ethylbenzene	ND	0.22	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
Methyl tert-butyl ether (MTBE)	ND	0.46	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
1,2,4-Trimethylbenzene	ND	0.25	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
1,3,5-Trimethylbenzene	ND	0.23	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
1,2-Dichloroethane (EDC)	ND	0.19	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
1,2-Dibromoethane (EDB)	ND	0.23	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
Naphthalene	ND	0.29	2.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
1-Methylnaphthalene	ND	0.34	4.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
2-Methylnaphthalene	ND	0.35	4.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
Acetone	1.1	0.76	10	J	µg/L	1	12/20/2018 1:09:29 PM	A56506
Bromobenzene	ND	0.32	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
Bromodichloromethane	ND	0.28	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
Bromoform	ND	0.32	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
Bromomethane	ND	0.27	3.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
2-Butanone	ND	1.4	10		µg/L	1	12/20/2018 1:09:29 PM	A56506
Carbon disulfide	ND	0.39	10		µg/L	1	12/20/2018 1:09:29 PM	A56506
Carbon Tetrachloride	ND	0.14	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
Chlorobenzene	ND	0.29	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
Chloroethane	ND	0.16	2.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
Chloroform	ND	0.24	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
Chloromethane	ND	0.32	3.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
2-Chlorotoluene	ND	0.25	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
4-Chlorotoluene	ND	0.28	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
cis-1,2-DCE	ND	0.38	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
cis-1,3-Dichloropropene	ND	0.30	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
1,2-Dibromo-3-chloropropane	ND	0.47	2.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
Dibromochloromethane	ND	0.24	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
Dibromomethane	ND	0.32	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
1,2-Dichlorobenzene	ND	0.31	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
1,3-Dichlorobenzene	ND	0.31	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
1,4-Dichlorobenzene	ND	0.29	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
Dichlorodifluoromethane	ND	0.26	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
1,1-Dichloroethane	ND	0.18	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
1,1-Dichloroethene	ND	0.12	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
1,2-Dichloropropane	ND	0.17	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
1,3-Dichloropropane	ND	0.27	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
2,2-Dichloropropane	ND	0.23	2.0		µg/L	1	12/20/2018 1:09:29 PM	A56506

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: Trip Blank
Project: Land Treatment Unit
Collection Date:
Lab ID: 1812764-002
Matrix: TRIP BLANK
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
1,1-Dichloropropene	ND	0.16	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
Hexachlorobutadiene	ND	0.39	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
2-Hexanone	ND	0.91	10		µg/L	1	12/20/2018 1:09:29 PM	A56506
Isopropylbenzene	ND	0.22	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
4-Isopropyltoluene	ND	0.24	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
4-Methyl-2-pentanone	ND	0.45	10		µg/L	1	12/20/2018 1:09:29 PM	A56506
Methylene Chloride	ND	0.21	3.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
n-Butylbenzene	ND	0.25	3.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
n-Propylbenzene	ND	0.24	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
sec-Butylbenzene	ND	0.20	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
Styrene	ND	0.25	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
tert-Butylbenzene	ND	0.22	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
1,1,1,2-Tetrachloroethane	ND	0.25	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
1,1,2,2-Tetrachloroethane	ND	0.33	2.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
Tetrachloroethene (PCE)	ND	0.15	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
trans-1,3-Dichloropropene	ND	0.28	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
1,2,3-Trichlorobenzene	ND	0.28	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
1,2,4-Trichlorobenzene	ND	0.27	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
1,1,1-Trichloroethane	ND	0.16	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
1,1,2-Trichloroethane	ND	0.23	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
Trichloroethene (TCE)	ND	0.26	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
Trichlorofluoromethane	ND	0.14	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
1,2,3-Trichloropropane	ND	0.57	2.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
Vinyl chloride	ND	0.12	1.0		µg/L	1	12/20/2018 1:09:29 PM	A56506
Xylenes, Total	ND	0.64	1.5		µg/L	1	12/20/2018 1:09:29 PM	A56506
1,4-Dioxane	ND	2.3	10		µg/L	1	12/20/2018 1:09:29 PM	A56506
Surr: 1,2-Dichloroethane-d4	100	0	70-130		%Rec	1	12/20/2018 1:09:29 PM	A56506
Surr: 4-Bromofluorobenzene	94.3	0	70-130		%Rec	1	12/20/2018 1:09:29 PM	A56506
Surr: Dibromofluoromethane	105	0	70-130		%Rec	1	12/20/2018 1:09:29 PM	A56506
Surr: Toluene-d8	100	0	70-130		%Rec	1	12/20/2018 1:09:29 PM	A56506

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
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S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU EB01
Project: Land Treatment Unit
Collection Date: 12/11/2018 3:25:00 PM
Lab ID: 1812764-003
Matrix: AQUEOUS
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE							Analyst: **JME**	
Diesel Range Organics (DRO)	ND	0.63	1.0		mg/L	1	12/14/2018 11:40:50 A	42095
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	12/14/2018 11:40:50 A	42095
Surr: DNOP	92.5	0	76.7-135		%Rec	1	12/14/2018 11:40:50 A	42095
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.024	0.050		mg/L	1	12/17/2018 11:15:24 A	G56381
Surr: BFB	79.3	0	72.8-125		%Rec	1	12/17/2018 11:15:24 A	G56381
EPA METHOD 6020: TOTAL METALS							Analyst: **DBK**	
Antimony	ND	0.00050	0.0010		mg/L	1	12/28/2018 4:28:16 PM	42270
Arsenic	ND	0.00050	0.0010		mg/L	1	12/28/2018 4:28:16 PM	42270
Lead	ND	0.00050	0.0010		mg/L	1	12/27/2018 3:40:06 PM	42270
Selenium	ND	0.00050	0.0010		mg/L	1	12/28/2018 4:28:16 PM	42270
EPA METHOD 7470: MERCURY							Analyst: **pmf**	
Mercury	0.000076	0.000038	0.00020	J	mg/L	1	12/19/2018 12:02:01 P	42182
EPA 6010B: TOTAL RECOVERABLE METALS							Analyst: **rde**	
Barium	ND	0.020	0.020		mg/L	1	12/26/2018 1:50:37 PM	42228
Beryllium	ND	0.00044	0.0030		mg/L	1	12/26/2018 1:50:37 PM	42228
Cadmium	ND	0.00099	0.0020		mg/L	1	12/26/2018 1:50:37 PM	42228
Chromium	ND	0.0011	0.0060		mg/L	1	12/28/2018 11:59:53 A	42228
Cobalt	ND	0.00098	0.0060		mg/L	1	12/28/2018 11:59:53 A	42228
Nickel	ND	0.0027	0.010		mg/L	1	12/28/2018 11:59:53 A	42228
Silver	ND	0.0018	0.0050		mg/L	1	12/26/2018 1:50:37 PM	42228
Vanadium	ND	0.0023	0.050		mg/L	1	12/26/2018 1:50:37 PM	42228
Zinc	0.0084	0.0033	0.020	J	mg/L	1	1/3/2019 12:37:25 PM	42228
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.17	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
Toluene	ND	0.17	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
Ethylbenzene	ND	0.22	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
Methyl tert-butyl ether (MTBE)	ND	0.46	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
1,2,4-Trimethylbenzene	ND	0.25	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
1,3,5-Trimethylbenzene	ND	0.23	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
1,2-Dichloroethane (EDC)	ND	0.19	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
1,2-Dibromoethane (EDB)	ND	0.23	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
Naphthalene	ND	0.29	2.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
1-Methylnaphthalene	ND	0.34	4.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
2-Methylnaphthalene	ND	0.35	4.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
Acetone	5.5	0.76	10	J	µg/L	1	12/20/2018 1:38:29 PM	A56506
Bromobenzene	ND	0.32	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU EB01
Project: Land Treatment Unit
Collection Date: 12/11/2018 3:25:00 PM
Lab ID: 1812764-003
Matrix: AQUEOUS
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Bromodichloromethane	ND	0.28	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
Bromoform	ND	0.32	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
Bromomethane	ND	0.27	3.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
2-Butanone	ND	1.4	10		µg/L	1	12/20/2018 1:38:29 PM	A56506
Carbon disulfide	ND	0.39	10		µg/L	1	12/20/2018 1:38:29 PM	A56506
Carbon Tetrachloride	ND	0.14	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
Chlorobenzene	ND	0.29	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
Chloroethane	ND	0.16	2.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
Chloroform	ND	0.24	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
Chloromethane	ND	0.32	3.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
2-Chlorotoluene	ND	0.25	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
4-Chlorotoluene	ND	0.28	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
cis-1,2-DCE	ND	0.38	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
cis-1,3-Dichloropropene	ND	0.30	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
1,2-Dibromo-3-chloropropane	ND	0.47	2.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
Dibromochloromethane	ND	0.24	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
Dibromomethane	ND	0.32	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
1,2-Dichlorobenzene	ND	0.31	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
1,3-Dichlorobenzene	ND	0.31	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
1,4-Dichlorobenzene	ND	0.29	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
Dichlorodifluoromethane	ND	0.26	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
1,1-Dichloroethane	ND	0.18	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
1,1-Dichloroethene	ND	0.12	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
1,2-Dichloropropane	ND	0.17	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
1,3-Dichloropropane	ND	0.27	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
2,2-Dichloropropane	ND	0.23	2.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
1,1-Dichloropropene	ND	0.16	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
Hexachlorobutadiene	ND	0.39	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
2-Hexanone	ND	0.91	10		µg/L	1	12/20/2018 1:38:29 PM	A56506
Isopropylbenzene	ND	0.22	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
4-Isopropyltoluene	ND	0.24	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
4-Methyl-2-pentanone	ND	0.45	10		µg/L	1	12/20/2018 1:38:29 PM	A56506
Methylene Chloride	ND	0.21	3.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
n-Butylbenzene	ND	0.25	3.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
n-Propylbenzene	ND	0.24	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
sec-Butylbenzene	ND	0.20	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
Styrene	ND	0.25	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
tert-Butylbenzene	ND	0.22	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
1,1,1,2-Tetrachloroethane	ND	0.25	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU EB01
Project: Land Treatment Unit
Collection Date: 12/11/2018 3:25:00 PM
Lab ID: 1812764-003
Matrix: AQUEOUS
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
1,1,2,2-Tetrachloroethane	ND	0.33	2.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
Tetrachloroethene (PCE)	ND	0.15	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
trans-1,2-DCE	ND	0.18	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
trans-1,3-Dichloropropene	ND	0.28	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
1,2,3-Trichlorobenzene	ND	0.28	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
1,2,4-Trichlorobenzene	ND	0.27	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
1,1,1-Trichloroethane	ND	0.16	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
1,1,2-Trichloroethane	ND	0.23	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
Trichloroethene (TCE)	ND	0.26	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
Trichlorofluoromethane	ND	0.14	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
1,2,3-Trichloropropane	ND	0.57	2.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
Vinyl chloride	ND	0.12	1.0		µg/L	1	12/20/2018 1:38:29 PM	A56506
Xylenes, Total	ND	0.64	1.5		µg/L	1	12/20/2018 1:38:29 PM	A56506
1,4-Dioxane	ND	2.3	10		µg/L	1	12/20/2018 1:38:29 PM	A56506
Surr: 1,2-Dichloroethane-d4	99.5	0	70-130		%Rec	1	12/20/2018 1:38:29 PM	A56506
Surr: 4-Bromofluorobenzene	97.1	0	70-130		%Rec	1	12/20/2018 1:38:29 PM	A56506
Surr: Dibromofluoromethane	107	0	70-130		%Rec	1	12/20/2018 1:38:29 PM	A56506
Surr: Toluene-d8	99.1	0	70-130		%Rec	1	12/20/2018 1:38:29 PM	A56506

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Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181217017
Address:	4901 HAWKINS NE SUITE D	**Project Name:**	1812764
	ALBUQUERQUE, NM 87109		
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	181217017-001	**Sampling Date**	12/11/2018	**Date/Time Received**	12/14/201 10:35 AM
Client Sample ID	1812764-001E/LTU FB01	**Sampling Time**	3:45 PM	**Extraction Date**	12/18/2018
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
1-Methylnaphthalene	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
2-Methylnaphthalene	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
Acenaphthene	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
Acenaphthylene	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
Anthracene	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
Benzo(ghi)perylene	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
Benzo[a]anthracene	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
Benzo[a]pyrene	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
Benzo[b]fluoranthene	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
Benzo[k]fluoranthene	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
Chrysene	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
Dibenz[a,h]anthracene	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
Fluoranthene	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
Fluorene	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
Indeno[1,2,3-cd]pyrene	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
Naphthalene	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
Phenanthrene	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
Pyrene	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
1,2-Dichlorobenzene	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
1,3-Dichlorobenzene	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
1,4-Dichlorobenzene	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
2,4-Dimethylphenol	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
2,4-Dinitrophenol	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
2-Methylphenol	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
3+4-Methylphenol	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
4-Nitrophenol	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
bis(2-Ethylhexyl)phthalate	1.02	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
Diethylphthalate	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
Dimethylphthalate	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
Di-n-butylphthalate	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
Phenol	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
Pyridine	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	
Quinoline	ND	ug/L	0.5	12/22/2018 1:05:00 AM	TGT	EPA 8270D	

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181217017
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1812764
Attn:	ANDY FREEMAN		

Surrogate Data

Sample Number 181217017-001

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270D	64.0	43-120
2-Fluorobiphenyl	EPA 8270D	87.6	55-127
2-Fluorophenol	EPA 8270D	91.8	41-119
Nitrobenzene-d5	EPA 8270D	91.2	55-120
Phenol-d5	EPA 8270D	91.8	52-115
Terphenyl-d14	EPA 8270D	94.8	22-133

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181217017
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1812764
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	181217017-003	**Sampling Date**	12/11/2018	**Date/Time Received**	12/14/20110:35 AM
Client Sample ID	1812764-003E/LTU EB01	**Sampling Time**	3:25 PM	**Extraction Date**	12/18/2018
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
1-Methylnaphthalene	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
2-Methylnaphthalene	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
Acenaphthene	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
Acenaphthylene	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
Anthracene	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
Benzo(ghi)perylene	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
Benzo[a]anthracene	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
Benzo[a]pyrene	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
Benzo[b]fluoranthene	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
Benzo[k]fluoranthene	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
Chrysene	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
Dibenz[a,h]anthracene	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
Fluoranthene	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
Fluorene	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
Indeno[1,2,3-cd]pyrene	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
Naphthalene	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
Phenanthrene	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
Pyrene	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
1,2-Dichlorobenzene	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
1,3-Dichlorobenzene	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
1,4-Dichlorobenzene	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
2,4-Dimethylphenol	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
2,4-Dinitrophenol	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
2-Methylphenol	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
3+4-Methylphenol	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
4-Nitrophenol	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
bis(2-Ethylhexyl)phthalate	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
Diethylphthalate	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
Dimethylphthalate	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
Di-n-butylphthalate	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
Phenol	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
Pyridine	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	
Quinoline	ND	ug/L	0.5	12/22/2018 1:32:00 AM	TGT	EPA 8270D	

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181217017
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1812764
Attn:	ANDY FREEMAN		

Surrogate Data

Sample Number 181217017-003

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270D	66.6	43-120
2-Fluorobiphenyl	EPA 8270D	88.0	55-127
2-Fluorophenol	EPA 8270D	92.2	41-119
Nitrobenzene-d5	EPA 8270D	90.0	55-120
Phenol-d5	EPA 8270D	91.2	52-115
Terphenyl-d14	EPA 8270D	80.4	22-133

Authorized Signature

Todd Taruscio, Lab Manager

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181217017
Project Name: 1812764

Analytical Results Report

Quality Control Data

Lab Control Sample

Parameter	LCS Result	Units	LCS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
Chrysene	4.84	ug/L	5	96.8	54-137	12/18/2018	12/21/2018
2-Methylnaphthalene	4.78	ug/L	5	95.6	56-128	12/18/2018	12/21/2018
Acenaphthene	4.69	ug/L	5	93.8	40-118	12/18/2018	12/21/2018
Acenaphthylene	4.68	ug/L	5	93.6	52-124	12/18/2018	12/21/2018
Anthracene	4.77	ug/L	5	95.4	44-122	12/18/2018	12/21/2018
Benzo(ghi)perylene	4.22	ug/L	5	84.4	50-136	12/18/2018	12/21/2018
Benzo[a]anthracene	4.81	ug/L	5	96.2	42-124	12/18/2018	12/21/2018
Benzo[a]pyrene	4.41	ug/L	5	88.2	41-133	12/18/2018	12/21/2018
1-Methylnaphthalene	4.76	ug/L	5	95.2	49-127	12/18/2018	12/21/2018
Benzo[k]fluoranthene	4.85	ug/L	5	97.0	42-143	12/18/2018	12/21/2018
Phenol	4.50	ug/L	5	90.0	45-134	12/18/2018	12/21/2018
Dibenz[a,h]anthracene	4.18	ug/L	5	83.6	52-140	12/18/2018	12/21/2018
Fluoranthene	4.97	ug/L	5	99.4	45-134	12/18/2018	12/21/2018
Fluorene	4.77	ug/L	5	95.4	41-123	12/18/2018	12/21/2018
Indeno[1,2,3-cd]pyrene	4.18	ug/L	5	83.6	51-137	12/18/2018	12/21/2018
Naphthalene	4.62	ug/L	5	92.4	53-120	12/18/2018	12/21/2018
Phenanthrene	4.79	ug/L	5	95.8	60-124	12/18/2018	12/21/2018
Pyrene	4.86	ug/L	5	97.2	65-139	12/18/2018	12/21/2018
bis(2-Ethylhexyl)phthalate	4.16	ug/L	5	83.2	51-149	12/18/2018	12/21/2018
Benzo[b]fluoranthene	4.85	ug/L	5	97.0	40-139	12/18/2018	12/21/2018

Lab Control Sample Duplicate

Parameter	LCSD Result	Units	LCSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Chrysene	4.46	ug/L	5	89.2	8.2	0-20	12/18/2018	12/21/2018
2-Methylnaphthalene	4.63	ug/L	5	92.6	3.2	0-20	12/18/2018	12/21/2018
Acenaphthene	4.52	ug/L	5	90.4	3.7	0-20	12/18/2018	12/21/2018
Acenaphthylene	4.51	ug/L	5	90.2	3.7	0-20	12/18/2018	12/21/2018
Anthracene	4.54	ug/L	5	90.8	4.9	0-20	12/18/2018	12/21/2018
Benzo(ghi)perylene	4.33	ug/L	5	86.6	2.6	0-20	12/18/2018	12/21/2018
Benzo[a]anthracene	4.69	ug/L	5	93.8	2.5	0-20	12/18/2018	12/21/2018
Benzo[a]pyrene	4.19	ug/L	5	83.8	5.1	0-20	12/18/2018	12/21/2018
1-Methylnaphthalene	4.63	ug/L	5	92.6	2.8	0-20	12/18/2018	12/21/2018
Benzo[k]fluoranthene	4.50	ug/L	5	90.0	7.5	0-20	12/18/2018	12/21/2018
Phenol	4.33	ug/L	5	86.6	3.9	0-25	12/18/2018	12/21/2018

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013;NV:ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181217017
Project Name: 1812764

Analytical Results Report

Quality Control Data

Lab Control Sample Duplicate

Parameter	LCSD Result	Units	LCSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Dibenz[a,h]anthracene	4.28	ug/L	5	85.6	2.4	0-20	12/18/2018	12/21/2018
Fluoranthene	4.72	ug/L	5	94.4	5.2	0-20	12/18/2018	12/21/2018
Fluorene	4.57	ug/L	5	91.4	4.3	0-20	12/18/2018	12/21/2018
Indeno[1,2,3-cd]pyrene	4.28	ug/L	5	85.6	2.4	0-20	12/18/2018	12/21/2018
Naphthalene	4.49	ug/L	5	89.8	2.9	0-20	12/18/2018	12/21/2018
Phenanthrene	4.58	ug/L	5	91.6	4.5	0-20	12/18/2018	12/21/2018
Pyrene	4.48	ug/L	5	89.6	8.1	0-20	12/18/2018	12/21/2018
bis(2-Ethylhexyl)phthalate	4.15	ug/L	5	83.0	0.2	0-43	12/18/2018	12/21/2018
Benzo[b]fluoranthene	4.66	ug/L	5	93.2	4.0	0-20	12/18/2018	12/21/2018

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
1,2-Dichlorobenzene	ND	ug/L	0.5	12/18/2018	12/21/2018
1,3-Dichlorobenzene	ND	ug/L	0.5	12/18/2018	12/21/2018
1,4-Dichlorobenzene	ND	ug/L	0.5	12/18/2018	12/21/2018
1-Methylnaphthalene	ND	ug/L	0.01	12/18/2018	12/21/2018
2,4-Dimethylphenol	ND	ug/L	0.5	12/18/2018	12/21/2018
2,4-Dinitrophenol	ND	ug/L	0.5	12/18/2018	12/21/2018
2-Methylnaphthalene	ND	ug/L	0.01	12/18/2018	12/21/2018
2-Methylphenol	ND	ug/L	0.5	12/18/2018	12/21/2018
3+4-Methylphenol	ND	ug/L	0.5	12/18/2018	12/21/2018
4-Nitrophenol	ND	ug/L	0.5	12/18/2018	12/21/2018
Acenaphthene	ND	ug/L	0.01	12/18/2018	12/21/2018
Acenaphthylene	ND	ug/L	0.01	12/18/2018	12/21/2018
Anthracene	ND	ug/L	0.01	12/18/2018	12/21/2018
Benzo(ghi)perylene	ND	ug/L	0.01	12/18/2018	12/21/2018
Benzo[a]anthracene	ND	ug/L	0.01	12/18/2018	12/21/2018
Benzo[a]pyrene	ND	ug/L	0.01	12/18/2018	12/21/2018
Benzo[b]fluoranthene	ND	ug/L	0.01	12/18/2018	12/21/2018
Benzo[k]fluoranthene	ND	ug/L	0.01	12/18/2018	12/21/2018
bis(2-Ethylhexyl)phthalate	ND	ug/L	0.5	12/18/2018	12/21/2018
Chrysene	ND	ug/L	0.01	12/18/2018	12/21/2018
Dibenz[a,h]anthracene	ND	ug/L	0.01	12/18/2018	12/21/2018
Diethylphthalate	ND	ug/L	0.5	12/18/2018	12/21/2018
Dimethylphthalate	ND	ug/L	0.5	12/18/2018	12/21/2018

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013;NV:ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181217017
Address:	4901 HAWKINS NE SUITE D	**Project Name:**	1812764
	ALBUQUERQUE, NM 87109		
Attn:	ANDY FREEMAN		

Analytical Results Report

Quality Control Data

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Di-n-butylphthalate	ND	ug/L	0.5	12/18/2018	12/21/2018
Fluoranthene	ND	ug/L	0.01	12/18/2018	12/21/2018
Fluorene	ND	ug/L	0.01	12/18/2018	12/21/2018
Indeno[1,2,3-cd]pyrene	ND	ug/L	0.01	12/18/2018	12/21/2018
Naphthalene	ND	ug/L	0.01	12/18/2018	12/21/2018
Phenanthrene	ND	ug/L	0.01	12/18/2018	12/21/2018
Phenol	ND	ug/L	0.5	12/18/2018	12/21/2018
Pyrene	ND	ug/L	0.01	12/18/2018	12/21/2018
Pyridine	ND	ug/L	0.5	12/18/2018	12/21/2018

AR	Acceptable Range
ND	Not Detected
PQL	Practical Quantitation Limit
RPD	Relative Percentage Difference

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013;NV:ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181217017
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1812764
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	181217017-002	**Sampling Date**	12/11/2018	**Date/Time Received**	12/14/2018 10:35 AM
Client Sample ID	1812764-001F/LTU FB01	**Sampling Time**	3:45 PM		
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/L	0.01	12/21/2018 12:00:00 PM	BKP	EPA 335.4	

Sample Number	181217017-004	**Sampling Date**	12/11/2018	**Date/Time Received**	12/14/2018 10:35 AM
Client Sample ID	1812764-003F/LTU EB01	**Sampling Time**	3:25 PM		
Matrix	Water				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/L	0.01	12/21/2018 12:00:00 PM	BKP	EPA 335.4	

Authorized Signature

Todd Taruscio, Lab Manager

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

This report shall not be reproduced except in full, without the written approval of the laboratory.
The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181217017
Project Name: 1812764

Analytical Results Report

Quality Control Data

Lab Control Sample

Parameter	LCS Result	Units	LCS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
Cyanide	0.520	mg/L	0.5	104.0	90-110	12/21/2018	12/26/2018

Matrix Spike

Sample Number	Parameter	Sample Result	MS Result	Units	MS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
181214035-003	Cyanide	ND	0.537	mg/L	0.5	107.4	80-120	12/21/2018	12/26/2018

Matrix Spike Duplicate

Parameter	MSD Result	Units	MSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Cyanide	0.517	mg/L	0.5	103.4	3.8	0-20	12/21/2018	12/26/2018

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Cyanide	ND	mg/L	0.01	12/21/2018	12/26/2018

AR	Acceptable Range
ND	Not Detected
PQL	Practical Quantitation Limit
RPD	Relative Percentage Difference

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013;NV:ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1812764**

08-Jan-19

Client: Marathon

Project: Land Treatment Unit

Sample ID	**MB-42270**	SampType:	**MBLK**	TestCode:	**EPA Method 6020: Total Metals**					
Client ID:	**PBW**	Batch ID:	**42270**	RunNo:	**56633**					
Prep Date:	**12/21/2018**	Analysis Date:	**12/27/2018**	SeqNo:	**1894698**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	ND	0.0010								

