



Western Refining Southwest LLC

A subsidiary of Marathon Petroleum Corporation

I-40 Exit 39
Jamestown, NM 87347

March 31, 2022

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

**RE: Response to Direction, Response to Approval with Modifications
French Drain Soil Sampling Investigation Work Plan
Western Refining Southwest LLC, Marathon Gallup Refinery
EPA ID# NMD000333211
HWB-WRG-20-022**

Dear Mr. Pierard:

Western Refining Southwest LLC (D/B/A Marathon Gallup Refinery) is submitting this response to comments contained in the New Mexico Environment Department (NMED) *Direction, Response to Approval with Modifications, French Drain Soil Sampling Investigation Work Plan* letter dated November 9, 2021. A timeline of the report is as follows:

- Report, submitted December 15, 2020
- *Approval with Modifications*, received January 8, 2021
- Response to Approval with Modifications, submitted September 30, 2021
- *Direction, Response to Approval with Modifications*, received November 9, 2021

The response to comments is provided in Attachment A. This submittal includes two hard copies of the report and a CD with an electronic copy of the redlined report and the revised report. The electronic copies will be submitted by email to NMED.

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.



Western Refining Southwest LLC

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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

A handwritten signature in black ink that reads 'Ruth A Cade'.

Ruth Cade
Vice-President

Enclosures

cc: D. Cobrain, NMED HWB
M. Suzuki, NMED HWB
L. Barr, NMOCD
L. King, EPA Region 6
M. Bracey, Marathon Petroleum Corporation
K. Luka, Marathon Petroleum Corporation
J. Moore, Marathon Gallup Refinery
H. Jones, Trihydro

ATTACHMENT A
RESPONSE TO COMMENTS

New Mexico Environment Department (NMED) to Marathon Petroleum Company (MPC) Comment Letter “Direction, Response to Approval with Modifications, French Drain Soil Sampling Investigation Work Plan” (November 9, 2021)

NMED Comment 1:	MPC Response 1:
<p>In the response to NMED's Approval with Modifications Comment 1, the Permittee states, “[t]anks 569, 570, 571, 572, and 354 are drained and out of service due to the indefinite idle of the Refinery.” Figure 3 (Proposed Soil Boring Locations) and Permit Attachment J (Plant Layout) designate the referenced tank as 345 rather than 354. Correct the typographical error in the revised Work Plan.</p>	<p>The text on page 5, <i>Background</i>, has been revised to state, “[t]anks 569, 570, 571, 572, and 345 are drained and out of service due to the indefinite idle of the Refinery.”</p>
NMED Comment 2:	MPC Response 2:
<p>In the response to NMED's Approval with Modifications Comment 2, the Permittee states, “Figure 3, Proposed Soil Boring Locations, does not depict any proposed soil boring north of STP-1 because the area was included in Sitewide LIF Investigation, completed during the week of May 10, 2021.” The results obtained from the referenced LIF investigation have not been reviewed or approved by NMED. The results obtained from the Sitewide LIF Investigation may only be used for screening purposes for the French Drain Soil Sampling Investigation. In addition, the results obtained from the LIF investigation do not provide information regarding presence/absence of a concentration exceedance for each contaminant of concern (COC). Therefore, the Permittee is required to include the collection of soil samples north or northwest of STP-1, as directed by NMED's Approval with Modifications Comment 7. Propose to collect soil samples required by Comment 7 in the revised Work Plan or provide a separate work plan for collecting soil samples north/northwest of STP-1.</p>	<p>The comment is acknowledged. MPC has added the requested borings to the revised work plan. Figure 3 has been revised and text updated.</p>

New Mexico Environment Department (NMED) to Marathon Petroleum Company (MPC) Comment Letter “Direction, Response to Approval with Modifications, French Drain Soil Sampling Investigation Work Plan” (November 9, 2021)

NMED Comment 3:	MPC Response 3:
<p>In the response to NMED's Approval with Modifications Comment 3, the Permittee states, “Figure 3, Proposed Soil Boring Location, does not depict any proposed soil borings in the vicinity of the well OW-61 because the area was included in Sitewide LIF Investigation, completed during the week of May 10, 2021. The Sitewide LIF location figure is provided in Attachment C. V-trenches installed during the Sitewide LIF Investigation allowed data collection in the 0 to 10 ft bgs interval that would be absent due to hydro-excavation. LIF logs for EB-LIF 34 and EB-LIF-27 (Attachment C) show less than 10% RE in the 0 to 10 ft bgs interval, indicating no to low SPH impact in the shallow zone.” According to the UVOST logs included in Attachment C, elevated % RE (272.2% RE at EB-LIF-27 at 14.46 feet bgs and 43.4% RE at EB-LIF-34) were observed in the vicinity of well OW-61. However, % RE appears to be negligible at depths shallower than ten feet below ground surface (bgs) at the locations; therefore, it is likely that the Separate Phase Hydrocarbon (SPH) detected in the French Drain did not originate from the vicinity of well OW-61 (e.g., Tank 572) and the elevated % RE detected in the vicinity of well OW-61 is not related to the French Drain Soil Sampling Investigation. Therefore, soil sampling is not required in the vicinity of well OW-61 as part of this investigation. The residual contamination detected in the vicinity of well OW-61 must be addressed separately. NMED received additional LIF investigation results on October 28, 2021. NMED will evaluate the LIF investigation results to determine if it is necessary for the Permittee to submit a separate work plan to investigate the residual contamination detected in the vicinity of well OW-61.</p>	<p>The comment is acknowledged.</p>

New Mexico Environment Department (NMED) to Marathon Petroleum Company (MPC) Comment Letter “Direction, Response to Approval with Modifications, French Drain Soil Sampling Investigation Work Plan” (November 9, 2021)

NMED Comment 4:	MPC Response 4:
<p>In the response to NMED's Approval with Modifications Comment 3, the Permittee states, “[b]orings are also not proposed near the location of OW-64. Well OW-64 is located adjacent to the February 2018 excavation #4 (Figure 3) conducted to investigate a hydrocarbon release from the drain line of the STP-1 French Drain. Borehole depths were not recorded but are estimated to reach 6 to 8 ft bgs. Excavation #4 showed no visible sign of SPH impact.” Although the data suggests that soil contamination remains at depths deeper than 10 feet bgs in the vicinity of well OW-64, it is likely that the SPH detected in the French Drain did not originate from the vicinity of well OW-64 (e.g., Tank 338) and the residual contamination in the vicinity of well OW-64 is unrelated to the French Drain. Therefore, soil sampling is not required in the vicinity of well OW-64 as part of this investigation. The residual contamination detected in the vicinity of well OW-64 may need to be addressed in a separate investigation depending on the NMED's review of the additional LIF investigation results (see Comment 3).</p>	<p>The comment is acknowledged.</p>

New Mexico Environment Department (NMED) to Marathon Petroleum Company (MPC) Comment Letter “Direction, Response to Approval with Modifications, French Drain Soil Sampling Investigation Work Plan” (November 9, 2021)

NMED Comment 5:	MPC Response 5:
<p>In the response to NMED's Approval with Modifications Comment 5, the Permittee states, “[t]he May 2021 LIF borings show the following % RE:</p> <ul style="list-style-type: none"> • EB-LIF-98: Diesel-type SPH 150% RE • WB-LIF-100: Gas/Diesel-type SPH 20% RE • WB-LIF-110: No LIF response • WB-LIF-116: No LIF response • WB-LIF-117: No LIF response • WB-LIF-118: No LIF response • WB-LIF-119: Gas/Diesel-type SPH 350% RE <p>MPC will collect three (3) soil samples from borings located near EB-LIF-98 and WB-LIF-119, i.e., those with the highest response. Soil samples will be collected at the water-table from the remainder boring locations.” As stated in Comment 2 above, the LIF investigation results may only be used for screening purposes (e.g., selection of sampling locations) and must not be used for compliance purposes (e.g., demonstration of compliance, omission of sample locations) because the Sitewide LIF Investigation report has not been reviewed or approved by NMED. In addition, according to the UVOST logs included in Attachment C, an elevated % RE (15.4% RE at 7.38 feet bgs) is also recorded in boring WB-LIF-116. Propose to collect three additional soil samples from the borings proposed near WB-LIF-100 and WB-LIF-116 in the same manner described for the borings proposed to be advanced near EB-LIF-98 and WB-LIF-119. The Permittee must also propose to collect three additional soil samples from the remainder of the proposed boring locations near WB-LIF-110, WB-LIF-117, and WB-LIF-118 in the same manner described for the borings to be advanced near EB-LIF-98 and WB-LIF-119. Even if an LIF response was not observed from these locations, the COCs may exceed the applicable screening levels. Furthermore, the results obtained from LIF Investigation do not provide information regarding the presence/absence of a concentration exceedance for each COC. Revise the Work Plan to include the additional soil samples.</p>	<p>The comment is acknowledged. Page 6, <i>Scope of Activities</i>, has been revised to state, “[a] Geoprobe drill rig will be used to advance soil borings and soil samples will be collected at each boring location. The nine proposed borings will be sampled at up to three intervals: the vadose zone interval with the highest PID reading, the water table, and the boring termination depth, if water is not encountered. The proposed locations are shown on Figure 3.”</p>

New Mexico Environment Department (NMED) to Marathon Petroleum Company (MPC) Comment Letter “Direction, Response to Approval with Modifications, French Drain Soil Sampling Investigation Work Plan” (November 9, 2021)

NMED Comment 6:	MPC Response 6:
<p>In the response to NMED's Approval with Modifications Comment 7, the Permittee states, “Figure 3, Proposed Soil Boring Location, does not depict any proposed soil borings in the vicinity of BH-3 and potential impacts north west of the French Drain because the area was included in Sitewide LIF Investigation, completed during the week of May 10, 2021. The Sitewide LIF location figure is provided in Attachment C. The Sitewide LIF investigation provided adequate coverage of the area.” Address the following:</p> <p>a. The Permittee is reminded that the results obtained from the referenced LIF investigation have not been reviewed or approved by NMED, therefore, it is not appropriate to propose to omit the requirement for the sample collection based on such data (see Comments 2, 3, 4 and 5).</p> <p>b. Figure 3 (Proposed Soil Boring Locations) depicts six proposed boring locations, however, some of the proposed locations do not appear to be consistent with the boring locations proposed in the response to NMED's Approval with Modifications Comment 5 (e.g., borings to be installed near EB-LIF-98, WB-LIF-100, -110, -116, -117, -118, and -119). Revise Figure 3 to include the seven boring locations proposed in the response to NMED’s Approval with Modifications Comment 5.</p> <p>c. NMED's Approval with Modifications Comment 7 requires the Permittee to install two additional soil borings: one east of Evaporation Pond 1 and one northwest of STP-1 where the French Drain merges with the stormwater drainage system. The Sitewide LIF investigation results cannot be substituted for the required investigation for the reasons stated above. Although the proposed boring near WB-LIF-117 (which is already included in the scope of the Work Plan) is representative of the required boring east of Evaporation Pond 1, the Permittee must propose to install an additional soil boring near EB-LIF-137 where the French Drain merges with the stormwater drainage system to address Comment 7. Include these soil boring locations in the revised Work Plan.</p>	<p>a. The comment is acknowledged.</p> <p>b. Figure 3 has been revised to include the seven boring locations in close proximity to the locations requested by NMED.</p> <p>c. Figure 3 has been revised to include the two boring locations in close proximity to the locations requested by NMED.</p>

