Western Refining Southwest LLC
A subsidiary of Marathon Petroleum Corporation

I-40 Exit 39
Jamestown, NM 87347

September 30, 2021

Mr. Kevin Pierard, Chief
New Mexico Environment Department
2905 Rodeo Park Drive East, Bldg. 1
Santa Fe, NM 87SOS-6303

RE: Addendum Solid Waste Management Unit No. 10 Sludge Pits Investigation Report
Western Refining Southwest Inc., Marathon Gallup Refinery
EPA ID# NMD000333211
HWB-WRG-16-001

Dear Mr. Pierard:

Marathon Gallup Refinery is submitting this addendum to the New Mexico Environment Department (NMED) approval with modifications, *Investigation Report Solid Waste Management Unit No. 10 Sludge Pits*, dated March 4, 2021. A timeline of the investigation work plan and report submittals is provided below.

- Investigation Work Plan, submitted September 16, 2014
- Approval with Modifications, received March 2, 2015
- Investigation Report, submitted March 4, 2016
- Withdrawal of Investigation Report, submitted June 10, 2016
- Revised Investigation Report, submitted December 20, 2016
- Disapproval, received June 14, 2018
- Response to Disapproval, submitted October 12, 2018
- Disapproval, received June 10, 2019
- Response to Disapproval, submitted August 30, 2019
- Approval with Modifications, received March 4, 2021

NMED Comment #4 of the approval with modifications recognized that the northern extent of TPH exceedances was not defined by the SWMU 10 investigation. However, NMED acknowledged that the planned addition of monitoring well OW-69, a short distance north of SWMU No. 10, to be installed as part of the investigation into the SMW-2 and GWM-1 Areas, could help bound the TPH exceedances.

The purpose of this addendum is to present the sample results from the installation of monitoring well OW-69 as they apply to the SWMU 10 investigation.

Between April 28, 2015 and September 21, 2016, twenty-five soil borings were installed and sampled within and around the area identified as Solid Waste Management Unit No. 10 Sludge Pits. Investigation results were submitted to the New Mexico Environment Department (NMED) in a report originally dated December 2016, subsequently revised in October 2018 and August 2019. The approved version of the investigation report is titled *Response to Disapproval, Investigation Report Solid Waste Management Unit No. 10 Sludge Pits* (Investigation Report) and is dated August 30, 2019.

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In a March 4, 2021 *Approval with Modifications, Response to Disapproval Investigation Report Solid Waste Management Unit No. 10 Sludge Pits*, NMED included a comment to further address the northern extent of TPH exceedances. The applicable comment from the NMED approval with modifications (comment #4) is provided below.

NMED Comment #4 (March 4, 2021):
"The response to NMED's Disapproval Comment 13 states, "[b]ased on the addition of the new TPH screening levels, there are numerous exceedances of the TPH screening levels, as shown for soil in Table 7 and groundwater in Table 8." Section 7.1, Conclusions states that the northern extent of TPH exceedances was not defined. Section 7.2, Recommendations states, "[a]n Investigation Work Plan for the SMW-2 and GWM-1 Areas was submitted in mid August 2019 and it includes a new monitoring well west of GWM-1, which will place the well a short distance north of SWMU No. 10 (DiSorbo, 2019). The collection of soil and groundwater samples from this location could provide additional information on the northern boundary of SWMU No. 10." NMED agrees with the Permittee's recommendation. NMED issued an Approval Response to Disapproval Investigation Work Plan SMW-2 and GWM-1 and approved an installation of the referenced well in July 1, 2020. NMED's Approval required the SMW-2 and GWM-1 investigation report no later than **July 31, 2021**. The results of the SMW-2 and GWM-1investigation may be incorporated as part of the SWMU 10 investigation; however, the discussion pertaining to the SWMU 10 investigation must not be included in the SMW-2 and GWM-1 investigation report; a separate report that focuses on the SWMU 10 investigation must be submitted no later than **October 1, 2021**."

The proposed monitoring well to be installed just north of SWMU 10, as part of the SMW-2/GWM-1 investigation, was monitoring well OW-69. The borehole for OW-69 was drilled on July 21, 2021, however the boring was dry during drilling. No monitoring well was installed, however, two soil samples were collected during drilling activities. Section 7.1 of the Investigation Report discussed both soil and groundwater exceedances. The groundwater exceedances were not fully bound and some of the exceedances are attributed to up-gradient sources. This addendum will focus on bounding the previously identified soil exceedances. A holistic depiction of groundwater analytical data at the site is provided and discussed in the annual groundwater reports.

Regarding soil concentrations, Section 7.1 of the Investigation Report details that "the northern extent of GRO was not defined on the northern boundary [of SWMU 10] as concentrations exceeded the GRO screening level in soil samples collected at both SWMU 10-24 and SWMU 10-25." However, with the addition and sampling of monitoring well OW-69, as part of the SMW-2 and GWM-1 investigation, the GRO extent has been bounded to the north. TPH results for OW-69 were collected at 6 feet below ground surface (ft-bgs) and 26 ft-bgs.; TPH results for the OW-69 soil samples were as follows:

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Boring Location	Sample ID	Sample Depth (ft-bgs)	Diesel Range Organics (DRO) (mg/kg)	Motor Range Organics (MRO) (mg/kg)	Gasoline Range Organics (GRO) (mg/kg)
OW-69	OW-69-6	6	8.4	ND (47)	ND (0.94)
OW-69	OW-69-26	26	ND (4.6)	ND (26)	ND (0.98)
***Soil Screening Level (mg/kg):**			**1000**	**1000**	**100**

Notes:
ft-bgs – feet below ground surface
mg/kg – milligrams per kilogram
ND – non detect (method detection limit in parentheses)
*Soil Screening Level from *Risk Assessment Guidance for Site Investigations and Remediation Volume I Soil Screening Guidance for Human Health Risk Assessments*, table 6-2 (dated February 2019)

Figure 1 depicts the approximate boundary of SWMU 10, the location of soil borings detailed in the Investigation Report, and the location of boring OW-69. The results presented above bound the northern extent of soil impacts not previously bound by the initial investigation.

If you have any questions or comments regarding the information contained herein, please do not hesitate to contact Mr. John Moore at 505-879-7643.

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction of 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.

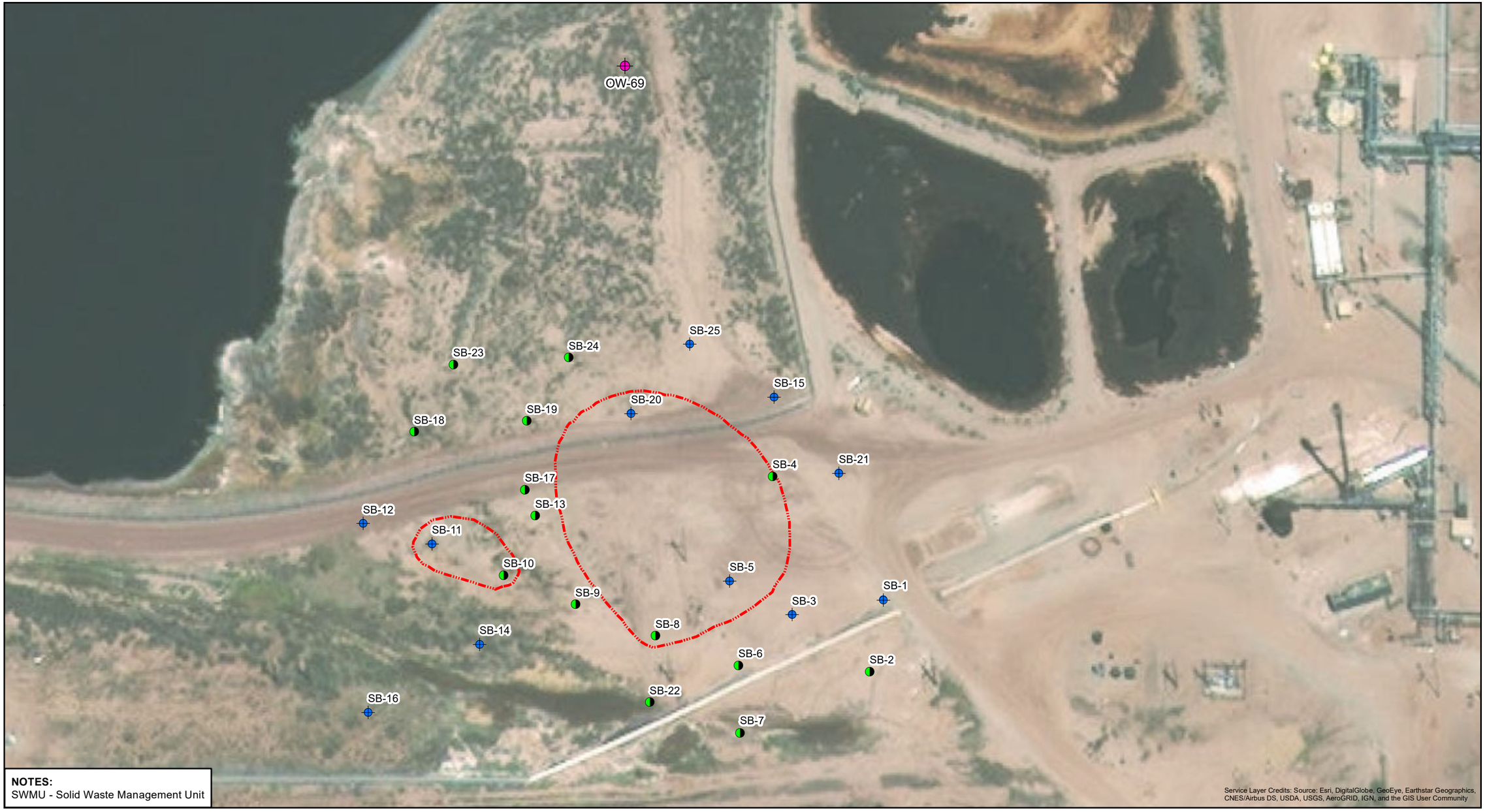
Sincerely,
Western Refining Southwest LLC, Marathon Gallup Refinery
Ruth A. Cade