Sample ID	**LLLCS-42270**	SampType:	**LCSLL**	TestCode:	**EPA Method 6020: Total Metals**					
Client ID:	**BatchQC**	Batch ID:	**42270**	RunNo:	**56633**					
Prep Date:	**12/21/2018**	Analysis Date:	**12/27/2018**	SeqNo:	**1894699**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.0010	0.0010	0.001000	0	105	70	130			

Sample ID	**LCS-42270**	SampType:	**LCS**	TestCode:	**EPA Method 6020: Total Metals**					
Client ID:	**LCSW**	Batch ID:	**42270**	RunNo:	**56633**					
Prep Date:	**12/21/2018**	Analysis Date:	**12/27/2018**	SeqNo:	**1894700**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.048	0.0010	0.05000	0	95.5	80	120			

Sample ID	**LCS-42270**	SampType:	**LCS**	TestCode:	**EPA Method 6020: Total Metals**					
Client ID:	**LCSW**	Batch ID:	**42270**	RunNo:	**56670**					
Prep Date:	**12/21/2018**	Analysis Date:	**12/28/2018**	SeqNo:	**1896445**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.053	0.0010	0.05000	0	106	80	120			
Arsenic	0.049	0.0010	0.05000	0	98.7	80	120			
Selenium	0.048	0.0010	0.05000	0	97.0	80	120			

Sample ID	**MB-42270**	SampType:	**MBLK**	TestCode:	**EPA Method 6020: Total Metals**					
Client ID:	**PBW**	Batch ID:	**42270**	RunNo:	**56670**					
Prep Date:	**12/21/2018**	Analysis Date:	**12/28/2018**	SeqNo:	**1896476**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	0.0010								
Arsenic	ND	0.0010								
Selenium	ND	0.0010								

Sample ID	**LLLCS-42270**	SampType:	**LCSLL**	TestCode:	**EPA Method 6020: Total Metals**					
Client ID:	**BatchQC**	Batch ID:	**42270**	RunNo:	**56670**					
Prep Date:	**12/21/2018**	Analysis Date:	**12/28/2018**	SeqNo:	**1896478**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	0.0011	0.0010	0.001000	0	105	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1812764**

08-Jan-19

Client: Marathon

Project: Land Treatment Unit

Sample ID	**LLLCS-42270**	SampType:	**LCSLL**	TestCode:	**EPA Method 6020: Total Metals**
Client ID:	**BatchQC**	Batch ID:	**42270**	RunNo:	**56670**
Prep Date:	**12/21/2018**	Analysis Date:	**12/28/2018**	SeqNo:	**1896478** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.00096	0.0010	0.001000	0	95.8	70	130			J
Selenium	0.0011	0.0010	0.001000	0	110	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1812764**

08-Jan-19

Client: Marathon

Project: Land Treatment Unit

Sample ID	**LCS-42095**	SampType:	**LCS**		TestCode:	**EPA Method 8015M/D: Diesel Range**				
Client ID:	**LCSW**	Batch ID:	**42095**		RunNo:	**56344**				
Prep Date:	**12/13/2018**	Analysis Date:	**12/14/2018**		SeqNo:	**1883555**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	4.3	1.0	5.000	0	85.9	70	130			
Surr: DNOP	0.42		0.5000		84.3	76.7	135			

Sample ID	**MB-42095**	SampType:	**MBLK**		TestCode:	**EPA Method 8015M/D: Diesel Range**				
Client ID:	**PBW**	Batch ID:	**42095**		RunNo:	**56344**				
Prep Date:	**12/13/2018**	Analysis Date:	**12/14/2018**		SeqNo:	**1883556**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	1.0								
Motor Oil Range Organics (MRO)	ND	5.0								
Surr: DNOP	0.84		1.000		83.8	76.7	135			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1812764**

08-Jan-19

Client: Marathon

Project: Land Treatment Unit

Sample ID **RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **G56381**	RunNo: **56381**
Prep Date:	Analysis Date: **12/17/2018**	SeqNo: **1885544** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	18		20.00		87.5	72.8	125			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **G56381**	RunNo: **56381**
Prep Date:	Analysis Date: **12/17/2018**	SeqNo: **1885545** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.49	0.050	0.5000	0	98.8	77.7	130			
Surr: BFB	21		20.00		107	72.8	125			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1812764**

08-Jan-19

Client: Marathon

Project: Land Treatment Unit

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **A56506**	RunNo: **56506**
Prep Date:	Analysis Date: **12/20/2018**	SeqNo: **1889881** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	1.5	10								J
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1812764**

08-Jan-19

Client: Marathon

Project: Land Treatment Unit

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **A56506**	RunNo: **56506**
Prep Date:	Analysis Date: **12/20/2018**	SeqNo: **1889881** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	10		10.00		101	70	130			
Surr: 4-Bromofluorobenzene	9.4		10.00		94.2	70	130			
Surr: Dibromofluoromethane	10		10.00		105	70	130			
Surr: Toluene-d8	10		10.00		99.5	70	130			

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **A56506**	RunNo: **56506**
Prep Date:	Analysis Date: **12/20/2018**	SeqNo: **1889882** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	94.4	70	130			
Toluene	19	1.0	20.00	0	95.7	70	130			
Chlorobenzene	19	1.0	20.00	0	93.2	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1812764**

08-Jan-19

Client: Marathon

Project: Land Treatment Unit

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **A56506**	RunNo: **56506**
Prep Date:	Analysis Date: **12/20/2018**	SeqNo: **1889882** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloroethene	20	1.0	20.00	0	100	70	130			
Trichloroethene (TCE)	18	1.0	20.00	0	92.3	70	130			
Surr: 1,2-Dichloroethane-d4	9.9		10.00		99.3	70	130			
Surr: 4-Bromofluorobenzene	9.8		10.00		97.5	70	130			
Surr: Dibromofluoromethane	10		10.00		102	70	130			
Surr: Toluene-d8	9.7		10.00		97.5	70	130			

Sample ID **rb1**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **A56506**	RunNo: **56506**
Prep Date:	Analysis Date: **12/20/2018**	SeqNo: **1889944** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	0.42	4.0								J
2-Methylnaphthalene	0.43	4.0								J
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	1.5	10								J
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1812764**

08-Jan-19

Client: Marathon

Project: Land Treatment Unit

Sample ID **rb1**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **A56506**	RunNo: **56506**
Prep Date:	Analysis Date: **12/20/2018**	SeqNo: **1889944** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	10		10.00		103	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1812764**

08-Jan-19

Client: Marathon

Project: Land Treatment Unit

Sample ID **rb1**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **A56506**	RunNo: **56506**
Prep Date:	Analysis Date: **12/20/2018**	SeqNo: **1889944** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	9.8		10.00		98.2	70	130			
Surr: Dibromofluoromethane	10		10.00		102	70	130			
Surr: Toluene-d8	9.7		10.00		97.1	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1812764**

08-Jan-19

Client: Marathon

Project: Land Treatment Unit

Sample ID	**MB-42182**	SampType:	**MBLK**	TestCode:	**EPA Method 7470: Mercury**					
Client ID:	**PBW**	Batch ID:	**42182**	RunNo:	**56465**					
Prep Date:	**12/18/2018**	Analysis Date:	**12/19/2018**	SeqNo:	**1888152**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.000071	0.00020								J

Sample ID	**LCS-42182**	SampType:	**LCS**	TestCode:	**EPA Method 7470: Mercury**					
Client ID:	**LCSW**	Batch ID:	**42182**	RunNo:	**56465**					
Prep Date:	**12/18/2018**	Analysis Date:	**12/19/2018**	SeqNo:	**1888153**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0049	0.00020	0.005000	0	97.3	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1812764**

08-Jan-19

Client: Marathon

Project: Land Treatment Unit

Sample ID **MB-42228**	SampType: **MBLK**	TestCode: **EPA 6010B: Total Recoverable Metals**
Client ID: **PBW**	Batch ID: **42228**	RunNo: **56631**
Prep Date: **12/20/2018**	Analysis Date: **12/26/2018**	SeqNo: **1894530** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	0.020								
Beryllium	ND	0.0030								
Cadmium	ND	0.0020								
Chromium	ND	0.0060								
Cobalt	ND	0.0060								
Nickel	ND	0.010								
Silver	ND	0.0050								
Vanadium	ND	0.050								
Zinc	0.0064	0.020								J

Sample ID **LCS-42228**	SampType: **LCS**	TestCode: **EPA 6010B: Total Recoverable Metals**
Client ID: **LCSW**	Batch ID: **42228**	RunNo: **56631**
Prep Date: **12/20/2018**	Analysis Date: **12/26/2018**	SeqNo: **1894531** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.50	0.020	0.5000	0	101	80	120			
Beryllium	0.53	0.0030	0.5000	0	107	80	120			
Cadmium	0.51	0.0020	0.5000	0	102	80	120			
Chromium	0.50	0.0060	0.5000	0	101	80	120			
Cobalt	0.49	0.0060	0.5000	0	99.0	80	120			
Nickel	0.49	0.010	0.5000	0	98.7	80	120			
Silver	0.10	0.0050	0.1000	0	102	80	120			
Vanadium	0.51	0.050	0.5000	0	103	80	120			
Zinc	0.50	0.020	0.5000	0	101	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: **MARATHON GALLUP** Work Order Number: **1812764** RcptNo: **1**

Received By: **Victoria Zellar** **12/13/2018 8:57:00 AM** Victoria Zellar

Completed By: **Erin Melendrez** **12/13/2018 10:57:35 AM**

Reviewed By: LB 12/13/18

LB: JAB 12/13/18

Chain of Custody

1. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2. How was the sample delivered?	Courier		

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
8. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
9. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: 2 2 (<2 or >2 unless noted)

Adjusted? No

Checked by: JAB 12/13/18

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date:

By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.4	Good	Yes			

_____ OF _____

Chain-of-Custody Record

Client: **Marathon Petroleum**
Gallup Refinery
Mailing Address: **92 Giant Crossing Road**
Gallup, NM 87301
Phone #: **505-726-3745**
email or Fax#: BMoore1@Marathonpetroleum.com
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
☐ Other _____
☒ EDD (Type) **EXCEL**

Turn-Around Time:
☒ Standard ☐ Rush_____
Project Name: **Land Treatment Unit**
Project #:
Project Manager: **Brian Moore**
Sampler: TRITICO
On Ice: ☒ Yes ☐ No
Sample Temperature: 3.4°C

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1812764	BTEX+MTBE+TMB's(8021)	BTEX+MTBE+TPH(Gas only)	TPH 8015 (GRO/DRO/MRO)	TPH (Method 418.1)	EDB (Method 8011)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B MOD. SKINNER LIST	8270 MOD. SKINNER LIST	METALS MOD SKINNER LIST	MERCURY	CYANIDE		Air Bubbles (Y or N)
12-11-18	1545	H_2O	LTU FB01	40ml VOA-5	HCl	-001			X							X						
	1545		LTU FB01	1 Liter Amber - 1	Neat												X					
	1545		LTU FB01	250 ml Amber-1	Neat				X													
	1545		LTU FB01	250 ml Plastic-1	HNO_3													X	X			
	1545		LTU FB01	500 ml Plastic-1	NaOH															X		
	--		TRIP BLANK	40ml VOA-3	HCL	-002										X						

Date	Time	Relinquished by:	Received by:	Date	Time
12-12-18	0800		Victoria Gallan	12/13/18	8:57
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: Courier 8:57 VVZ 12/13/18

_____ OF _____

Chain-of-Custody Record

Client: **Marathon Petroleum**
Gallup Refinery
Mailing Address: **92 Giant Crossing Road**
Gallup, NM 87301
Phone #: **505-726-3745**
email or Fax#: BMoore1@Marathonpetroleum.com
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
☐ Other _____
☒ EDD (Type) **EXCEL**

Turn-Around Time:
☒ Standard ☐ Rush _____
Project Name: **Land Treatment Unit**
Project #:
Project Manager: **Brian Moore**
Sampler: TRITICO
On Ice: ☒ Yes ☐ No
Sample Temperature: 3.4°C

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1812764	BTEX+MTBE+TMB's(8021)	BTEX+MTBE+TPH(Gas only)	TPH 8015 (GRO/DRO/MRO)	TPH (Method 418.1)	EDB (Method 8011)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B MOD. SKINNER LIST	8270 MOD. SKINNER LIST	METALS MOD SKINNER LIST	MERCURY	CYANIDE		Air Bubbles (Y or N)
12-11-18	1525	H_2O	LTU EB01	40ml VOA-5	HCl	-003			X							X						
	1525		LTU EB01	1 Liter Amber - 1	Neat												X					
	1525		LTU EB01	250 ml Amber-1	Neat				X													
	1525		LTU EB01	250 ml Plastic-1	HNO_3													X	X			
	1525		LTU EB01	500 ml Plastic-1	NaOH															X		

Date:	Time:	Relinquished by:	Received by:	Date	Time
12-12-18	0800		Victoria Gallon	12/13/18	8:57
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: Courier UVZ 12/13/18 8:57

ATTACHMENT 1

Region 5 Waste Management Branch "Skinner List"
Constituents of Concern for Wastes from Petroleum Processes

Inorganics

Antimony	Cadmium	Lead	Silver
Arsenic	Chromium	Mercury	Vanadium
Barium	Cobalt	Nickel	Zinc
Beryllium	Cyanide	Selenium	

Volatile Organics

Benzene	1,2-Dichloroethane	Ethylene dibromide (EDB)	1,1,1-Trichloroethane
Carbon disulfide	1,1-Dichloroethane	Methyl ethyl ketone (MEK)	Trichloroethene
Chlorobenzene	1,4-Dioxane	Styrene	Tetrachloroethylene
Chloroform	Ethylbenzene	Toluene	Xylenes (total)

Semivolatile Organics

Acenaphthene	o-Cresol	Diethyl phthalate	Naphthalene
Anthracene	m-Cresol	2,4 Dimethylphenol	4-Nitrophenol
Benzo(a)anthracene	p-Cresol	Dimethyl phthalate	Phenanthrene
Benzo(b)fluroranthene	Dibenz(a,h)anthracene	2,4 Dinitrophenol	Phenol
Benzo(k)fluoranthene	Di-n-butyl phthalate	Fluoranthene	Pyrene
Benzo(a)pyrene	1,2-Dichlorobenzene*	Fluorene	Pyridine
Bis(2-ethylhexyl) phthalate	1,3-Dichlorobenzene*	Indeno(1,2,3-cd)pyrene	Quinoline
Chrysene	1,4-Dichlorobenzene*	Methyl tertiary butyl ether (MTBE)	*- can be tested as a volatile

Low Concentration Polynuclear Aromatic Hydrocarbons (Optional)

Benzo(a)anthracene	Benzo(k)fluoranthene	Dibenz(a,h)anthracene	Indeno(1,2,3-cd)pyrene
Benzo(b)fluoranthene	Benzo(a)pyrene	Chrysene*	

* added to this group to assist the chromatographic resolution of chrysene from Dibenz(a,h)anthracene in sample extracts

Optional Semivolatile Organics

~~Indene~~ no ℄	~~Benzenethiol~~** no ℄	~~Dibenz(a,h)acridine~~ no ℄	1-Methylnaphthalene*

*Note that 2-Methylnaphthalene is part of Appendix IX and is a CLP TCL organic. 1-Methylnaphthalene is not on these lists.

**Benzenethiol can be detected in certain petroleum refinery wastes. Its measurement must compensate for its instability at neutral and acid pH values during sample preparation and its unstable instrument calibration standards

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

July 03, 2019

Brian Moore

Marathon
92 Giant Crossing Rd
Gallup, NM 87301
TEL: (505) 722-3833
FAX:

RE: Land Treatment Unit OrderNo.: 1812773

Dear Brian Moore:

Hall Environmental Analysis Laboratory received 13 sample(s) on 12/13/2018 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued January 02, 2019.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman

Laboratory Manager

4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C1L1 ZOI
Project: Land Treatment Unit
Collection Date: 12/11/2018 12:45:00 PM
Lab ID: 1812773-001
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **lrm**	
Diesel Range Organics (DRO)	ND	1.9	9.6		mg/Kg	1	12/17/2018 4:16:06 PM	42114
Motor Oil Range Organics (MRO)	ND	48	48		mg/Kg	1	12/17/2018 4:16:06 PM	42114
Surr: DNOP	102	0	50.6-138		%Rec	1	12/17/2018 4:16:06 PM	42114
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	1.4	5.0		mg/Kg	1	12/14/2018 9:27:40 PM	42099
Surr: BFB	101	0	73.8-119		%Rec	1	12/14/2018 9:27:40 PM	42099
EPA METHOD 7471: MERCURY							Analyst: **pmf**	
Mercury	ND	0.0070	0.035		mg/Kg	1	12/17/2018 5:51:08 PM	42146
EPA METHOD 6010B: SOIL METALS							Analyst: **rde**	
Antimony	ND	1.8	12		mg/Kg	5	12/20/2018 2:58:06 PM	42119
Arsenic	ND	6.9	12		mg/Kg	5	12/20/2018 2:58:06 PM	42119
Barium	240	0.11	0.48		mg/Kg	5	12/20/2018 2:58:06 PM	42119
Beryllium	1.6	0.044	0.72		mg/Kg	5	12/20/2018 2:58:06 PM	42119
Cadmium	ND	0.12	0.48		mg/Kg	5	12/20/2018 2:58:06 PM	42119
Chromium	20	0.38	1.4		mg/Kg	5	12/20/2018 2:58:06 PM	42119
Cobalt	7.1	0.51	1.4		mg/Kg	5	12/22/2018 3:49:16 PM	42119
Lead	1.3	1.2	1.2		mg/Kg	5	12/20/2018 2:58:06 PM	42119
Nickel	18	0.72	2.4		mg/Kg	5	12/20/2018 2:58:06 PM	42119
Selenium	ND	6.1	12		mg/Kg	5	12/20/2018 2:58:06 PM	42119
Silver	ND	0.15	1.2		mg/Kg	5	12/20/2018 2:58:06 PM	42119
Vanadium	34	0.32	12		mg/Kg	5	12/20/2018 2:58:06 PM	42119
Zinc	26	1.9	12		mg/Kg	5	12/22/2018 3:49:16 PM	42119
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.0041	0.025		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Toluene	ND	0.0048	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Ethylbenzene	ND	0.0029	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Methyl tert-butyl ether (MTBE)	ND	0.012	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
1,2,4-Trimethylbenzene	ND	0.0046	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
1,3,5-Trimethylbenzene	ND	0.0048	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
1,2-Dichloroethane (EDC)	ND	0.0051	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
1,2-Dibromoethane (EDB)	ND	0.0046	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Naphthalene	ND	0.010	0.10		mg/Kg	1	12/17/2018 2:01:05 PM	42099
1-Methylnaphthalene	ND	0.029	0.20		mg/Kg	1	12/17/2018 2:01:05 PM	42099
2-Methylnaphthalene	ND	0.022	0.20		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Acetone	ND	0.041	0.75		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Bromobenzene	ND	0.0048	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Bromodichloromethane	ND	0.0046	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099

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Qualifiers:

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D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C1L1 ZOI
Project: Land Treatment Unit
Collection Date: 12/11/2018 12:45:00 PM
Lab ID: 1812773-001
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Bromoform	ND	0.0045	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Bromomethane	ND	0.012	0.15		mg/Kg	1	12/17/2018 2:01:05 PM	42099
2-Butanone	ND	0.058	0.50		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Carbon disulfide	ND	0.016	0.50		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Carbon tetrachloride	ND	0.0047	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Chlorobenzene	ND	0.0064	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Chloroethane	ND	0.0074	0.10		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Chloroform	ND	0.0040	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Chloromethane	ND	0.0048	0.15		mg/Kg	1	12/17/2018 2:01:05 PM	42099
2-Chlorotoluene	ND	0.0043	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
4-Chlorotoluene	ND	0.0041	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
cis-1,2-DCE	ND	0.0068	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
cis-1,3-Dichloropropene	ND	0.0042	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
1,2-Dibromo-3-chloropropane	ND	0.0051	0.10		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Dibromochloromethane	ND	0.0035	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Dibromomethane	ND	0.0054	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
1,2-Dichlorobenzene	ND	0.0041	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
1,3-Dichlorobenzene	ND	0.0043	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
1,4-Dichlorobenzene	ND	0.0042	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Dichlorodifluoromethane	ND	0.012	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
1,1-Dichloroethane	ND	0.0032	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
1,1-Dichloroethene	ND	0.020	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
1,2-Dichloropropane	ND	0.0036	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
1,3-Dichloropropane	ND	0.0054	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
2,2-Dichloropropane	ND	0.016	0.10		mg/Kg	1	12/17/2018 2:01:05 PM	42099
1,1-Dichloropropene	ND	0.0045	0.10		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Hexachlorobutadiene	ND	0.0051	0.10		mg/Kg	1	12/17/2018 2:01:05 PM	42099
2-Hexanone	ND	0.0083	0.50		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Isopropylbenzene	ND	0.0036	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
4-Isopropyltoluene	ND	0.0041	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
4-Methyl-2-pentanone	ND	0.0094	0.50		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Methylene chloride	ND	0.0088	0.15		mg/Kg	1	12/17/2018 2:01:05 PM	42099
n-Butylbenzene	ND	0.0047	0.15		mg/Kg	1	12/17/2018 2:01:05 PM	42099
n-Propylbenzene	ND	0.0040	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
sec-Butylbenzene	ND	0.0056	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Styrene	ND	0.0039	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
tert-Butylbenzene	ND	0.0047	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
1,1,1,2-Tetrachloroethane	ND	0.0034	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
1,1,2,2-Tetrachloroethane	ND	0.0051	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099

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Qualifiers:

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D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C1L1 ZOI
Project: Land Treatment Unit
Collection Date: 12/11/2018 12:45:00 PM
Lab ID: 1812773-001
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Tetrachloroethene (PCE)	ND	0.0040	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
trans-1,2-DCE	ND	0.0046	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
trans-1,3-Dichloropropene	ND	0.0053	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
1,2,3-Trichlorobenzene	ND	0.0044	0.10		mg/Kg	1	12/17/2018 2:01:05 PM	42099
1,2,4-Trichlorobenzene	ND	0.0050	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
1,1,1-Trichloroethane	ND	0.0045	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
1,1,2-Trichloroethane	ND	0.0035	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Trichloroethene (TCE)	ND	0.0058	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Trichlorofluoromethane	ND	0.017	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
1,2,3-Trichloropropane	ND	0.0081	0.10		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Vinyl chloride	ND	0.0033	0.050		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Xylenes, Total	ND	0.013	0.10		mg/Kg	1	12/17/2018 2:01:05 PM	42099
1,4-Dioxane	ND	0.14	0.50		mg/Kg	1	12/17/2018 2:01:05 PM	42099
Surr: Dibromofluoromethane	106		70-130		%Rec	1	12/17/2018 2:01:05 PM	42099
Surr: 1,2-Dichloroethane-d4	103		70-130		%Rec	1	12/17/2018 2:01:05 PM	42099
Surr: Toluene-d8	99.6		70-130		%Rec	1	12/17/2018 2:01:05 PM	42099
Surr: 4-Bromofluorobenzene	92.6		70-130		%Rec	1	12/17/2018 2:01:05 PM	42099

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C1L1 TZ
Project: Land Treatment Unit
Collection Date: 12/11/2018 1:00:00 PM
Lab ID: 1812773-002
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **lrm**	
Diesel Range Organics (DRO)	ND	2.0	9.9		mg/Kg	1	12/17/2018 5:22:12 PM	42114
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	12/17/2018 5:22:12 PM	42114
Surr: DNOP	96.5	0	50.6-138		%Rec	1	12/17/2018 5:22:12 PM	42114
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	1.4	4.8		mg/Kg	1	12/14/2018 9:51:17 PM	42099
Surr: BFB	96.2	0	73.8-119		%Rec	1	12/14/2018 9:51:17 PM	42099
EPA METHOD 7471: MERCURY							Analyst: **pmf**	
Mercury	ND	0.0070	0.035		mg/Kg	1	12/17/2018 6:06:28 PM	42146
EPA METHOD 6010B: SOIL METALS							Analyst: **rde**	
Antimony	ND	1.8	12		mg/Kg	5	12/20/2018 2:21:09 PM	42119
Arsenic	ND	6.9	12		mg/Kg	5	12/20/2018 2:21:09 PM	42119
Barium	230	0.11	0.48		mg/Kg	5	12/20/2018 2:21:09 PM	42119
Beryllium	1.3	0.044	0.73		mg/Kg	5	12/20/2018 2:21:09 PM	42119
Cadmium	ND	0.12	0.48		mg/Kg	5	12/20/2018 2:21:09 PM	42119
Chromium	18	0.39	1.5		mg/Kg	5	12/20/2018 2:21:09 PM	42119
Cobalt	8.1	0.51	1.5		mg/Kg	5	12/20/2018 2:21:09 PM	42119
Lead	1.9	1.2	1.2		mg/Kg	5	12/20/2018 2:21:09 PM	42119
Nickel	18	0.72	2.4		mg/Kg	5	12/20/2018 2:21:09 PM	42119
Selenium	ND	6.1	12		mg/Kg	5	12/20/2018 2:21:09 PM	42119
Silver	ND	0.16	1.2		mg/Kg	5	12/20/2018 2:21:09 PM	42119
Vanadium	32	0.32	12		mg/Kg	5	12/20/2018 2:21:09 PM	42119
Zinc	31	1.9	12		mg/Kg	5	12/20/2018 2:21:09 PM	42119
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.0039	0.024		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Toluene	ND	0.0046	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Ethylbenzene	ND	0.0028	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Methyl tert-butyl ether (MTBE)	ND	0.011	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
1,2,4-Trimethylbenzene	ND	0.0044	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
1,3,5-Trimethylbenzene	ND	0.0047	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
1,2-Dichloroethane (EDC)	ND	0.0049	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
1,2-Dibromoethane (EDB)	ND	0.0044	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Naphthalene	ND	0.0096	0.096		mg/Kg	1	12/17/2018 2:30:47 PM	42099
1-Methylnaphthalene	ND	0.028	0.19		mg/Kg	1	12/17/2018 2:30:47 PM	42099
2-Methylnaphthalene	ND	0.021	0.19		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Acetone	ND	0.040	0.72		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Bromobenzene	ND	0.0046	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Bromodichloromethane	ND	0.0044	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099