New Mexico Environment Department (NMED) to Marathon Petroleum Company (MPC) Comment Letter “Direction, Response to Approval with Modifications, French Drain Soil Sampling Investigation Work Plan” (November 9, 2021)

NMED Comment 7:	MPC Response 7:
<p>In the response to NMED's Approval with Modifications Comment 8, the Permittee states, “[i]f exceedances are detected in confirmation samples, additional step-out borings will be installed 25 ft from the original boring location.” NMED's Approval with Modifications Comment 8 states, “if exceedances are detected in confirmation samples, additional step-out borings must be installed five feet from the original locations.” To clarify, this direction only applies to those cases where exceedances are detected in samples collected at the termination depth of the boring. The proposed investigation method (i.e., installation of additional step-out borings 25 feet from the original boring location) is acceptable to delineate the lateral extent of contamination; however, it does not apply for the delineation of the vertical extent of contamination. Therefore, if exceedances are detected in the samples collected from the termination depth of the borings, additional step-out borings must be installed within five feet from the original locations and the Permittee must collect a soil sample from a depth five feet deeper than the termination depth of the original boring. This procedure may need to be repeated until the vertical extent of contamination is delineated or the boring depth reaches at the Chinle/Alluvial interface. Include the provision in the revised Work Plan.</p>	<p>Page 6, <i>Scope of Activities</i>, has been revised to state, “[i]f impacts are observed at the boring termination depth based on analytical exceedances, additional soil borings will be advanced to at least 5 ft below the deepest detected contamination in the original boring to delineate vertical distribution. These additional step-out borings will be drilled 5 ft downgradient from the original boring location and will extend 5 ft beyond the termination depth of the original boring. One sample will be collected from the termination depth of each additional step-out boring. The 5 ft step-out and 5 ft step-down will continue until unimpacted soil or the Chinle/Alluvium interface is encountered, whichever occurs first.</p> <p>If impacts are observed within the original boring (i.e., between surface and terminus), additional soil borings will be advanced to at least 5 ft below the deepest detected contamination based on analytical exceedances. These additional step-out borings will be drilled 25 ft downgradient from the original boring location and sampled at up to three intervals: the vadose zone interval with the highest PID reading, the water table, and the boring termination depth, if water is not encountered. The 25 ft step-out will continue until unimpacted soil is encountered.”</p> <p>Page 7, <i>Investigation Methods</i>, has been revised to state, “[t]he proposed locations include nine boreholes around the STP-1 French Drain area and additional step-out borings installed as needed based on analytical exceedances.”</p> <p>Page 8, <i>Sample Frequency</i>, has been revised to state, “[s]oil samples will be collected at up to three depths from the nine borings: the vadose zone interval with the highest PID reading,</p>

New Mexico Environment Department (NMED) to Marathon Petroleum Company (MPC) Comment Letter “Direction, Response to Approval with Modifications, French Drain Soil Sampling Investigation Work Plan” (November 9, 2021)

NMED Comment 7:	MPC Response 7:
	<p>the water table, and the boring termination depth, if water is not encountered. Figure 3 shows the proposed locations. Additional vertical delineation step-out borings will be drilled 5 ft downgradient from the original boring location and will extend 5 ft beyond the termination depth of the original boring if impacts are observed based on analytical exceedances. Additional horizontal delineation step-out borings will be drilled 25 ft downgradient from the original boring location and sampled at up to three intervals. The vertical and horizontal step-outs will continue until unimpacted soil is encountered.”</p>

ATTACHMENT B
ELECTRONIC RED-LINE/STRIKE-OUT REPORT
AND
ELECTRONIC REVISED REPORT
(PLEASE SEE ATTACHED CD)



MARATHON PETROLEUM CORPORATION
GALLUP REFINING DIVISION
FRENCH DRAIN SOIL SAMPLING INVESTIGATION
WORK PLAN
HWB-WRG-18-014

REVISED ~~SEPTEMBER 30, 2021~~ MARCH 31, 2022



Gallup Refining Division French Drain Soil Sampling
Investigation Work Plan

Executive Summary

The Marathon Petroleum Company (MPC), Gallup Refining Division is submitting this Investigation Work Plan for the investigation of hydrocarbon impacts to soils in the Sanitary Treatment Pond (STP-1) French Drain area.

Hydrocarbon impacts were discovered in the drain line of the STP-1 French Drain on February 6, 2018.

Subsequent investigation efforts were completed on February 8 and 10, 2018. This Investigation Work Plan was developed to investigate and sample the underlying soils to further delineate the potential impacts to the subsurface.

Initial investigation efforts included borehole installations and soil excavations in February 2018. As a result of the investigation, six deep soil boring locations were converted into groundwater monitoring wells and have been added to the annual groundwater sampling schedule since April 2018.

This Investigation Work Plan describes the proposed installation of soil borings and sample collection further east and west of the STP-1 French Drain and north of the wastewater treatment plant. This investigation is intended to reduce data gaps and will be utilized to determine if additional remediation or investigation is warranted.



Gallup Refining Division French Drain Soil Sampling
Investigation Work Plan

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1. Facility Location. Marathon Petroleum Corp. Gallup Refining Division. Gallup, New Mexico
2. French Drain Location. Marathon Petroleum Corp. Gallup Refining Division. Gallup, New Mexico
3. Proposed Soil Boring Locations. Marathon Petroleum Corp. Gallup Refining Division. Gallup, New Mexico

List of Appendices

- A. WELL LOGS
- B. STANDARD OPERATING PROCEDURE – SOIL SAMPLING



Introduction

The MPC, Gallup Refining Division (Refinery) is located approximately 17 miles east of Gallup, McKinley County, New Mexico along the north side of Interstate Highway I-40 (Figure 1). The physical address is I-40, Exit #39 Jamestown, New Mexico 87347. The Refinery property covers approximately 810 acres.

Trihydro Corporation prepared this Investigation Work Plan for the investigation of soils contained in and around the STP-1 French Drain, located on the northwestern portion of the Refinery. The French Drain is located on the east side of STP-1 (Figure 2).

The Refinery is a petroleum oil refinery that processes crude oil received by pipeline or tanker truck from the Four Corners region. The Refinery is currently transitioning to idle mode. Various process units that have operated at the Refinery, and include crude distillation, reformer, fluidized catalytic cracker, alkylation, sulfur recovery, mercox treater, and hydrotreater. Past operations have produced gasoline, diesel fuels, jet fuels, kerosene, propane, butane, and residual fuel.

Background

As detailed in MPC's Response to Comment No. 39 on 2017 Annual Groundwater Monitoring Report (Marathon 2019a), a hydrocarbon release from the drain line of the STP-1 French Drain was discovered on February 6, 2018. Efforts to pinpoint the source of the hydrocarbon release included borehole installation and soil excavations conducted on February 8 and February 10, 2018, respectively. Investigation activities are detailed in the Second Response to Comments No. 39 on 2017 Annual Groundwater Monitoring Report from MPC (Marathon 2019b). Borehole and soil excavation locations of the February 2018 investigation are shown on Figure 3. Hydrocarbons were identified in the shallow subsurface in BH#1, #2, and #3 near the southeast corner of STP-1. Borehole depths were not recorded but are estimated to reach 6 to 8 feet (ft) below ground surface (ft-bgs). Hydrocarbons were also visually identified in soil at excavation #9 located between the wastewater treatment plant and STP-1. Excavations #4, #5, #6, #7, #8, #10, and #11 showed no visible signs of hydrocarbon contamination.

Smaller hand excavations were also completed to the east of STP-1, where hydrocarbons were identified at approximately 3 ft bgs. Hand excavations completed on the northwest sides of Tanks 569, 570, 571, and 572 showed no visible evidence of a release. Locations of the hand excavations were not recorded as documented in the "Response to Approval with Modifications on 2017 Annual Groundwater Monitoring Report"

Gallup Refining Division French Drain Soil Sampling
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(Comment No. 39 Response 7) dated December 9, 2019. Fluid levels were monitored in Tanks 570, 571, and 345 to determine if a potential leak was responsible for the release. A static level test of Tank 570 in 2019 showed a loss of product, which lead to the tank being taken out of service. There were no indications of leaks in Tanks 571 and 345. Tanks 569, 570, 571, 572, and ~~354~~345 are drained and out of service due to the indefinite idle of the Refinery.

On March 5, 2019, six deep soil borings were installed throughout the tank farm and north of STP-1: SB-FD-1, OW-61, OW-62, OW-63, OW-64, and OW-65. These locations are shown on Figure 2 of this report and boring/well logs can be found in Appendix A. Hydrocarbon impacts were identified at OW-61 at depths ranging from 10 to 26 ft bgs. Elevated photoionization detector (PID) readings were identified at OW-62 (18-20 ft bgs), OW-63 (18-24 ft bgs), OW-64 (10-24 ft bgs), and OW-65 (14-20 ft bgs), which could suggest hydrocarbon contamination in the area.

The purpose of this Investigation Work Plan is to further identify and delineate horizontal and vertical soil impacts from a potential hydrocarbon release near the STP-1 French Drain. This investigation will evaluate the need for any further investigation and/or remediation.

Site Conditions

Surface Conditions

Local site topographic features include high ground in the southeast gradually decreasing to a lowland fluvial plain to the northwest. Elevations on the refinery property range from 7,040 ~~feet (ft)~~ to 6,860 ft. The area near STP-1 and the French Drain is approximately 6,910 ft above mean sea level.