Ruth Cade
Vice-President

Attachments

cc D. Cobrain, NMED HWB
L. Barr, NMOCD
G. McCartney, Marathon Petroleum Company
H. Jones, Trihydro
M. Suzuki, NMED HWB
K. Luka, Marathon Petroleum Company
J. Moore, Marathon Gallup Refinery

FIGURE



EXPLANATION

MONITORING WELL OW-69

HISTORICAL INVESTIGATION LOCATIONS

SOIL BORING / TEMPORARY WELL LOCATION AND IDENTIFICATION NUMBER

SOIL BORING LOCATION AND IDENTIFICATION NUMBER

APPROXIMATE LOCATION OF SWMU NO. 10

N

0 60'

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

FIGURE 1

HISTORICAL INVESTIGATION LOCATION AND MONITORING WELL OW-69

**WESTERN REFINING SOUTHWEST, LLC.
MARATHON GALLUP REFINERY GALLUP, NEW MEXICO**

Drawn By: JDH	Checked By: CF	Scale: 1 " = 60 '	Date: 9/13/21	File: 202109_SWMU10Addendum.mxd

M:\TON\MARATHON\GIS\PROJECTS\GALLUPREF\NERY\SWMU10_SLUDGEPITS\2021\09_SWMU10REPORTADDENDUM\2021\09_SWMU10ADDENDUM.MXD

ATTACHMENT

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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

August 04, 2021

Lesli Alexander

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

RE: Well Installations 2021 OrderNo.: 2107A83

Dear Lesli Alexander:

Hall Environmental Analysis Laboratory received 11 sample(s) on 7/21/2021 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 **2107A83**
Date Reported: **8/4/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon **Client Sample ID:** MeOH Blank
Project: Well Installations 2021 **Collection Date:**
Lab ID: 2107A83-009 **Matrix:** MEOH BLAN **Received Date:** 7/21/2021 4:10:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **JMR**	
Benzene	ND	0.0096	0.025		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Toluene	ND	0.0052	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Ethylbenzene	ND	0.012	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Methyl tert-butyl ether (MTBE)	0.017	0.010	0.050	J	mg/Kg	1	7/23/2021 1:25:20 AM	A80017
1,2,4-Trimethylbenzene	ND	0.0071	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
1,3,5-Trimethylbenzene	ND	0.011	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
1,2-Dichloroethane (EDC)	ND	0.011	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
1,2-Dibromoethane (EDB)	ND	0.020	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Naphthalene	ND	0.0092	0.10		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
1-Methylnaphthalene	ND	0.057	0.20		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
2-Methylnaphthalene	ND	0.046	0.20		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Acetone	ND	0.045	0.75		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Bromobenzene	ND	0.0040	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Bromodichloromethane	ND	0.0046	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Bromoform	ND	0.012	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Bromomethane	ND	0.044	0.15		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
2-Butanone	0.15	0.077	0.50	J	mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Carbon disulfide	ND	0.012	0.50		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Carbon tetrachloride	ND	0.0044	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Chlorobenzene	ND	0.0079	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Chloroethane	ND	0.019	0.10		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Chloroform	ND	0.0069	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Chloromethane	ND	0.0048	0.15		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
2-Chlorotoluene	ND	0.010	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
4-Chlorotoluene	ND	0.032	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
cis-1,2-DCE	ND	0.025	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
cis-1,3-Dichloropropene	ND	0.0066	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
1,2-Dibromo-3-chloropropane	ND	0.022	0.10		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Dibromochloromethane	ND	0.0066	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Dibromomethane	ND	0.0076	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
1,2-Dichlorobenzene	ND	0.010	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
1,3-Dichlorobenzene	ND	0.0094	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
1,4-Dichlorobenzene	ND	0.013	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Dichlorodifluoromethane	ND	0.015	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
1,1-Dichloroethane	ND	0.0084	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
1,1-Dichloroethene	ND	0.0073	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
1,2-Dichloropropane	ND	0.0086	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
1,3-Dichloropropane	ND	0.011	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
2,2-Dichloropropane	ND	0.0059	0.10		mg/Kg	1	7/23/2021 1:25:20 AM	A80017

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

Analytical Report
Lab Order **2107A83**
Date Reported: **8/4/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon **Client Sample ID:** MeOH Blank
Project: Well Installations 2021 **Collection Date:**
Lab ID: 2107A83-009 **Matrix:** MEOH BLAN **Received Date:** 7/21/2021 4:10:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **JMR**	
1,1-Dichloropropene	ND	0.0053	0.10		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Hexachlorobutadiene	ND	0.013	0.10		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
2-Hexanone	ND	0.0095	0.50		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Isopropylbenzene	ND	0.0093	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
4-Isopropyltoluene	ND	0.013	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
4-Methyl-2-pentanone	ND	0.058	0.50		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Methylene chloride	ND	0.036	0.15		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
n-Butylbenzene	ND	0.013	0.15		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
n-Propylbenzene	ND	0.0081	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
sec-Butylbenzene	ND	0.041	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Styrene	ND	0.0063	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
tert-Butylbenzene	ND	0.012	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
1,1,1,2-Tetrachloroethane	ND	0.0044	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
1,1,2,2-Tetrachloroethane	ND	0.016	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Tetrachloroethene (PCE)	ND	0.014	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
trans-1,2-DCE	ND	0.0085	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
trans-1,3-Dichloropropene	ND	0.012	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
1,2,3-Trichlorobenzene	ND	0.0034	0.10		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
1,2,4-Trichlorobenzene	ND	0.017	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
1,1,1-Trichloroethane	ND	0.011	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
1,1,2-Trichloroethane	ND	0.0044	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Trichloroethene (TCE)	ND	0.0077	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Trichlorofluoromethane	ND	0.011	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
1,2,3-Trichloropropane	ND	0.021	0.10		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Vinyl chloride	ND	0.0042	0.050		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Xylenes, Total	ND	0.026	0.10		mg/Kg	1	7/23/2021 1:25:20 AM	A80017
Surr: Dibromofluoromethane	102		70-130		%Rec	1	7/23/2021 1:25:20 AM	A80017
Surr: 1,2-Dichloroethane-d4	104		70-130		%Rec	1	7/23/2021 1:25:20 AM	A80017
Surr: Toluene-d8	97.4		70-130		%Rec	1	7/23/2021 1:25:20 AM	A80017
Surr: 4-Bromofluorobenzene	102		70-130		%Rec	1	7/23/2021 1:25:20 AM	A80017