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PQL	Practical Quanitative Limit
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B	Analyte detected in the associated Method Blank
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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C1L1 TZ
Project: Land Treatment Unit
Collection Date: 12/11/2018 1:00:00 PM
Lab ID: 1812773-002
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Bromoform	ND	0.0043	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Bromomethane	ND	0.012	0.14		mg/Kg	1	12/17/2018 2:30:47 PM	42099
2-Butanone	ND	0.056	0.48		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Carbon disulfide	ND	0.016	0.48		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Carbon tetrachloride	ND	0.0046	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Chlorobenzene	ND	0.0062	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Chloroethane	ND	0.0071	0.096		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Chloroform	ND	0.0039	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Chloromethane	ND	0.0046	0.14		mg/Kg	1	12/17/2018 2:30:47 PM	42099
2-Chlorotoluene	ND	0.0042	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
4-Chlorotoluene	ND	0.0039	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
cis-1,2-DCE	ND	0.0066	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
cis-1,3-Dichloropropene	ND	0.0041	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
1,2-Dibromo-3-chloropropane	ND	0.0049	0.096		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Dibromochloromethane	ND	0.0034	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Dibromomethane	ND	0.0052	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
1,2-Dichlorobenzene	ND	0.0039	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
1,3-Dichlorobenzene	ND	0.0042	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
1,4-Dichlorobenzene	ND	0.0040	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Dichlorodifluoromethane	ND	0.011	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
1,1-Dichloroethane	ND	0.0031	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
1,1-Dichloroethene	ND	0.019	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
1,2-Dichloropropane	ND	0.0035	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
1,3-Dichloropropane	ND	0.0052	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
2,2-Dichloropropane	ND	0.016	0.096		mg/Kg	1	12/17/2018 2:30:47 PM	42099
1,1-Dichloropropene	ND	0.0044	0.096		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Hexachlorobutadiene	ND	0.0049	0.096		mg/Kg	1	12/17/2018 2:30:47 PM	42099
2-Hexanone	ND	0.0080	0.48		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Isopropylbenzene	ND	0.0035	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
4-Isopropyltoluene	ND	0.0040	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
4-Methyl-2-pentanone	ND	0.0091	0.48		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Methylene chloride	ND	0.0085	0.14		mg/Kg	1	12/17/2018 2:30:47 PM	42099
n-Butylbenzene	ND	0.0045	0.14		mg/Kg	1	12/17/2018 2:30:47 PM	42099
n-Propylbenzene	ND	0.0038	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
sec-Butylbenzene	ND	0.0054	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Styrene	ND	0.0038	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
tert-Butylbenzene	ND	0.0045	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
1,1,1,2-Tetrachloroethane	ND	0.0032	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
1,1,2,2-Tetrachloroethane	ND	0.0049	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099

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Qualifiers:

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PQL	Practical Quanitative Limit
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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C1L1 TZ
Project: Land Treatment Unit
Collection Date: 12/11/2018 1:00:00 PM
Lab ID: 1812773-002
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Tetrachloroethene (PCE)	ND	0.0038	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
trans-1,2-DCE	ND	0.0044	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
trans-1,3-Dichloropropene	ND	0.0051	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
1,2,3-Trichlorobenzene	ND	0.0042	0.096		mg/Kg	1	12/17/2018 2:30:47 PM	42099
1,2,4-Trichlorobenzene	ND	0.0049	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
1,1,1-Trichloroethane	ND	0.0043	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
1,1,2-Trichloroethane	ND	0.0034	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Trichloroethene (TCE)	ND	0.0056	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Trichlorofluoromethane	ND	0.016	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
1,2,3-Trichloropropane	ND	0.0078	0.096		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Vinyl chloride	ND	0.0031	0.048		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Xylenes, Total	ND	0.012	0.096		mg/Kg	1	12/17/2018 2:30:47 PM	42099
1,4-Dioxane	ND	0.13	0.48		mg/Kg	1	12/17/2018 2:30:47 PM	42099
Surr: Dibromofluoromethane	103		70-130		%Rec	1	12/17/2018 2:30:47 PM	42099
Surr: 1,2-Dichloroethane-d4	104		70-130		%Rec	1	12/17/2018 2:30:47 PM	42099
Surr: Toluene-d8	99.4		70-130		%Rec	1	12/17/2018 2:30:47 PM	42099
Surr: 4-Bromofluorobenzene	93.3		70-130		%Rec	1	12/17/2018 2:30:47 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C1L2 ZOI
Project: Land Treatment Unit
Collection Date: 12/11/2018 12:00:00 PM
Lab ID: 1812773-003
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **lrm**	
Diesel Range Organics (DRO)	ND	2.0	10		mg/Kg	1	12/17/2018 5:44:15 PM	42114
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	12/17/2018 5:44:15 PM	42114
Surr: DNOP	96.8	0	50.6-138		%Rec	1	12/17/2018 5:44:15 PM	42114
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	1.4	4.8		mg/Kg	1	12/14/2018 10:14:50 P	42099
Surr: BFB	95.9	0	73.8-119		%Rec	1	12/14/2018 10:14:50 P	42099
EPA METHOD 7471: MERCURY							Analyst: **pmf**	
Mercury	0.0079	0.0066	0.033	J	mg/Kg	1	12/17/2018 6:09:36 PM	42146
EPA METHOD 6010B: SOIL METALS							Analyst: **rde**	
Antimony	ND	1.8	12		mg/Kg	5	12/20/2018 2:30:39 PM	42119
Arsenic	ND	7.1	12		mg/Kg	5	12/20/2018 2:30:39 PM	42119
Barium	310	0.12	0.50		mg/Kg	5	12/20/2018 2:30:39 PM	42119
Beryllium	1.7	0.046	0.75		mg/Kg	5	12/20/2018 2:30:39 PM	42119
Cadmium	ND	0.12	0.50		mg/Kg	5	12/20/2018 2:30:39 PM	42119
Chromium	17	0.40	1.5		mg/Kg	5	12/20/2018 2:30:39 PM	42119
Cobalt	6.9	0.53	1.5		mg/Kg	5	12/22/2018 4:32:13 PM	42119
Lead	3.0	1.2	1.2		mg/Kg	5	12/20/2018 2:30:39 PM	42119
Nickel	16	0.75	2.5		mg/Kg	5	12/20/2018 2:30:39 PM	42119
Selenium	ND	6.3	12		mg/Kg	5	12/20/2018 2:30:39 PM	42119
Silver	ND	0.16	1.2		mg/Kg	5	12/20/2018 2:30:39 PM	42119
Vanadium	28	0.33	12		mg/Kg	5	12/20/2018 2:30:39 PM	42119
Zinc	24	2.0	12		mg/Kg	5	12/22/2018 4:32:13 PM	42119
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.0039	0.024		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Toluene	ND	0.0046	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Ethylbenzene	ND	0.0028	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Methyl tert-butyl ether (MTBE)	ND	0.011	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
1,2,4-Trimethylbenzene	ND	0.0044	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
1,3,5-Trimethylbenzene	ND	0.0047	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
1,2-Dichloroethane (EDC)	ND	0.0049	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
1,2-Dibromoethane (EDB)	ND	0.0044	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Naphthalene	ND	0.0096	0.096		mg/Kg	1	12/17/2018 3:00:34 PM	42099
1-Methylnaphthalene	ND	0.028	0.19		mg/Kg	1	12/17/2018 3:00:34 PM	42099
2-Methylnaphthalene	ND	0.021	0.19		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Acetone	ND	0.040	0.72		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Bromobenzene	ND	0.0046	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Bromodichloromethane	ND	0.0044	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C1L2 ZOI
Project: Land Treatment Unit
Collection Date: 12/11/2018 12:00:00 PM
Lab ID: 1812773-003
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Bromoform	ND	0.0043	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Bromomethane	ND	0.012	0.14		mg/Kg	1	12/17/2018 3:00:34 PM	42099
2-Butanone	ND	0.056	0.48		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Carbon disulfide	ND	0.016	0.48		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Carbon tetrachloride	ND	0.0046	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Chlorobenzene	ND	0.0062	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Chloroethane	ND	0.0071	0.096		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Chloroform	ND	0.0039	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Chloromethane	ND	0.0046	0.14		mg/Kg	1	12/17/2018 3:00:34 PM	42099
2-Chlorotoluene	ND	0.0042	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
4-Chlorotoluene	ND	0.0039	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
cis-1,2-DCE	ND	0.0066	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
cis-1,3-Dichloropropene	ND	0.0041	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
1,2-Dibromo-3-chloropropane	ND	0.0049	0.096		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Dibromochloromethane	ND	0.0034	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Dibromomethane	ND	0.0052	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
1,2-Dichlorobenzene	ND	0.0039	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
1,3-Dichlorobenzene	ND	0.0042	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
1,4-Dichlorobenzene	ND	0.0040	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Dichlorodifluoromethane	ND	0.011	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
1,1-Dichloroethane	ND	0.0031	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
1,1-Dichloroethene	ND	0.019	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
1,2-Dichloropropane	ND	0.0035	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
1,3-Dichloropropane	ND	0.0052	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
2,2-Dichloropropane	ND	0.016	0.096		mg/Kg	1	12/17/2018 3:00:34 PM	42099
1,1-Dichloropropene	ND	0.0044	0.096		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Hexachlorobutadiene	ND	0.0049	0.096		mg/Kg	1	12/17/2018 3:00:34 PM	42099
2-Hexanone	ND	0.0080	0.48		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Isopropylbenzene	ND	0.0035	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
4-Isopropyltoluene	ND	0.0040	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
4-Methyl-2-pentanone	ND	0.0091	0.48		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Methylene chloride	ND	0.0085	0.14		mg/Kg	1	12/17/2018 3:00:34 PM	42099
n-Butylbenzene	ND	0.0045	0.14		mg/Kg	1	12/17/2018 3:00:34 PM	42099
n-Propylbenzene	ND	0.0038	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
sec-Butylbenzene	ND	0.0054	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Styrene	ND	0.0038	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
tert-Butylbenzene	ND	0.0045	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
1,1,1,2-Tetrachloroethane	ND	0.0033	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
1,1,2,2-Tetrachloroethane	ND	0.0049	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
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B	Analyte detected in the associated Method Blank
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RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C1L2 ZOI
Project: Land Treatment Unit
Collection Date: 12/11/2018 12:00:00 PM
Lab ID: 1812773-003
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Tetrachloroethene (PCE)	ND	0.0038	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
trans-1,2-DCE	ND	0.0044	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
trans-1,3-Dichloropropene	ND	0.0051	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
1,2,3-Trichlorobenzene	ND	0.0042	0.096		mg/Kg	1	12/17/2018 3:00:34 PM	42099
1,2,4-Trichlorobenzene	ND	0.0049	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
1,1,1-Trichloroethane	ND	0.0043	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
1,1,2-Trichloroethane	ND	0.0034	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Trichloroethene (TCE)	ND	0.0056	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Trichlorofluoromethane	ND	0.016	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
1,2,3-Trichloropropane	ND	0.0078	0.096		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Vinyl chloride	ND	0.0031	0.048		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Xylenes, Total	ND	0.012	0.096		mg/Kg	1	12/17/2018 3:00:34 PM	42099
1,4-Dioxane	ND	0.13	0.48		mg/Kg	1	12/17/2018 3:00:34 PM	42099
Surr: Dibromofluoromethane	104		70-130		%Rec	1	12/17/2018 3:00:34 PM	42099
Surr: 1,2-Dichloroethane-d4	101		70-130		%Rec	1	12/17/2018 3:00:34 PM	42099
Surr: Toluene-d8	102		70-130		%Rec	1	12/17/2018 3:00:34 PM	42099
Surr: 4-Bromofluorobenzene	97.7		70-130		%Rec	1	12/17/2018 3:00:34 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C1L2 TZ
Project: Land Treatment Unit
Collection Date: 12/11/2018 12:10:00 PM
Lab ID: 1812773-004
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **lrm**	
Diesel Range Organics (DRO)	ND	1.9	9.6		mg/Kg	1	12/17/2018 6:06:23 PM	42114
Motor Oil Range Organics (MRO)	ND	48	48		mg/Kg	1	12/17/2018 6:06:23 PM	42114
Surr: DNOP	98.2	0	50.6-138		%Rec	1	12/17/2018 6:06:23 PM	42114
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	1.4	4.8		mg/Kg	1	12/14/2018 10:38:19 P	42099
Surr: BFB	97.6	0	73.8-119		%Rec	1	12/14/2018 10:38:19 P	42099
EPA METHOD 7471: MERCURY							Analyst: **pmf**	
Mercury	ND	0.0070	0.035		mg/Kg	1	12/17/2018 6:18:24 PM	42146
EPA METHOD 6010B: SOIL METALS							Analyst: **rde**	
Antimony	ND	1.8	12		mg/Kg	5	12/20/2018 2:32:27 PM	42119
Arsenic	ND	6.9	12		mg/Kg	5	12/20/2018 2:32:27 PM	42119
Barium	340	0.11	0.48		mg/Kg	5	12/20/2018 2:32:27 PM	42119
Beryllium	1.7	0.044	0.72		mg/Kg	5	12/20/2018 2:32:27 PM	42119
Cadmium	ND	0.12	0.48		mg/Kg	5	12/20/2018 2:32:27 PM	42119
Chromium	19	0.38	1.4		mg/Kg	5	12/20/2018 2:32:27 PM	42119
Cobalt	7.4	0.51	1.4		mg/Kg	5	12/22/2018 4:33:53 PM	42119
Lead	2.9	1.2	1.2		mg/Kg	5	12/20/2018 2:32:27 PM	42119
Nickel	18	0.72	2.4		mg/Kg	5	12/20/2018 2:32:27 PM	42119
Selenium	ND	6.1	12		mg/Kg	5	12/20/2018 2:32:27 PM	42119
Silver	ND	0.15	1.2		mg/Kg	5	12/20/2018 2:32:27 PM	42119
Vanadium	33	0.32	12		mg/Kg	5	12/20/2018 2:32:27 PM	42119
Zinc	27	1.9	12		mg/Kg	5	12/22/2018 4:33:53 PM	42119
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.0039	0.024		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Toluene	ND	0.0046	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Ethylbenzene	ND	0.0028	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Methyl tert-butyl ether (MTBE)	ND	0.011	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
1,2,4-Trimethylbenzene	ND	0.0044	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
1,3,5-Trimethylbenzene	ND	0.0047	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
1,2-Dichloroethane (EDC)	ND	0.0049	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
1,2-Dibromoethane (EDB)	ND	0.0044	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Naphthalene	ND	0.0096	0.096		mg/Kg	1	12/17/2018 3:29:30 PM	42099
1-Methylnaphthalene	ND	0.028	0.19		mg/Kg	1	12/17/2018 3:29:30 PM	42099
2-Methylnaphthalene	ND	0.021	0.19		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Acetone	ND	0.040	0.72		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Bromobenzene	ND	0.0046	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Bromodichloromethane	ND	0.0044	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099