Subsurface Conditions

The shallow subsurface soil (alluvium) is comprised of clay and silt with some inter-bedded sand layers. Beneath the alluvium is the Petrified Forest Member of the Chinle Group, which primarily consists of interbedded mudstone, siltstone, and sandstone. The ~~Alluvium/~~Chinle/Alluvium interface ranges from 15 ft bgs to more than 32 ft bgs.



Scope of Activities

The investigative activities of the STP-1 French Drain will be initiated to further delineate horizontal and vertical hydrocarbon impacts to soil and to confirm data previously collected. The sampling activities will be conducted per the Resource Conservation and Recovery Act (RCRA) Post-Closure Permit Section IV.J.2.ii. Pending New Mexico Environmental Department (NMED) approval, MPC anticipates investigation work to be completed in 202~~21~~²⁴.

A Geoprobe drill rig will be used to advance soil borings and soil samples will be collected at each boring location. The ~~twonine~~^{ten} proposed borings ~~located west of Tanks 337/344 and east of evaporation pond 1~~ will be sampled at up to three intervals: the vadose zone interval with the highest PID reading, the water table, and the boring termination depth, if water is not encountered. ~~The remaining four boring locations will be sampled at the water table.~~ The proposed locations are shown on Figure 3. Based upon prior investigations completed by MPC, hydrocarbon impacts around the STP-1 French Drain area were observed at approximately 8 ft bgs.

~~To delineate vertical distribution, soil borings will be advanced to at least 5 ft below the deepest detected contamination based on PID field screening and field observation results. If exceedances are detected in confirmation samples, additional step-out borings will be installed 25 ft from the original boring location.~~

If impacts are observed at the boring termination depth based on analytical exceedances, additional soil borings will be advanced to at least 5 ft below the deepest detected contamination in the original boring to delineate vertical distribution. These additional step-out borings will be drilled 5 ft downgradient from the original boring location and will extend 5 ft beyond the termination depth of the original boring. One sample will be collected from the termination depth of each additional step-out boring. The 5 ft step-out and 5 ft step-down will continue until unimpacted soil or the Chinle/Alluvium interface is encountered, whichever occurs first.

If impacts are observed within the original boring (i.e., between surface and terminus), additional soil borings will be advanced to at least 5 ft below the deepest detected contamination based on analytical exceedances. These additional step-out borings will be drilled 25 ft downgradient from the original boring location and sampled at up to three intervals: the vadose zone interval with the highest PID reading, the water table, and the boring termination depth, if water is not encountered. The 25 ft step-out will continue until unimpacted soil is encountered.

Soil samples will be analyzed for hydrocarbon impacts via Method 8270 (semi-volatile organic compounds [SVOCs]), Method 8260 (volatile organic compounds [VOCs]), and Method 8015M (total petroleum



hydrocarbons [TPH] gasoline range organics [GRO], diesel range organics [DRO], and motor oil range organics [MRO]). Analytical results will be screened by comparison to NMED Industrial, Residential, and Construction Worker Soil Screening Levels (SSLs).

After the investigation has been completed, MPC will prepare an investigation report summarizing analytical results from the soil sampling. The investigation report will be submitted to NMED.

Investigation Methods

The proposed sampling locations are shown on Figure 3. The proposed locations include ninesix boreholes around the STP-1 French Drain area and additional step-out borings installed as needed based on analytical exceedances.

Soils obtained will be visually inspected and classified in general accordance with ASTM D2487 (Unified Soil Classification System) and D2488 (Description and Identification of Soils). Detailed soil boring logs will be completed in the field by qualified field staff. Soil samples will be field screened at regular intervals via PID for evidence of contaminants and will be recorded in the boring logs.

Sample Collection Procedures

Samples will be collected in accordance with the soil sampling Standard Operating Procedure (Appendix B). Details related to sample collection will be documented on the confirmation sampling field forms. General observations recorded on the field forms for each soil sample location will include sampling start and end times, weather, site conditions, sampling team members, and other affiliations present. Sample-specific information will include: field sample identification, sample start and end depth, collection method, sample type (i.e., composite or aliquot), soil classification and characteristics, deviations or clarification of sampling procedures, and other observations. Field techniques will be applied consistently across the STP-1 French Drain area by a team of dedicated sampling personnel who may be assisted by site supervisors. A summary of the sampling activities is shown below:

1. Install ninesix soil borings to observe and collect soil samples from the borings in order to delineate horizontal and vertical extent of hydrocarbon impacts.
2. Analyze soil samples for:
 - pH

Gallup Refining Division French Drain Soil Sampling
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- SVOCs, Method 8270
- VOCs, Method 8260
- TPH GRO, DRO, MRO, Method 8015M
- Density

3. Screen analytical data by comparing with NMED SSLs.

Soil sampling equipment will be decontaminated before collecting each sample, and equipment decontamination will be noted on the field forms. Immediately after collection, soil samples will be placed into a clean, sealable plastic bag labeled with the field sample identification. Sample jars will be filled, labeled, and placed in a cooler. Before shipment, coolers will be packed with additional ice and one temperature blank per cooler. A chain of custody (CoC) form will accompany each sample shipment. Coolers will be sealed and shipped overnight to the Eurofins TestAmerica Analytical Laboratory in Pensacola, FL.

Sample Frequency

~~Soil sample collection will be conducted based on data collected from the Sitewide Laser-Induced Fluorescence/Hydraulic Profiling Investigation.~~ Soil samples will be collected at up to three depths from the ~~ninetwo~~ borings: the vadose zone interval with the highest PID reading, the water table, and the boring termination depth, if water is not encountered. ~~located west of Tanks 337/344 and east of evaporation pond 1.~~ ~~The remaining four borings will be sampled at the water table.~~ Figure 3 shows the proposed locations. Additional vertical delineation step-out borings will be drilled 5 ft downgradient from the original boring location and will extend 5 ft beyond the termination depth of the original boring based on analytical exceedances. Additional horizontal delineation step-out borings will be drilled 25 ft downgradient from the original boring location and sampled at up to three intervals. The vertical and horizontal step-outs will continue until unimpacted soil is encountered.

Data Quality and Validation

Quality assurance/quality control (QA/QC) samples will be collected during sampling to monitor the validity of the sample collection procedures. Field duplicates will be collected at a rate of ten percent of all samples collected. Equipment blanks will be collected from re-usable equipment at a rate of ten percent; if disposable sampling equipment is used, the blanks shall be collected at a frequency of one per day. Field blank samples will



Gallup Refining Division French Drain Soil Sampling Investigation Work Plan

also be collected once a day. The field duplicate and blank samples will be submitted to the laboratory along with the soil samples.

QA/QC samples will be recorded on the field forms and CoCs. All data will undergo Tier II data validation.

Data Evaluation

Analytical results will be compared to NMED SSLs, and the chosen disposal facility's waste acceptance criteria. Soil recovered during sampling will be placed in containers within the area of the STP-1 French Drain and characterized prior to disposal.

Monitoring and Sampling Program

Monitoring wells OW-61 through OW-65 were added to the routine quarterly groundwater sampling event beginning in April 2018 and have been sampled quarterly since that time.

Schedule

Pending NMED approval, MPC anticipates the investigation to begin in early 202~~2~~¹. After the investigation has been completed, MPC will prepare an investigation report [for submittal to NMED](#) summarizing the sampling results.

References

Marathon. 2019a. Response to Comment No. 39 on 2017 Annual Groundwater Monitoring Report (dated March 21, 2019), Marathon Petroleum Company LP, Gallup Refinery, (dba Western Refining Southwest, Inc.), EPA ID# NMD000333211, HWB-WRG-18-014. May 23, 2019.

Marathon. 2019b. Second Response to Comment No. 39 on 2017 Annual Groundwater Monitoring Report (dated March 21, 2019), Marathon Petroleum Company LP, Gallup Refinery, (dba Western Refining Southwest, Inc.), EPA ID# NMD000333211, HWB-WRG-18-014. August 23, 2019.






Figures

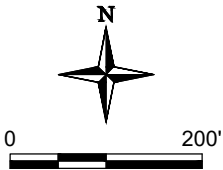
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Image Cite: DigitalGlobe © CNES (2020) Distribution Airbus DS © Microsoft Corporation, BING Imagery

EXPLANATION

-  PROPOSED SOIL BORING
-  BORING AND DESIGNATION (INSTALLED FEBRUARY 2018)
-  FRENCH DRAIN
-  HYDROCARBON IMPACTS (EXCAVATION INSTALLED FEBRUARY 2018)
-  HYDROCARBON ABSENT (EXCAVATION INSTALLED FEBRUARY 2018)



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Drawn By: REP	Checked By: JP	Scale: 1" = 200'	Date: 5/18/21	File: 697-FD-PROPSOILLOC_202105
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FIGURE 3

PROPOSED SOIL BORING LOCATIONS

**MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO**



MARATHON PETROLEUM CORPORATION

GALLUP REFINING DIVISION

FRENCH DRAIN SOIL SAMPLING INVESTIGATION

WORK PLAN

HWB-WRG-18-014

REVISED MARCH 31, 2022



Gallup Refining Division French Drain Soil Sampling
Investigation Work Plan

Executive Summary

The Marathon Petroleum Company (MPC), Gallup Refining Division is submitting this Investigation Work Plan for the investigation of hydrocarbon impacts to soils in the Sanitary Treatment Pond (STP-1) French Drain area.

Hydrocarbon impacts were discovered in the drain line of the STP-1 French Drain on February 6, 2018.

Subsequent investigation efforts were completed on February 8 and 10, 2018. This Investigation Work Plan was developed to investigate and sample the underlying soils to further delineate the potential impacts to the subsurface.

Initial investigation efforts included borehole installations and soil excavations in February 2018. As a result of the investigation, six deep soil boring locations were converted into groundwater monitoring wells and have been added to the annual groundwater sampling schedule since April 2018.

This Investigation Work Plan describes the proposed installation of soil borings and sample collection further east and west of the STP-1 French Drain and north of the wastewater treatment plant. This investigation is intended to reduce data gaps and will be utilized to determine if additional remediation or investigation is warranted.



Gallup Refining Division French Drain Soil Sampling
Investigation Work Plan

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List of Appendices

- A. WELL LOGS
- B. STANDARD OPERATING PROCEDURE – SOIL SAMPLING



Introduction

The MPC, Gallup Refining Division (Refinery) is located approximately 17 miles east of Gallup, McKinley County, New Mexico along the north side of Interstate Highway I-40 (Figure 1). The physical address is I-40, Exit #39 Jamestown, New Mexico 87347. The Refinery property covers approximately 810 acres.