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

Analytical Report
Lab Order **2107A83**
Date Reported: **8/4/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon **Client Sample ID:** OW-69-26
Project: Well Installations 2021 **Collection Date:** 7/21/2021 12:10:00 PM
Lab ID: 2107A83-010 **Matrix:** MEOH (SOIL) **Received Date:** 7/21/2021 4:10:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **CLP**	
Diesel Range Organics (DRO)	ND	4.6	9.3		mg/Kg	1	7/23/2021 10:52:22 AM	61499
Motor Oil Range Organics (MRO)	ND	46	46		mg/Kg	1	7/23/2021 10:52:22 AM	61499
Surr: DNOP	173	0	70-130	S	%Rec	1	7/23/2021 10:52:22 AM	61499
EPA METHOD 7471: MERCURY							Analyst: **ags**	
Mercury	ND	0.0025	0.032		mg/Kg	1	7/23/2021 10:29:45 AM	61495
EPA METHOD 6010B: SOIL METALS							Analyst: **ags**	
Arsenic	ND	2.9	5.1		mg/Kg	2	7/23/2021 4:49:49 PM	61509
Barium	160	0.12	0.20		mg/Kg	2	7/29/2021 3:02:32 PM	61509
Cadmium	ND	0.10	0.20		mg/Kg	2	7/23/2021 4:49:49 PM	61509
Chromium	18	0.31	0.61		mg/Kg	2	7/29/2021 3:02:32 PM	61509
Lead	ND	0.54	0.61		mg/Kg	2	7/23/2021 4:49:49 PM	61509
Selenium	ND	4.5	5.1		mg/Kg	2	7/29/2021 3:02:32 PM	61509
Silver	ND	0.30	0.51		mg/Kg	2	7/23/2021 4:49:49 PM	61509
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **DAM**	
Acenaphthene	ND	0.085	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Acenaphthylene	ND	0.087	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Aniline	ND	0.066	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Anthracene	ND	0.087	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Azobenzene	ND	0.095	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Benz(a)anthracene	ND	0.062	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Benzo(a)pyrene	ND	0.090	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Benzo(b)fluoranthene	ND	0.10	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Benzo(g,h,i)perylene	ND	0.097	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Benzo(k)fluoranthene	ND	0.072	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Benzoic acid	ND	0.12	0.48		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Benzyl alcohol	ND	0.078	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Bis(2-chloroethoxy)methane	ND	0.073	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Bis(2-chloroethyl)ether	ND	0.10	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Bis(2-chloroisopropyl)ether	ND	0.097	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Bis(2-ethylhexyl)phthalate	0.31	0.21	0.48	J	mg/Kg	1	7/28/2021 7:14:20 PM	61566
4-Bromophenyl phenyl ether	ND	0.10	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Butyl benzyl phthalate	ND	0.058	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Carbazole	ND	0.084	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
4-Chloro-3-methylphenol	ND	0.081	0.48		mg/Kg	1	7/28/2021 7:14:20 PM	61566
4-Chloroaniline	ND	0.093	0.48		mg/Kg	1	7/28/2021 7:14:20 PM	61566
2-Chloronaphthalene	ND	0.091	0.24		mg/Kg	1	7/28/2021 7:14:20 PM	61566
2-Chlorophenol	ND	0.10	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
4-Chlorophenyl phenyl ether	ND	0.081	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566

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

Analytical Report
Lab Order **2107A83**
Date Reported: **8/4/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon **Client Sample ID:** OW-69-26
Project: Well Installations 2021 **Collection Date:** 7/21/2021 12:10:00 PM
Lab ID: 2107A83-010 **Matrix:** MEOH (SOIL) **Received Date:** 7/21/2021 4:10:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **DAM**	
Chrysene	ND	0.084	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Di-n-butyl phthalate	0.35	0.27	0.38	J	mg/Kg	1	7/28/2021 7:14:20 PM	61566
Di-n-octyl phthalate	ND	0.12	0.38		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Dibenz(a,h)anthracene	ND	0.10	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Dibenzofuran	ND	0.099	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
1,2-Dichlorobenzene	ND	0.077	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
1,3-Dichlorobenzene	ND	0.068	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
1,4-Dichlorobenzene	ND	0.081	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
3,3´-Dichlorobenzidine	ND	0.14	0.24		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Diethyl phthalate	0.88	0.31	0.48	B	mg/Kg	1	7/28/2021 7:14:20 PM	61566
Dimethyl phthalate	ND	0.088	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
2,4-Dichlorophenol	ND	0.078	0.38		mg/Kg	1	7/28/2021 7:14:20 PM	61566
2,4-Dimethylphenol	ND	0.068	0.29		mg/Kg	1	7/28/2021 7:14:20 PM	61566
4,6-Dinitro-2-methylphenol	ND	0.081	0.38		mg/Kg	1	7/28/2021 7:14:20 PM	61566
2,4-Dinitrophenol	ND	0.048	0.48		mg/Kg	1	7/28/2021 7:14:20 PM	61566
2,4-Dinitrotoluene	ND	0.12	0.48		mg/Kg	1	7/28/2021 7:14:20 PM	61566
2,6-Dinitrotoluene	ND	0.097	0.48		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Fluoranthene	ND	0.077	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Fluorene	ND	0.085	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Hexachlorobenzene	ND	0.085	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Hexachlorobutadiene	ND	0.090	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Hexachlorocyclopentadiene	ND	0.11	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Hexachloroethane	ND	0.085	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Indeno(1,2,3-cd)pyrene	ND	0.11	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Isophorone	ND	0.078	0.38		mg/Kg	1	7/28/2021 7:14:20 PM	61566
1-Methylnaphthalene	ND	0.088	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
2-Methylnaphthalene	ND	0.079	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
2-Methylphenol	ND	0.080	0.38		mg/Kg	1	7/28/2021 7:14:20 PM	61566
3+4-Methylphenol	ND	0.079	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
N-Nitrosodi-n-propylamine	ND	0.089	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
N-Nitrosodimethylamine	ND	0.14	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
N-Nitrosodiphenylamine	ND	0.10	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Naphthalene	ND	0.090	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
2-Nitroaniline	ND	0.098	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
3-Nitroaniline	ND	0.11	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
4-Nitroaniline	ND	0.12	0.38		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Nitrobenzene	ND	0.078	0.38		mg/Kg	1	7/28/2021 7:14:20 PM	61566
2-Nitrophenol	ND	0.082	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
4-Nitrophenol	ND	0.079	0.24		mg/Kg	1	7/28/2021 7:14:20 PM	61566

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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

Analytical Report
Lab Order **2107A83**
Date Reported: **8/4/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon **Client Sample ID:** OW-69-26
Project: Well Installations 2021 **Collection Date:** 7/21/2021 12:10:00 PM
Lab ID: 2107A83-010 **Matrix:** MEOH (SOIL) **Received Date:** 7/21/2021 4:10:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **DAM**	
Pentachlorophenol	ND	0.083	0.38		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Phenanthrene	ND	0.098	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Phenol	ND	0.074	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Pyrene	ND	0.072	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Pyridine	ND	0.15	0.38		mg/Kg	1	7/28/2021 7:14:20 PM	61566
1,2,4-Trichlorobenzene	ND	0.088	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
2,4,5-Trichlorophenol	ND	0.061	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
2,4,6-Trichlorophenol	ND	0.082	0.19		mg/Kg	1	7/28/2021 7:14:20 PM	61566
Surr: 2-Fluorophenol	61.5		20.3-74.1		%Rec	1	7/28/2021 7:14:20 PM	61566
Surr: Phenol-d5	70.7		23.1-92.7		%Rec	1	7/28/2021 7:14:20 PM	61566
Surr: 2,4,6-Tribromophenol	84.7		17.3-122		%Rec	1	7/28/2021 7:14:20 PM	61566
Surr: Nitrobenzene-d5	57.8		24.7-73.2		%Rec	1	7/28/2021 7:14:20 PM	61566
Surr: 2-Fluorobiphenyl	59.0		21.5-90.1		%Rec	1	7/28/2021 7:14:20 PM	61566
Surr: 4-Terphenyl-d14	69.5		15-140		%Rec	1	7/28/2021 7:14:20 PM	61566
EPA METHOD 8260B: VOLATILES							Analyst: **JMR**	
Benzene	ND	0.0068	0.018		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Toluene	ND	0.0037	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Ethylbenzene	ND	0.0086	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Methyl tert-butyl ether (MTBE)	ND	0.0070	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
1,2,4-Trimethylbenzene	ND	0.0050	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
1,3,5-Trimethylbenzene	ND	0.0079	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
1,2-Dichloroethane (EDC)	ND	0.0081	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
1,2-Dibromoethane (EDB)	ND	0.014	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Naphthalene	ND	0.0065	0.071		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
1-Methylnaphthalene	ND	0.041	0.14		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
2-Methylnaphthalene	ND	0.033	0.14		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Acetone	ND	0.032	0.53		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Bromobenzene	ND	0.0028	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Bromodichloromethane	ND	0.0033	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Bromoform	ND	0.0085	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Bromomethane	ND	0.031	0.11		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
2-Butanone	0.16	0.055	0.35	J	mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Carbon disulfide	ND	0.0086	0.35		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Carbon tetrachloride	ND	0.0031	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Chlorobenzene	ND	0.0056	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Chloroethane	ND	0.013	0.071		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Chloroform	ND	0.0049	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Chloromethane	ND	0.0034	0.11		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
2-Chlorotoluene	ND	0.0073	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017