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Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C1L2 TZ
Project: Land Treatment Unit
Collection Date: 12/11/2018 12:10:00 PM
Lab ID: 1812773-004
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Bromoform	ND	0.0043	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Bromomethane	ND	0.012	0.14		mg/Kg	1	12/17/2018 3:29:30 PM	42099
2-Butanone	ND	0.056	0.48		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Carbon disulfide	ND	0.016	0.48		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Carbon tetrachloride	ND	0.0046	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Chlorobenzene	ND	0.0062	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Chloroethane	ND	0.0071	0.096		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Chloroform	ND	0.0039	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Chloromethane	ND	0.0046	0.14		mg/Kg	1	12/17/2018 3:29:30 PM	42099
2-Chlorotoluene	ND	0.0042	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
4-Chlorotoluene	ND	0.0039	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
cis-1,2-DCE	ND	0.0066	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
cis-1,3-Dichloropropene	ND	0.0041	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
1,2-Dibromo-3-chloropropane	ND	0.0049	0.096		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Dibromochloromethane	ND	0.0034	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Dibromomethane	ND	0.0052	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
1,2-Dichlorobenzene	ND	0.0039	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
1,3-Dichlorobenzene	ND	0.0042	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
1,4-Dichlorobenzene	ND	0.0040	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Dichlorodifluoromethane	ND	0.011	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
1,1-Dichloroethane	ND	0.0031	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
1,1-Dichloroethene	ND	0.019	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
1,2-Dichloropropane	ND	0.0035	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
1,3-Dichloropropane	ND	0.0052	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
2,2-Dichloropropane	ND	0.016	0.096		mg/Kg	1	12/17/2018 3:29:30 PM	42099
1,1-Dichloropropene	ND	0.0044	0.096		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Hexachlorobutadiene	ND	0.0049	0.096		mg/Kg	1	12/17/2018 3:29:30 PM	42099
2-Hexanone	ND	0.0080	0.48		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Isopropylbenzene	ND	0.0035	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
4-Isopropyltoluene	ND	0.0040	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
4-Methyl-2-pentanone	ND	0.0091	0.48		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Methylene chloride	ND	0.0085	0.14		mg/Kg	1	12/17/2018 3:29:30 PM	42099
n-Butylbenzene	ND	0.0045	0.14		mg/Kg	1	12/17/2018 3:29:30 PM	42099
n-Propylbenzene	ND	0.0038	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
sec-Butylbenzene	ND	0.0054	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Styrene	ND	0.0038	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
tert-Butylbenzene	ND	0.0045	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
1,1,1,2-Tetrachloroethane	ND	0.0033	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
1,1,2,2-Tetrachloroethane	ND	0.0049	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C1L2 TZ
Project: Land Treatment Unit
Collection Date: 12/11/2018 12:10:00 PM
Lab ID: 1812773-004
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Tetrachloroethene (PCE)	ND	0.0038	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
trans-1,2-DCE	ND	0.0044	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
trans-1,3-Dichloropropene	ND	0.0051	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
1,2,3-Trichlorobenzene	ND	0.0042	0.096		mg/Kg	1	12/17/2018 3:29:30 PM	42099
1,2,4-Trichlorobenzene	ND	0.0049	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
1,1,1-Trichloroethane	ND	0.0043	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
1,1,2-Trichloroethane	ND	0.0034	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Trichloroethene (TCE)	ND	0.0056	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Trichlorofluoromethane	ND	0.016	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
1,2,3-Trichloropropane	ND	0.0078	0.096		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Vinyl chloride	ND	0.0031	0.048		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Xylenes, Total	ND	0.012	0.096		mg/Kg	1	12/17/2018 3:29:30 PM	42099
1,4-Dioxane	ND	0.13	0.48		mg/Kg	1	12/17/2018 3:29:30 PM	42099
Surr: Dibromofluoromethane	105		70-130		%Rec	1	12/17/2018 3:29:30 PM	42099
Surr: 1,2-Dichloroethane-d4	98.2		70-130		%Rec	1	12/17/2018 3:29:30 PM	42099
Surr: Toluene-d8	104		70-130		%Rec	1	12/17/2018 3:29:30 PM	42099
Surr: 4-Bromofluorobenzene	96.6		70-130		%Rec	1	12/17/2018 3:29:30 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU ZOI DUP
Project: Land Treatment Unit
Collection Date: 12/11/2018
Lab ID: 1812773-005
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **lrm**	
Diesel Range Organics (DRO)	ND	2.0	9.8		mg/Kg	1	12/17/2018 6:28:19 PM	42114
Motor Oil Range Organics (MRO)	ND	49	49		mg/Kg	1	12/17/2018 6:28:19 PM	42114
Surr: DNOP	97.1	0	50.6-138		%Rec	1	12/17/2018 6:28:19 PM	42114
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	1.4	4.8		mg/Kg	1	12/14/2018 11:01:48 P	42099
Surr: BFB	99.1	0	73.8-119		%Rec	1	12/14/2018 11:01:48 P	42099
EPA METHOD 7471: MERCURY							Analyst: **pmf**	
Mercury	ND	0.0068	0.034		mg/Kg	1	12/17/2018 6:21:40 PM	42146
EPA METHOD 6010B: SOIL METALS							Analyst: **rde**	
Antimony	ND	1.8	12		mg/Kg	5	12/20/2018 2:34:19 PM	42119
Arsenic	ND	6.9	12		mg/Kg	5	12/20/2018 2:34:19 PM	42119
Barium	270	0.11	0.48		mg/Kg	5	12/20/2018 2:34:19 PM	42119
Beryllium	1.7	0.044	0.72		mg/Kg	5	12/20/2018 2:34:19 PM	42119
Cadmium	ND	0.12	0.48		mg/Kg	5	12/20/2018 2:34:19 PM	42119
Chromium	20	0.38	1.4		mg/Kg	5	12/20/2018 2:34:19 PM	42119
Cobalt	7.4	0.51	1.4		mg/Kg	5	12/22/2018 4:35:26 PM	42119
Lead	1.7	1.2	1.2		mg/Kg	5	12/20/2018 2:34:19 PM	42119
Nickel	19	0.72	2.4		mg/Kg	5	12/20/2018 2:34:19 PM	42119
Selenium	ND	6.1	12		mg/Kg	5	12/20/2018 2:34:19 PM	42119
Silver	ND	0.15	1.2		mg/Kg	5	12/20/2018 2:34:19 PM	42119
Vanadium	33	0.32	12		mg/Kg	5	12/20/2018 2:34:19 PM	42119
Zinc	28	1.9	12		mg/Kg	5	12/22/2018 4:35:26 PM	42119
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.0040	0.024		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Toluene	ND	0.0046	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Ethylbenzene	ND	0.0028	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Methyl tert-butyl ether (MTBE)	ND	0.011	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
1,2,4-Trimethylbenzene	ND	0.0044	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
1,3,5-Trimethylbenzene	ND	0.0047	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
1,2-Dichloroethane (EDC)	ND	0.0049	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
1,2-Dibromoethane (EDB)	ND	0.0044	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Naphthalene	ND	0.0097	0.097		mg/Kg	1	12/17/2018 3:58:36 PM	42099
1-Methylnaphthalene	ND	0.028	0.19		mg/Kg	1	12/17/2018 3:58:36 PM	42099
2-Methylnaphthalene	ND	0.021	0.19		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Acetone	ND	0.040	0.73		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Bromobenzene	ND	0.0046	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Bromodichloromethane	ND	0.0044	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU ZOI DUP
Project: Land Treatment Unit
Collection Date: 12/11/2018
Lab ID: 1812773-005
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Bromoform	ND	0.0044	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Bromomethane	ND	0.012	0.15		mg/Kg	1	12/17/2018 3:58:36 PM	42099
2-Butanone	ND	0.056	0.48		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Carbon disulfide	ND	0.016	0.48		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Carbon tetrachloride	ND	0.0046	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Chlorobenzene	ND	0.0062	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Chloroethane	ND	0.0071	0.097		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Chloroform	ND	0.0039	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Chloromethane	ND	0.0046	0.15		mg/Kg	1	12/17/2018 3:58:36 PM	42099
2-Chlorotoluene	ND	0.0042	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
4-Chlorotoluene	ND	0.0040	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
cis-1,2-DCE	ND	0.0066	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
cis-1,3-Dichloropropene	ND	0.0041	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
1,2-Dibromo-3-chloropropane	ND	0.0050	0.097		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Dibromochloromethane	ND	0.0034	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Dibromomethane	ND	0.0052	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
1,2-Dichlorobenzene	ND	0.0040	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
1,3-Dichlorobenzene	ND	0.0042	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
1,4-Dichlorobenzene	ND	0.0040	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Dichlorodifluoromethane	ND	0.011	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
1,1-Dichloroethane	ND	0.0031	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
1,1-Dichloroethene	ND	0.019	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
1,2-Dichloropropane	ND	0.0035	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
1,3-Dichloropropane	ND	0.0052	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
2,2-Dichloropropane	ND	0.016	0.097		mg/Kg	1	12/17/2018 3:58:36 PM	42099
1,1-Dichloropropene	ND	0.0044	0.097		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Hexachlorobutadiene	ND	0.0049	0.097		mg/Kg	1	12/17/2018 3:58:36 PM	42099
2-Hexanone	ND	0.0080	0.48		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Isopropylbenzene	ND	0.0035	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
4-Isopropyltoluene	ND	0.0040	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
4-Methyl-2-pentanone	ND	0.0091	0.48		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Methylene chloride	ND	0.0085	0.15		mg/Kg	1	12/17/2018 3:58:36 PM	42099
n-Butylbenzene	ND	0.0045	0.15		mg/Kg	1	12/17/2018 3:58:36 PM	42099
n-Propylbenzene	ND	0.0039	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
sec-Butylbenzene	ND	0.0054	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Styrene	ND	0.0038	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
tert-Butylbenzene	ND	0.0046	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
1,1,1,2-Tetrachloroethane	ND	0.0033	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
1,1,2,2-Tetrachloroethane	ND	0.0049	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU ZOI DUP
Project: Land Treatment Unit
Collection Date: 12/11/2018
Lab ID: 1812773-005
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Tetrachloroethene (PCE)	ND	0.0039	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
trans-1,2-DCE	ND	0.0044	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
trans-1,3-Dichloropropene	ND	0.0051	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
1,2,3-Trichlorobenzene	ND	0.0042	0.097		mg/Kg	1	12/17/2018 3:58:36 PM	42099
1,2,4-Trichlorobenzene	ND	0.0049	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
1,1,1-Trichloroethane	ND	0.0044	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
1,1,2-Trichloroethane	ND	0.0034	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Trichloroethene (TCE)	ND	0.0056	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Trichlorofluoromethane	ND	0.016	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
1,2,3-Trichloropropane	ND	0.0078	0.097		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Vinyl chloride	ND	0.0032	0.048		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Xylenes, Total	ND	0.012	0.097		mg/Kg	1	12/17/2018 3:58:36 PM	42099
1,4-Dioxane	ND	0.14	0.48		mg/Kg	1	12/17/2018 3:58:36 PM	42099
Surr: Dibromofluoromethane	106		70-130		%Rec	1	12/17/2018 3:58:36 PM	42099
Surr: 1,2-Dichloroethane-d4	98.9		70-130		%Rec	1	12/17/2018 3:58:36 PM	42099
Surr: Toluene-d8	102		70-130		%Rec	1	12/17/2018 3:58:36 PM	42099
Surr: 4-Bromofluorobenzene	97.5		70-130		%Rec	1	12/17/2018 3:58:36 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C2L1 ZOI
Project: Land Treatment Unit
Collection Date: 12/11/2018 2:20:00 PM
Lab ID: 1812773-006 **Matrix:** SOIL **Received Date:** 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **lrm**	
Diesel Range Organics (DRO)	51	2.0	9.9		mg/Kg	1	12/17/2018 12:29:55 P	42114
Motor Oil Range Organics (MRO)	ND	49	49		mg/Kg	1	12/17/2018 12:29:55 P	42114
Surr: DNOP	67.3	0	50.6-138		%Rec	1	12/17/2018 12:29:55 P	42114
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	1.4	4.9		mg/Kg	1	12/14/2018 11:25:07 P	42099
Surr: BFB	98.7	0	73.8-119		%Rec	1	12/14/2018 11:25:07 P	42099
EPA METHOD 7471: MERCURY							Analyst: **pmf**	
Mercury	0.026	0.0066	0.033	J	mg/Kg	1	12/18/2018 10:47:00 A	42146
EPA METHOD 6010B: SOIL METALS							Analyst: **rde**	
Antimony	ND	1.8	12		mg/Kg	5	12/20/2018 2:36:14 PM	42119
Arsenic	ND	7.0	12		mg/Kg	5	12/20/2018 2:36:14 PM	42119
Barium	410	0.11	0.49		mg/Kg	5	12/20/2018 2:36:14 PM	42119
Beryllium	1.5	0.045	0.74		mg/Kg	5	12/20/2018 2:36:14 PM	42119
Cadmium	ND	0.12	0.49		mg/Kg	5	12/20/2018 2:36:14 PM	42119
Chromium	21	0.39	1.5		mg/Kg	5	12/20/2018 2:36:14 PM	42119
Cobalt	6.3	0.52	1.5		mg/Kg	5	12/22/2018 4:37:04 PM	42119
Lead	6.6	1.2	1.2		mg/Kg	5	12/20/2018 2:36:14 PM	42119
Nickel	17	0.73	2.5		mg/Kg	5	12/20/2018 2:36:14 PM	42119
Selenium	ND	6.2	12		mg/Kg	5	12/20/2018 2:36:14 PM	42119
Silver	ND	0.16	1.2		mg/Kg	5	12/20/2018 2:36:14 PM	42119
Vanadium	27	0.33	12		mg/Kg	5	12/20/2018 2:36:14 PM	42119
Zinc	45	1.9	12		mg/Kg	5	12/22/2018 4:37:04 PM	42119
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.0040	0.025		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Toluene	ND	0.0047	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Ethylbenzene	ND	0.0029	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Methyl tert-butyl ether (MTBE)	ND	0.012	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
1,2,4-Trimethylbenzene	ND	0.0045	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
1,3,5-Trimethylbenzene	ND	0.0048	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
1,2-Dichloroethane (EDC)	ND	0.0050	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
1,2-Dibromoethane (EDB)	ND	0.0045	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Naphthalene	ND	0.0098	0.098		mg/Kg	1	12/17/2018 4:27:32 PM	42099
1-Methylnaphthalene	ND	0.028	0.20		mg/Kg	1	12/17/2018 4:27:32 PM	42099
2-Methylnaphthalene	ND	0.021	0.20		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Acetone	ND	0.041	0.74		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Bromobenzene	ND	0.0047	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Bromodichloromethane	ND	0.0045	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C2L1 ZOI
Project: Land Treatment Unit
Collection Date: 12/11/2018 2:20:00 PM
Lab ID: 1812773-006
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Bromoform	ND	0.0044	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Bromomethane	ND	0.012	0.15		mg/Kg	1	12/17/2018 4:27:32 PM	42099
2-Butanone	ND	0.057	0.49		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Carbon disulfide	ND	0.016	0.49		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Carbon tetrachloride	ND	0.0047	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Chlorobenzene	ND	0.0063	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Chloroethane	ND	0.0072	0.098		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Chloroform	ND	0.0040	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Chloromethane	ND	0.0047	0.15		mg/Kg	1	12/17/2018 4:27:32 PM	42099
2-Chlorotoluene	ND	0.0043	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
4-Chlorotoluene	ND	0.0040	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
cis-1,2-DCE	ND	0.0067	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
cis-1,3-Dichloropropene	ND	0.0041	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
1,2-Dibromo-3-chloropropane	ND	0.0050	0.098		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Dibromochloromethane	ND	0.0035	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Dibromomethane	ND	0.0053	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
1,2-Dichlorobenzene	ND	0.0040	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
1,3-Dichlorobenzene	ND	0.0043	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
1,4-Dichlorobenzene	ND	0.0041	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Dichlorodifluoromethane	ND	0.011	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
1,1-Dichloroethane	ND	0.0031	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
1,1-Dichloroethene	ND	0.020	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
1,2-Dichloropropane	ND	0.0036	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
1,3-Dichloropropane	ND	0.0053	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
2,2-Dichloropropane	ND	0.016	0.098		mg/Kg	1	12/17/2018 4:27:32 PM	42099
1,1-Dichloropropene	ND	0.0045	0.098		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Hexachlorobutadiene	ND	0.0050	0.098		mg/Kg	1	12/17/2018 4:27:32 PM	42099
2-Hexanone	ND	0.0082	0.49		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Isopropylbenzene	ND	0.0035	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
4-Isopropyltoluene	ND	0.0041	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
4-Methyl-2-pentanone	ND	0.0093	0.49		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Methylene chloride	ND	0.0087	0.15		mg/Kg	1	12/17/2018 4:27:32 PM	42099
n-Butylbenzene	ND	0.0046	0.15		mg/Kg	1	12/17/2018 4:27:32 PM	42099
n-Propylbenzene	ND	0.0039	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
sec-Butylbenzene	ND	0.0055	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Styrene	ND	0.0039	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
tert-Butylbenzene	ND	0.0046	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
1,1,1,2-Tetrachloroethane	ND	0.0033	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
1,1,2,2-Tetrachloroethane	ND	0.0050	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C2L1 ZOI
Project: Land Treatment Unit
Collection Date: 12/11/2018 2:20:00 PM
Lab ID: 1812773-006
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Tetrachloroethene (PCE)	ND	0.0039	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
trans-1,2-DCE	ND	0.0045	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
trans-1,3-Dichloropropene	ND	0.0052	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
1,2,3-Trichlorobenzene	ND	0.0043	0.098		mg/Kg	1	12/17/2018 4:27:32 PM	42099
1,2,4-Trichlorobenzene	ND	0.0050	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
1,1,1-Trichloroethane	ND	0.0044	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
1,1,2-Trichloroethane	ND	0.0035	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Trichloroethene (TCE)	ND	0.0057	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Trichlorofluoromethane	ND	0.017	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
1,2,3-Trichloropropane	ND	0.0080	0.098		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Vinyl chloride	ND	0.0032	0.049		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Xylenes, Total	ND	0.012	0.098		mg/Kg	1	12/17/2018 4:27:32 PM	42099
1,4-Dioxane	ND	0.14	0.49		mg/Kg	1	12/17/2018 4:27:32 PM	42099
Surr: Dibromofluoromethane	106		70-130		%Rec	1	12/17/2018 4:27:32 PM	42099
Surr: 1,2-Dichloroethane-d4	99.2		70-130		%Rec	1	12/17/2018 4:27:32 PM	42099
Surr: Toluene-d8	100		70-130		%Rec	1	12/17/2018 4:27:32 PM	42099
Surr: 4-Bromofluorobenzene	97.8		70-130		%Rec	1	12/17/2018 4:27:32 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C2L1 TZ
Project: Land Treatment Unit
Collection Date: 12/11/2018 2:35:00 PM
Lab ID: 1812773-007
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **lrm**	
Diesel Range Organics (DRO)	55	2.0	9.9		mg/Kg	1	12/17/2018 12:52:01 P	42114
Motor Oil Range Organics (MRO)	78	50	50		mg/Kg	1	12/17/2018 12:52:01 P	42114
Surr: DNOP	105	0	50.6-138		%Rec	1	12/17/2018 12:52:01 P	42114
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	1.4	4.8		mg/Kg	1	12/14/2018 11:48:34 P	42099
Surr: BFB	93.3	0	73.8-119		%Rec	1	12/14/2018 11:48:34 P	42099
EPA METHOD 7471: MERCURY							Analyst: **pmf**	
Mercury	0.30	0.0069	0.034		mg/Kg	1	12/18/2018 10:49:00 A	42146
EPA METHOD 6010B: SOIL METALS							Analyst: **rde**	
Antimony	ND	1.8	12		mg/Kg	5	12/20/2018 2:37:54 PM	42119
Arsenic	ND	7.0	12		mg/Kg	5	12/20/2018 2:37:54 PM	42119
Barium	280	0.11	0.49		mg/Kg	5	12/20/2018 2:37:54 PM	42119
Beryllium	1.7	0.045	0.74		mg/Kg	5	12/20/2018 2:37:54 PM	42119
Cadmium	ND	0.12	0.49		mg/Kg	5	12/20/2018 2:37:54 PM	42119
Chromium	24	0.39	1.5		mg/Kg	5	12/20/2018 2:37:54 PM	42119
Cobalt	6.9	0.52	1.5		mg/Kg	5	12/22/2018 4:38:44 PM	42119
Lead	4.8	1.2	1.2		mg/Kg	5	12/20/2018 2:37:54 PM	42119
Nickel	18	0.74	2.5		mg/Kg	5	12/20/2018 2:37:54 PM	42119
Selenium	ND	6.2	12		mg/Kg	5	12/20/2018 2:37:54 PM	42119
Silver	ND	0.16	1.2		mg/Kg	5	12/20/2018 2:37:54 PM	42119
Vanadium	28	0.33	12		mg/Kg	5	12/20/2018 2:37:54 PM	42119
Zinc	45	2.0	12		mg/Kg	5	12/22/2018 4:38:44 PM	42119
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.0039	0.024		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Toluene	ND	0.0046	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Ethylbenzene	ND	0.0028	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Methyl tert-butyl ether (MTBE)	ND	0.011	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
1,2,4-Trimethylbenzene	ND	0.0044	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
1,3,5-Trimethylbenzene	ND	0.0046	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
1,2-Dichloroethane (EDC)	ND	0.0049	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
1,2-Dibromoethane (EDB)	ND	0.0044	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Naphthalene	ND	0.0096	0.095		mg/Kg	1	12/17/2018 4:56:49 PM	42099
1-Methylnaphthalene	ND	0.027	0.19		mg/Kg	1	12/17/2018 4:56:49 PM	42099
2-Methylnaphthalene	ND	0.021	0.19		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Acetone	ND	0.040	0.72		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Bromobenzene	ND	0.0046	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Bromodichloromethane	ND	0.0044	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C2L1 TZ
Project: Land Treatment Unit
Collection Date: 12/11/2018 2:35:00 PM
Lab ID: 1812773-007
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Bromoform	ND	0.0043	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Bromomethane	ND	0.012	0.14		mg/Kg	1	12/17/2018 4:56:49 PM	42099
2-Butanone	ND	0.055	0.48		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Carbon disulfide	ND	0.016	0.48		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Carbon tetrachloride	ND	0.0045	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Chlorobenzene	ND	0.0061	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Chloroethane	ND	0.0070	0.095		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Chloroform	ND	0.0038	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Chloromethane	ND	0.0046	0.14		mg/Kg	1	12/17/2018 4:56:49 PM	42099
2-Chlorotoluene	ND	0.0042	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
4-Chlorotoluene	ND	0.0039	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
cis-1,2-DCE	ND	0.0065	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
cis-1,3-Dichloropropene	ND	0.0040	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
1,2-Dibromo-3-chloropropane	ND	0.0049	0.095		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Dibromochloromethane	ND	0.0034	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Dibromomethane	ND	0.0051	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
1,2-Dichlorobenzene	ND	0.0039	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
1,3-Dichlorobenzene	ND	0.0041	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
1,4-Dichlorobenzene	ND	0.0040	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Dichlorodifluoromethane	ND	0.011	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
1,1-Dichloroethane	ND	0.0031	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
1,1-Dichloroethene	ND	0.019	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
1,2-Dichloropropane	ND	0.0035	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
1,3-Dichloropropane	ND	0.0052	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
2,2-Dichloropropane	ND	0.016	0.095		mg/Kg	1	12/17/2018 4:56:49 PM	42099
1,1-Dichloropropene	ND	0.0043	0.095		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Hexachlorobutadiene	ND	0.0049	0.095		mg/Kg	1	12/17/2018 4:56:49 PM	42099
2-Hexanone	ND	0.0079	0.48		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Isopropylbenzene	ND	0.0034	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
4-Isopropyltoluene	ND	0.0039	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
4-Methyl-2-pentanone	ND	0.0090	0.48		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Methylene chloride	ND	0.0084	0.14		mg/Kg	1	12/17/2018 4:56:49 PM	42099
n-Butylbenzene	ND	0.0044	0.14		mg/Kg	1	12/17/2018 4:56:49 PM	42099
n-Propylbenzene	ND	0.0038	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
sec-Butylbenzene	ND	0.0054	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Styrene	ND	0.0037	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
tert-Butylbenzene	ND	0.0045	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
1,1,1,2-Tetrachloroethane	ND	0.0032	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
1,1,2,2-Tetrachloroethane	ND	0.0048	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C2L1 TZ
Project: Land Treatment Unit
Collection Date: 12/11/2018 2:35:00 PM
Lab ID: 1812773-007
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Tetrachloroethene (PCE)	ND	0.0038	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
trans-1,2-DCE	ND	0.0044	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
trans-1,3-Dichloropropene	ND	0.0050	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
1,2,3-Trichlorobenzene	ND	0.0042	0.095		mg/Kg	1	12/17/2018 4:56:49 PM	42099
1,2,4-Trichlorobenzene	ND	0.0048	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
1,1,1-Trichloroethane	ND	0.0043	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
1,1,2-Trichloroethane	ND	0.0034	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Trichloroethene (TCE)	ND	0.0055	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Trichlorofluoromethane	ND	0.016	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
1,2,3-Trichloropropane	ND	0.0077	0.095		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Vinyl chloride	ND	0.0031	0.048		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Xylenes, Total	ND	0.012	0.095		mg/Kg	1	12/17/2018 4:56:49 PM	42099
1,4-Dioxane	ND	0.13	0.48		mg/Kg	1	12/17/2018 4:56:49 PM	42099
Surr: Dibromofluoromethane	107		70-130		%Rec	1	12/17/2018 4:56:49 PM	42099
Surr: 1,2-Dichloroethane-d4	96.0		70-130		%Rec	1	12/17/2018 4:56:49 PM	42099
Surr: Toluene-d8	104		70-130		%Rec	1	12/17/2018 4:56:49 PM	42099
Surr: 4-Bromofluorobenzene	98.0		70-130		%Rec	1	12/17/2018 4:56:49 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C2L2 ZOI
Project: Land Treatment Unit
Collection Date: 12/11/2018 3:00:00 PM
Lab ID: 1812773-008 **Matrix:** SOIL **Received Date:** 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **lrm**	
Diesel Range Organics (DRO)	5300	20	98		mg/Kg	10	12/17/2018 1:14:01 PM	42114
Motor Oil Range Organics (MRO)	5500	490	490		mg/Kg	10	12/17/2018 1:14:01 PM	42114
Surr: DNOP	0	0	50.6-138	S	%Rec	10	12/17/2018 1:14:01 PM	42114
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	1.4	4.8		mg/Kg	1	12/15/2018 12:12:05 A	42099
Surr: BFB	93.6	0	73.8-119		%Rec	1	12/15/2018 12:12:05 A	42099
EPA METHOD 7471: MERCURY							Analyst: **pmf**	
Mercury	4.9	0.13	0.64		mg/Kg	20	12/18/2018 10:51:00 A	42146
EPA METHOD 6010B: SOIL METALS							Analyst: **rde**	
Antimony	ND	1.8	12		mg/Kg	5	12/20/2018 2:39:41 PM	42119
Arsenic	16	7.1	12		mg/Kg	5	12/20/2018 2:39:41 PM	42119
Barium	350	0.12	0.50		mg/Kg	5	12/20/2018 2:39:41 PM	42119
Beryllium	1.4	0.046	0.75		mg/Kg	5	12/20/2018 2:39:41 PM	42119
Cadmium	ND	0.12	0.50		mg/Kg	5	12/20/2018 2:39:41 PM	42119
Chromium	92	0.40	1.5		mg/Kg	5	12/20/2018 2:39:41 PM	42119
Cobalt	8.0	0.53	1.5		mg/Kg	5	12/22/2018 4:40:23 PM	42119
Lead	44	1.2	1.2		mg/Kg	5	12/20/2018 2:39:41 PM	42119
Nickel	40	0.74	2.5		mg/Kg	5	12/20/2018 2:39:41 PM	42119
Selenium	ND	6.3	12		mg/Kg	5	12/20/2018 2:39:41 PM	42119
Silver	ND	0.16	1.2		mg/Kg	5	12/20/2018 2:39:41 PM	42119
Vanadium	36	0.33	12		mg/Kg	5	12/20/2018 2:39:41 PM	42119
Zinc	390	2.0	12		mg/Kg	5	12/22/2018 4:40:23 PM	42119
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.0039	0.024		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Toluene	ND	0.0046	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Ethylbenzene	ND	0.0028	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Methyl tert-butyl ether (MTBE)	ND	0.011	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
1,2,4-Trimethylbenzene	ND	0.0044	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
1,3,5-Trimethylbenzene	ND	0.0046	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
1,2-Dichloroethane (EDC)	ND	0.0049	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
1,2-Dibromoethane (EDB)	ND	0.0043	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Naphthalene	ND	0.0095	0.095		mg/Kg	1	12/17/2018 5:26:06 PM	42099
1-Methylnaphthalene	ND	0.027	0.19		mg/Kg	1	12/17/2018 5:26:06 PM	42099
2-Methylnaphthalene	ND	0.021	0.19		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Acetone	ND	0.040	0.71		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Bromobenzene	ND	0.0046	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Bromodichloromethane	ND	0.0043	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099

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Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C2L2 ZOI
Project: Land Treatment Unit
Collection Date: 12/11/2018 3:00:00 PM
Lab ID: 1812773-008 **Matrix:** SOIL **Received Date:** 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Bromoform	ND	0.0043	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Bromomethane	ND	0.011	0.14		mg/Kg	1	12/17/2018 5:26:06 PM	42099
2-Butanone	ND	0.055	0.48		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Carbon disulfide	ND	0.016	0.48		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Carbon tetrachloride	ND	0.0045	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Chlorobenzene	ND	0.0061	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Chloroethane	ND	0.0070	0.095		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Chloroform	ND	0.0038	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Chloromethane	ND	0.0046	0.14		mg/Kg	1	12/17/2018 5:26:06 PM	42099
2-Chlorotoluene	ND	0.0041	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
4-Chlorotoluene	ND	0.0039	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
cis-1,2-DCE	ND	0.0065	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
cis-1,3-Dichloropropene	ND	0.0040	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
1,2-Dibromo-3-chloropropane	ND	0.0049	0.095		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Dibromochloromethane	ND	0.0034	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Dibromomethane	ND	0.0051	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
1,2-Dichlorobenzene	ND	0.0039	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
1,3-Dichlorobenzene	ND	0.0041	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
1,4-Dichlorobenzene	ND	0.0040	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Dichlorodifluoromethane	ND	0.011	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
1,1-Dichloroethane	ND	0.0030	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
1,1-Dichloroethene	ND	0.019	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
1,2-Dichloropropane	ND	0.0035	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
1,3-Dichloropropane	ND	0.0052	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
2,2-Dichloropropane	ND	0.016	0.095		mg/Kg	1	12/17/2018 5:26:06 PM	42099
1,1-Dichloropropene	ND	0.0043	0.095		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Hexachlorobutadiene	ND	0.0048	0.095		mg/Kg	1	12/17/2018 5:26:06 PM	42099
2-Hexanone	ND	0.0079	0.48		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Isopropylbenzene	ND	0.0034	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
4-Isopropyltoluene	ND	0.0039	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
4-Methyl-2-pentanone	ND	0.0090	0.48		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Methylene chloride	ND	0.0084	0.14		mg/Kg	1	12/17/2018 5:26:06 PM	42099
n-Butylbenzene	ND	0.0044	0.14		mg/Kg	1	12/17/2018 5:26:06 PM	42099
n-Propylbenzene	ND	0.0038	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
sec-Butylbenzene	ND	0.0054	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Styrene	ND	0.0037	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
tert-Butylbenzene	ND	0.0045	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
1,1,1,2-Tetrachloroethane	ND	0.0032	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
1,1,2,2-Tetrachloroethane	ND	0.0048	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099

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Qualifiers:

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D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C2L2 ZOI
Project: Land Treatment Unit
Collection Date: 12/11/2018 3:00:00 PM
Lab ID: 1812773-008
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Tetrachloroethene (PCE)	ND	0.0038	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
trans-1,2-DCE	ND	0.0044	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
trans-1,3-Dichloropropene	ND	0.0050	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
1,2,3-Trichlorobenzene	ND	0.0042	0.095		mg/Kg	1	12/17/2018 5:26:06 PM	42099
1,2,4-Trichlorobenzene	ND	0.0048	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
1,1,1-Trichloroethane	ND	0.0043	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
1,1,2-Trichloroethane	ND	0.0034	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Trichloroethene (TCE)	ND	0.0055	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Trichlorofluoromethane	ND	0.016	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
1,2,3-Trichloropropane	ND	0.0077	0.095		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Vinyl chloride	ND	0.0031	0.048		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Xylenes, Total	ND	0.012	0.095		mg/Kg	1	12/17/2018 5:26:06 PM	42099
1,4-Dioxane	ND	0.13	0.48		mg/Kg	1	12/17/2018 5:26:06 PM	42099
Surr: Dibromofluoromethane	105		70-130		%Rec	1	12/17/2018 5:26:06 PM	42099
Surr: 1,2-Dichloroethane-d4	101		70-130		%Rec	1	12/17/2018 5:26:06 PM	42099
Surr: Toluene-d8	106		70-130		%Rec	1	12/17/2018 5:26:06 PM	42099
Surr: 4-Bromofluorobenzene	98.3		70-130		%Rec	1	12/17/2018 5:26:06 PM	42099

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Qualifiers:

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D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C2L2 TZ
Project: Land Treatment Unit
Collection Date: 12/11/2018 3:10:00 PM
Lab ID: 1812773-009
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **lrm**	
Diesel Range Organics (DRO)	1100	19	97		mg/Kg	10	12/17/2018 2:20:09 PM	42114
Motor Oil Range Organics (MRO)	850	490	490		mg/Kg	10	12/17/2018 2:20:09 PM	42114
Surr: DNOP	0	0	50.6-138	S	%Rec	10	12/17/2018 2:20:09 PM	42114
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	1.3	4.6		mg/Kg	1	12/15/2018 12:35:31 A	42099
Surr: BFB	94.9	0	73.8-119		%Rec	1	12/15/2018 12:35:31 A	42099
EPA METHOD 7471: MERCURY							Analyst: **pmf**	
Mercury	0.033	0.0064	0.032		mg/Kg	1	12/18/2018 10:53:01 A	42146
EPA METHOD 6010B: SOIL METALS							Analyst: **rde**	
Antimony	ND	1.8	12		mg/Kg	5	12/20/2018 2:41:22 PM	42119
Arsenic	7.7	7.0	12	J	mg/Kg	5	12/20/2018 2:41:22 PM	42119
Barium	320	0.11	0.49		mg/Kg	5	12/20/2018 2:41:22 PM	42119
Beryllium	1.6	0.045	0.74		mg/Kg	5	12/20/2018 2:41:22 PM	42119
Cadmium	ND	0.12	0.49		mg/Kg	5	12/20/2018 2:41:22 PM	42119
Chromium	55	0.39	1.5		mg/Kg	5	12/20/2018 2:41:22 PM	42119
Cobalt	19	0.52	1.5		mg/Kg	5	12/22/2018 4:42:01 PM	42119
Lead	19	1.2	1.2		mg/Kg	5	12/20/2018 2:41:22 PM	42119
Nickel	23	0.73	2.5		mg/Kg	5	12/20/2018 2:41:22 PM	42119
Selenium	ND	6.2	12		mg/Kg	5	12/20/2018 2:41:22 PM	42119
Silver	ND	0.16	1.2		mg/Kg	5	12/20/2018 2:41:22 PM	42119
Vanadium	33	0.33	12		mg/Kg	5	12/20/2018 2:41:22 PM	42119
Zinc	150	1.9	12		mg/Kg	5	12/22/2018 4:42:01 PM	42119
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.0037	0.023		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Toluene	ND	0.0044	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Ethylbenzene	ND	0.0027	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Methyl tert-butyl ether (MTBE)	ND	0.011	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
1,2,4-Trimethylbenzene	ND	0.0042	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
1,3,5-Trimethylbenzene	ND	0.0044	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
1,2-Dichloroethane (EDC)	ND	0.0047	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
1,2-Dibromoethane (EDB)	ND	0.0042	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Naphthalene	ND	0.0092	0.092		mg/Kg	1	12/17/2018 5:55:07 PM	42099
1-Methylnaphthalene	ND	0.026	0.18		mg/Kg	1	12/17/2018 5:55:07 PM	42099
2-Methylnaphthalene	ND	0.020	0.18		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Acetone	ND	0.038	0.69		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Bromobenzene	ND	0.0044	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Bromodichloromethane	ND	0.0042	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099

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Qualifiers:

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H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
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RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C2L2 TZ
Project: Land Treatment Unit
Collection Date: 12/11/2018 3:10:00 PM
Lab ID: 1812773-009
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Bromoform	ND	0.0041	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Bromomethane	ND	0.011	0.14		mg/Kg	1	12/17/2018 5:55:07 PM	42099
2-Butanone	ND	0.053	0.46		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Carbon disulfide	ND	0.015	0.46		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Carbon tetrachloride	ND	0.0043	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Chlorobenzene	ND	0.0059	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Chloroethane	ND	0.0067	0.092		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Chloroform	ND	0.0037	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Chloromethane	ND	0.0044	0.14		mg/Kg	1	12/17/2018 5:55:07 PM	42099
2-Chlorotoluene	ND	0.0040	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
4-Chlorotoluene	ND	0.0038	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
cis-1,2-DCE	ND	0.0063	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
cis-1,3-Dichloropropene	ND	0.0039	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
1,2-Dibromo-3-chloropropane	ND	0.0047	0.092		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Dibromochloromethane	ND	0.0033	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Dibromomethane	ND	0.0049	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
1,2-Dichlorobenzene	ND	0.0038	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
1,3-Dichlorobenzene	ND	0.0040	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
1,4-Dichlorobenzene	ND	0.0038	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Dichlorodifluoromethane	ND	0.011	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
1,1-Dichloroethane	ND	0.0029	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
1,1-Dichloroethene	ND	0.018	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
1,2-Dichloropropane	ND	0.0033	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
1,3-Dichloropropane	ND	0.0050	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
2,2-Dichloropropane	ND	0.015	0.092		mg/Kg	1	12/17/2018 5:55:07 PM	42099
1,1-Dichloropropene	ND	0.0042	0.092		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Hexachlorobutadiene	ND	0.0047	0.092		mg/Kg	1	12/17/2018 5:55:07 PM	42099
2-Hexanone	ND	0.0076	0.46		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Isopropylbenzene	ND	0.0033	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
4-Isopropyltoluene	ND	0.0038	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
4-Methyl-2-pentanone	ND	0.0087	0.46		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Methylene chloride	ND	0.0081	0.14		mg/Kg	1	12/17/2018 5:55:07 PM	42099
n-Butylbenzene	ND	0.0043	0.14		mg/Kg	1	12/17/2018 5:55:07 PM	42099
n-Propylbenzene	ND	0.0037	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
sec-Butylbenzene	ND	0.0052	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Styrene	ND	0.0036	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
tert-Butylbenzene	ND	0.0043	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
1,1,1,2-Tetrachloroethane	ND	0.0031	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
1,1,2,2-Tetrachloroethane	ND	0.0046	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099

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Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C2L2 TZ
Project: Land Treatment Unit
Collection Date: 12/11/2018 3:10:00 PM
Lab ID: 1812773-009
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Tetrachloroethene (PCE)	ND	0.0037	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
trans-1,2-DCE	ND	0.0042	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
trans-1,3-Dichloropropene	ND	0.0048	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
1,2,3-Trichlorobenzene	ND	0.0040	0.092		mg/Kg	1	12/17/2018 5:55:07 PM	42099
1,2,4-Trichlorobenzene	ND	0.0046	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
1,1,1-Trichloroethane	ND	0.0041	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
1,1,2-Trichloroethane	ND	0.0032	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Trichloroethene (TCE)	ND	0.0053	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Trichlorofluoromethane	ND	0.016	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
1,2,3-Trichloropropane	ND	0.0074	0.092		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Vinyl chloride	ND	0.0030	0.046		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Xylenes, Total	ND	0.012	0.092		mg/Kg	1	12/17/2018 5:55:07 PM	42099
1,4-Dioxane	ND	0.13	0.46		mg/Kg	1	12/17/2018 5:55:07 PM	42099
Surr: Dibromofluoromethane	107		70-130		%Rec	1	12/17/2018 5:55:07 PM	42099
Surr: 1,2-Dichloroethane-d4	99.3		70-130		%Rec	1	12/17/2018 5:55:07 PM	42099
Surr: Toluene-d8	106		70-130		%Rec	1	12/17/2018 5:55:07 PM	42099
Surr: 4-Bromofluorobenzene	98.0		70-130		%Rec	1	12/17/2018 5:55:07 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C3L1 ZOI
Project: Land Treatment Unit
Collection Date: 12/11/2018 11:15:00 AM
Lab ID: 1812773-010
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **TOM**	
Diesel Range Organics (DRO)	61	2.0	9.9		mg/Kg	1	12/18/2018 10:15:29 P	42114
Motor Oil Range Organics (MRO)	84	50	50		mg/Kg	1	12/18/2018 10:15:29 P	42114
Surr: DNOP	106	0	50.6-138		%Rec	1	12/18/2018 10:15:29 P	42114
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	1.4	5.0		mg/Kg	1	12/15/2018 12:58:58 A	42099
Surr: BFB	97.7	0	73.8-119		%Rec	1	12/15/2018 12:58:58 A	42099
EPA METHOD 7471: MERCURY							Analyst: **pmf**	
Mercury	1.4	0.033	0.16		mg/Kg	5	12/18/2018 10:55:03 A	42146
EPA METHOD 6010B: SOIL METALS							Analyst: **rde**	
Antimony	ND	1.8	12		mg/Kg	5	12/20/2018 2:43:07 PM	42119
Arsenic	ND	6.8	12		mg/Kg	5	12/20/2018 2:43:07 PM	42119
Barium	360	0.11	0.48		mg/Kg	5	12/20/2018 2:43:07 PM	42119
Beryllium	1.7	0.044	0.72		mg/Kg	5	12/20/2018 2:43:07 PM	42119
Cadmium	ND	0.12	0.48		mg/Kg	5	12/20/2018 2:43:07 PM	42119
Chromium	95	0.38	1.4		mg/Kg	5	12/20/2018 2:43:07 PM	42119
Cobalt	7.7	0.51	1.4		mg/Kg	5	12/22/2018 4:50:20 PM	42119
Lead	15	1.2	1.2		mg/Kg	5	12/20/2018 2:43:07 PM	42119
Nickel	22	0.72	2.4		mg/Kg	5	12/20/2018 2:43:07 PM	42119
Selenium	ND	6.0	12		mg/Kg	5	12/20/2018 2:43:07 PM	42119
Silver	ND	0.15	1.2		mg/Kg	5	12/20/2018 2:43:07 PM	42119
Vanadium	35	0.32	12		mg/Kg	5	12/20/2018 2:43:07 PM	42119
Zinc	230	1.9	12		mg/Kg	5	12/22/2018 4:50:20 PM	42119
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.0041	0.025		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Toluene	ND	0.0047	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Ethylbenzene	ND	0.0029	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Methyl tert-butyl ether (MTBE)	ND	0.012	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
1,2,4-Trimethylbenzene	ND	0.0045	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
1,3,5-Trimethylbenzene	ND	0.0048	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
1,2-Dichloroethane (EDC)	ND	0.0051	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
1,2-Dibromoethane (EDB)	ND	0.0045	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Naphthalene	ND	0.0099	0.099		mg/Kg	1	12/17/2018 6:24:25 PM	42099
1-Methylnaphthalene	ND	0.028	0.20		mg/Kg	1	12/17/2018 6:24:25 PM	42099
2-Methylnaphthalene	ND	0.022	0.20		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Acetone	ND	0.041	0.74		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Bromobenzene	ND	0.0048	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Bromodichloromethane	ND	0.0045	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C3L1 ZOI
Project: Land Treatment Unit
Collection Date: 12/11/2018 11:15:00 AM
Lab ID: 1812773-010
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Bromoform	ND	0.0045	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Bromomethane	ND	0.012	0.15		mg/Kg	1	12/17/2018 6:24:25 PM	42099
2-Butanone	ND	0.057	0.50		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Carbon disulfide	ND	0.016	0.50		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Carbon tetrachloride	ND	0.0047	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Chlorobenzene	ND	0.0063	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Chloroethane	ND	0.0073	0.099		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Chloroform	ND	0.0040	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Chloromethane	ND	0.0047	0.15		mg/Kg	1	12/17/2018 6:24:25 PM	42099
2-Chlorotoluene	ND	0.0043	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
4-Chlorotoluene	ND	0.0041	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
cis-1,2-DCE	ND	0.0068	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
cis-1,3-Dichloropropene	ND	0.0042	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
1,2-Dibromo-3-chloropropane	ND	0.0051	0.099		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Dibromochloromethane	ND	0.0035	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Dibromomethane	ND	0.0053	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
1,2-Dichlorobenzene	ND	0.0041	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
1,3-Dichlorobenzene	ND	0.0043	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
1,4-Dichlorobenzene	ND	0.0041	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Dichlorodifluoromethane	ND	0.012	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
1,1-Dichloroethane	ND	0.0032	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
1,1-Dichloroethene	ND	0.020	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
1,2-Dichloropropane	ND	0.0036	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
1,3-Dichloropropane	ND	0.0054	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
2,2-Dichloropropane	ND	0.016	0.099		mg/Kg	1	12/17/2018 6:24:25 PM	42099
1,1-Dichloropropene	ND	0.0045	0.099		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Hexachlorobutadiene	ND	0.0050	0.099		mg/Kg	1	12/17/2018 6:24:25 PM	42099
2-Hexanone	ND	0.0082	0.50		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Isopropylbenzene	ND	0.0036	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
4-Isopropyltoluene	ND	0.0041	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
4-Methyl-2-pentanone	ND	0.0094	0.50		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Methylene chloride	ND	0.0088	0.15		mg/Kg	1	12/17/2018 6:24:25 PM	42099
n-Butylbenzene	ND	0.0046	0.15		mg/Kg	1	12/17/2018 6:24:25 PM	42099
n-Propylbenzene	ND	0.0040	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
sec-Butylbenzene	ND	0.0056	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Styrene	ND	0.0039	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
tert-Butylbenzene	ND	0.0047	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
1,1,1,2-Tetrachloroethane	ND	0.0033	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
1,1,2,2-Tetrachloroethane	ND	0.0050	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C3L1 ZOI
Project: Land Treatment Unit
Collection Date: 12/11/2018 11:15:00 AM
Lab ID: 1812773-010
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Tetrachloroethene (PCE)	ND	0.0040	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
trans-1,2-DCE	ND	0.0045	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
trans-1,3-Dichloropropene	ND	0.0052	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
1,2,3-Trichlorobenzene	ND	0.0044	0.099		mg/Kg	1	12/17/2018 6:24:25 PM	42099
1,2,4-Trichlorobenzene	ND	0.0050	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
1,1,1-Trichloroethane	ND	0.0045	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
1,1,2-Trichloroethane	ND	0.0035	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Trichloroethene (TCE)	ND	0.0057	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Trichlorofluoromethane	ND	0.017	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
1,2,3-Trichloropropane	ND	0.0080	0.099		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Vinyl chloride	ND	0.0032	0.050		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Xylenes, Total	ND	0.012	0.099		mg/Kg	1	12/17/2018 6:24:25 PM	42099
1,4-Dioxane	ND	0.14	0.50		mg/Kg	1	12/17/2018 6:24:25 PM	42099
Surr: Dibromofluoromethane	106		70-130		%Rec	1	12/17/2018 6:24:25 PM	42099
Surr: 1,2-Dichloroethane-d4	104		70-130		%Rec	1	12/17/2018 6:24:25 PM	42099
Surr: Toluene-d8	107		70-130		%Rec	1	12/17/2018 6:24:25 PM	42099
Surr: 4-Bromofluorobenzene	97.4		70-130		%Rec	1	12/17/2018 6:24:25 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C3L1 TZ
Project: Land Treatment Unit
Collection Date: 12/11/2018 11:30:00 AM
Lab ID: 1812773-011
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **lrm**	
Diesel Range Organics (DRO)	ND	1.9	9.5		mg/Kg	1	12/17/2018 7:12:07 PM	42114
Motor Oil Range Organics (MRO)	ND	48	48		mg/Kg	1	12/17/2018 7:12:07 PM	42114
Surr: DNOP	106	0	50.6-138		%Rec	1	12/17/2018 7:12:07 PM	42114
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	1.4	4.9		mg/Kg	1	12/15/2018 1:22:23 AM	42099
Surr: BFB	96.2	0	73.8-119		%Rec	1	12/15/2018 1:22:23 AM	42099
EPA METHOD 7471: MERCURY							Analyst: **pmf**	
Mercury	0.0085	0.0069	0.034	J	mg/Kg	1	12/18/2018 10:57:04 A	42146
EPA METHOD 6010B: SOIL METALS							Analyst: **rde**	
Antimony	ND	1.8	12		mg/Kg	5	12/20/2018 2:44:59 PM	42119
Arsenic	ND	7.1	12		mg/Kg	5	12/20/2018 2:44:59 PM	42119
Barium	280	0.12	0.50		mg/Kg	5	12/20/2018 2:44:59 PM	42119
Beryllium	1.8	0.046	0.75		mg/Kg	5	12/20/2018 2:44:59 PM	42119
Cadmium	ND	0.12	0.50		mg/Kg	5	12/20/2018 2:44:59 PM	42119
Chromium	19	0.40	1.5		mg/Kg	5	12/20/2018 2:44:59 PM	42119
Cobalt	7.0	0.53	1.5		mg/Kg	5	12/22/2018 4:52:00 PM	42119
Lead	ND	1.2	1.2		mg/Kg	5	12/20/2018 2:44:59 PM	42119
Nickel	17	0.75	2.5		mg/Kg	5	12/20/2018 2:44:59 PM	42119
Selenium	ND	6.3	12		mg/Kg	5	12/20/2018 2:44:59 PM	42119
Silver	ND	0.16	1.2		mg/Kg	5	12/20/2018 2:44:59 PM	42119
Vanadium	31	0.33	12		mg/Kg	5	12/20/2018 2:44:59 PM	42119
Zinc	26	2.0	12		mg/Kg	5	12/22/2018 4:52:00 PM	42119
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.0040	0.024		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Toluene	ND	0.0046	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Ethylbenzene	ND	0.0028	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Methyl tert-butyl ether (MTBE)	ND	0.012	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
1,2,4-Trimethylbenzene	ND	0.0044	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
1,3,5-Trimethylbenzene	ND	0.0047	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
1,2-Dichloroethane (EDC)	ND	0.0050	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
1,2-Dibromoethane (EDB)	ND	0.0044	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Naphthalene	ND	0.0097	0.097		mg/Kg	1	12/17/2018 6:53:38 PM	42099
1-Methylnaphthalene	ND	0.028	0.19		mg/Kg	1	12/17/2018 6:53:38 PM	42099
2-Methylnaphthalene	ND	0.021	0.19		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Acetone	ND	0.040	0.73		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Bromobenzene	ND	0.0047	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Bromodichloromethane	ND	0.0044	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C3L1 TZ
Project: Land Treatment Unit
Collection Date: 12/11/2018 11:30:00 AM
Lab ID: 1812773-011
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Bromoform	ND	0.0044	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Bromomethane	ND	0.012	0.15		mg/Kg	1	12/17/2018 6:53:38 PM	42099
2-Butanone	ND	0.056	0.49		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Carbon disulfide	ND	0.016	0.49		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Carbon tetrachloride	ND	0.0046	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Chlorobenzene	ND	0.0062	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Chloroethane	ND	0.0072	0.097		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Chloroform	ND	0.0039	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Chloromethane	ND	0.0046	0.15		mg/Kg	1	12/17/2018 6:53:38 PM	42099
2-Chlorotoluene	ND	0.0042	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
4-Chlorotoluene	ND	0.0040	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
cis-1,2-DCE	ND	0.0066	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
cis-1,3-Dichloropropene	ND	0.0041	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
1,2-Dibromo-3-chloropropane	ND	0.0050	0.097		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Dibromochloromethane	ND	0.0034	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Dibromomethane	ND	0.0052	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
1,2-Dichlorobenzene	ND	0.0040	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
1,3-Dichlorobenzene	ND	0.0042	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
1,4-Dichlorobenzene	ND	0.0041	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Dichlorodifluoromethane	ND	0.011	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
1,1-Dichloroethane	ND	0.0031	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
1,1-Dichloroethene	ND	0.019	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
1,2-Dichloropropane	ND	0.0035	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
1,3-Dichloropropane	ND	0.0053	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
2,2-Dichloropropane	ND	0.016	0.097		mg/Kg	1	12/17/2018 6:53:38 PM	42099
1,1-Dichloropropene	ND	0.0044	0.097		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Hexachlorobutadiene	ND	0.0049	0.097		mg/Kg	1	12/17/2018 6:53:38 PM	42099
2-Hexanone	ND	0.0081	0.49		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Isopropylbenzene	ND	0.0035	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
4-Isopropyltoluene	ND	0.0040	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
4-Methyl-2-pentanone	ND	0.0092	0.49		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Methylene chloride	ND	0.0086	0.15		mg/Kg	1	12/17/2018 6:53:38 PM	42099
n-Butylbenzene	ND	0.0045	0.15		mg/Kg	1	12/17/2018 6:53:38 PM	42099
n-Propylbenzene	ND	0.0039	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
sec-Butylbenzene	ND	0.0055	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Styrene	ND	0.0038	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
tert-Butylbenzene	ND	0.0046	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
1,1,1,2-Tetrachloroethane	ND	0.0033	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
1,1,2,2-Tetrachloroethane	ND	0.0049	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C3L1 TZ
Project: Land Treatment Unit
Collection Date: 12/11/2018 11:30:00 AM
Lab ID: 1812773-011
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Tetrachloroethene (PCE)	ND	0.0039	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
trans-1,2-DCE	ND	0.0044	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
trans-1,3-Dichloropropene	ND	0.0051	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
1,2,3-Trichlorobenzene	ND	0.0043	0.097		mg/Kg	1	12/17/2018 6:53:38 PM	42099
1,2,4-Trichlorobenzene	ND	0.0049	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
1,1,1-Trichloroethane	ND	0.0044	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
1,1,2-Trichloroethane	ND	0.0034	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Trichloroethene (TCE)	ND	0.0056	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Trichlorofluoromethane	ND	0.016	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
1,2,3-Trichloropropane	ND	0.0079	0.097		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Vinyl chloride	ND	0.0032	0.049		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Xylenes, Total	ND	0.012	0.097		mg/Kg	1	12/17/2018 6:53:38 PM	42099
1,4-Dioxane	ND	0.14	0.49		mg/Kg	1	12/17/2018 6:53:38 PM	42099
Surr: Dibromofluoromethane	108		70-130		%Rec	1	12/17/2018 6:53:38 PM	42099
Surr: 1,2-Dichloroethane-d4	105		70-130		%Rec	1	12/17/2018 6:53:38 PM	42099
Surr: Toluene-d8	108		70-130		%Rec	1	12/17/2018 6:53:38 PM	42099
Surr: 4-Bromofluorobenzene	98.7		70-130		%Rec	1	12/17/2018 6:53:38 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C3L2 ZOI
Project: Land Treatment Unit
Collection Date: 12/11/2018 10:40:00 AM
Lab ID: 1812773-012
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **lrm**	
Diesel Range Organics (DRO)	ND	2.0	10		mg/Kg	1	12/17/2018 7:34:05 PM	42114
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	12/17/2018 7:34:05 PM	42114
Surr: DNOP	106	0	50.6-138		%Rec	1	12/17/2018 7:34:05 PM	42114
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	1.4	4.9		mg/Kg	1	12/15/2018 1:45:49 AM	42099
Surr: BFB	97.6	0	73.8-119		%Rec	1	12/15/2018 1:45:49 AM	42099
EPA METHOD 7471: MERCURY							Analyst: **pmf**	
Mercury	ND	0.0067	0.033		mg/Kg	1	12/18/2018 10:58:59 A	42146
EPA METHOD 6010B: SOIL METALS							Analyst: **rde**	
Antimony	ND	1.8	12		mg/Kg	5	12/20/2018 2:46:48 PM	42119
Arsenic	ND	6.9	12		mg/Kg	5	12/20/2018 2:46:48 PM	42119
Barium	330	0.11	0.48		mg/Kg	5	12/20/2018 2:46:48 PM	42119
Beryllium	1.6	0.044	0.73		mg/Kg	5	12/20/2018 2:46:48 PM	42119
Cadmium	ND	0.12	0.48		mg/Kg	5	12/20/2018 2:46:48 PM	42119
Chromium	16	0.39	1.5		mg/Kg	5	12/20/2018 2:46:48 PM	42119
Cobalt	6.5	0.51	1.5		mg/Kg	5	12/22/2018 4:53:37 PM	42119
Lead	3.9	1.2	1.2		mg/Kg	5	12/20/2018 2:46:48 PM	42119
Nickel	16	0.72	2.4		mg/Kg	5	12/20/2018 2:46:48 PM	42119
Selenium	ND	6.1	12		mg/Kg	5	12/20/2018 2:46:48 PM	42119
Silver	ND	0.16	1.2		mg/Kg	5	12/20/2018 2:46:48 PM	42119
Vanadium	26	0.32	12		mg/Kg	5	12/20/2018 2:46:48 PM	42119
Zinc	21	1.9	12		mg/Kg	5	12/22/2018 4:53:37 PM	42119
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.0040	0.024		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Toluene	ND	0.0046	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Ethylbenzene	ND	0.0028	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Methyl tert-butyl ether (MTBE)	ND	0.012	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
1,2,4-Trimethylbenzene	ND	0.0044	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
1,3,5-Trimethylbenzene	ND	0.0047	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
1,2-Dichloroethane (EDC)	ND	0.0050	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
1,2-Dibromoethane (EDB)	ND	0.0044	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Naphthalene	ND	0.0097	0.097		mg/Kg	1	12/17/2018 7:22:52 PM	42099
1-Methylnaphthalene	ND	0.028	0.19		mg/Kg	1	12/17/2018 7:22:52 PM	42099
2-Methylnaphthalene	ND	0.021	0.19		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Acetone	ND	0.040	0.73		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Bromobenzene	ND	0.0047	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Bromodichloromethane	ND	0.0044	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C3L2 ZOI
Project: Land Treatment Unit
Collection Date: 12/11/2018 10:40:00 AM
Lab ID: 1812773-012
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Bromoform	ND	0.0044	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Bromomethane	ND	0.012	0.15		mg/Kg	1	12/17/2018 7:22:52 PM	42099
2-Butanone	ND	0.056	0.49		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Carbon disulfide	ND	0.016	0.49		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Carbon tetrachloride	ND	0.0046	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Chlorobenzene	ND	0.0062	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Chloroethane	ND	0.0071	0.097		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Chloroform	ND	0.0039	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Chloromethane	ND	0.0046	0.15		mg/Kg	1	12/17/2018 7:22:52 PM	42099
2-Chlorotoluene	ND	0.0042	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
4-Chlorotoluene	ND	0.0040	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
cis-1,2-DCE	ND	0.0066	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
cis-1,3-Dichloropropene	ND	0.0041	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
1,2-Dibromo-3-chloropropane	ND	0.0050	0.097		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Dibromochloromethane	ND	0.0034	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Dibromomethane	ND	0.0052	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
1,2-Dichlorobenzene	ND	0.0040	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
1,3-Dichlorobenzene	ND	0.0042	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
1,4-Dichlorobenzene	ND	0.0041	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Dichlorodifluoromethane	ND	0.011	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
1,1-Dichloroethane	ND	0.0031	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
1,1-Dichloroethene	ND	0.019	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
1,2-Dichloropropane	ND	0.0035	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
1,3-Dichloropropane	ND	0.0053	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
2,2-Dichloropropane	ND	0.016	0.097		mg/Kg	1	12/17/2018 7:22:52 PM	42099
1,1-Dichloropropene	ND	0.0044	0.097		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Hexachlorobutadiene	ND	0.0049	0.097		mg/Kg	1	12/17/2018 7:22:52 PM	42099
2-Hexanone	ND	0.0081	0.49		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Isopropylbenzene	ND	0.0035	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
4-Isopropyltoluene	ND	0.0040	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
4-Methyl-2-pentanone	ND	0.0092	0.49		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Methylene chloride	ND	0.0086	0.15		mg/Kg	1	12/17/2018 7:22:52 PM	42099
n-Butylbenzene	ND	0.0045	0.15		mg/Kg	1	12/17/2018 7:22:52 PM	42099
n-Propylbenzene	ND	0.0039	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
sec-Butylbenzene	ND	0.0055	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Styrene	ND	0.0038	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
tert-Butylbenzene	ND	0.0046	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
1,1,1,2-Tetrachloroethane	ND	0.0033	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
1,1,2,2-Tetrachloroethane	ND	0.0049	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C3L2 ZOI
Project: Land Treatment Unit
Collection Date: 12/11/2018 10:40:00 AM
Lab ID: 1812773-012
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Tetrachloroethene (PCE)	ND	0.0039	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
trans-1,2-DCE	ND	0.0044	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
trans-1,3-Dichloropropene	ND	0.0051	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
1,2,3-Trichlorobenzene	ND	0.0043	0.097		mg/Kg	1	12/17/2018 7:22:52 PM	42099
1,2,4-Trichlorobenzene	ND	0.0049	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
1,1,1-Trichloroethane	ND	0.0044	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
1,1,2-Trichloroethane	ND	0.0034	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Trichloroethene (TCE)	ND	0.0056	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Trichlorofluoromethane	ND	0.016	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
1,2,3-Trichloropropane	ND	0.0079	0.097		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Vinyl chloride	ND	0.0032	0.049		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Xylenes, Total	ND	0.012	0.097		mg/Kg	1	12/17/2018 7:22:52 PM	42099
1,4-Dioxane	ND	0.14	0.49		mg/Kg	1	12/17/2018 7:22:52 PM	42099
Surr: Dibromofluoromethane	110		70-130		%Rec	1	12/17/2018 7:22:52 PM	42099
Surr: 1,2-Dichloroethane-d4	103		70-130		%Rec	1	12/17/2018 7:22:52 PM	42099
Surr: Toluene-d8	108		70-130		%Rec	1	12/17/2018 7:22:52 PM	42099
Surr: 4-Bromofluorobenzene	99.0		70-130		%Rec	1	12/17/2018 7:22:52 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C3L2 TZ
Project: Land Treatment Unit
Collection Date: 12/11/2018 10:55:00 AM
Lab ID: 1812773-013
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **lrm**	
Diesel Range Organics (DRO)	ND	1.9	9.7		mg/Kg	1	12/17/2018 7:55:58 PM	42114
Motor Oil Range Organics (MRO)	ND	49	49		mg/Kg	1	12/17/2018 7:55:58 PM	42114
Surr: DNOP	117	0	50.6-138		%Rec	1	12/17/2018 7:55:58 PM	42114
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	1.4	4.8		mg/Kg	1	12/15/2018 2:09:15 AM	42099
Surr: BFB	97.6	0	73.8-119		%Rec	1	12/15/2018 2:09:15 AM	42099
EPA METHOD 7471: MERCURY							Analyst: **pmf**	
Mercury	ND	0.0068	0.034		mg/Kg	1	12/18/2018 11:00:53 A	42146
EPA METHOD 6010B: SOIL METALS							Analyst: **rde**	
Antimony	ND	1.8	12		mg/Kg	5	12/20/2018 2:56:18 PM	42119
Arsenic	ND	7.0	12		mg/Kg	5	12/20/2018 2:56:18 PM	42119
Barium	350	0.11	0.49		mg/Kg	5	12/20/2018 2:56:18 PM	42119
Beryllium	1.3	0.045	0.74		mg/Kg	5	12/20/2018 2:56:18 PM	42119
Cadmium	ND	0.12	0.49		mg/Kg	5	12/20/2018 2:56:18 PM	42119
Chromium	12	0.39	1.5		mg/Kg	5	12/20/2018 2:56:18 PM	42119
Cobalt	5.5	0.52	1.5		mg/Kg	5	12/22/2018 4:55:16 PM	42119
Lead	3.6	1.2	1.2		mg/Kg	5	12/20/2018 2:56:18 PM	42119
Nickel	12	0.73	2.5		mg/Kg	5	12/20/2018 2:56:18 PM	42119
Selenium	ND	6.2	12		mg/Kg	5	12/20/2018 2:56:18 PM	42119
Silver	ND	0.16	1.2		mg/Kg	5	12/20/2018 2:56:18 PM	42119
Vanadium	22	0.33	12		mg/Kg	5	12/20/2018 2:56:18 PM	42119
Zinc	18	1.9	12		mg/Kg	5	12/22/2018 4:55:16 PM	42119
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Benzene	ND	0.0039	0.024		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Toluene	ND	0.0046	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Ethylbenzene	ND	0.0028	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Methyl tert-butyl ether (MTBE)	ND	0.011	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
1,2,4-Trimethylbenzene	ND	0.0044	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
1,3,5-Trimethylbenzene	ND	0.0046	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
1,2-Dichloroethane (EDC)	ND	0.0049	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
1,2-Dibromoethane (EDB)	ND	0.0044	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Naphthalene	ND	0.0096	0.096		mg/Kg	1	12/17/2018 7:52:13 PM	42099
1-Methylnaphthalene	ND	0.028	0.19		mg/Kg	1	12/17/2018 7:52:13 PM	42099
2-Methylnaphthalene	ND	0.021	0.19		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Acetone	ND	0.040	0.72		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Bromobenzene	ND	0.0046	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Bromodichloromethane	ND	0.0044	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C3L2 TZ
Project: Land Treatment Unit
Collection Date: 12/11/2018 10:55:00 AM
Lab ID: 1812773-013
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Bromoform	ND	0.0043	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Bromomethane	ND	0.012	0.14		mg/Kg	1	12/17/2018 7:52:13 PM	42099
2-Butanone	ND	0.056	0.48		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Carbon disulfide	ND	0.016	0.48		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Carbon tetrachloride	ND	0.0046	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Chlorobenzene	ND	0.0062	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Chloroethane	ND	0.0071	0.096		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Chloroform	ND	0.0039	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Chloromethane	ND	0.0046	0.14		mg/Kg	1	12/17/2018 7:52:13 PM	42099
2-Chlorotoluene	ND	0.0042	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
4-Chlorotoluene	ND	0.0039	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
cis-1,2-DCE	ND	0.0066	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
cis-1,3-Dichloropropene	ND	0.0041	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
1,2-Dibromo-3-chloropropane	ND	0.0049	0.096		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Dibromochloromethane	ND	0.0034	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Dibromomethane	ND	0.0052	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
1,2-Dichlorobenzene	ND	0.0039	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
1,3-Dichlorobenzene	ND	0.0042	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
1,4-Dichlorobenzene	ND	0.0040	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Dichlorodifluoromethane	ND	0.011	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
1,1-Dichloroethane	ND	0.0031	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
1,1-Dichloroethene	ND	0.019	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
1,2-Dichloropropane	ND	0.0035	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
1,3-Dichloropropane	ND	0.0052	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
2,2-Dichloropropane	ND	0.016	0.096		mg/Kg	1	12/17/2018 7:52:13 PM	42099
1,1-Dichloropropene	ND	0.0044	0.096		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Hexachlorobutadiene	ND	0.0049	0.096		mg/Kg	1	12/17/2018 7:52:13 PM	42099
2-Hexanone	ND	0.0080	0.48		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Isopropylbenzene	ND	0.0035	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
4-Isopropyltoluene	ND	0.0040	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
4-Methyl-2-pentanone	ND	0.0091	0.48		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Methylene chloride	ND	0.0085	0.14		mg/Kg	1	12/17/2018 7:52:13 PM	42099
n-Butylbenzene	ND	0.0045	0.14		mg/Kg	1	12/17/2018 7:52:13 PM	42099
n-Propylbenzene	ND	0.0038	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
sec-Butylbenzene	ND	0.0054	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Styrene	ND	0.0038	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
tert-Butylbenzene	ND	0.0045	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
1,1,1,2-Tetrachloroethane	ND	0.0032	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
1,1,2,2-Tetrachloroethane	ND	0.0049	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: LTU C3L2 TZ
Project: Land Treatment Unit
Collection Date: 12/11/2018 10:55:00 AM
Lab ID: 1812773-013
Matrix: SOIL
Received Date: 12/13/2018 8:57:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **DJF**	
Tetrachloroethene (PCE)	ND	0.0038	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
trans-1,2-DCE	ND	0.0044	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
trans-1,3-Dichloropropene	ND	0.0051	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
1,2,3-Trichlorobenzene	ND	0.0042	0.096		mg/Kg	1	12/17/2018 7:52:13 PM	42099
1,2,4-Trichlorobenzene	ND	0.0049	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
1,1,1-Trichloroethane	ND	0.0043	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
1,1,2-Trichloroethane	ND	0.0034	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Trichloroethene (TCE)	ND	0.0056	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Trichlorofluoromethane	ND	0.016	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
1,2,3-Trichloropropane	ND	0.0078	0.096		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Vinyl chloride	ND	0.0031	0.048		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Xylenes, Total	ND	0.012	0.096		mg/Kg	1	12/17/2018 7:52:13 PM	42099
1,4-Dioxane	ND	0.13	0.48		mg/Kg	1	12/17/2018 7:52:13 PM	42099
Surr: Dibromofluoromethane	107		70-130		%Rec	1	12/17/2018 7:52:13 PM	42099
Surr: 1,2-Dichloroethane-d4	103		70-130		%Rec	1	12/17/2018 7:52:13 PM	42099
Surr: Toluene-d8	109		70-130		%Rec	1	12/17/2018 7:52:13 PM	42099
Surr: 4-Bromofluorobenzene	99.0		70-130		%Rec	1	12/17/2018 7:52:13 PM	42099