Trihydro Corporation prepared this Investigation Work Plan for the investigation of soils contained in and around the STP-1 French Drain, located on the northwestern portion of the Refinery. The French Drain is located on the east side of STP-1 (Figure 2).

The Refinery is a petroleum oil refinery that processes crude oil received by pipeline or tanker truck from the Four Corners region. The Refinery is currently transitioning to idle mode. Various process units that have operated at the Refinery, and include crude distillation, reformer, fluidized catalytic cracker, alkylation, sulfur recovery, mercox treater, and hydrotreater. Past operations have produced gasoline, diesel fuels, jet fuels, kerosene, propane, butane, and residual fuel.

Background

As detailed in MPC's Response to Comment No. 39 on 2017 Annual Groundwater Monitoring Report (Marathon 2019a), a hydrocarbon release from the drain line of the STP-1 French Drain was discovered on February 6, 2018. Efforts to pinpoint the source of the hydrocarbon release included borehole installation and soil excavations conducted on February 8 and February 10, 2018, respectively. Investigation activities are detailed in the Second Response to Comments No. 39 on 2017 Annual Groundwater Monitoring Report from MPC (Marathon 2019b). Borehole and soil excavation locations of the February 2018 investigation are shown on Figure 3. Hydrocarbons were identified in the shallow subsurface in BH#1, #2, and #3 near the southeast corner of STP-1. Borehole depths were not recorded but are estimated to reach 6 to 8 feet (ft) below ground surface (bgs). Hydrocarbons were also visually identified in soil at excavation #9 located between the wastewater treatment plant and STP-1. Excavations #4, #5, #6, #7, #8, #10, and #11 showed no visible signs of hydrocarbon contamination.

Smaller hand excavations were also completed to the east of STP-1, where hydrocarbons were identified at approximately 3 ft bgs. Hand excavations completed on the northwest sides of Tanks 569, 570, 571, and 572 showed no visible evidence of a release. Locations of the hand excavations were not recorded as documented in the "Response to Approval with Modifications on 2017 Annual Groundwater Monitoring Report"

Gallup Refining Division French Drain Soil Sampling
Investigation Work Plan

(Comment No. 39 Response 7) dated December 9, 2019. Fluid levels were monitored in Tanks 570, 571, and 345 to determine if a potential leak was responsible for the release. A static level test of Tank 570 in 2019 showed a loss of product, which lead to the tank being taken out of service. There were no indications of leaks in Tanks 571 and 345. Tanks 569, 570, 571, 572, and 345 are drained and out of service due to the indefinite idle of the Refinery.

On March 5, 2019, six deep soil borings were installed throughout the tank farm and north of STP-1: SB-FD-1, OW-61, OW-62, OW-63, OW-64, and OW-65. These locations are shown on Figure 2 of this report and boring/well logs can be found in Appendix A. Hydrocarbon impacts were identified at OW-61 at depths ranging from 10 to 26 ft bgs. Elevated photoionization detector (PID) readings were identified at OW-62 (18-20 ft bgs), OW-63 (18-24 ft bgs), OW-64 (10-24 ft bgs), and OW-65 (14-20 ft bgs), which could suggest hydrocarbon contamination in the area.

The purpose of this Investigation Work Plan is to further identify and delineate horizontal and vertical soil impacts from a potential hydrocarbon release near the STP-1 French Drain. This investigation will evaluate the need for any further investigation and/or remediation.

Site Conditions

Surface Conditions

Local site topographic features include high ground in the southeast gradually decreasing to a lowland fluvial plain to the northwest. Elevations on the refinery property range from 7,040 ft to 6,860 ft. The area near STP-1 and the French Drain is approximately 6,910 ft above mean sea level.

Subsurface Conditions

The shallow subsurface soil (alluvium) is comprised of clay and silt with some inter-bedded sand layers. Beneath the alluvium is the Petrified Forest Member of the Chinle Group, which primarily consists of interbedded mudstone, siltstone, and sandstone. The Chinle/Alluvium interface ranges from 15 ft bgs to more than 32 ft bgs.

Scope of Activities

The investigative activities of the STP-1 French Drain will be initiated to further delineate horizontal and vertical hydrocarbon impacts to soil and to confirm data previously collected. The sampling activities will be conducted

Gallup Refining Division French Drain Soil Sampling
Investigation Work Plan

per the Resource Conservation and Recovery Act (RCRA) Post-Closure Permit Section IV.J.2.ii. Pending New Mexico Environment Department (NMED) approval, MPC anticipates investigation work to be completed in 2022.

A Geoprobe drill rig will be used to advance soil borings and soil samples will be collected at each boring location. The nine proposed borings will be sampled at up to three intervals: the vadose zone interval with the highest PID reading, the water table, and the boring termination depth, if water is not encountered. The proposed locations are shown on Figure 3. Based upon prior investigations completed by MPC, hydrocarbon impacts around the STP-1 French Drain area were observed at approximately 8 ft bgs.

If impacts are observed at the boring termination depth based on analytical exceedances, additional soil borings will be advanced to at least 5 ft below the deepest detected contamination in the original boring to delineate vertical distribution. These additional step-out borings will be drilled 5 ft downgradient from the original boring location and will extend 5 ft beyond the termination depth of the original boring. One sample will be collected from the termination depth of each additional step-out boring. The 5 ft step-out and 5 ft step-down will continue until unimpacted soil or the Chinle/Alluvium interface is encountered, whichever occurs first.

If impacts are observed within the original boring (i.e., between surface and terminus), additional soil borings will be advanced to at least 5 ft below the deepest detected contamination based on analytical exceedances. These additional step-out borings will be drilled 25 ft downgradient from the original boring location and sampled at up to three intervals: the vadose zone interval with the highest PID reading, the water table, and the boring termination depth, if water is not encountered. The 25 ft step-out will continue until unimpacted soil is encountered.

Soil samples will be analyzed for hydrocarbon impacts via Method 8270 (semi-volatile organic compounds [SVOCs]), Method 8260 (volatile organic compounds [VOCs]), and Method 8015M (total petroleum hydrocarbons [TPH] gasoline range organics [GRO], diesel range organics [DRO], and motor oil range organics [MRO]). Analytical results will be screened by comparison to NMED Industrial, Residential, and Construction Worker Soil Screening Levels (SSLs).

After the investigation has been completed, MPC will prepare an investigation report summarizing analytical results from the soil sampling. The investigation report will be submitted to NMED.



Investigation Methods

The proposed sampling locations are shown on Figure 3. The proposed locations include nine boreholes around the STP-1 French Drain area and additional step-out borings installed as needed based on analytical exceedances.

Soils obtained will be visually inspected and classified in general accordance with ASTM D2487 (Unified Soil Classification System) and D2488 (Description and Identification of Soils). Detailed soil boring logs will be completed in the field by qualified field staff. Soil samples will be field screened at regular intervals via PID for evidence of contaminants and will be recorded in the boring logs.

Sample Collection Procedures

Samples will be collected in accordance with the soil sampling Standard Operating Procedure (Appendix B). Details related to sample collection will be documented on the confirmation sampling field forms. General observations recorded on the field forms for each soil sample location will include sampling start and end times, weather, site conditions, sampling team members, and other affiliations present. Sample-specific information will include: field sample identification, sample start and end depth, collection method, sample type (i.e., composite or aliquot), soil classification and characteristics, deviations or clarification of sampling procedures, and other observations. Field techniques will be applied consistently across the STP-1 French Drain area by a team of dedicated sampling personnel who may be assisted by site supervisors. A summary of the sampling activities is shown below:

1. Install nine soil borings to observe and collect soil samples from the borings in order to delineate horizontal and vertical extent of hydrocarbon impacts.
2. Analyze soil samples for:
 - pH
 - SVOCs, Method 8270
 - VOCs, Method 8260
 - TPH GRO, DRO, MRO, Method 8015M
 - Density
3. Screen analytical data by comparing with NMED SSLs.

Gallup Refining Division French Drain Soil Sampling
Investigation Work Plan

Soil sampling equipment will be decontaminated before collecting each sample, and equipment decontamination will be noted on the field forms. Immediately after collection, soil samples will be placed into a clean, sealable plastic bag labeled with the field sample identification. Sample jars will be filled, labeled, and placed in a cooler. Before shipment, coolers will be packed with additional ice and one temperature blank per cooler. A chain of custody (CoC) form will accompany each sample shipment. Coolers will be sealed and shipped overnight to the Eurofins TestAmerica Analytical Laboratory in Pensacola, FL.

Sample Frequency

Soil samples will be collected at up to three depths from the nine borings: the vadose zone interval with the highest PID reading, the water table, and the boring termination depth, if water is not encountered. Figure 3 shows the proposed locations. Additional vertical delineation step-out borings will be drilled 5 ft downgradient from the original boring location and will extend 5 ft beyond the termination depth of the original boring based on analytical exceedances. Additional horizontal delineation step-out borings will be drilled 25 ft downgradient from the original boring location and sampled at up to three intervals. The vertical and horizontal step-outs will continue until unimpacted soil is encountered.

Data Quality and Validation

Quality assurance/quality control (QA/QC) samples will be collected during sampling to monitor the validity of the sample collection procedures. Field duplicates will be collected at a rate of ten percent of all samples collected. Equipment blanks will be collected from re-usable equipment at a rate of ten percent; if disposable sampling equipment is used, the blanks shall be collected at a frequency of one per day. Field blank samples will also be collected once a day. The field duplicate and blank samples will be submitted to the laboratory along with the soil samples.

QA/QC samples will be recorded on the field forms and CoCs. All data will undergo Tier II data validation.

Data Evaluation

Analytical results will be compared to NMED SSLs, and the chosen disposal facility's waste acceptance criteria. Soil recovered during sampling will be placed in containers within the area of the STP-1 French Drain and characterized prior to disposal.



Monitoring and Sampling Program

Monitoring wells OW-61 through OW-65 were added to the routine quarterly groundwater sampling event beginning in April 2018 and have been sampled quarterly since that time.

Schedule

Pending NMED approval, MPC anticipates the investigation to begin in early 2022. After the investigation has been completed, MPC will prepare an investigation report for submittal to NMED summarizing the sampling results.

References

Marathon. 2019a. Response to Comment No. 39 on 2017 Annual Groundwater Monitoring Report (dated March 21, 2019), Marathon Petroleum Company LP, Gallup Refinery, (dba Western Refining Southwest, Inc.), EPA ID# NMD000333211, HWB-WRG-18-014. May 23, 2019.