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Qualifiers:

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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

Analytical Report
Lab Order **2107A83**
Date Reported: **8/4/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon
Client Sample ID: OW-69-26
Project: Well Installations 2021
Collection Date: 7/21/2021 12:10:00 PM
Lab ID: 2107A83-010
Matrix: MEOH (SOIL)
Received Date: 7/21/2021 4:10:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **JMR**	
4-Chlorotoluene	ND	0.022	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
cis-1,2-DCE	ND	0.018	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
cis-1,3-Dichloropropene	ND	0.0047	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
1,2-Dibromo-3-chloropropane	ND	0.015	0.071		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Dibromochloromethane	ND	0.0046	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Dibromomethane	ND	0.0054	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
1,2-Dichlorobenzene	ND	0.0074	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
1,3-Dichlorobenzene	ND	0.0067	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
1,4-Dichlorobenzene	ND	0.0095	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Dichlorodifluoromethane	ND	0.011	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
1,1-Dichloroethane	ND	0.0059	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
1,1-Dichloroethene	ND	0.0052	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
1,2-Dichloropropane	ND	0.0061	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
1,3-Dichloropropane	ND	0.0078	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
2,2-Dichloropropane	ND	0.0041	0.071		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
1,1-Dichloropropene	ND	0.0037	0.071		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Hexachlorobutadiene	ND	0.0092	0.071		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
2-Hexanone	ND	0.0067	0.35		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Isopropylbenzene	ND	0.0066	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
4-Isopropyltoluene	ND	0.0091	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
4-Methyl-2-pentanone	ND	0.041	0.35		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Methylene chloride	ND	0.026	0.11		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
n-Butylbenzene	ND	0.0094	0.11		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
n-Propylbenzene	ND	0.0057	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
sec-Butylbenzene	ND	0.029	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Styrene	ND	0.0044	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
tert-Butylbenzene	ND	0.0082	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
1,1,1,2-Tetrachloroethane	ND	0.0031	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
1,1,2,2-Tetrachloroethane	ND	0.011	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Tetrachloroethene (PCE)	ND	0.0097	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
trans-1,2-DCE	ND	0.0060	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
trans-1,3-Dichloropropene	ND	0.0083	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
1,2,3-Trichlorobenzene	ND	0.0024	0.071		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
1,2,4-Trichlorobenzene	ND	0.012	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
1,1,1-Trichloroethane	ND	0.0078	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
1,1,2-Trichloroethane	ND	0.0031	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Trichloroethene (TCE)	ND	0.0054	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Trichlorofluoromethane	ND	0.0080	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
1,2,3-Trichloropropane	ND	0.015	0.071		mg/Kg	1	7/23/2021 1:53:54 AM	A80017

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Qualifiers:

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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

Analytical Report
Lab Order **2107A83**
Date Reported: **8/4/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon **Client Sample ID:** OW-69-26
Project: Well Installations 2021 **Collection Date:** 7/21/2021 12:10:00 PM
Lab ID: 2107A83-010 **Matrix:** MEOH (SOIL) **Received Date:** 7/21/2021 4:10:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **JMR**	
Vinyl chloride	ND	0.0030	0.035		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Xylenes, Total	ND	0.019	0.071		mg/Kg	1	7/23/2021 1:53:54 AM	A80017
Surr: Dibromofluoromethane	104		70-130		%Rec	1	7/23/2021 1:53:54 AM	A80017
Surr: 1,2-Dichloroethane-d4	104		70-130		%Rec	1	7/23/2021 1:53:54 AM	A80017
Surr: Toluene-d8	96.2		70-130		%Rec	1	7/23/2021 1:53:54 AM	A80017
Surr: 4-Bromofluorobenzene	98.9		70-130		%Rec	1	7/23/2021 1:53:54 AM	A80017
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: **JMR**	
Gasoline Range Organics (GRO)	ND	0.98	3.5		mg/Kg	1	7/23/2021 1:53:54 AM	C80017
Surr: BFB	95.8	0	70-130		%Rec	1	7/23/2021 1:53:54 AM	C80017

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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		

Analytical Report
Lab Order **2107A83**
Date Reported: **8/4/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon **Client Sample ID:** OW-69-6
Project: Well Installations 2021 **Collection Date:** 7/21/2021 12:15:00 PM
Lab ID: 2107A83-011 **Matrix:** MEOH (SOIL) **Received Date:** 7/21/2021 4:10:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: **CLP**	
Diesel Range Organics (DRO)	8.4	4.7	9.5	J	mg/Kg	1	7/23/2021 11:21:20 AM	61499
Motor Oil Range Organics (MRO)	ND	47	47		mg/Kg	1	7/23/2021 11:21:20 AM	61499
Surr: DNOP	117	0	70-130		%Rec	1	7/23/2021 11:21:20 AM	61499
EPA METHOD 7471: MERCURY							Analyst: **ags**	
Mercury	0.0051	0.0028	0.035	J	mg/Kg	1	7/23/2021 10:31:50 AM	61495
EPA METHOD 6010B: SOIL METALS							Analyst: **ags**	
Arsenic	ND	2.8	4.9		mg/Kg	2	7/23/2021 4:52:01 PM	61509
Barium	290	0.12	0.20		mg/Kg	2	7/29/2021 3:06:50 PM	61509
Cadmium	ND	0.099	0.20		mg/Kg	2	7/23/2021 4:52:01 PM	61509
Chromium	5.5	0.30	0.59		mg/Kg	2	7/29/2021 3:06:50 PM	61509
Lead	4.5	0.53	0.59		mg/Kg	2	7/29/2021 3:06:50 PM	61509
Selenium	ND	4.3	4.9		mg/Kg	2	7/29/2021 3:06:50 PM	61509
Silver	ND	0.29	0.49		mg/Kg	2	7/23/2021 4:52:01 PM	61509
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **DAM**	
Acenaphthene	ND	0.086	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Acenaphthylene	ND	0.087	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Aniline	ND	0.066	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Anthracene	ND	0.087	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Azobenzene	ND	0.096	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Benz(a)anthracene	ND	0.062	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Benzo(a)pyrene	ND	0.090	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Benzo(b)fluoranthene	ND	0.10	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Benzo(g,h,i)perylene	ND	0.098	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Benzo(k)fluoranthene	ND	0.072	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Benzoic acid	ND	0.12	0.48		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Benzyl alcohol	ND	0.079	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Bis(2-chloroethoxy)methane	ND	0.073	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Bis(2-chloroethyl)ether	ND	0.10	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Bis(2-chloroisopropyl)ether	ND	0.097	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Bis(2-ethylhexyl)phthalate	ND	0.21	0.48		mg/Kg	1	7/28/2021 7:56:12 PM	61566
4-Bromophenyl phenyl ether	ND	0.10	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Butyl benzyl phthalate	ND	0.058	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Carbazole	ND	0.084	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
4-Chloro-3-methylphenol	ND	0.081	0.48		mg/Kg	1	7/28/2021 7:56:12 PM	61566
4-Chloroaniline	ND	0.093	0.48		mg/Kg	1	7/28/2021 7:56:12 PM	61566
2-Chloronaphthalene	ND	0.091	0.24		mg/Kg	1	7/28/2021 7:56:12 PM	61566
2-Chlorophenol	ND	0.10	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
4-Chlorophenyl phenyl ether	ND	0.081	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566