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181217021
Project Name: 1812773

Analytical Results Report

Sample Number 181217021-001 **Sampling Date** 12/11/2018 **Date/Time Received** 12/14/2018 10:38 AM
Matrix Soil **Sampling Time** 12:45 PM
Client Sample ID 1812773-001B/LTU C1L1 ZOI
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.22	12/19/2018 11:30:00 AM	BKP	EPA 335.4	
1-Methylnaphthalene	ND	mg/kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
2-Methylnaphthalene	ND	mg/Kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
Acenaphthene	ND	mg/Kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
Acenaphthylene	ND	mg/Kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
Anthracene	ND	mg/Kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
Benzo(ghi)perylene	ND	mg/Kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
Benzo[a]anthracene	ND	mg/Kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
Benzo[a]pyrene	ND	mg/Kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
Benzo[b]fluoranthene	ND	mg/Kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
Benzo[k]fluoranthene	ND	mg/Kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
Chrysene	ND	mg/Kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
Dibenz[a,h]anthracene	ND	mg/Kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
Fluoranthene	ND	mg/Kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
Fluorene	ND	mg/Kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
Indeno[1,2,3-cd]pyrene	ND	mg/Kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
Naphthalene	ND	mg/Kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
Phenanthrene	ND	mg/Kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
Pyrene	ND	mg/Kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
1,2-Dichlorobenzene	ND	mg/kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
1,4-Dichlorobenzene	ND	mg/kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
2,4-Dimethylphenol	ND	mg/kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
2,4-Dinitrophenol	ND	mg/kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
2-Methylphenol	ND	mg/kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
3+4-Methylphenol	ND	mg/kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
4-Nitrophenol	ND	mg/kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
bis(2-Ethylhexyl)phthalate	ND	mg/kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
Diethylphthalate	ND	mg/kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
Dimethylphthalate	ND	mg/kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
Di-n-butylphthalate	ND	mg/kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
Phenol	ND	mg/kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
Pyridine	ND	mg/kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
Quinoline	ND	mg/kg	0.1	12/22/2018 1:58:00 AM	TGT	EPA 8270D	
%moisture	13.8	Percent		12/19/2018 2:26:00 PM	BKP	%moisture	

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013;NV:ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181217021
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1812773
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	181217021-001	**Sampling Date**	12/11/2018	**Date/Time Received**	12/14/20110:38 AM
Matrix	Soil	**Sampling Time**	12:45 PM		
Client Sample ID	1812773-001B/LTU C1L1 ZOI				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier

Surrogate Data

Sample Number 181217021-001

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270D	55.0	41-121
2-Fluorobiphenyl	EPA 8270D	74.4	51-121
2-Fluorophenol	EPA 8270D	81.2	33-114
Nitrobenzene-d5	EPA 8270D	67.6	30-121
Phenol-d5	EPA 8270D	84.2	34-120
Terphenyl-d14	EPA 8270D	79.2	40-134

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181217021
Project Name: 1812773

Analytical Results Report

Sample Number 181217021-002 **Sampling Date** 12/11/2018 **Date/Time Received** 12/14/20110:38 AM
Matrix Soil **Sampling Time** 1:00 PM
Client Sample ID 1812773-002B/LTU C1L1 TZ
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.259	12/19/2018 11:30:00 AM	BKP	EPA 335.4	
1-Methylnaphthalene	ND	mg/kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
2-Methylnaphthalene	ND	mg/Kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
Acenaphthene	ND	mg/Kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
Acenaphthylene	ND	mg/Kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
Anthracene	ND	mg/Kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
Benzo(ghi)perylene	ND	mg/Kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
Benzo[a]anthracene	ND	mg/Kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
Benzo[a]pyrene	ND	mg/Kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
Benzo[b]fluoranthene	ND	mg/Kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
Benzo[k]fluoranthene	ND	mg/Kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
Chrysene	ND	mg/Kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
Dibenz[a,h]anthracene	ND	mg/Kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
Fluoranthene	ND	mg/Kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
Fluorene	ND	mg/Kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
Indeno[1,2,3-cd]pyrene	ND	mg/Kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
Naphthalene	ND	mg/Kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
Phenanthrene	ND	mg/Kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
Pyrene	ND	mg/Kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
1,2-Dichlorobenzene	ND	mg/kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
1,4-Dichlorobenzene	ND	mg/kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
2,4-Dimethylphenol	ND	mg/kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
2,4-Dinitrophenol	ND	mg/kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
2-Methylphenol	ND	mg/kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
3+4-Methylphenol	ND	mg/kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
4-Nitrophenol	ND	mg/kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
bis(2-Ethylhexyl)phthalate	ND	mg/kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
Diethylphthalate	ND	mg/kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
Dimethylphthalate	ND	mg/kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
Di-n-butylphthalate	ND	mg/kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
Phenol	ND	mg/kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
Pyridine	ND	mg/kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
Quinoline	ND	mg/kg	0.1	12/22/2018 2:25:00 AM	TGT	EPA 8270D	
%moisture	12.8	Percent		12/19/2018 2:26:00 PM	BKP	%moisture	

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181217021
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1812773
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	181217021-002	**Sampling Date**	12/11/2018	**Date/Time Received**	12/14/20110:38 AM
Matrix	Soil	**Sampling Time**	1:00 PM		
Client Sample ID	1812773-002B/LTU C1L1 TZ				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier

Surrogate Data

Sample Number 181217021-002

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270D	52.2	41-121
2-Fluorobiphenyl	EPA 8270D	72.8	51-121
2-Fluorophenol	EPA 8270D	82.0	33-114
Nitrobenzene-d5	EPA 8270D	66.8	30-121
Phenol-d5	EPA 8270D	84.0	34-120
Terphenyl-d14	EPA 8270D	73.2	40-134

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181217021
Project Name: 1812773

Analytical Results Report

Sample Number 181217021-003 **Sampling Date** 12/11/2018 **Date/Time Received** 12/14/20110:38 AM
Matrix Soil **Sampling Time** 12:00 PM
Client Sample ID 1812773-003B/LTU C1L2 ZOI
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.248	12/19/2018 11:30:00 AM	BKP	EPA 335.4	
1-Methylnaphthalene	ND	mg/kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
2-Methylnaphthalene	ND	mg/Kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
Acenaphthene	ND	mg/Kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
Acenaphthylene	ND	mg/Kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
Anthracene	ND	mg/Kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
Benzo(ghi)perylene	ND	mg/Kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
Benzo[a]anthracene	ND	mg/Kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
Benzo[a]pyrene	ND	mg/Kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
Benzo[b]fluoranthene	ND	mg/Kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
Benzo[k]fluoranthene	ND	mg/Kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
Chrysene	ND	mg/Kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
Dibenz[a,h]anthracene	ND	mg/Kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
Fluoranthene	0.06	mg/Kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	J
Fluorene	ND	mg/Kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
Indeno[1,2,3-cd]pyrene	ND	mg/Kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
Naphthalene	ND	mg/Kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
Phenanthrene	ND	mg/Kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
Pyrene	ND	mg/Kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
1,2-Dichlorobenzene	ND	mg/kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
1,4-Dichlorobenzene	ND	mg/kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
2,4-Dimethylphenol	ND	mg/kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
2,4-Dinitrophenol	ND	mg/kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
2-Methylphenol	ND	mg/kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
3+4-Methylphenol	ND	mg/kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
4-Nitrophenol	ND	mg/kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
bis(2-Ethylhexyl)phthalate	ND	mg/kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
Diethylphthalate	ND	mg/kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
Dimethylphthalate	ND	mg/kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
Di-n-butylphthalate	ND	mg/kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
Phenol	ND	mg/kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
Pyridine	ND	mg/kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
Quinoline	ND	mg/kg	0.1	12/22/2018 4:38:00 AM	TGT	EPA 8270D	
%moisture	13.6	Percent		12/19/2018 2:26:00 PM	BKP	%moisture	

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181217021
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1812773
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	181217021-003	**Sampling Date**	12/11/2018	**Date/Time Received**	12/14/20110:38 AM
Matrix	Soil	**Sampling Time**	12:00 PM		
Client Sample ID	1812773-003B/LTU C1L2 ZOI				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier

Surrogate Data

Sample Number 181217021-003

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270D	54.6	41-121
2-Fluorobiphenyl	EPA 8270D	74.8	51-121
2-Fluorophenol	EPA 8270D	77.0	33-114
Nitrobenzene-d5	EPA 8270D	65.2	30-121
Phenol-d5	EPA 8270D	78.8	34-120
Terphenyl-d14	EPA 8270D	79.2	40-134

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181217021
Project Name: 1812773

Analytical Results Report

Sample Number 181217021-004 **Sampling Date** 12/11/2018 **Date/Time Received** 12/14/2018 10:38 AM
Matrix Soil **Sampling Time** 12:10 PM
Client Sample ID 1812773-004B/LTU C1L2 TZ
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.254	12/19/2018 11:30:00 AM	BKP	EPA 335.4	
1-Methylnaphthalene	ND	mg/kg	0.1	12/22/2018 2:52:00 AM	TGT	EPA 8270D	
2-Methylnaphthalene	ND	mg/Kg	0.1	12/22/2018 2:52:00 AM	TGT	EPA 8270D	
Acenaphthene	ND	mg/Kg	0.1	12/22/2018 2:52:00 AM	TGT	EPA 8270D	
Acenaphthylene	ND	mg/Kg	0.1	12/22/2018 2:52:00 AM	TGT	EPA 8270D	
Anthracene	ND	mg/Kg	0.1	12/22/2018 2:52:00 AM	TGT	EPA 8270D	
Benzo(ghi)perylene	ND	mg/Kg	0.1	12/22/2018 2:52:00 AM	TGT	EPA 8270D	
Benzo[a]anthracene	ND	mg/Kg	0.1	12/22/2018 2:52:00 AM	TGT	EPA 8270D	
Benzo[a]pyrene	ND	mg/Kg	0.1	12/22/2018 2:52:00 AM	TGT	EPA 8270D	
Benzo[b]fluoranthene	ND	mg/Kg	0.1	12/22/2018 2:52:00 AM	TGT	EPA 8270D	
Benzo[k]fluoranthene	ND	mg/Kg	0.1	12/22/2018 2:52:00 AM	TGT	EPA 8270D	
Chrysene	ND	mg/Kg	0.1	12/22/2018 2:52:00 AM	TGT	EPA 8270D	
Dibenz[a,h]anthracene	ND	mg/Kg	0.1	12/22/2018 2:52:00 AM	TGT	EPA 8270D	
Fluoranthene	ND	mg/Kg	0.1	12/22/2018 2:52:00 AM	TGT	EPA 8270D	
Fluorene	ND	mg/Kg	0.1	12/22/2018 2:52:00 AM	TGT	EPA 8270D	
Indeno[1,2,3-cd]pyrene	ND	mg/Kg	0.1	12/22/2018 2:52:00 AM	TGT	EPA 8270D	
Naphthalene	ND	mg/Kg	0.1	12/22/2018 2:52:00 AM	TGT	EPA 8270D	
Phenanthrene	ND	mg/Kg	0.1	12/22/2018 2:52:00 AM	TGT	EPA 8270D	
Pyrene	ND	mg/Kg	0.1	12/22/2018 2:52:00 AM	TGT	EPA 8270D	
1,2-Dichlorobenzene	ND	mg/kg	0.1	2/22/2018 2:52:00 AM	TGT	EPA 8270D	
1,4-Dichlorobenzene	ND	mg/kg	0.1	2/22/2018 2:52:00 AM	TGT	EPA 8270D	
2,4-Dimethylphenol	ND	mg/kg	0.1	2/22/2018 2:52:00 AM	TGT	EPA 8270D	
2,4-Dinitrophenol	ND	mg/kg	0.1	2/22/2018 2:52:00 AM	TGT	EPA 8270D	
2-Methylphenol	ND	mg/kg	0.1	2/22/2018 2:52:00 AM	TGT	EPA 8270D	
3+4-Methylphenol	ND	mg/kg	0.1	2/22/2018 2:52:00 AM	TGT	EPA 8270D	
4-Nitrophenol	ND	mg/kg	0.1	2/22/2018 2:52:00 AM	TGT	EPA 8270D	
bis(2-Ethylhexyl)phthalate	ND	mg/kg	0.1	2/22/2018 2:52:00 AM	TGT	EPA 8270D	
Diethylphthalate	ND	mg/kg	0.1	2/22/2018 2:52:00 AM	TGT	EPA 8270D	
Dimethylphthalate	ND	mg/kg	0.1	2/22/2018 2:52:00 AM	TGT	EPA 8270D	
Di-n-butylphthalate	ND	mg/kg	0.1	2/22/2018 2:52:00 AM	TGT	EPA 8270D	
Phenol	ND	mg/kg	0.1	2/22/2018 2:52:00 AM	TGT	EPA 8270D	
Pyridine	ND	mg/kg	0.1	2/22/2018 2:52:00 AM	TGT	EPA 8270D	
Quinoline	ND	mg/kg	0.1	2/22/2018 2:52:00 AM	TGT	EPA 8270D	
%moisture	13.5	Percent		12/19/2018 2:26:00 PM	BKP	%moisture	

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181217021
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1812773
Attn:	ANDY FREEMAN		

Surrogate Data

Sample Number 181217021-004

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270D	59.2	41-121
2-Fluorobiphenyl	EPA 8270D	74.4	51-121
2-Fluorophenol	EPA 8270D	82.8	33-114
Nitrobenzene-d5	EPA 8270D	66.0	30-121
Phenol-d5	EPA 8270D	85.6	34-120
Terphenyl-d14	EPA 8270D	80.4	40-134

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181217021
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1812773
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	181217021-005	**Sampling Date**	12/11/2018	**Date/Time Received**	12/14/20110:38 AM
Matrix	Soil	**Sampling Time**			
Client Sample ID	1812773-005B/LTU ZOI DUP				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.278	12/19/2018 11:30:00 AM	BKP	EPA 335.4	
1-Methylnaphthalene	ND	mg/kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
2-Methylnaphthalene	ND	mg/Kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
Acenaphthene	ND	mg/Kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
Acenaphthylene	ND	mg/Kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
Anthracene	ND	mg/Kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
Benzo(ghi)perylene	ND	mg/Kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
Benzo[a]anthracene	ND	mg/Kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
Benzo[a]pyrene	ND	mg/Kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
Benzo[b]fluoranthene	ND	mg/Kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
Benzo[k]fluoranthene	ND	mg/Kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
Chrysene	ND	mg/Kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
Dibenz[a,h]anthracene	ND	mg/Kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
Fluoranthene	ND	mg/Kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
Fluorene	ND	mg/Kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
Indeno[1,2,3-cd]pyrene	ND	mg/Kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
Naphthalene	ND	mg/Kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
Phenanthrene	ND	mg/Kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
Pyrene	ND	mg/Kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
1,2-Dichlorobenzene	ND	mg/kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
1,4-Dichlorobenzene	ND	mg/kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
2,4-Dimethylphenol	ND	mg/kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
2,4-Dinitrophenol	ND	mg/kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
2-Methylphenol	ND	mg/kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
3+4-Methylphenol	ND	mg/kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
4-Nitrophenol	ND	mg/kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
bis(2-Ethylhexyl)phthalate	ND	mg/kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
Diethylphthalate	ND	mg/kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
Dimethylphthalate	ND	mg/kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
Di-n-butylphthalate	ND	mg/kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
Phenol	ND	mg/kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
Pyridine	ND	mg/kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
Quinoline	ND	mg/kg	0.1	12/22/2018 3:19:00 AM	TGT	EPA 8270D	
%moisture	13.6	Percent		12/19/2018 2:26:00 PM	BKP	%moisture	

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181217021
Project Name: 1812773