Marathon. 2019b. Second Response to Comment No. 39 on 2017 Annual Groundwater Monitoring Report (dated March 21, 2019), Marathon Petroleum Company LP, Gallup Refinery, (dba Western Refining Southwest, Inc.), EPA ID# NMD000333211, HWB-WRG-18-014. August 23, 2019.

Figures



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EXPLANATION

 INTERSTATE HIGHWAY



0 2,000'



Trihydro
CORPORATION
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(P) 307/745.7474 (F) 307/745.7729

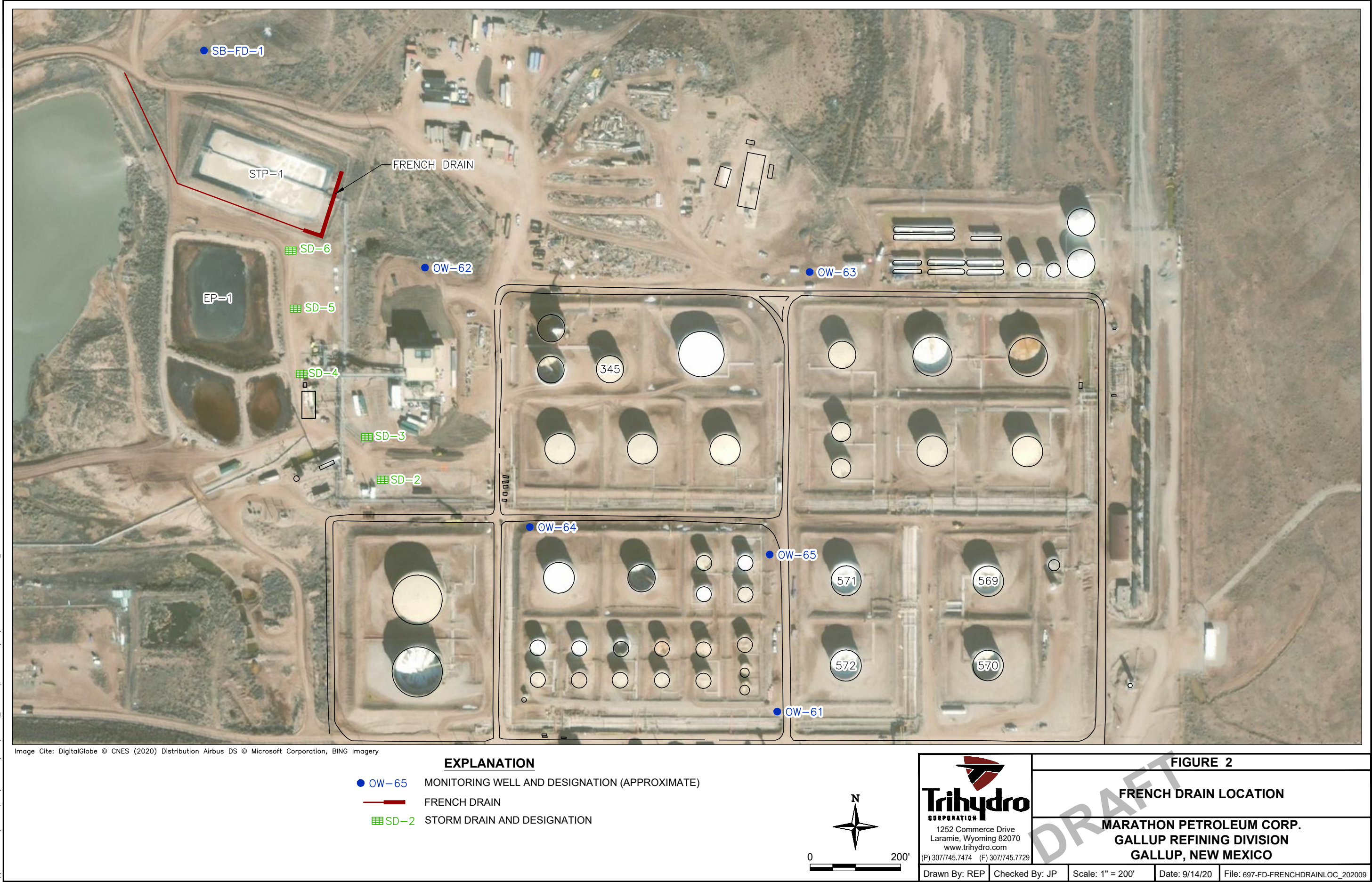
FIGURE 1

FACILITY LOCATION

**MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO**

Drawn By: REP | Checked By: JP | Scale: 1" = 2,000' | Date: 9/14/20 | File: 697-FD-FACILITYLOC_202009

\\TRIHYRO.COM\CLIENTS\TOM MARATHON\CADD\GALLUP\REPORTS\FRENCHDRAIN\WP\697-FD-FRENCHDRAINLOC_202009








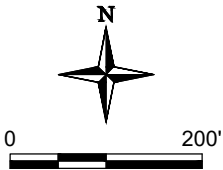
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Image Cite: DigitalGlobe © CNES (2020) Distribution Airbus DS © Microsoft Corporation, BING Imagery

EXPLANATION

-  PROPOSED SOIL BORING
-  BORING AND DESIGNATION (INSTALLED FEBRUARY 2018)
-  FRENCH DRAIN
-  HYDROCARBON IMPACTS (EXCAVATION INSTALLED FEBRUARY 2018)
-  HYDROCARBON ABSENT (EXCAVATION INSTALLED FEBRUARY 2018)



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FIGURE 3

PROPOSED SOIL BORING LOCATIONS

**MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO**

Appendix A

Well Logs



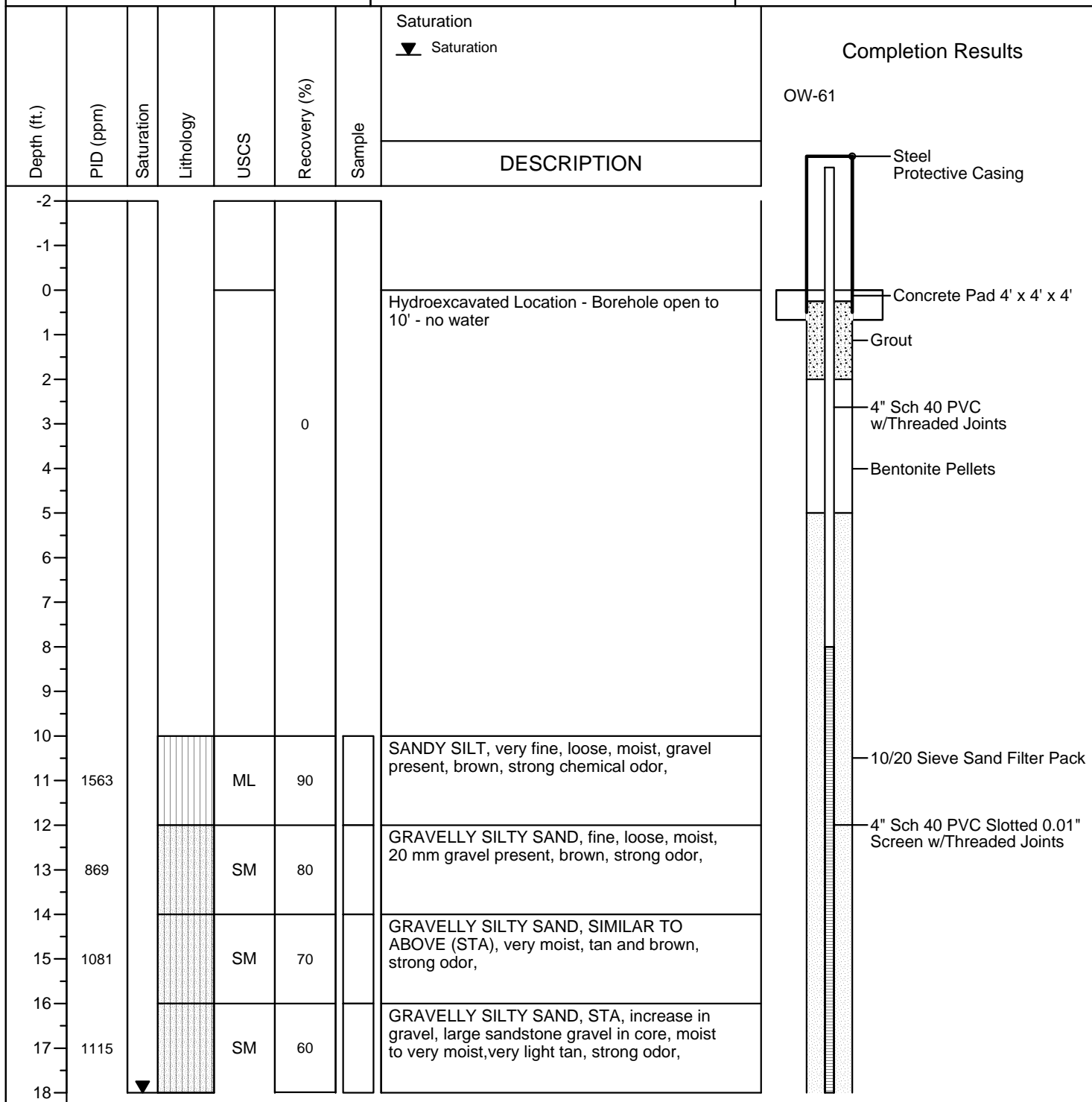
Andeavor
Gallup Refinery - French Drain Release
WEST18012

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc./Cohagan
Drilling Rig : CME75
Drilling Method : Hollow-Stem Augers
Sampling Method : Split Spoon 2'
Comments :
Total Depth : 32'
Ground Water : 18' BGL
Start Date : 3-13-2018
Finish Date : 3-13-2018

WELL NO. OW-61

(Sheet 1 of 2)

Elev., TOC (ft.msl) : 6963.57
Elev., PAD (ft. msl) : 6960.91
Elev., GL (ft. msl) : NS
Site Coordinates :
N : 1633887.74
E : 2546702.36



1001 Louisiana Street, Suite 3250
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
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Gallup Refinery - French Drain Release
WEST18012

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc./Cohagan
Drilling Rig : CME75
Drilling Method : Hollow-Stem Augers
Sampling Method : Split Spoon 2'
Comments :
Total Depth : 32'
Ground Water : 18' BGL
Start Date : 3-13-2018
Finish Date : 3-13-2018

WELL NO. OW-61

(Sheet 2 of 2)

Elev., TOC (ft.msl) : 6963.57
Elev., PAD (ft. msl) : 6960.91
Elev., GL (ft. msl) : NS
Site Coordinates :
N : 1633887.74
E : 2546702.36