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

Analytical Report
Lab Order **2107A83**
Date Reported: **8/4/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon **Client Sample ID:** OW-69-6
Project: Well Installations 2021 **Collection Date:** 7/21/2021 12:15:00 PM
Lab ID: 2107A83-011 **Matrix:** MEOH (SOIL) **Received Date:** 7/21/2021 4:10:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **DAM**	
Chrysene	ND	0.085	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Di-n-butyl phthalate	ND	0.27	0.38		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Di-n-octyl phthalate	ND	0.12	0.38		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Dibenz(a,h)anthracene	ND	0.10	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Dibenzofuran	ND	0.10	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
1,2-Dichlorobenzene	ND	0.077	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
1,3-Dichlorobenzene	ND	0.068	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
1,4-Dichlorobenzene	ND	0.081	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
3,3´-Dichlorobenzidine	ND	0.14	0.24		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Diethyl phthalate	0.69	0.31	0.48	B	mg/Kg	1	7/28/2021 7:56:12 PM	61566
Dimethyl phthalate	ND	0.089	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
2,4-Dichlorophenol	ND	0.078	0.38		mg/Kg	1	7/28/2021 7:56:12 PM	61566
2,4-Dimethylphenol	ND	0.068	0.29		mg/Kg	1	7/28/2021 7:56:12 PM	61566
4,6-Dinitro-2-methylphenol	ND	0.081	0.38		mg/Kg	1	7/28/2021 7:56:12 PM	61566
2,4-Dinitrophenol	ND	0.048	0.48		mg/Kg	1	7/28/2021 7:56:12 PM	61566
2,4-Dinitrotoluene	ND	0.12	0.48		mg/Kg	1	7/28/2021 7:56:12 PM	61566
2,6-Dinitrotoluene	ND	0.097	0.48		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Fluoranthene	ND	0.077	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Fluorene	ND	0.085	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Hexachlorobenzene	ND	0.085	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Hexachlorobutadiene	ND	0.090	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Hexachlorocyclopentadiene	ND	0.11	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Hexachloroethane	ND	0.085	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Indeno(1,2,3-cd)pyrene	ND	0.11	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Isophorone	ND	0.078	0.38		mg/Kg	1	7/28/2021 7:56:12 PM	61566
1-Methylnaphthalene	ND	0.088	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
2-Methylnaphthalene	ND	0.079	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
2-Methylphenol	ND	0.081	0.38		mg/Kg	1	7/28/2021 7:56:12 PM	61566
3+4-Methylphenol	ND	0.079	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
N-Nitrosodi-n-propylamine	ND	0.089	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
N-Nitrosodimethylamine	ND	0.14	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
N-Nitrosodiphenylamine	ND	0.10	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Naphthalene	ND	0.090	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
2-Nitroaniline	ND	0.098	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
3-Nitroaniline	ND	0.11	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
4-Nitroaniline	ND	0.12	0.38		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Nitrobenzene	ND	0.079	0.38		mg/Kg	1	7/28/2021 7:56:12 PM	61566
2-Nitrophenol	ND	0.083	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
4-Nitrophenol	ND	0.079	0.24		mg/Kg	1	7/28/2021 7:56:12 PM	61566

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Qualifiers:

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D	Sample Diluted Due to Matrix
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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

Analytical Report
Lab Order **2107A83**
Date Reported: **8/4/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon **Client Sample ID:** OW-69-6
Project: Well Installations 2021 **Collection Date:** 7/21/2021 12:15:00 PM
Lab ID: 2107A83-011 **Matrix:** MEOH (SOIL) **Received Date:** 7/21/2021 4:10:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8270C: SEMIVOLATILES							Analyst: **DAM**	
Pentachlorophenol	ND	0.083	0.38		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Phenanthrene	ND	0.098	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Phenol	ND	0.074	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Pyrene	ND	0.073	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Pyridine	ND	0.15	0.38		mg/Kg	1	7/28/2021 7:56:12 PM	61566
1,2,4-Trichlorobenzene	ND	0.088	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
2,4,5-Trichlorophenol	ND	0.061	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
2,4,6-Trichlorophenol	ND	0.082	0.19		mg/Kg	1	7/28/2021 7:56:12 PM	61566
Surr: 2-Fluorophenol	49.7		20.3-74.1		%Rec	1	7/28/2021 7:56:12 PM	61566
Surr: Phenol-d5	56.2		23.1-92.7		%Rec	1	7/28/2021 7:56:12 PM	61566
Surr: 2,4,6-Tribromophenol	91.4		17.3-122		%Rec	1	7/28/2021 7:56:12 PM	61566
Surr: Nitrobenzene-d5	48.0		24.7-73.2		%Rec	1	7/28/2021 7:56:12 PM	61566
Surr: 2-Fluorobiphenyl	51.0		21.5-90.1		%Rec	1	7/28/2021 7:56:12 PM	61566
Surr: 4-Terphenyl-d14	65.2		15-140		%Rec	1	7/28/2021 7:56:12 PM	61566
EPA METHOD 8260B: VOLATILES							Analyst: **JMR**	
Benzene	ND	0.0065	0.017		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Toluene	ND	0.0035	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Ethylbenzene	ND	0.0082	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Methyl tert-butyl ether (MTBE)	ND	0.0067	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
1,2,4-Trimethylbenzene	ND	0.0048	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
1,3,5-Trimethylbenzene	ND	0.0076	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
1,2-Dichloroethane (EDC)	ND	0.0077	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
1,2-Dibromoethane (EDB)	ND	0.013	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Naphthalene	ND	0.0062	0.068		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
1-Methylnaphthalene	ND	0.039	0.14		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
2-Methylnaphthalene	ND	0.031	0.14		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Acetone	ND	0.030	0.51		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Bromobenzene	ND	0.0027	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Bromodichloromethane	ND	0.0031	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Bromoform	ND	0.0082	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Bromomethane	ND	0.030	0.10		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
2-Butanone	0.094	0.052	0.34	J	mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Carbon disulfide	ND	0.0082	0.34		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Carbon tetrachloride	ND	0.0030	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Chlorobenzene	ND	0.0054	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Chloroethane	ND	0.013	0.068		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Chloroform	ND	0.0047	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Chloromethane	ND	0.0033	0.10		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
2-Chlorotoluene	ND	0.0070	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017

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

Qualifiers:

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H	Holding times for preparation or analysis exceeded
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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

Analytical Report
Lab Order **2107A83**
Date Reported: **8/4/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon **Client Sample ID:** OW-69-6
Project: Well Installations 2021 **Collection Date:** 7/21/2021 12:15:00 PM
Lab ID: 2107A83-011 **Matrix:** MEOH (SOIL) **Received Date:** 7/21/2021 4:10:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **JMR**	
4-Chlorotoluene	ND	0.021	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
cis-1,2-DCE	ND	0.017	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
cis-1,3-Dichloropropene	ND	0.0045	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
1,2-Dibromo-3-chloropropane	ND	0.015	0.068		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Dibromochloromethane	ND	0.0044	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Dibromomethane	ND	0.0052	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
1,2-Dichlorobenzene	ND	0.0070	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
1,3-Dichlorobenzene	ND	0.0064	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
1,4-Dichlorobenzene	ND	0.0091	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Dichlorodifluoromethane	ND	0.010	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
1,1-Dichloroethane	ND	0.0057	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
1,1-Dichloroethene	ND	0.0049	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
1,2-Dichloropropane	ND	0.0058	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
1,3-Dichloropropane	ND	0.0074	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
2,2-Dichloropropane	ND	0.0040	0.068		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
1,1-Dichloropropene	ND	0.0036	0.068		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Hexachlorobutadiene	ND	0.0088	0.068		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
2-Hexanone	ND	0.0065	0.34		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Isopropylbenzene	ND	0.0063	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
4-Isopropyltoluene	ND	0.0087	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
4-Methyl-2-pentanone	ND	0.039	0.34		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Methylene chloride	ND	0.025	0.10		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
n-Butylbenzene	ND	0.0090	0.10		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
n-Propylbenzene	ND	0.0055	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
sec-Butylbenzene	ND	0.028	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Styrene	ND	0.0043	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
tert-Butylbenzene	ND	0.0078	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
1,1,1,2-Tetrachloroethane	ND	0.0030	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
1,1,2,2-Tetrachloroethane	ND	0.011	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Tetrachloroethene (PCE)	ND	0.0093	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
trans-1,2-DCE	ND	0.0058	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
trans-1,3-Dichloropropene	ND	0.0079	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
1,2,3-Trichlorobenzene	ND	0.0023	0.068		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
1,2,4-Trichlorobenzene	ND	0.012	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
1,1,1-Trichloroethane	ND	0.0075	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
1,1,2-Trichloroethane	ND	0.0030	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Trichloroethene (TCE)	ND	0.0052	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Trichlorofluoromethane	ND	0.0077	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
1,2,3-Trichloropropane	ND	0.014	0.068		mg/Kg	1	7/23/2021 2:22:27 AM	A80017

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
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RL	Reporting Limit