Surrogate Data

Sample Number 181217021-005

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270D	58.0	41-121
2-Fluorobiphenyl	EPA 8270D	72.4	51-121
2-Fluorophenol	EPA 8270D	76.8	33-114
Nitrobenzene-d5	EPA 8270D	62.4	30-121
Phenol-d5	EPA 8270D	82.2	34-120
Terphenyl-d14	EPA 8270D	83.2	40-134

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181217021
Project Name: 1812773

Analytical Results Report

Sample Number 181217021-006 **Sampling Date** 12/11/2018 **Date/Time Received** 12/14/20110:38 AM
Matrix Soil **Sampling Time** 2:20 PM
Client Sample ID 1812773-006B/LTU C2L1 ZOI
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	1.18	mg/Kg	0.276	12/19/2018 11:30:00 AM	BKP	EPA 335.4	
1-Methylnaphthalene	ND	mg/kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
2-Methylnaphthalene	ND	mg/Kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
Acenaphthene	ND	mg/Kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
Acenaphthylene	ND	mg/Kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
Anthracene	ND	mg/Kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
Benzo(ghi)perylene	0.13	mg/Kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
Benzo[a]anthracene	0.27	mg/Kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
Benzo[a]pyrene	0.07	mg/Kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	J
Benzo[b]fluoranthene	0.05	mg/Kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	J
Benzo[k]fluoranthene	ND	mg/Kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
Chrysene	ND	mg/Kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
Dibenz[a,h]anthracene	0.06	mg/Kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	J
Fluoranthene	ND	mg/Kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
Fluorene	ND	mg/Kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
Indeno[1,2,3-cd]pyrene	ND	mg/Kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
Naphthalene	ND	mg/Kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
Phenanthrene	ND	mg/Kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
Pyrene	ND	mg/Kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
1,2-Dichlorobenzene	ND	mg/kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
1,4-Dichlorobenzene	ND	mg/kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
2,4-Dimethylphenol	ND	mg/kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
2,4-Dinitrophenol	ND	mg/kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
2-Methylphenol	ND	mg/kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
3+4-Methylphenol	ND	mg/kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
4-Nitrophenol	ND	mg/kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
bis(2-Ethylhexyl)phthalate	ND	mg/kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
Diethylphthalate	ND	mg/kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
Dimethylphthalate	ND	mg/kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
Di-n-butylphthalate	ND	mg/kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
Phenol	ND	mg/kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
Pyridine	ND	mg/kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
Quinoline	ND	mg/kg	0.1	12/22/2018 6:24:00 AM	TGT	EPA 8270D	
%moisture	10.9	Percent		12/19/2018 2:26:00 PM	BKP	%moisture	

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181217021
Address:	4901 HAWKINS NE SUITE D	**Project Name:**	1812773
	ALBUQUERQUE, NM 87109		
Attn:	ANDY FREEMAN		

Surrogate Data

Sample Number 181217021-006

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270D	51.8	41-121
2-Fluorobiphenyl	EPA 8270D	71.6	51-121
2-Fluorophenol	EPA 8270D	73.8	33-114
Nitrobenzene-d5	EPA 8270D	64.4	30-121
Phenol-d5	EPA 8270D	77.6	34-120
Terphenyl-d14	EPA 8270D	71.2	40-134

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181217021
Project Name: 1812773

Analytical Results Report

Sample Number 181217021-007 **Sampling Date** 12/11/2018 **Date/Time Received** 12/14/20110:38 AM
Matrix Soil **Sampling Time** 2:35 PM
Client Sample ID 1812773-007B/LTU C2L1 TZ
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	0.430	mg/Kg	0.25	12/19/2018 11:30:00 AM	BKP	EPA 335.4	
1-Methylnaphthalene	ND	mg/kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
2-Methylnaphthalene	ND	mg/Kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
Acenaphthene	ND	mg/Kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
Acenaphthylene	ND	mg/Kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
Anthracene	ND	mg/Kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
Benzo(ghi)perylene	0.05	mg/Kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	J
Benzo[a]anthracene	ND	mg/Kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
Benzo[a]pyrene	ND	mg/Kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
Benzo[b]fluoranthene	ND	mg/Kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
Benzo[k]fluoranthene	ND	mg/Kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
Chrysene	ND	mg/Kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
Dibenz[a,h]anthracene	ND	mg/Kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
Fluoranthene	ND	mg/Kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
Fluorene	ND	mg/Kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
Indeno[1,2,3-cd]pyrene	ND	mg/Kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
Naphthalene	ND	mg/Kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
Phenanthrene	ND	mg/Kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
Pyrene	ND	mg/Kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
1,2-Dichlorobenzene	ND	mg/kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
1,4-Dichlorobenzene	ND	mg/kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
2,4-Dimethylphenol	ND	mg/kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
2,4-Dinitrophenol	ND	mg/kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
2-Methylphenol	ND	mg/kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
3+4-Methylphenol	ND	mg/kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
4-Nitrophenol	ND	mg/kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
bis(2-Ethylhexyl)phthalate	ND	mg/kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
Diethylphthalate	ND	mg/kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
Dimethylphthalate	ND	mg/kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
Di-n-butylphthalate	ND	mg/kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
Phenol	ND	mg/kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
Pyridine	ND	mg/kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
Quinoline	ND	mg/kg	0.1	12/22/2018 5:31:00 AM	TGT	EPA 8270D	
%moisture	13.7	Percent		12/19/2018 2:26:00 PM	BKP	%moisture	

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013;NV:ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181217021
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1812773
Attn:	ANDY FREEMAN		

Surrogate Data

Sample Number 181217021-007

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270D	48.2	41-121
2-Fluorobiphenyl	EPA 8270D	65.2	51-121
2-Fluorophenol	EPA 8270D	66.4	33-114
Nitrobenzene-d5	EPA 8270D	56.8	30-121
Phenol-d5	EPA 8270D	71.2	34-120
Terphenyl-d14	EPA 8270D	70.0	40-134

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181217021
Project Name: 1812773

Analytical Results Report

Sample Number 181217021-008 **Sampling Date** 12/11/2018 **Date/Time Received** 12/14/20110:38 AM
Matrix Soil **Sampling Time** 3:00 PM
Client Sample ID 1812773-008B/LTU C2L2 ZOI
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	52.7	mg/Kg	1.41	12/19/2018 11:30:00 AM	BKP	EPA 335.4	
1-Methylnaphthalene	0.06	mg/kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	J
2-Methylnaphthalene	0.07	mg/Kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	J
Acenaphthene	ND	mg/Kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
Acenaphthylene	ND	mg/Kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
Anthracene	0.08	mg/Kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	J
Benzo(ghi)perylene	0.96	mg/Kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
Benzo[a]anthracene	2.68	mg/Kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
Benzo[a]pyrene	0.41	mg/Kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
Benzo[b]fluoranthene	0.51	mg/Kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
Benzo[k]fluoranthene	ND	mg/Kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
Chrysene	ND	mg/Kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
Dibenz[a,h]anthracene	0.62	mg/Kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
Fluoranthene	ND	mg/Kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
Fluorene	ND	mg/Kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
Indeno[1,2,3-cd]pyrene	0.34	mg/Kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
Naphthalene	ND	mg/Kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
Phenanthrene	0.19	mg/Kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
Pyrene	0.26	mg/Kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
1,2-Dichlorobenzene	ND	mg/kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
1,4-Dichlorobenzene	ND	mg/kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
2,4-Dimethylphenol	ND	mg/kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
2,4-Dinitrophenol	ND	mg/kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
2-Methylphenol	ND	mg/kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
3+4-Methylphenol	ND	mg/kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
4-Nitrophenol	ND	mg/kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
bis(2-Ethylhexyl)phthalate	0.32	mg/kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
Diethylphthalate	ND	mg/kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
Dimethylphthalate	ND	mg/kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
Di-n-butylphthalate	ND	mg/kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
Phenol	ND	mg/kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
Pyridine	ND	mg/kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
Quinoline	ND	mg/kg	0.1	12/22/2018 7:17:00 AM	TGT	EPA 8270D	
%moisture	17.2	Percent		12/19/2018 2:26:00 PM	BKP	%moisture	

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181217021
Project Name: 1812773

Surrogate Data

Sample Number 181217021-008

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270D	109.6	41-121
2-Fluorobiphenyl	EPA 8270D	83.2	51-121
2-Fluorophenol	EPA 8270D	82.4	33-114
Nitrobenzene-d5	EPA 8270D	76.8	30-121
Phenol-d5	EPA 8270D	92.0	34-120
Terphenyl-d14	EPA 8270D	75.6	40-134

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181217021
Project Name: 1812773

Analytical Results Report

Sample Number 181217021-009 **Sampling Date** 12/11/2018 **Date/Time Received** 12/14/20110:38 AM
Matrix Soil **Sampling Time** 3:10 PM
Client Sample ID 1812773-009B/LTU C2L2 TZ
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	0.976	mg/Kg	0.247	12/19/2018 11:30:00 AM	BKP	EPA 335.4	
1-Methylnaphthalene	ND	mg/kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
2-Methylnaphthalene	ND	mg/Kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
Acenaphthene	ND	mg/Kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
Acenaphthylene	ND	mg/Kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
Anthracene	ND	mg/Kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
Benzo(ghi)perylene	0.21	mg/Kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
Benzo[a]anthracene	0.65	mg/Kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
Benzo[a]pyrene	0.10	mg/Kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
Benzo[b]fluoranthene	0.11	mg/Kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
Benzo[k]fluoranthene	ND	mg/Kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
Chrysene	ND	mg/Kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
Dibenz[a,h]anthracene	0.12	mg/Kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
Fluoranthene	ND	mg/Kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
Fluorene	ND	mg/Kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
Indeno[1,2,3-cd]pyrene	0.07	mg/Kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	J
Naphthalene	ND	mg/Kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
Phenanthrene	ND	mg/Kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
Pyrene	0.09	mg/Kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	J
1,2-Dichlorobenzene	ND	mg/kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
1,4-Dichlorobenzene	ND	mg/kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
2,4-Dimethylphenol	ND	mg/kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
2,4-Dinitrophenol	ND	mg/kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
2-Methylphenol	ND	mg/kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
3+4-Methylphenol	ND	mg/kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
4-Nitrophenol	ND	mg/kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
bis(2-Ethylhexyl)phthalate	0.05	mg/kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	J
Diethylphthalate	ND	mg/kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
Dimethylphthalate	ND	mg/kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
Di-n-butylphthalate	ND	mg/kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
Phenol	ND	mg/kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
Pyridine	ND	mg/kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
Quinoline	ND	mg/kg	0.1	12/22/2018 6:51:00 AM	TGT	EPA 8270D	
%moisture	16.6	Percent		12/19/2018 2:26:00 PM	BKP	%moisture	

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181217021
Project Name: 1812773

Surrogate Data

Sample Number 181217021-009

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270D	63.6	41-121
2-Fluorobiphenyl	EPA 8270D	75.6	51-121
2-Fluorophenol	EPA 8270D	76.0	33-114
Nitrobenzene-d5	EPA 8270D	66.0	30-121
Phenol-d5	EPA 8270D	83.0	34-120
Terphenyl-d14	EPA 8270D	74.4	40-134

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181217021
Project Name: 1812773

Analytical Results Report

Sample Number 181217021-010 **Sampling Date** 12/11/2018 **Date/Time Received** 12/14/2018 10:38 AM
Matrix Soil **Sampling Time** 11:15 AM
Client Sample ID 1812773-010B/LTU C3L1 ZOI
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	0.477	mg/Kg	0.269	12/19/2018 11:30:00 AM	BKP	EPA 335.4	
1-Methylnaphthalene	ND	mg/kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
2-Methylnaphthalene	ND	mg/Kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
Acenaphthene	ND	mg/Kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
Acenaphthylene	ND	mg/Kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
Anthracene	ND	mg/Kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
Benzo(ghi)perylene	0.07	mg/Kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	J
Benzo[a]anthracene	0.09	mg/Kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	J
Benzo[a]pyrene	ND	mg/Kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
Benzo[b]fluoranthene	ND	mg/Kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
Benzo[k]fluoranthene	ND	mg/Kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
Chrysene	ND	mg/Kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
Dibenz[a,h]anthracene	ND	mg/Kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
Fluoranthene	ND	mg/Kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
Fluorene	ND	mg/Kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
Indeno[1,2,3-cd]pyrene	ND	mg/Kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
Naphthalene	ND	mg/Kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
Phenanthrene	ND	mg/Kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
Pyrene	ND	mg/Kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
1,2-Dichlorobenzene	ND	mg/kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
1,4-Dichlorobenzene	ND	mg/kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
2,4-Dimethylphenol	ND	mg/kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
2,4-Dinitrophenol	ND	mg/kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
2-Methylphenol	ND	mg/kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
3+4-Methylphenol	ND	mg/kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
4-Nitrophenol	ND	mg/kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
bis(2-Ethylhexyl)phthalate	ND	mg/kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
Diethylphthalate	ND	mg/kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
Dimethylphthalate	ND	mg/kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
Di-n-butylphthalate	ND	mg/kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
Phenol	ND	mg/kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
Pyridine	ND	mg/kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
Quinoline	ND	mg/kg	0.1	12/22/2018 5:58:00 AM	TGT	EPA 8270D	
%moisture	12.0	Percent		12/19/2018 2:26:00 PM	BKP	%moisture	

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181217021
Project Name: 1812773

Surrogate Data

Sample Number 181217021-010

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270D	57.4	41-121
2-Fluorobiphenyl	EPA 8270D	75.2	51-121
2-Fluorophenol	EPA 8270D	73.0	33-114
Nitrobenzene-d5	EPA 8270D	67.6	30-121
Phenol-d5	EPA 8270D	78.4	34-120
Terphenyl-d14	EPA 8270D	75.2	40-134

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181217021
Project Name: 1812773

Analytical Results Report

Sample Number 181217021-011 **Sampling Date** 12/11/2018 **Date/Time Received** 12/14/20110:38 AM
Matrix Soil **Sampling Time** 11:30 AM
Client Sample ID 1812773-011B/LTU C3L1 TZ
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.271	12/19/2018 11:30:00 AM	BKP	EPA 335.4	
1-Methylnaphthalene	ND	mg/kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
2-Methylnaphthalene	ND	mg/Kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
Acenaphthene	ND	mg/Kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
Acenaphthylene	ND	mg/Kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
Anthracene	ND	mg/Kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
Benzo(ghi)perylene	ND	mg/Kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
Benzo[a]anthracene	ND	mg/Kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
Benzo[a]pyrene	ND	mg/Kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
Benzo[b]fluoranthene	ND	mg/Kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
Benzo[k]fluoranthene	ND	mg/Kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
Chrysene	ND	mg/Kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
Dibenz[a,h]anthracene	ND	mg/Kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
Fluoranthene	ND	mg/Kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
Fluorene	ND	mg/Kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
Indeno[1,2,3-cd]pyrene	ND	mg/Kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
Naphthalene	ND	mg/Kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
Phenanthrene	ND	mg/Kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
Pyrene	ND	mg/Kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
1,2-Dichlorobenzene	ND	mg/kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
1,4-Dichlorobenzene	ND	mg/kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
2,4-Dimethylphenol	ND	mg/kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
2,4-Dinitrophenol	ND	mg/kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
2-Methylphenol	ND	mg/kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
3+4-Methylphenol	ND	mg/kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
4-Nitrophenol	ND	mg/kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
bis(2-Ethylhexyl)phthalate	ND	mg/kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
Diethylphthalate	ND	mg/kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
Dimethylphthalate	ND	mg/kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
Di-n-butylphthalate	ND	mg/kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
Phenol	ND	mg/kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
Pyridine	ND	mg/kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
Quinoline	ND	mg/kg	0.1	12/22/2018 4:12:00 AM	TGT	EPA 8270D	
%moisture	13.9	Percent		12/19/2018 2:26:00 PM	BKP	%moisture	

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181217021
Project Name: 1812773

Surrogate Data

Sample Number 181217021-011

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270D	52.6	41-121
2-Fluorobiphenyl	EPA 8270D	66.0	51-121
2-Fluorophenol	EPA 8270D	70.0	33-114
Nitrobenzene-d5	EPA 8270D	56.8	30-121
Phenol-d5	EPA 8270D	72.6	34-120
Terphenyl-d14	EPA 8270D	75.2	40-134

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181217021
Project Name: 1812773

Analytical Results Report

Sample Number 181217021-012 **Sampling Date** 12/11/2018 **Date/Time Received** 12/14/2018 10:38 AM
Matrix Soil **Sampling Time** 10:40 AM
Client Sample ID 1812773-012B/LTU C3L2 ZOI
Comments

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.269	12/19/2018 11:30:00 AM	BKP	EPA 335.4	
1-Methylnaphthalene	ND	mg/kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
2-Methylnaphthalene	ND	mg/Kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
Acenaphthene	ND	mg/Kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
Acenaphthylene	ND	mg/Kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
Anthracene	ND	mg/Kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
Benzo(ghi)perylene	ND	mg/Kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
Benzo[a]anthracene	ND	mg/Kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
Benzo[a]pyrene	ND	mg/Kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
Benzo[b]fluoranthene	ND	mg/Kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
Benzo[k]fluoranthene	ND	mg/Kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
Chrysene	ND	mg/Kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
Dibenz[a,h]anthracene	ND	mg/Kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
Fluoranthene	ND	mg/Kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
Fluorene	ND	mg/Kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
Indeno[1,2,3-cd]pyrene	ND	mg/Kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
Naphthalene	ND	mg/Kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
Phenanthrene	ND	mg/Kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
Pyrene	ND	mg/Kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
1,2-Dichlorobenzene	ND	mg/kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
1,4-Dichlorobenzene	ND	mg/kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
2,4-Dimethylphenol	ND	mg/kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
2,4-Dinitrophenol	ND	mg/kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
2-Methylphenol	ND	mg/kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
3+4-Methylphenol	ND	mg/kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
4-Nitrophenol	ND	mg/kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
bis(2-Ethylhexyl)phthalate	ND	mg/kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
Diethylphthalate	ND	mg/kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
Dimethylphthalate	ND	mg/kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
Di-n-butylphthalate	ND	mg/kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
Phenol	ND	mg/kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
Pyridine	ND	mg/kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
Quinoline	ND	mg/kg	0.1	12/22/2018 5:05:00 AM	TGT	EPA 8270D	
%moisture	13.2	Percent		12/19/2018 2:26:00 PM	BKP	%moisture	

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181217021
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1812773
Attn:	ANDY FREEMAN		

Surrogate Data

Sample Number 181217021-012

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270D	63.4	41-121
2-Fluorobiphenyl	EPA 8270D	68.4	51-121
2-Fluorophenol	EPA 8270D	64.8	33-114
Nitrobenzene-d5	EPA 8270D	69.6	30-121
Phenol-d5	EPA 8270D	74.4	34-120
Terphenyl-d14	EPA 8270D	79.6	40-134

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181217021
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1812773
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	181217021-013	**Sampling Date**	12/11/2018	**Date/Time Received**	12/14/20110:38 AM
Matrix	Soil	**Sampling Time**	10:55 AM		
Client Sample ID	1812773-013B/LTU C3L2 TZ				
Comments					

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide	ND	mg/Kg	0.196	12/19/2018 11:30:00 AM	BKP	EPA 335.4	
1-Methylnaphthalene	ND	mg/kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
2-Methylnaphthalene	ND	mg/Kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
Acenaphthene	ND	mg/Kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
Acenaphthylene	ND	mg/Kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
Anthracene	ND	mg/Kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
Benzo(ghi)perylene	ND	mg/Kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
Benzo[a]anthracene	ND	mg/Kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
Benzo[a]pyrene	ND	mg/Kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
Benzo[b]fluoranthene	ND	mg/Kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
Benzo[k]fluoranthene	ND	mg/Kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
Chrysene	ND	mg/Kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
Dibenz[a,h]anthracene	ND	mg/Kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
Fluoranthene	ND	mg/Kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
Fluorene	ND	mg/Kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
Indeno[1,2,3-cd]pyrene	ND	mg/Kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
Naphthalene	ND	mg/Kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
Phenanthrene	ND	mg/Kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
Pyrene	ND	mg/Kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
1,2-Dichlorobenzene	ND	mg/kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
1,4-Dichlorobenzene	ND	mg/kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
2,4-Dimethylphenol	ND	mg/kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
2,4-Dinitrophenol	ND	mg/kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
2-Methylphenol	ND	mg/kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
3+4-Methylphenol	ND	mg/kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
4-Nitrophenol	ND	mg/kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
bis(2-Ethylhexyl)phthalate	ND	mg/kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
Diethylphthalate	ND	mg/kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
Dimethylphthalate	ND	mg/kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
Di-n-butylphthalate	ND	mg/kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
Phenol	ND	mg/kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
Pyridine	ND	mg/kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
Quinoline	ND	mg/kg	0.1	12/22/2018 3:45:00 AM	TGT	EPA 8270D	
%moisture	10.2	Percent		12/19/2018 2:26:00 PM	BKP	%moisture	

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Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	181217021
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1812773
Attn:	ANDY FREEMAN		

Surrogate Data

Sample Number 181217021-013

Surrogate Standard	Method	Percent Recovery	Control Limits
2,4,6-Tribromophenol	EPA 8270D	58.8	41-121
2-Fluorobiphenyl	EPA 8270D	72.0	51-121
2-Fluorophenol	EPA 8270D	65.2	33-114
Nitrobenzene-d5	EPA 8270D	61.6	30-121
Phenol-d5	EPA 8270D	72.0	34-120
Terphenyl-d14	EPA 8270D	82.8	40-134

Authorized Signature

Todd Taruscio, Lab Manager

J	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
MCL	EPA's Maximum Contaminant Level
ND	Not Detected
PQL	Practical Quantitation Limit

The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

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Client: HALL ENVIRONMENTAL ANALYSIS LAB
Address: 4901 HAWKINS NE SUITE D
ALBUQUERQUE, NM 87109
Attn: ANDY FREEMAN

Batch #: 181217021
Project Name: 1812773

Analytical Results Report

Quality Control Data

Lab Control Sample

Parameter	LCS Result	Units	LCS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
Cyanide	0.524	mg/kg	0.5	104.8	90-110	12/19/2018	12/19/2018

Matrix Spike

Sample Number	Parameter	Sample Result	MS Result	Units	MS Spike	%Rec	AR %Rec	Prep Date	Analysis Date
181217021-001	Cyanide	ND	11.2	mg/kg	13.4	83.6	70-130	12/19/2018	12/19/2018

Matrix Spike Duplicate

Parameter	MSD Result	Units	MSD Spike	%Rec	%RPD	AR %RPD	Prep Date	Analysis Date
Cyanide	11.3	mg/kg	13.4		0.9	0-25	12/19/2018	12/19/2018

Method Blank

Parameter	Result	Units	PQL	Prep Date	Analysis Date
Cyanide	ND	mg/Kg	0.01	12/19/2018	12/19/2018

AR	Acceptable Range
ND	Not Detected
PQL	Practical Quantitation Limit
RPD	Relative Percentage Difference

Comments:

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; FL(NELAP):E87893; ID:ID00013; MT:CERT0028; NM: ID00013;NV:ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; ID:WA00169; WA:C585; MT:Cert0095; FL(NELAP): E871099

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1812773**
03-Jul-19

Client: Marathon
Project: Land Treatment Unit

Sample ID: **LCS-42114** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **42114** RunNo: **56379**
Prep Date: **12/14/2018** Analysis Date: **12/17/2018** SeqNo: **1884998** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	54	10	50.00	0	109	70	130			
Surr: DNOP	4.7		5.000		94.4	50.6	138			

Sample ID: **MB-42114** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **42114** RunNo: **56379**
Prep Date: **12/14/2018** Analysis Date: **12/17/2018** SeqNo: **1884999** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	10		10.00		101	50.6	138			

Sample ID: **1812773-001AMS** SampType: **MS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LTU C1L1 ZOI** Batch ID: **42114** RunNo: **56379**
Prep Date: **12/14/2018** Analysis Date: **12/17/2018** SeqNo: **1885949** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	54	9.9	49.60	0	110	53.5	126			
Surr: DNOP	4.8		4.960		96.7	50.6	138			

Sample ID: **1812773-001AMSD** SampType: **MSD** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LTU C1L1 ZOI** Batch ID: **42114** RunNo: **56379**
Prep Date: **12/14/2018** Analysis Date: **12/17/2018** SeqNo: **1885950** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	9.8	48.88	0	103	53.5	126	7.78	21.7	
Surr: DNOP	5.0		4.888		102	50.6	138	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1812773**

03-Jul-19

Client: Marathon

Project: Land Treatment Unit

Sample ID: **MB-42099**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS**	Batch ID: **42099**	RunNo: **56353**
Prep Date: **12/13/2018**	Analysis Date: **12/14/2018**	SeqNo: **1884458** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	950		1000		95.2	73.8	119			

Sample ID: **LCS-42099**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS**	Batch ID: **42099**	RunNo: **56353**
Prep Date: **12/13/2018**	Analysis Date: **12/14/2018**	SeqNo: **1884460** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	26	5.0	25.00	0	104	80.1	123			
Surr: BFB	1100		1000		107	73.8	119			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1812773**
03-Jul-19