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION	Completion Results OW-61
18								GRAVELLY CLAYEY SAND, fine to coarse grain sand with brown clay, soft, very damp gravel (10-20 mm), saturated at base,	
19	1702			SC	20				
20								SILTY SAND, medium, loose, trace clay and gravel, saturated, dark brown, strong odor,	
21	1269			SM	60				
22				SM	60			SILTY SAND, STA, saturated,	
23	1638			CL	60			GRAVELLY SANDY CLAY, low, soft, gravel throughout, damp to saturated in seams, brown, strong odor,	
24								GRAVELLY CLAY, low, firm, damp, dark blueish grey, strong odor,	
25	1538			CL	50				
26								GRAVELLY CLAY, STA, trace very fine grain sand, damp, very stiff, odor,	
27	377			CL	40				
28								SILTY CLAY, low, very stiff, trace sand and very small gravel, damp, grey to light grey, odor,	
29	298			CL	60				
30								SILTY CLAY, STA, damp, light grey and pink.	
31	60.9			CL	70				
32									
33									
34									
35									
36									
37									
38									

4" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints

10/20 Sieve Sand Filter Pack

4" Flush Threaded Sch 40 PVC Cap

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Houston, Texas 77002
713-955-1230

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Austin, Texas 78759
512-693-4190



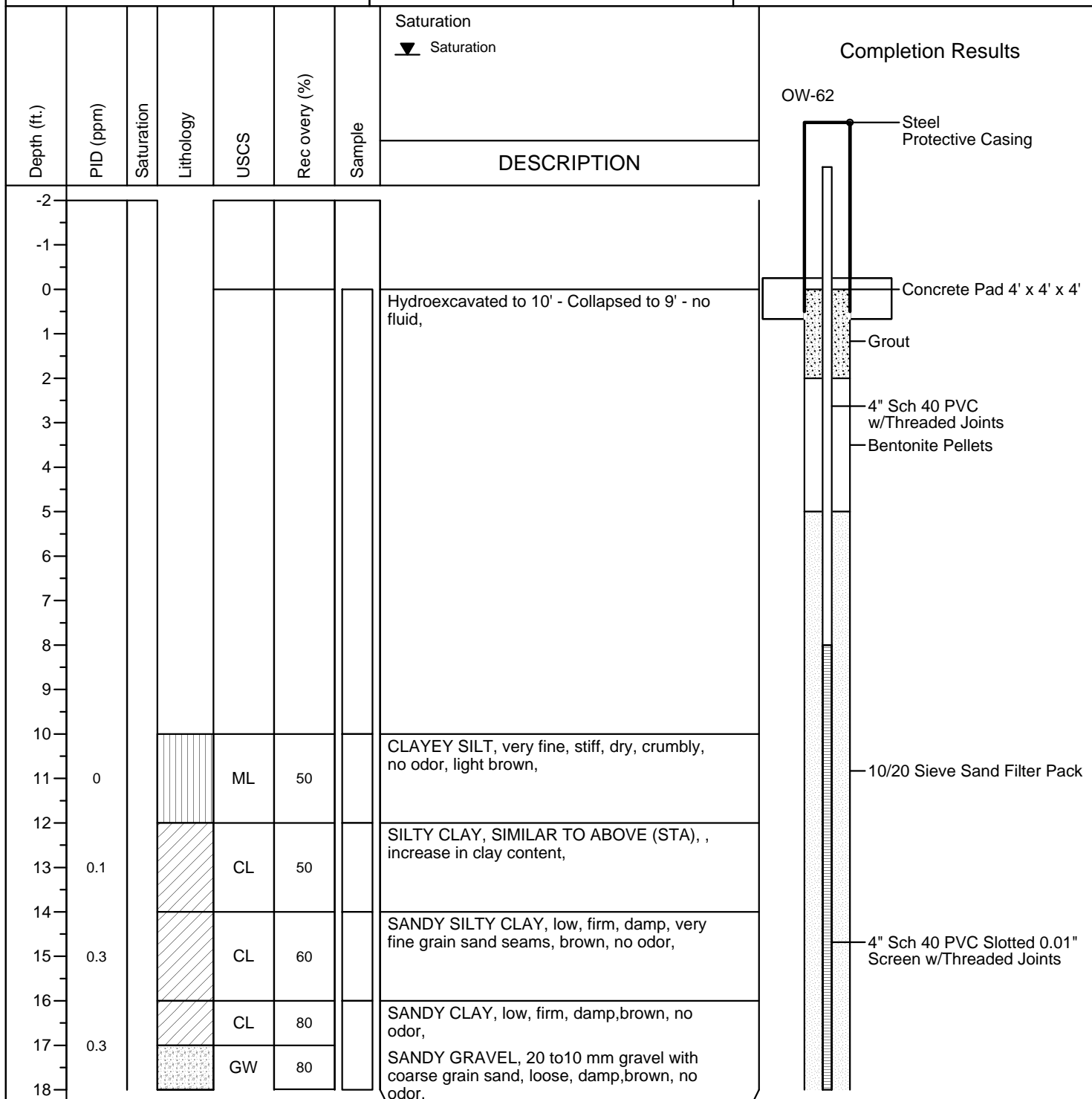
Andeavor
Gallup Refinery - French Drain Release
WEST18012

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc./Cohagan
Drilling Rig : CME75
Drilling Method : Hollow-Stem Augers
Sampling Method : 2' Split Spoon
Comments :
Total Depth : 40'
Ground Water : Not Encountered
Start Date : 03/15/2018
Finish Date : 03/15/2018

WELL NO. OW-62

(Sheet 1 of 3)




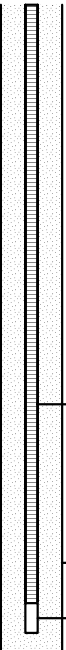

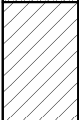

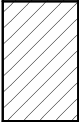
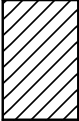
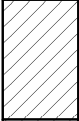



Elev., TOC (ft.msl) : 6937.36
Elev., PAD (ft. msl) : 6934.73
Elev., GL (ft. msl) : NS
Site Coordinates :
N : 1634866.14
E : 2545914.00



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512-693-4190

 Andeavor Gallup Refinery - French Drain Release WEST18012						Geologist : Tracy Payne Driller : Enviro-Drill, Inc./Cohagan Drilling Rig : CME75 Drilling Method : Hollow-Stem Augers Sampling Method : 2' Split Spoon Comments : Total Depth : 40' Ground Water : Not Encountered Start Date : 03/15/2018 Finish Date : 03/15/2018		WELL NO. OW-62 (Sheet 2 of 3)	
						Elev., TOC (ft.msl) : 6937.36 Elev., PAD (ft. msl) : 6934.73 Elev., GL (ft. msl) : NS Site Coordinates : N : 1634866.14 E : 2545914.00			
Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Rec overy (%)	Sample	Saturation  Saturation		Completion Results OW-62
							DESCRIPTION		
18	3380			GC	80		CLAYEY SANDY GRAVEL, STA except clay present, very moist, hydrocarbon (HC) odor, ,		 4" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints 10/20 Sieve Sand Filter Pack 4" Flush Threaded Sch 40 PVC Cap
19							CLAYEY SANDY GRAVEL, STA, damp to moist, HC odor,		
20	82.9		GC	70		CLAYEY SANDY GRAVEL, STA, damp to moist, HC odor,			
21						CLAYEY SANDY GRAVEL, STA, damp to moist, HC odor,			
22	33		CL	60		SILTY CLAY, low, soft, trace sand,calcareous, damp to moist, reddish brown, HC odor,			
23						SILTY CLAY, low, soft, trace sand,calcareous, damp to moist, reddish brown, HC odor,			
24	800		CL	70		SILTY CLAY, low, stiff, damp,reddish brown, HC odor,			
25						SILTY CLAY, low, stiff, damp,reddish brown, HC odor,			
26	555		CL	80		SILTY CLAY, STA, calcareous, odor,			
27						SILTY CLAY, STA, calcareous, odor,			
28	56		CH	90		CLAY, high, very stiff, damp,reddish brown, faint odor,			
29						CLAY, high, very stiff, damp,reddish brown, faint odor,			
30	351		CL	90		SILTY CLAY, low, firm/crumbly, damp,reddish brown, trace grey, no odor,			
31						SILTY CLAY, low, firm/crumbly, damp,reddish brown, trace grey, no odor,			
32	125		CL	90		SILTY CLAY, STA,			
33						SILTY CLAY, STA,			
34	159		CL	90		SILTY CLAY, STA,			
35						SILTY CLAY, STA,			
36	91		CL	90		SILTY CLAY, STA,			
37						SILTY CLAY, STA,			
38									

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Andeavor
Gallup Refinery - French Drain Release
WEST18012

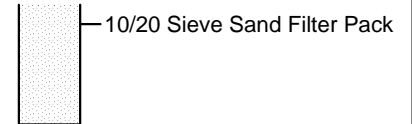
Geologist : Tracy Payne
Driller : Enviro-Drill, Inc./Cohagan
Drilling Rig : CME75
Drilling Method : Hollow-Stem Augers
Sampling Method : 2' Split Spoon
Comments :
Total Depth : 40'
Ground Water : Not Encountered
Start Date : 03/15/2018
Finish Date : 03/15/2018

WELL NO. OW-62

(Sheet 3 of 3)

Elev., TOC (ft.msl) : 6937.36
Elev., PAD (ft. msl) : 6934.73
Elev., GL (ft. msl) : NS
Site Coordinates :
N : 1634866.14
E : 2545914.00

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Rec overy (%)	Sample	Saturation ▼ Saturation	Completion Results OW-62
							DESCRIPTION	
38							SILTY CLAY, STA.	
39	44			CL	90			
40								
41								
42								
43								
44								
45								
46								
47								
48								
49								
50								
51								
52								
53								
54								
55								
56								
57								
58								