Analytical Report
Lab Order **2107A83**
Date Reported: **8/4/2021**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Marathon **Client Sample ID:** OW-69-6
Project: Well Installations 2021 **Collection Date:** 7/21/2021 12:15:00 PM
Lab ID: 2107A83-011 **Matrix:** MEOH (SOIL) **Received Date:** 7/21/2021 4:10:00 PM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8260B: VOLATILES							Analyst: **JMR**	
Vinyl chloride	ND	0.0028	0.034		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Xylenes, Total	ND	0.018	0.068		mg/Kg	1	7/23/2021 2:22:27 AM	A80017
Surr: Dibromofluoromethane	100		70-130		%Rec	1	7/23/2021 2:22:27 AM	A80017
Surr: 1,2-Dichloroethane-d4	103		70-130		%Rec	1	7/23/2021 2:22:27 AM	A80017
Surr: Toluene-d8	97.4		70-130		%Rec	1	7/23/2021 2:22:27 AM	A80017
Surr: 4-Bromofluorobenzene	101		70-130		%Rec	1	7/23/2021 2:22:27 AM	A80017
EPA METHOD 8015D MOD: GASOLINE RANGE							Analyst: **JMR**	
Gasoline Range Organics (GRO)	ND	0.94	3.4		mg/Kg	1	7/23/2021 2:22:27 AM	C80017
Surr: BFB	102	0	70-130		%Rec	1	7/23/2021 2:22:27 AM	C80017

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	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#: **2107A83**
04-Aug-21

Client: Marathon
Project: Well Installations 2021

Sample ID: **MB-61499** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **61499** RunNo: **80042**
Prep Date: **7/22/2021** Analysis Date: **7/23/2021** SeqNo: **2816402** 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	13		10.00		129	70	130			

Sample ID: **LCS-61499** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **61499** RunNo: **80042**
Prep Date: **7/22/2021** Analysis Date: **7/23/2021** SeqNo: **2816403** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	51	10	50.00	0	103	68.9	141			
Surr: DNOP	4.4		5.000		87.3	70	130			

Sample ID: **2107A83-010AMS** SampType: **MS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **OW-69-26** Batch ID: **61499** RunNo: **80042**
Prep Date: **7/22/2021** Analysis Date: **7/23/2021** SeqNo: **2816405** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	50	9.1	45.45	0	109	15	184			
Surr: DNOP	4.9		4.545		108	70	130			

Sample ID: **MB-61498** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **61498** RunNo: **80027**
Prep Date: **7/22/2021** Analysis Date: **7/23/2021** SeqNo: **2817071** 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	13		10.00		132	70	130			S

Sample ID: **LCS-61498** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **61498** RunNo: **80027**
Prep Date: **7/22/2021** Analysis Date: **7/23/2021** SeqNo: **2817072** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	64	10	50.00	0	128	68.9	141			
Surr: DNOP	6.6		5.000		131	70	130			S

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#: **2107A83**
04-Aug-21

Client: Marathon
Project: Well Installations 2021

Sample ID: **2107A83-010AMSD** SampType: **MSD** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **OW-69-26** Batch ID: **61499** RunNo: **80090**
Prep Date: **7/22/2021** Analysis Date: **7/26/2021** SeqNo: **2819394** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	44	8.6	42.77	0	102	15	184	12.7	23.9	
Surr: DNOP	5.0		4.277		116	70	130	0	0	

Sample ID: **LCS-61655** SampType: **LCS** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **61655** RunNo: **80212**
Prep Date: **7/29/2021** Analysis Date: **7/30/2021** SeqNo: **2824813** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	5.5		5.000		110	70	130			

Sample ID: **MB-61655** SampType: **MBLK** TestCode: **EPA Method 8015M/D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **61655** RunNo: **80212**
Prep Date: **7/29/2021** Analysis Date: **7/30/2021** SeqNo: **2824814** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	11		10.00		114	70	130			

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
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2107A83**
04-Aug-21

Client: Marathon
Project: Well Installations 2021

Sample ID: **100ng lcs** SampType: **LCS** TestCode: **EPA Method 8260B: Volatiles**
Client ID: **LCSS** Batch ID: **A80017** RunNo: **80017**
Prep Date: Analysis Date: **7/22/2021** SeqNo: **2815786** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.025	1.000	0	110	70	130			
Toluene	1.0	0.050	1.000	0	99.9	70	130			
Chlorobenzene	0.97	0.050	1.000	0	97.2	70	130			
1,1-Dichloroethene	1.0	0.050	1.000	0	105	70	130			
Trichloroethene (TCE)	0.93	0.050	1.000	0	93.4	70	130			
Surr: Dibromofluoromethane	0.49		0.5000		97.6	70	130			
Surr: 1,2-Dichloroethane-d4	0.50		0.5000		99.6	70	130			
Surr: Toluene-d8	0.49		0.5000		98.2	70	130			
Surr: 4-Bromofluorobenzene	0.54		0.5000		108	70	130			

Sample ID: **mb** SampType: **MBLK** TestCode: **EPA Method 8260B: Volatiles**
Client ID: **PBS** Batch ID: **A80017** RunNo: **80017**
Prep Date: Analysis Date: **7/22/2021** SeqNo: **2815787** 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								

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2107A83**
04-Aug-21

Client: Marathon
Project: Well Installations 2021

Sample ID: **mb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **PBS**	Batch ID: **A80017**	RunNo: **80017**
Prep Date:	Analysis Date: **7/22/2021**	SeqNo: **2815787** Units: **mg/Kg**

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

Qualifiers:

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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#: **2107A83**
04-Aug-21

Client: Marathon
Project: Well Installations 2021

Sample ID: **mb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: Volatiles**
Client ID: **PBS**	Batch ID: **A80017**	RunNo: **80017**
Prep Date:	Analysis Date: **7/22/2021**	SeqNo: **2815787** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: Dibromofluoromethane	0.50		0.5000		101	70	130			
Surr: 1,2-Dichloroethane-d4	0.50		0.5000		100	70	130			
Surr: Toluene-d8	0.49		0.5000		97.2	70	130			
Surr: 4-Bromofluorobenzene	0.52		0.5000		104	70	130			

Qualifiers:

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B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
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QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2107A83**
04-Aug-21

Client: Marathon
Project: Well Installations 2021

Sample ID: **mb-61566** SampType: **MBLK** TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **PBS** Batch ID: **61566** RunNo: **80150**
Prep Date: **7/26/2021** Analysis Date: **7/28/2021** SeqNo: **2822045** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	ND	0.20								
Acenaphthylene	ND	0.20								
Aniline	ND	0.20								
Anthracene	ND	0.20								
Azobenzene	ND	0.20								
Benz(a)anthracene	ND	0.20								
Benzo(a)pyrene	ND	0.20								
Benzo(b)fluoranthene	ND	0.20								
Benzo(g,h,i)perylene	ND	0.20								
Benzo(k)fluoranthene	ND	0.20								
Benzoic acid	ND	0.50								
Benzyl alcohol	ND	0.20								
Bis(2-chloroethoxy)methane	ND	0.20								
Bis(2-chloroethyl)ether	ND	0.20								
Bis(2-chloroisopropyl)ether	ND	0.20								
Bis(2-ethylhexyl)phthalate	ND	0.50								
4-Bromophenyl phenyl ether	ND	0.20								
Butyl benzyl phthalate	ND	0.20								
Carbazole	ND	0.20								
4-Chloro-3-methylphenol	ND	0.50								
4-Chloroaniline	ND	0.50								
2-Chloronaphthalene	ND	0.25								
2-Chlorophenol	ND	0.20								
4-Chlorophenyl phenyl ether	ND	0.20								
Chrysene	ND	0.20								
Di-n-butyl phthalate	ND	0.40								
Di-n-octyl phthalate	ND	0.40								
Dibenz(a,h)anthracene	ND	0.20								
Dibenzofuran	ND	0.20								
1,2-Dichlorobenzene	ND	0.20								
1,3-Dichlorobenzene	ND	0.20								
1,4-Dichlorobenzene	ND	0.20								
3,3´-Dichlorobenzidine	ND	0.25								
Diethyl phthalate	0.76	0.50								
Dimethyl phthalate	ND	0.20								
2,4-Dichlorophenol	ND	0.40								
2,4-Dimethylphenol	ND	0.30								
4,6-Dinitro-2-methylphenol	ND	0.40								
2,4-Dinitrophenol	ND	0.50								

Qualifiers:

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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#: **2107A83**
04-Aug-21