Client: Marathon
Project: Land Treatment Unit

Sample ID: **mb-42099**	SampType: **MBLK**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **PBS**	Batch ID: **42099**	RunNo: **56400**
Prep Date: **12/13/2018**	Analysis Date: **12/18/2018**	SeqNo: **1885587** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.025								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Methyl tert-butyl ether (MTBE)	ND	0.050								
1,2,4-Trimethylbenzene	ND	0.050								
1,3,5-Trimethylbenzene	ND	0.050								
1,2-Dichloroethane (EDC)	ND	0.050								
1,2-Dibromoethane (EDB)	ND	0.050								
Naphthalene	ND	0.10								
1-Methylnaphthalene	ND	0.20								
2-Methylnaphthalene	ND	0.20								
Acetone	ND	0.75								
Bromobenzene	ND	0.050								
Bromodichloromethane	ND	0.050								
Bromoform	ND	0.050								
Bromomethane	ND	0.15								
2-Butanone	ND	0.50								
Carbon disulfide	ND	0.50								
Carbon tetrachloride	ND	0.050								
Chlorobenzene	ND	0.050								
Chloroethane	ND	0.10								
Chloroform	ND	0.050								
Chloromethane	ND	0.15								
2-Chlorotoluene	ND	0.050								
4-Chlorotoluene	ND	0.050								
cis-1,2-DCE	ND	0.050								
cis-1,3-Dichloropropene	ND	0.050								
1,2-Dibromo-3-chloropropane	ND	0.10								
Dibromochloromethane	ND	0.050								
Dibromomethane	ND	0.050								
1,2-Dichlorobenzene	ND	0.050								
1,3-Dichlorobenzene	ND	0.050								
1,4-Dichlorobenzene	ND	0.050								
Dichlorodifluoromethane	ND	0.050								
1,1-Dichloroethane	ND	0.050								
1,1-Dichloroethene	ND	0.050								
1,2-Dichloropropane	ND	0.050								
1,3-Dichloropropane	ND	0.050								
2,2-Dichloropropane	ND	0.10								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1812773**
03-Jul-19

Client: Marathon
Project: Land Treatment Unit

Sample ID: **mb-42099**	SampType: **MBLK**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **PBS**	Batch ID: **42099**	RunNo: **56400**
Prep Date: **12/13/2018**	Analysis Date: **12/18/2018**	SeqNo: **1885587** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	0.10								
Hexachlorobutadiene	ND	0.10								
2-Hexanone	ND	0.50								
Isopropylbenzene	ND	0.050								
4-Isopropyltoluene	ND	0.050								
4-Methyl-2-pentanone	ND	0.50								
Methylene chloride	ND	0.15								
n-Butylbenzene	ND	0.15								
n-Propylbenzene	ND	0.050								
sec-Butylbenzene	ND	0.050								
Styrene	ND	0.050								
tert-Butylbenzene	ND	0.050								
1,1,1,2-Tetrachloroethane	ND	0.050								
1,1,2,2-Tetrachloroethane	ND	0.050								
Tetrachloroethene (PCE)	ND	0.050								
trans-1,2-DCE	ND	0.050								
trans-1,3-Dichloropropene	ND	0.050								
1,2,3-Trichlorobenzene	ND	0.10								
1,2,4-Trichlorobenzene	ND	0.050								
1,1,1-Trichloroethane	ND	0.050								
1,1,2-Trichloroethane	ND	0.050								
Trichloroethene (TCE)	ND	0.050								
Trichlorofluoromethane	ND	0.050								
1,2,3-Trichloropropane	ND	0.10								
Vinyl chloride	ND	0.050								
Xylenes, Total	ND	0.10								
1,4-Dioxane	ND	0.50								
Surr: Dibromofluoromethane	0.56		0.5000		112	70	130			
Surr: 1,2-Dichloroethane-d4	0.53		0.5000		107	70	130			
Surr: Toluene-d8	0.56		0.5000		111	70	130			
Surr: 4-Bromofluorobenzene	0.52		0.5000		105	70	130			

Sample ID: **lcs-42099**	SampType: **LCS**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **LCSS**	Batch ID: **42099**	RunNo: **56400**
Prep Date: **12/13/2018**	Analysis Date: **12/18/2018**	SeqNo: **1885588** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.95	0.025	1.000	0	94.6	70	130			
Toluene	1.0	0.050	1.000	0	100	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1812773**

03-Jul-19

Client: Marathon

Project: Land Treatment Unit

Sample ID: **lcs-42099** SampType: **LCS** TestCode: **EPA Method 8260B: Volatiles**

Client ID: **LCSS** Batch ID: **42099** RunNo: **56400**

Prep Date: **12/13/2018** Analysis Date: **12/18/2018** SeqNo: **1885588** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chlorobenzene	1.0	0.050	1.000	0	101	70	130			
1,1-Dichloroethene	1.0	0.050	1.000	0	104	50.8	164			
Trichloroethene (TCE)	0.98	0.050	1.000	0	98.3	70	130			
Surr: Dibromofluoromethane	0.58		0.5000		115	70	130			
Surr: 1,2-Dichloroethane-d4	0.53		0.5000		107	70	130			
Surr: Toluene-d8	0.57		0.5000		113	70	130			
Surr: 4-Bromofluorobenzene	0.53		0.5000		106	70	130			

Sample ID: **1812773-001ams** SampType: **MS** TestCode: **EPA Method 8260B: Volatiles**

Client ID: **LTU C1L1 ZOI** Batch ID: **42099** RunNo: **56400**

Prep Date: **12/13/2018** Analysis Date: **12/17/2018** SeqNo: **1885590** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.86	0.024	0.9643	0	89.1	68.9	131			
Toluene	0.90	0.048	0.9643	0	92.9	64.3	137			
Chlorobenzene	0.88	0.048	0.9643	0	90.9	65.9	143			
1,1-Dichloroethene	0.99	0.048	0.9643	0	103	53.4	150			
Trichloroethene (TCE)	0.87	0.048	0.9643	0	90.5	70	130			
Surr: Dibromofluoromethane	0.55		0.4822		113	70	130			
Surr: 1,2-Dichloroethane-d4	0.52		0.4822		107	70	130			
Surr: Toluene-d8	0.52		0.4822		108	70	130			
Surr: 4-Bromofluorobenzene	0.51		0.4822		106	70	130			

Sample ID: **1812773-001amsd** SampType: **MSD** TestCode: **EPA Method 8260B: Volatiles**

Client ID: **LTU C1L1 ZOI** Batch ID: **42099** RunNo: **56400**

Prep Date: **12/13/2018** Analysis Date: **12/17/2018** SeqNo: **1885591** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.86	0.024	0.9479	0	90.2	68.9	131	0.403	20	
Toluene	0.92	0.047	0.9479	0	97.5	64.3	137	3.10	20	
Chlorobenzene	0.92	0.047	0.9479	0	96.6	65.9	143	4.35	20	
1,1-Dichloroethene	0.95	0.047	0.9479	0	101	53.4	150	3.98	20	
Trichloroethene (TCE)	0.90	0.047	0.9479	0	95.2	70	130	3.39	20	
Surr: Dibromofluoromethane	0.54		0.4739		114	70	130	0	0	
Surr: 1,2-Dichloroethane-d4	0.53		0.4739		111	70	130	0	0	
Surr: Toluene-d8	0.54		0.4739		114	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.49		0.4739		103	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1812773**
03-Jul-19

Client: Marathon
Project: Land Treatment Unit

Sample ID: **MB-42146** SampType: **MBLK** TestCode: **EPA Method 7471: Mercury**
Client ID: **PBS** Batch ID: **42146** RunNo: **56412**
Prep Date: **12/17/2018** Analysis Date: **12/17/2018** SeqNo: **1886105** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.033								

Sample ID: **LLLCS-42146** SampType: **LCSLL** TestCode: **EPA Method 7471: Mercury**
Client ID: **BatchQC** Batch ID: **42146** RunNo: **56412**
Prep Date: **12/17/2018** Analysis Date: **12/17/2018** SeqNo: **1886107** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0085	0.033	0.006660	0	127	70	130			J

Sample ID: **LCS-42146** SampType: **LCS** TestCode: **EPA Method 7471: Mercury**
Client ID: **LCSS** Batch ID: **42146** RunNo: **56412**
Prep Date: **12/17/2018** Analysis Date: **12/17/2018** SeqNo: **1886108** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.15	0.033	0.1667	0	89.3	80	120			

Sample ID: **1812773-001AMS** SampType: **MS** TestCode: **EPA Method 7471: Mercury**
Client ID: **LTU C1L1 ZOI** Batch ID: **42146** RunNo: **56412**
Prep Date: **12/17/2018** Analysis Date: **12/17/2018** SeqNo: **1886110** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.14	0.033	0.1658	0	85.5	80	120			

Sample ID: **1812773-001AMSD** SampType: **MSD** TestCode: **EPA Method 7471: Mercury**
Client ID: **LTU C1L1 ZOI** Batch ID: **42146** RunNo: **56412**
Prep Date: **12/17/2018** Analysis Date: **12/17/2018** SeqNo: **1886111** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.15	0.034	0.1729	0	88.3	80	120	7.33	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1812773**
03-Jul-19

Client: Marathon
Project: Land Treatment Unit

Sample ID: **LCS-42119** SampType: **LCS** TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **LCSS** Batch ID: **42119** RunNo: **56432**
Prep Date: **12/14/2018** Analysis Date: **12/18/2018** SeqNo: **1886943** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Beryllium	26	0.15	25.00	0	105	80	120			
Cobalt	23	0.30	25.00	0	93.6	80	120			
Zinc	24	2.5	25.00	0	96.6	80	120			

Sample ID: **MB-42119** SampType: **MBLK** TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **PBS** Batch ID: **42119** RunNo: **56472**
Prep Date: **12/14/2018** Analysis Date: **12/19/2018** SeqNo: **1888302** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	2.5								
Arsenic	ND	2.5								
Barium	ND	0.10								
Beryllium	ND	0.15								
Cadmium	ND	0.10								
Chromium	ND	0.30								
Cobalt	ND	0.30								
Nickel	ND	0.50								
Selenium	ND	2.5								
Silver	ND	0.25								
Vanadium	ND	2.5								
Zinc	0.54	2.5								J

Sample ID: **LCS-42119** SampType: **LCS** TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **LCSS** Batch ID: **42119** RunNo: **56472**
Prep Date: **12/14/2018** Analysis Date: **12/19/2018** SeqNo: **1888303** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	25	2.5	25.00	0	100	80	120			
Arsenic	26	2.5	25.00	0	106	80	120			
Barium	25	0.10	25.00	0	101	80	120			
Beryllium	26	0.15	25.00	0	106	80	120			
Cadmium	25	0.10	25.00	0	101	80	120			
Chromium	25	0.30	25.00	0	101	80	120			
Cobalt	24	0.30	25.00	0	97.5	80	120			
Nickel	25	0.50	25.00	0	99.4	80	120			
Selenium	24	2.5	25.00	0	94.7	80	120			
Silver	5.1	0.25	5.000	0	103	80	120			
Vanadium	26	2.5	25.00	0	104	80	120			
Zinc	25	2.5	25.00	0	99.7	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1812773**

03-Jul-19

Client: Marathon

Project: Land Treatment Unit

Sample ID: **MB-42119**	SampType: **MBLK**	TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **PBS**	Batch ID: **42119**	RunNo: **56498**
Prep Date: **12/14/2018**	Analysis Date: **12/20/2018**	SeqNo: **1889585** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	2.5								
Arsenic	ND	2.5								
Barium	0.024	0.10								J
Beryllium	ND	0.15								
Cadmium	ND	0.10								
Chromium	ND	0.30								
Cobalt	ND	0.30								
Lead	ND	0.25								
Nickel	ND	0.50								
Selenium	ND	2.5								
Silver	ND	0.25								
Vanadium	ND	2.5								
Zinc	0.65	2.5								J

Sample ID: **LCS-42119**	SampType: **LCS**	TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **LCSS**	Batch ID: **42119**	RunNo: **56498**
Prep Date: **12/14/2018**	Analysis Date: **12/20/2018**	SeqNo: **1889586** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	26	2.5	25.00	0	105	80	120			
Arsenic	26	2.5	25.00	0	104	80	120			
Barium	26	0.10	25.00	0	103	80	120			
Beryllium	27	0.15	25.00	0	108	80	120			
Cadmium	26	0.10	25.00	0	105	80	120			
Chromium	26	0.30	25.00	0	105	80	120			
Cobalt	26	0.30	25.00	0	103	80	120			
Lead	25	0.25	25.00	0	102	80	120			
Nickel	26	0.50	25.00	0	103	80	120			
Selenium	25	2.5	25.00	0	101	80	120			
Silver	5.1	0.25	5.000	0	101	80	120			
Vanadium	26	2.5	25.00	0	106	80	120			
Zinc	27	2.5	25.00	0	106	80	120			

Sample ID: **1812773-001AMS**	SampType: **MS**	TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **LTU C1L1 ZOI**	Batch ID: **42119**	RunNo: **56498**
Prep Date: **12/14/2018**	Analysis Date: **12/20/2018**	SeqNo: **1890179** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	12	24.79	0	0	75	125			S
Arsenic	24	12	24.79	0	96.4	75	125			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1812773**

03-Jul-19

Client: Marathon

Project: Land Treatment Unit

Sample ID: **1812773-001AMS** SampType: **MS** TestCode: **EPA Method 6010B: Soil Metals**

Client ID: **LTU C1L1 ZOI** Batch ID: **42119** RunNo: **56498**

Prep Date: **12/14/2018** Analysis Date: **12/20/2018** SeqNo: **1890179** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	430	0.50	24.79	237.6	793	75	125			S
Beryllium	28	0.74	24.79	1.588	106	75	125			
Cadmium	24	0.50	24.79	0	95.8	75	125			
Chromium	45	1.5	24.79	19.68	100	75	125			
Lead	24	1.2	24.79	1.303	91.2	75	125			
Nickel	43	2.5	24.79	18.13	101	75	125			
Selenium	23	12	24.79	0	91.1	75	125			
Silver	2.7	1.2	4.957	0	54.4	75	125			S
Vanadium	62	12	24.79	33.90	113	75	125			

Sample ID: **1812773-001AMSD** SampType: **MSD** TestCode: **EPA Method 6010B: Soil Metals**

Client ID: **LTU C1L1 ZOI** Batch ID: **42119** RunNo: **56498**

Prep Date: **12/14/2018** Analysis Date: **12/20/2018** SeqNo: **1890180** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	ND	12	24.77	0	0	75	125	0	20	S
Arsenic	22	12	24.77	0	90.1	75	125	6.89	20	
Barium	340	0.50	24.77	237.6	405	75	125	25.0	20	RS
Beryllium	28	0.74	24.77	1.588	108	75	125	2.17	20	
Cadmium	24	0.50	24.77	0	96.4	75	125	0.566	20	
Chromium	45	1.5	24.77	19.68	104	75	125	1.74	20	
Lead	24	1.2	24.77	1.303	91.2	75	125	0.0539	20	
Nickel	44	2.5	24.77	18.13	105	75	125	2.19	20	
Selenium	24	12	24.77	0	98.3	75	125	7.53	20	
Silver	2.3	1.2	4.955	0	46.8	75	125	15.0	20	S
Vanadium	61	12	24.77	33.90	107	75	125	2.12	20	

Sample ID: **1812773-001APS** SampType: **PS** TestCode: **EPA Method 6010B: Soil Metals**

Client ID: **LTU C1L1 ZOI** Batch ID: **42119** RunNo: **56498**

Prep Date: Analysis Date: **12/20/2018** SeqNo: **1890181** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Antimony	97	12	120.5	0	80.3	80	120			
Barium	350	0.48	120.5	237.6	90.4	80	120			
Silver	18	1.2	24.09	0	76.6	80	120			S

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1812773**
03-Jul-19

Client: Marathon
Project: Land Treatment Unit

Sample ID: **1812773-001AMS** SampType: **MS** TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **LTU C1L1 ZOI** Batch ID: **42119** RunNo: **56598**
Prep Date: **12/14/2018** Analysis Date: **12/22/2018** SeqNo: **1893481** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	28	1.5	24.79	7.148	86.0	75	125			
Zinc	49	12	24.79	25.89	94.8	75	125			

Sample ID: **1812773-001AMSD** SampType: **MSD** TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **LTU C1L1 ZOI** Batch ID: **42119** RunNo: **56598**
Prep Date: **12/14/2018** Analysis Date: **12/22/2018** SeqNo: **1893482** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	29	1.5	24.77	7.148	88.7	75	125	2.25	20	
Zinc	51	12	24.77	25.89	103	75	125	3.92	20	

Sample ID: **1812773-001APS** SampType: **PS** TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **LTU C1L1 ZOI** Batch ID: **42119** RunNo: **56598**
Prep Date: Analysis Date: **12/22/2018** SeqNo: **1893483** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cobalt	110	1.4	120.5	7.148	85.6	80	120			
Zinc	140	12	120.5	25.89	90.7	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: **MARATHON GALLUP** Work Order Number: **1812773** RcptNo: 1

Received By: **Victoria Zellar** **12/13/2018 8:57:00 AM** Victoria Zellar

Completed By: **Erin Melendrez** **12/13/2018 11:13:39 AM**

Reviewed By: LB 12/13/18

LB: JAB 12/13/18

Chain of Custody

1. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C Yes ☑ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☑ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
8. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
9. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☑
10. Were any sample containers received broken? Yes ☐ No ☑
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes ☑ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
13. Is it clear what analyses were requested? Yes ☑ No ☐
14. Were all holding times able to be met? (If no, notify customer for authorization.) Yes ☑ No ☐

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)
Adjusted? _____
Checked by: JAB 12/13/18

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date: _____
By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding: _____
Client Instructions: _____

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.9	Good	Yes			

_____ OF _____

Chain-of-Custody Record

Client: **Marathon Petroleum**

Gallup Refinery

Mailing Address: **92 Giant Crossing Road**

Gallup, NM 87301

Phone #: **505-726-3745**

email or Fax#: BMoore1@Marathonpetroleum.com

QA/QC Package:

☐ Standard ☒ Level 4 (Full Validation)

☐ Other _____

☒ EDD (Type) **EXCEL**

Turn-Around Time:

☒ Standard ☐ Rush _____

Project Name: **Land Treatment Unit**

Project #:

Project Manager: **Brian Moore**

Sampler: TRITICO

On Ice: ☒ Yes ☐ No

Sample Temperature: 3.9c

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1812773	BTEX+MTBE+TMB's(8021)	BTEX+MTBE+TPH(Gas only)	TPH 8015 (GRO/DRO/MRO)	TPH (Method 418.1)	EDB (Method 8011)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B MOD. SKINNER LIST	8270 MOD. SKINNER LIST	METALS MOD SKINNER LIST	MERCURY	CYANIDE		Air Bubbles (Y or N)
12-11-18	1245	SOIL	LTU C1L1 ZOI	8oz jar - 2 4oz jar - 1	None	-001			X							X	X	X	X	X		
	1247		LTU C1L1 ZOI MS	8oz jar - 2 4oz jar - 1	None	-001			X							X	X	X	X	X		
	1249		LTU C1L1 ZOI MSD	8oz jar - 2 4oz jar - 1	None	-001			X							X	X	X	X	X		
	1300		LTU C1L1 TZ	8oz jar - 2 4oz jar - 1	None	-002			X							X	X	X	X	X		
	1200		LTU C1L2 ZOI	8oz jar - 2 4oz jar - 1	None	-003			X							X	X	X	X	X		
	1210		LTU C1L2 TZ	8oz jar - 2 4oz jar - 1	None	-004			X							X	X	X	X	X		
	-----		LTU ZOI DUP	8oz jar - 2 4oz jar - 1	None	-005			X							X	X	X	X	X		

Date	Time	Relinquished by:	Received by:	Date	Time
12-12-18	0800	T. Tritico	Victoria Gallon	12/13/18	8:57
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:

Courier VV2 12/13/18 857

_____ OF _____

Chain-of-Custody Record

Client: **Marathon Petroleum**

Gallup Refinery

Mailing Address: **92 Giant Crossing Road**

Gallup, NM 87301

Phone #: **505-726-3745**

email or Fax#: BMoore1@Marathonpetroleum.com

QA/QC Package:

☐ Standard ☒ Level 4 (Full Validation)

☐ Other _____

☒ EDD (Type) **EXCEL**

Turn-Around Time:

☒ Standard ☐ Rush _____

Project Name: **Land Treatment Unit**

Project #:

Project Manager: **Brian Moore**

Sampler: TR LTCU

On Ice: ☑ Yes ☐ No

Sample Temperature: 5.0

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4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 181773	BTEX+MTBE+TMB's(8021)	BTEX+MTBE+TPH(Gas only)	TPH 8015 (GRO/DRO/MRO)	TPH (Method 418.1)	EDB (Method 8011)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B MOD. SKINNER LIST	8270 MOD. SKINNER LIST	METALS MOD SKINNER LIST	MERCURY	CYANIDE		Air Bubbles (Y or N)
12-11-18	1420	SOIL	LTU C2L1 ZOI	8oz jar - ~~2~~ 3 ~~4oz jar - 1~~	None	-006			X							X	X	X	X	X		
	1435		LTU C2L1 TZ	8oz jar - ~~2~~ 3 ~~4oz jar - 1~~	None	-007			X							X	X	X	X	X		
	1500		LTU C2L2 ZOI	8oz jar - ~~1~~ 3 ~~4oz jar - 1~~	None	-008			X							X	X	X	X	X		
	1510		LTU C2L2 TZ	8oz jar - ~~1~~ 3 ~~4oz jar - 1~~	None	-009			X							X	X	X	X	X		

Date	Time	Relinquished by:	Received by:	Date	Time
12-12-18	0800		Victoria Ballen	12/13/18	8:57
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: Courier VVZ 12/13/18 8:57

_____ OF _____

Chain-of-Custody Record

Client: **Marathon Petroleum**

Gallup Refinery

Mailing Address: **92 Giant Crossing Road**

Gallup, NM 87301

Phone #: **505-726-3745**

email or Fax#: BMoore1@Marathonpetroleum.com

QA/QC Package:

☐ Standard X Level 4 (Full Validation)

☐ Other _____

X EDD (Type) **EXCEL**

Turn-Around Time:

X Standard ☐ Rush _____

Project Name: **Land Treatment Unit**

Project #:

Project Manager: **Brian Moore**

Sampler: TRITICO

On Ice: X Yes ☐ No

Sample Temperature: 5.0°C

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1812773	BTEX+MTBE+TMB's(8021)	BTEX+MTBE+TPH(Gas only)	TPH 8015 (GRO/DRO/MRO)	TPH (Method 418.1)	EDB (Method 8011)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B MOD. SKINNER LIST	8270 MOD. SKINNER LIST	METALS MOD SKINNER LIST	MERCURY	CYANIDE		Air Bubbles (Y or N)
12-4-18	1115	SOIL	LTU C3L1 ZOI	8oz jar - 2 4oz jar - 1	None	-010			X							X	X	X	X	X		
	1130		LTU C3L1 TZ	8oz jar - 2 4oz jar - 1	None	-011			X							X	X	X	X	X		
	1040		LTU C3L2 ZOI	8oz jar - 2 4oz jar - 1	None	-012			X							X	X	X	X	X		
	1055		LTU C3L2 TZ	8oz jar - 2 4oz jar - 1	None	-013			X							X	X	X	X	X		

Date	Time	Relinquished by	Received by	Date	Time
12-12-18	0800	Tritico	Victoria Ballar	12/13/18	8:57
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:
Courier VVZ 12/13/18 8:57

ATTACHMENT 1

Region 5 Waste Management Branch "Skinner List"
Constituents of Concern for Wastes from Petroleum Processes

Inorganics

Antimony	Cadmium	Lead	Silver
Arsenic	Chromium	Mercury	Vanadium
Barium	Cobalt	Nickel	Zinc
Beryllium	Cyanide	Selenium	

Volatile Organics

Benzene	1,2-Dichloroethane	Ethylene dibromide (EDB)	1,1,1-Trichloroethane
Carbon disulfide	1,1-Dichloroethane	Methyl ethyl ketone (MEK)	Trichloroethene
Chlorobenzene	1,4-Dioxane	Styrene	Tetrachloroethylene
Chloroform	Ethylbenzene	Toluene	Xylenes (total)

Semivolatile Organics

Acenaphthene	o-Cresol	Diethyl phthalate	Naphthalene
Anthracene	m-Cresol	2,4 Dimethylphenol	4-Nitrophenol
Benzo(a)anthracene	p-Cresol	Dimethyl phthalate	Phenanthrene
Benzo(b)fluroranthene	Dibenz(a,h)anthracene	2,4 Dinitrophenol	Phenol
Benzo(k)fluoranthene	Di-n-butyl phthalate	Fluoranthene	Pyrene
Benzo(a)pyrene	1,2-Dichlorobenzene*	Fluorene	Pyridine
Bis(2-ethylhexyl) phthalate	1,3-Dichlorobenzene*	Indeno(1,2,3-cd)pyrene	Quinoline
Chrysene	1,4-Dichlorobenzene*	Methyl tertiary butyl ether (MTBE)	*- can be tested as a volatile

Low Concentration Polynuclear Aromatic Hydrocarbons (Optional)

Benzo(a)anthracene	Benzo(k)fluoranthene	Dibenz(a,h)anthracene	Indeno(1,2,3-cd)pyrene
Benzo(b)fluoranthene	Benzo(a)pyrene	Chrysene*	

* added to this group to assist the chromatographic resolution of chrysene from Dibenz(a,h)anthracene in sample extracts

Optional Semivolatile Organics

~~Indene~~ no ✓	~~Benzenethiol~~** no ✓	~~Dibenz(a,h)acridine~~ no ✓	1-Methylnaphthalene*

*Note that 2-Methylnaphthalene is part of Appendix IX and is a CLP TCL organic. 1-Methylnaphthalene is not on these lists.

**Benzenethiol can be detected in certain petroleum refinery wastes. Its measurement must compensate for its instability at neutral and acid pH values during sample preparation and its unstable instrument calibration standards