10/20 Sieve Sand Filter Pack

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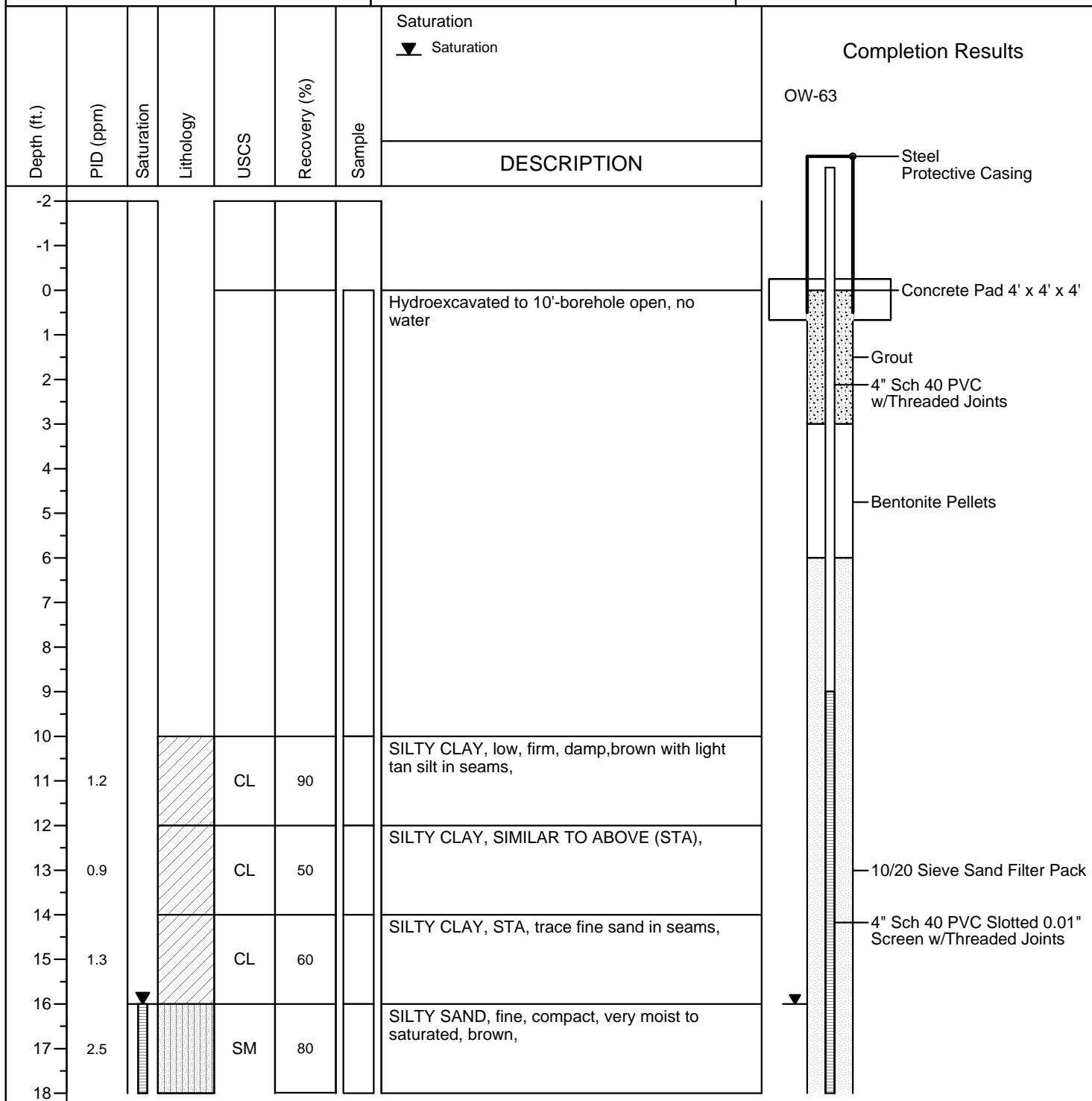
Andeavor
Gallup Refinery - French Drain Release
WEST18012

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc./Cohagan
Drilling Rig : CME75
Drilling Method : Hollow-Stem Auger
Sampling Method : 2' Split Spoon
Comments :
Total Depth : 32
Ground Water : 16'/25'
Start Date : 03/14/2018
Finish Date : 03/14/2018

WELL NO. OW-63

(Sheet 1 of 2)

Elev., TOC (ft.msl) : 6935.06
Elev., PAD (ft. msl) : 6932.34
Elev., GL (ft. msl) : NS
Site Coordinates :
N : 1634859.73
E : 2546756.41



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Andeavor
Gallup Refinery - French Drain Release
WEST18012

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc./Cohagan
Drilling Rig : CME75
Drilling Method : Hollow-Stem Auger
Sampling Method : 2' Split Spoon
Comments :
Total Depth : 32
Ground Water : 16'/25'
Start Date : 03/14/2018
Finish Date : 03/14/2018

WELL NO. OW-63

(Sheet 2 of 2)

Elev., TOC (ft.msl) : 6935.06
Elev., PAD (ft. msl) : 6932.34
Elev., GL (ft. msl) : NS
Site Coordinates :
N : 1634859.73
E : 2546756.41

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION	Completion Results OW-63
18								SANDY SILTY CLAY, low, firm, damp, occasional gravel, brown, odor,	
19	428			CL	80				
20								SILTY SANDY CLAY, STA, moist in sand seams at base, odor,	
21	652			CL	80				
22								SILTY SANDY CLAY, STA, odor,	
23	275			CL	70				
24				CH	70			CLAY, high, soft to firm,damp,brown, odor,	
25	39			CH	90			CLAY, STA, odor,	
26	28			GC	90			CLAYEY GRAVEL, sandstone gravel in pink/brown/olive green clay and silt, coarse sand present, saturated, odor,	
27	150			GC	90			CLAYEY GRAVEL, STA, saturated, odor,	
28								WEATHERED SANDSTONE, very dense, dry, grey to light purple, faint odor,	
29	40				90				
30								WEATHERED SANDSTONE, STA, grey and light purple.	
31	10.9				50				
32									
33									
34									
35									
36									
37									
38									

4" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints
10/20 Sieve Sand Filter Pack
4" Flush Threaded Sch 10 PVC Cap

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Andeavor
Gallup Refinery - French Drain Release
WEST18012

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc./Cohagan
Drilling Rig : CME75
Drilling Method : Pilot Hole 7 1/4 HSA
Sampling Method : 2' Split Spoon
Comments :
Total Depth : 44' BGL
Ground Water : Not Encountered
Start Date : 03/05/2018
Finish Date : 03/05/2018

WELL NO. OW-64

(Sheet 1 of 3)

Elev., TOC (ft.msl) : 6947.40
Elev., PAD (ft. msl) : 6945.07
Elev., GL (ft. msl) : NS
Site Coordinates :
N : 1634301.36
E : 2546150.80

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	Completion Results
							DESCRIPTION	
-2								OW-64
-1								
0							Hydroexcavated to 10' BGL, sloughed to 8' BGL, water in hole at 5.20' BGL, no separate phase hydrocarbon (SPH) detected,	Steel Protective Casing
1								Concrete Pad 4' x 4' x 4'
2								Grout
3								Bentonite Pellets
4								4" Sch 40 PVC w/Threaded Joints
5								
6								
7								
8								
9								
10								10/20 Sieve Sand Filter Pack
11	280			CL	50		SILTY CLAY, low, firm, damp, brown and grey, faint hydrocarbon (HC) odor,	4" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints
12								
13	267			CL	70		SILTY CLAY, SIMILAR TO ABOVE (STA), faint HC odor,	
14								
15	308			CL	80		SILTY CLAY, low to moderate, stiff, calcareous near and at base, damp,brown, grey to greyish white, faint HC odor,	
16								
17	137			CL	50		SILTY CLAY, STA, increase in plasticity, mostly grey-trace brown,faint HC ordor,	
18								

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Andeavor
Gallup Refinery - French Drain Release
WEST18012

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc./Cohagan
Drilling Rig : CME75
Drilling Method : Pilot Hole 7 1/4 HSA
Sampling Method : 2' Split Spoon
Comments :
Total Depth : 44' BGL
Ground Water : Not Encountered
Start Date : 03/05/2018
Finish Date : 03/05/2018

WELL NO. OW-64

(Sheet 2 of 3)

Elev., TOC (ft.msl) : 6947.40
Elev., PAD (ft. msl) : 6945.07
Elev., GL (ft. msl) : NS
Site Coordinates :
N : 1634301.36
E : 2546150.80

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION	Completion Results OW-64
18								SILTY CLAY, moderate, firm, damp, brown-trace grey, faint odor,	
19	47			CL	70				
20								SILTY CLAY, STA, reddish brown to grey at 20.5', faint odor,	
21	133			CL	70				
22								SILTY CLAY, moderate, firm to stiff, damp, grey, faint odor,	
23	20			CL	60				
24								SILTY CLAY, STA, stiff,	
25	17			CL	80				
26								SILTY CLAY, STA, stiff, calcareous at base, reddish brown and grey, greenish grey,	
27	75			CL	70				
28								SILTY CLAY, low, stiff/crumbly, damp, dark reddish brown and grey, no odor,	
29	74			CL	60				
30								SILTY CLAY, STA, very stiff, no odor,	
31	35			CL	60				
32								SILTY CLAY, low, very stiff, damp, dark reddish brown, black shale at base, no odor,	
33	20			CL	40				
34								CLAYEY SILT, sandstone gravel (cobble) at top of interval, low, firm/crumbly, dry/damp, brown, no odor,	
35	30			ML	40				
36								SILTY CLAY, low, very stiff, dry/damp, brown, no odor,	
37	8			ML	50				
38									

4" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints

4" Flush Threaded Sch 40 PVC Cap

10/20 Sieve Sand Filter Pack

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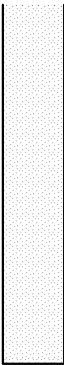
Andeavor
Gallup Refinery - French Drain Release
WEST18012

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc./Cohagan
Drilling Rig : CME75
Drilling Method : Pilot Hole 7 1/4 HSA
Sampling Method : 2' Split Spoon
Comments :
Total Depth : 44' BGL
Ground Water : Not Encountered
Start Date : 03/05/2018
Finish Date : 03/05/2018

WELL NO. OW-64

(Sheet 3 of 3)

Elev., TOC (ft.msl) : 6947.40
Elev., PAD (ft. msl) : 6945.07
Elev., GL (ft. msl) : NS
Site Coordinates :
N : 1634301.36
E : 2546150.80

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	Completion Results OW-64
							DESCRIPTION	
38	12			ML	70		SILTY CLAY, STA,	 10/20 Sieve Sand Filter Pack
39								
40	8			ML	60		SILTY CLAY, STA,	
41								
42	6			ML	60		SILTY CLAY, STA.	
43								
44								
45								
46								
47								
48								
49								
50								
51								
52								
53								
54								
55								
56								
57								
58								

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Andeavor
Gallup Refinery - French Drain Release
WEST18012