Client: Marathon
Project: Well Installations 2021

Sample ID: **mb-61566**	SampType: **MBLK**	TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **PBS**	Batch ID: **61566**	RunNo: **80150**
Prep Date: **7/26/2021**	Analysis Date: **7/28/2021**	SeqNo: **2822045** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene	ND	0.50								
2,6-Dinitrotoluene	ND	0.50								
Fluoranthene	ND	0.20								
Fluorene	ND	0.20								
Hexachlorobenzene	ND	0.20								
Hexachlorobutadiene	ND	0.20								
Hexachlorocyclopentadiene	ND	0.20								
Hexachloroethane	ND	0.20								
Indeno(1,2,3-cd)pyrene	ND	0.20								
Isophorone	ND	0.40								
1-Methylnaphthalene	ND	0.20								
2-Methylnaphthalene	ND	0.20								
2-Methylphenol	ND	0.40								
3+4-Methylphenol	ND	0.20								
N-Nitrosodi-n-propylamine	ND	0.20								
N-Nitrosodimethylamine	ND	0.20								
N-Nitrosodiphenylamine	ND	0.20								
Naphthalene	ND	0.20								
2-Nitroaniline	ND	0.20								
3-Nitroaniline	ND	0.20								
4-Nitroaniline	ND	0.40								
Nitrobenzene	ND	0.40								
2-Nitrophenol	ND	0.20								
4-Nitrophenol	ND	0.25								
Pentachlorophenol	ND	0.40								
Phenanthrene	ND	0.20								
Phenol	ND	0.20								
Pyrene	ND	0.20								
Pyridine	ND	0.40								
1,2,4-Trichlorobenzene	ND	0.20								
2,4,5-Trichlorophenol	ND	0.20								
2,4,6-Trichlorophenol	ND	0.20								
Surr: 2-Fluorophenol	1.7		3.330		50.7	20.3	74.1			
Surr: Phenol-d5	2.1		3.330		63.0	23.1	92.7			
Surr: 2,4,6-Tribromophenol	2.4		3.330		73.2	17.3	122			
Surr: Nitrobenzene-d5	0.85		1.670		51.2	24.7	73.2			
Surr: 2-Fluorobiphenyl	0.97		1.670		57.9	21.5	90.1			
Surr: 4-Terphenyl-d14	2.1		1.670		123	15	140			

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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2107A83**
04-Aug-21

Client: Marathon
Project: Well Installations 2021

Sample ID: **lcs-61566** SampType: **LCS** TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **LCSS** Batch ID: **61566** RunNo: **80150**
Prep Date: **7/26/2021** Analysis Date: **7/28/2021** SeqNo: **2822046** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	1.1	0.20	1.670	0	68.3	22.9	109			
4-Chloro-3-methylphenol	2.3	0.50	3.330	0	68.5	24.2	109			
2-Chlorophenol	1.8	0.20	3.330	0	55.5	18.8	103			
1,4-Dichlorobenzene	0.83	0.20	1.670	0	49.5	18.8	89.5			
2,4-Dinitrotoluene	1.1	0.50	1.670	0	66.1	20.2	94.5			
N-Nitrosodi-n-propylamine	1.1	0.20	1.670	0	64.4	19.2	96.9			
4-Nitrophenol	3.0	0.25	3.330	0	90.9	25	118			
Pentachlorophenol	2.5	0.40	3.330	0	74.1	24.1	107			
Phenol	2.1	0.20	3.330	0	62.8	17.8	112			
Pyrene	1.8	0.20	1.670	0	110	25.9	125			
1,2,4-Trichlorobenzene	0.91	0.20	1.670	0	54.4	18.5	92.8			
Surr: 2-Fluorophenol	1.7		3.330		52.3	20.3	74.1			
Surr: Phenol-d5	2.1		3.330		63.7	23.1	92.7			
Surr: 2,4,6-Tribromophenol	2.5		3.330		75.2	17.3	122			
Surr: Nitrobenzene-d5	0.95		1.670		57.1	24.7	73.2			
Surr: 2-Fluorobiphenyl	1.1		1.670		63.3	21.5	90.1			
Surr: 4-Terphenyl-d14	2.1		1.670		124	15	140			

Sample ID: **2107a83-001ams** SampType: **MS** TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **OW-66-18** Batch ID: **61566** RunNo: **80150**
Prep Date: **7/26/2021** Analysis Date: **7/28/2021** SeqNo: **2822048** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	0.95	0.19	1.625	0	58.5	24.8	111			
4-Chloro-3-methylphenol	2.2	0.49	3.239	0	67.1	40.7	97.8			
2-Chlorophenol	1.9	0.19	3.239	0	57.5	21.2	91.6			
1,4-Dichlorobenzene	0.57	0.19	1.625	0	35.3	17.8	74.2			
2,4-Dinitrotoluene	0.94	0.49	1.625	0	58.0	36.5	81.5			
N-Nitrosodi-n-propylamine	1.1	0.19	1.625	0	66.9	25.5	85.2			
4-Nitrophenol	3.0	0.24	3.239	0	92.5	15	143			
Pentachlorophenol	2.8	0.39	3.239	0	87.9	15	116			
Phenol	2.2	0.19	3.239	0.1480	64.1	24.8	94.5			
Pyrene	1.7	0.19	1.625	0	108	42	112			
1,2,4-Trichlorobenzene	0.80	0.19	1.625	0	49.1	18.5	85.3			
Surr: 2-Fluorophenol	0		3.239		0	20.3	74.1			S
Surr: Phenol-d5	2.2		3.239		67.3	23.1	92.7			
Surr: 2,4,6-Tribromophenol	3.0		3.239		93.1	17.3	122			
Surr: Nitrobenzene-d5	0.86		1.625		53.1	24.7	73.2			
Surr: 2-Fluorobiphenyl	0.83		1.625		51.2	21.5	90.1			

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
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2107A83**
04-Aug-21

Client: Marathon
Project: Well Installations 2021

Sample ID: **2107a83-001ams** SampType: **MS** TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **OW-66-18** Batch ID: **61566** RunNo: **80150**
Prep Date: **7/26/2021** Analysis Date: **7/28/2021** SeqNo: **2822048** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Terphenyl-d14	0.85		1.625		52.5	15	140			

Sample ID: **2107a83-001amsd** SampType: **MSD** TestCode: **EPA Method 8270C: Semivolatiles**
Client ID: **OW-66-18** Batch ID: **61566** RunNo: **80150**
Prep Date: **7/26/2021** Analysis Date: **7/28/2021** SeqNo: **2822049** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Acenaphthene	1.0	0.20	1.661	0	62.7	24.8	111	9.01	20	
4-Chloro-3-methylphenol	2.2	0.50	3.311	0	66.5	40.7	97.8	1.30	20	
2-Chlorophenol	2.0	0.20	3.311	0	60.2	21.2	91.6	6.66	20	
1,4-Dichlorobenzene	0.69	0.20	1.661	0	41.5	17.8	74.2	18.2	20	
2,4-Dinitrotoluene	0.94	0.50	1.661	0	56.8	36.5	81.5	0.0592	20	
N-Nitrosodi-n-propylamine	1.2	0.20	1.661	0	72.0	25.5	85.2	9.48	20	
4-Nitrophenol	2.9	0.25	3.311	0	89.0	15	143	1.72	20	
Pentachlorophenol	2.9	0.40	3.311	0	88.5	15	116	2.97	20	
Phenol	2.3	0.20	3.311	0.1480	65.4	24.8	94.5	3.95	20	
Pyrene	1.8	0.20	1.661	0	108	42	112	2.16	20	
1,2,4-Trichlorobenzene	0.92	0.20	1.661	0	55.2	18.5	85.3	13.9	20	
Surr: 2-Fluorophenol	0		3.311		0	20.3	74.1	0	0	S
Surr: Phenol-d5	2.2		3.311		67.4	23.1	92.7	0	0	
Surr: 2,4,6-Tribromophenol	3.0		3.311		90.3	17.3	122	0	0	
Surr: Nitrobenzene-d5	0.93		1.661		56.2	24.7	73.2	0	0	
Surr: 2-Fluorobiphenyl	0.97		1.661		58.6	21.5	90.1	0	0	
Surr: 4-Terphenyl-d14	0.96		1.661		57.7	15	140	0	0	

Qualifiers:

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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#: **2107A83**
04-Aug-21

Client: Marathon
Project: Well Installations 2021

Sample ID: **MB-61495** SampType: **MBLK** TestCode: **EPA Method 7471: Mercury**
Client ID: **PBS** Batch ID: **61495** RunNo: **80020**
Prep Date: **7/22/2021** Analysis Date: **7/23/2021** SeqNo: **2815962** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.033								

Sample ID: **LLLCS-61495** SampType: **LCSLL** TestCode: **EPA Method 7471: Mercury**
Client ID: **BatchQC** Batch ID: **61495** RunNo: **80020**
Prep Date: **7/22/2021** Analysis Date: **7/23/2021** SeqNo: **2815963** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0063	0.033	0.006660	0	94.2	70	130			J

Sample ID: **LCS-61495** SampType: **LCS** TestCode: **EPA Method 7471: Mercury**
Client ID: **LCSS** Batch ID: **61495** RunNo: **80020**
Prep Date: **7/22/2021** Analysis Date: **7/23/2021** SeqNo: **2815964** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.17	0.033	0.1667	0	101	80	120			

Sample ID: **2107A83-007AMS** SampType: **MS** TestCode: **EPA Method 7471: Mercury**
Client ID: **OW-67-17** Batch ID: **61495** RunNo: **80020**
Prep Date: **7/22/2021** Analysis Date: **7/23/2021** SeqNo: **2816001** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.17	0.18	0.1802	0	93.5	80	120			J

Sample ID: **2107A83-007AMSD** SampType: **MSD** TestCode: **EPA Method 7471: Mercury**
Client ID: **OW-67-17** Batch ID: **61495** RunNo: **80020**
Prep Date: **7/22/2021** Analysis Date: **7/23/2021** SeqNo: **2816002** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.21	0.17	0.1761	0	117	80	120	19.9	20	

Qualifiers:

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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

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **2107A83**
04-Aug-21

Client: Marathon
Project: Well Installations 2021

Sample ID: **MB-61509** SampType: **MBLK** TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **PBS** Batch ID: **61509** RunNo: **80056**
Prep Date: **7/22/2021** Analysis Date: **7/23/2021** SeqNo: **2817187** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	2.5								
Barium	ND	0.10								
Cadmium	0.059	0.10								J
Chromium	ND	0.30								
Lead	ND	0.30								
Silver	ND	0.25								

Sample ID: **LCS-61509** SampType: **LCS** TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **LCSS** Batch ID: **61509** RunNo: **80056**
Prep Date: **7/22/2021** Analysis Date: **7/23/2021** SeqNo: **2817189** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	24	2.5	25.00	0	95.5	80	120			
Barium	24	0.10	25.00	0	97.0	80	120			
Cadmium	24	0.10	25.00	0	95.8	80	120			
Chromium	24	0.30	25.00	0	97.4	80	120			
Lead	25	0.30	25.00	0	98.8	80	120			
Silver	4.8	0.25	5.000	0	95.6	80	120			

Sample ID: **2107A83-001AMS** SampType: **MS** TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **OW-66-18** Batch ID: **61509** RunNo: **80056**
Prep Date: **7/22/2021** Analysis Date: **7/23/2021** SeqNo: **2817240** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	23	5.2	25.83	2.912	78.4	75	125			
Cadmium	23	0.21	25.83	0	89.5	75	125			
Chromium	28	0.62	25.83	4.279	92.6	75	125			
Lead	26	0.62	25.83	1.205	97.0	75	125			
Silver	5.0	0.52	5.165	0	96.2	75	125			

Sample ID: **2107A83-001AMSD** SampType: **MSD** TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **OW-66-18** Batch ID: **61509** RunNo: **80056**
Prep Date: **7/22/2021** Analysis Date: **7/23/2021** SeqNo: **2817244** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	27	5.2	25.83	2.912	92.4	75	125	14.4	20	
Cadmium	24	0.21	25.83	0	92.9	75	125	3.81	20	
Chromium	31	0.62	25.83	4.279	102	75	125	7.88	20	
Lead	26	0.62	25.83	1.205	94.4	75	125	2.57	20	
Silver	4.5	0.52	5.165	0	87.6	75	125	9.40	20	

Qualifiers:

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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#: **2107A83**
04-Aug-21

Client: Marathon
Project: Well Installations 2021

Sample ID: **MB-61509** SampType: **MBLK** TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **PBS** Batch ID: **61509** RunNo: **80177**
Prep Date: **7/22/2021** Analysis Date: **7/29/2021** SeqNo: **2823029** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Selenium	ND	2.5								

Sample ID: **LCS-61509** SampType: **LCS** TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **LCSS** Batch ID: **61509** RunNo: **80177**
Prep Date: **7/22/2021** Analysis Date: **7/29/2021** SeqNo: **2823031** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Selenium	22	2.5	25.00	0	89.2	80	120			

Sample ID: **2107A83-001AMS** SampType: **MS** TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **OW-66-18** Batch ID: **61509** RunNo: **80177**
Prep Date: **7/22/2021** Analysis Date: **7/29/2021** SeqNo: **2823077** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Selenium	21	5.2	25.83	0	80.2	75	125			

Sample ID: **2107A83-001AMSD** SampType: **MSD** TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **OW-66-18** Batch ID: **61509** RunNo: **80177**
Prep Date: **7/22/2021** Analysis Date: **7/29/2021** SeqNo: **2823078** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Selenium	23	5.2	25.83	0	87.9	75	125	9.15	20	

Sample ID: **2107A83-001APS** SampType: **PS** TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **OW-66-18** Batch ID: **61509** RunNo: **80177**
Prep Date: Analysis Date: **7/29/2021** SeqNo: **2823082** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	490	26	129.1	343.2	110	80	120			

Qualifiers:

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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#: **2107A83**
04-Aug-21

Client: Marathon
Project: Well Installations 2021

Sample ID: **2.5ug gro lcs**	SampType: **LCS**	TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **LCSS**	Batch ID: **C80017**	RunNo: **80017**
Prep Date:	Analysis Date: **7/22/2021**	SeqNo: **2815823** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	23	5.0	25.00	0	93.8	70	130			
Surr: BFB	480		500.0		96.8	70	130			

Sample ID: **mb**	SampType: **MBLK**	TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **PBS**	Batch ID: **C80017**	RunNo: **80017**
Prep Date:	Analysis Date: **7/22/2021**	SeqNo: **2815824** 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	490		500.0		98.9	70	130			

Sample ID: **mb**	SampType: **MBLK**	TestCode: **EPA Method 8015D Mod: Gasoline Range**
Client ID: **PBS**	Batch ID: **R80062**	RunNo: **80062**
Prep Date:	Analysis Date: **7/23/2021**	SeqNo: **2817654** 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	510		500.0		102	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
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PQL	Practical Quanitative Limit
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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

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

Sample Log-In Check List

Client Name: **Marathon** Work Order Number: **2107A83** RcptNo: **1**

Received By: **Kasandra Payan** **7/21/2021 4:10:00 PM**

Completed By: **Desiree Dominguez** **7/21/2021 4:30:26 PM**

Reviewed By: KPG 7/22/21

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 ☐ Approved by client.
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. Received at least 1 vial with headspace <1/4" for AQ VOA? Yes ☐ No ☐ NA ☑
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: JR 7/22/21

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	11.6	Good				

Chain-of-Custody Record

Client: Marathon - Gallup Refinery

Mailing Address:

Phone #: 970-481-0718

email or Fax#: Lalexander@trihydro.com

QA/QC Package:
☑ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☒ EDD (Type)

Turn-Around Time:
☐ Standard ☐ Rush

Project Name: Well Installations - 2021

Project #: 697-092-001

Project Manager: Lesli Alexander

Sampler: M. Swift, W. Glenn

On Ice: ☑ Yes ☐ No

# of Coolers: 1

Cooler Temp(including CF): 11.8 - 0.2 = 11.6 (°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 Name	Container Type and #	Preservative Type	HEAL No. 2107A83
7/19/21	1200	S	OW-66-18	glass/4	Methanol	-001
↓	1150	↓	OW-66-26	↓	↓	-002
↓	1555	↓	OW-13A-14	↓	↓	-003
↓	1545	↓	OW-13A-25.5	↓	↓	-004
7/20/21	1715	↓	OW-68-22	↓	↓	-005
↓	1520	↓	OW-68-26	↓	↓	-006
↓	1210	↓	OW-67-17	↓	↓	-007
↓	1225	↓	OW-67-26	↓	↓	-008
			trip blank	glass/1	MeOH	-009
7/21/21	1210	S	OW-69-26	glass/a	↓	-010
↓	1215	↓	OW-69-6	glass/a	↓	-011

Analysis Request

BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)
	X				X		X	X	
	↓				↓		↓	↓	
	↓				↓		↓	↓	
	↓				↓		↓	↓	
	↓				↓		↓	↓	
	↓				↓		↓	↓	
	↓				↓		↓	↓	
	↓				↓		↓	↓	
	↓				↓		↓	↓	
	X				X		X	X	
	↓				↓		↓	↓	

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
7/21/21	1400	M. Swift		Courier	7/21/21	16:10
Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time

Remarks:

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.

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 51836

CONDITIONS

Operator: Western Refining Southwest LLC 539 South Main Street Findlay, OH 45840	OGRID: 267595
	Action Number: 51836
	Action Type: [UF-DP] Discharge Permit (DISCHARGE PERMIT)

CONDITIONS

Created By	Condition	Condition Date
scwells	Accepted for Record Retention Purposes-Only	11/22/2022