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc./Cohagan
Drilling Rig : CME75
Drilling Method : Hollow-Stem Auger
Sampling Method : 2' Split Spoon
Comments :
Total Depth : 40' BGL
Ground Water : 20' BGL
Start Date : 03/09/2018
Finish Date : 03/09/2018

WELL NO. OW-65

(Sheet 1 of 3)

Elev., TOC (ft.msl) : 6954.05
Elev., PAD (ft. msl) : 6951.62
Elev., GL (ft. msl) : NS
Site Coordinates :
N : 1634238.38
E : 2546692.01

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	Completion Results
							DESCRIPTION	
-2								OW-65
-1								
0							Cleared borehole to 5', 1" asphalt and base, SILTY CLAY, low, stiff, damp, mixed with gravelly sand, brown, no order,	Steel Protective Casing
1				CL	100			Concrete Pad 4' x 4' x 4'
2								
3								
4								
5	17.4			SW	100		GRAVELLY SAND, fine to coarse, loose, damp, gravel <10 mm, brown, no odor,	Grout
6								
7	23			SW	80		GRAVELLY SAND, SIMILAR TO ABOVE (STA), clayey sand at base, very damp, brown, odor,	4" Sch 40 PVC w/Threaded Joints
8								
9	12			SM	90		SILTY SAND, medium to coarse, loose, very damp, brown, odor,	
10								
11	16			SM	80		CLAYEY GRAVELLY SAND, fine to coarse, compact, gravelly clay lense 2" thick at 11', brown, odor,	
12								Bentonite Pellets
13	66			SM	70		SILTY SAND, medium, loose, very damp, brown, odor,	
14								
15	822			GC	60		CLAYEY GRAVEL, <10 mm gravel in brown clay, coarse sand throughout, very damp, odor,	4" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints
16								
17	885			SM	60		SILTY SAND, fine, loose, very damp to moist, hydrocarbon (HC) odor,	10/20 Sieve Sand Filter Pack
18								

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Andeavor
Gallup Refinery - French Drain Release
WEST18012

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc./Cohagan
Drilling Rig : CME75
Drilling Method : Hollow-Stem Auger
Sampling Method : 2' Split Spoon
Comments :
Total Depth : 40' BGL
Ground Water : 20' BGL
Start Date : 03/09/2018
Finish Date : 03/09/2018

WELL NO. OW-65

(Sheet 2 of 3)



Elev., TOC (ft.msl) : 6954.05
Elev., PAD (ft. msl) : 6951.62
Elev., GL (ft. msl) : NS
Site Coordinates :
N : 1634238.38
E : 2546692.01

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	Completion Results OW-65
							DESCRIPTION	
18	1195			GC	50		CLAYEY GRAVEL, 40 mm sandstone cobbles (tan and green) in brown clay, coarse sand throughout, damp, odor,	
19							CLAYEY GRAVEL, STA, moist to saturated in sand, water in split spoon,	
20								
21				GC	60		CLAYEY GRAVEL, STA, moist to saturated in sand, water in split spoon,	
22								
23				GC	90		CLAYEY GRAVELLY SAND, coarse sand with 10 mm gravel, loose/soft, saturated, brown, HC odor,	
24								
25				SC	80		CLAYEY SAND, coarse, loose, very soft, trace gravel, saturated, brown, odor,	
26								
27				SC	80		CLAYEY SAND, fine to medium, compact, moist, dark brown, HC odor,	
28								
29				CL	80		SILTY CLAY, low, very soft, damp, dark brown, strong HC odor,	
30								
31				SC	60		CLAYEY SAND, fine, compact, saturated/oily, dark brown, saturated/oily,	
32							CLAYEY SAND, STA, HC odor,	
33				SC	80		CLAYEY SAND, STA, increase in clay at base, becomes moist,	
34								
35				SM	90		SILTY SAND, medium to coarse, loose, gravelly (<5 mm) at base, saturated, dark brown, HC odor,	
36								
37				SW	80		GRAVELLY SAND, coarse, loose, trace clay-gravel (10 mm), saturated, dark brown, HC odor,	
38							SANDY CLAY, low, firm, trace gravel, damp, dark brown, HC odor,	

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<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">  <p>DiSorbo Environmental Consulting Firm</p> </div> <div> <p>Geologist : Tracy Payne Driller : Enviro-Drill, Inc./Cohagan Drilling Rig : CME75 Drilling Method : Hollow-Stem Auger Sampling Method : 2' Split Spoon Comments : Total Depth : 40' BGL Ground Water : 20' BGL Start Date : 03/09/2018 Finish Date : 03/09/2018</p> </div> <div style="text-align: center;"> <p>WELL NO. OW-65 (Sheet 3 of 3)</p> </div> </div>									
							<p style="text-align: center;">Andeavor Gallup Refinery - French Drain Release WEST18012</p>		
Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	<p>Saturation ▼ Saturation</p>		<p>Completion Results</p> <p>OW-65</p>
							DESCRIPTION		
38				CL	40		SANDY CLAY, STA.		 <p>10/20 Sieve Sand Filter Pack</p>
39									
40									
41									
42									
43									
44									
45									
46									
47									
48									
49									
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58									
<p>1001 Louisiana Street, Suite 3250 Houston, Texas 77002 713-955-1230</p>							<p>DiSorbo Consulting, LLC</p>		<p>8501 N. MoPac Expy, Suite 300 Austin, Texas 78759 512-693-4190</p>

Appendix B

Standard Operating Procedure – Soil Sampling



memorandum

To: Sampling Team Members
From: Project Manager
Date: Revised September 30, 2021
Re: Standard Operating Procedure – Soil Sampling

1.0 INTRODUCTION

Soil sampling related to site characterization and site clean-up is expected to involve source sampling of potentially contaminated Soils for characterization and profiling. Soil sampling is expected to occur in and around the STP-1 French drain.

All personnel involved in Soil sampling projects are required to review this Standard Operating Procedure (SOP) before sampling to ensure the continued generation of reliable data. This SOP is based on experience gained from collecting Soil samples and the latest information available in guidance manuals. This SOP may be updated as additional experience and information are acquired.

2.0 PRE-FIELD ACTIVITIES

Several activities will be conducted prior to departure for the project site. A project team will be assigned and the members will begin coordinating the sample collection event with Marathon Petroleum Company. Field equipment will be checked and organized. Access to the areas to be sampled will be checked, and provisions made to pack the necessary equipment for delivery to the project site.

3.0 PREPARATION

The Project Manager will review the current sampling and analysis plans and work plans to determine if any documents need to be brought to the site during monitoring. The Project Manager will also evaluate whether any changes have been made in the sampling and analytical procedures, and notify the appropriate personnel.

The Sampling Team Members will review available surface water level data before leaving for the sampling site. This preparation ensures that the proper equipment and personnel are available at the site. All field screening equipment will be inspected prior to departure, ensuring that it is in proper working order. For Soil sampling, the only field monitoring equipment used will be the Photoionization detection (PID) meter and it should be calibrated and operated according to manufacturer's recommendations.



Sampling Team Members
Revised September 30, 2021
Page 2

4.0 EQUIPMENT

The following equipment is recommended for Soil sampling:

- Required personal protective equipment (PPE), listed in the site-specific health and safety plan (HASP) (generally nitrile gloves, waders, life preserver, rope and safety glasses)
- Soil sampling devices (i.e., hand auger)
- Sampling beaker, bottles, labels, and preservatives
- Gloves
- Chain-of-custody/sample-analysis-request forms
- Photoionization detection meter (PID)
- Opaque Cooler(s) and bagged ice or frozen Blue Ice
- Detergent or solvent for cleaning monitoring equipment
- Brushes dedicated for decontamination
- Decontamination containers dedicated for wash, rinse 1, and rinse 2
- Paper towels
- Trash bags
- Field logbook
- Wrist watch (with digital display)

5.0 SAMPLE COLLECTION

A critical aspect of any sampling program is selection and implementation of an appropriate sampling technique. Selection of equipment and technique should be appropriate for the volume of material required and the type of analysis to be performed. In general, the sampling equipment and technique will be chosen to minimize, to the extent possible, the amount of handling a sample will undergo prior to analysis. In many cases, the material to be sampled will be easy to access, and simple "grab" samples collected using a shovel, trowel, or drive sampler are appropriate. In other cases, such as underwater or heavily saturated samples, the Soils may be difficult to access, and sampling will involve the use of specialized Soil sampling equipment. Specific analytical requirements and sampling frequencies are specified in the work plan.

Soil samples located in dry areas will be collected from representative locations using a decontaminated drive sampler equipped with clean brass or stainless steel sampling rings, a thin-walled tube sampler or a shovel or hand trowel. The sampling device will be driven completely into the material manually or using



Sampling Team Members
Revised September 30, 2021
Page 3

a manually operated auger, drive hammer, or mallet. The sampling device will then be extracted from the material using a shovel or trowel as needed. If used, filled sampling rings or the thin walled tube will then be removed from the sampling device and immediately sealed on both ends with teflon sheeting and plastic caps. Otherwise, the material will be placed directly from the trowel or other appropriate sampling device into a clean glass jar. The jar will be filled completely to minimize headspace (by tamping during filling), and immediately sealed with a teflon-lined lid.

In accordance with the work plan saturated and underwater Soil samples will be collected using a hand auger, geoprobe, Soil sampler or a similar device. Samples will be collected from the shore or boat at each preselected sampling location. Underwater samples will be capped prior to breaking the surface of the water to prevent agitation of the sample and to assist in core characterization. In addition, care will be taken to prevent mixing when collecting saturated and underwater samples. Soil will be placed in sample containers provided by the laboratory and filled to the top to minimize headspace. If necessary, several cores may be collected from each location to provide adequate sample volume for the laboratory. The sample containers will be labeled with endurable ink. Filled sample containers should be wiped dry and placed in a cooler with ice (or equivalent) for storage at the time of collection. Enough ice and protective packing material should be used to cool the samples to 4° C and ensure that the container remains intact prior to final packing and shipment.

Field screening may involve the use of a PID probe, which will be inserted into the bag and the reading taken. All samples shall be screened at as close to the same temperature as possible to obtain consistent results.

Sampling devices will be decontaminated between sampling locations using a four-stage decontamination system consisting of a two detergent/water washes and two deionized water rinses. Sample locations will be recorded with a GPS in order to accurately map the sampling locations.

Field logbooks, Soil Sampling Field Log, and photograph logs will provide a written record of field data gathered, field observations, field equipment calibrations, the samples collected for analysis, and sample custody. Color photographs will be used to substantiate and augment the field notes, if necessary.

697-078-001

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District II
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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 93224

CONDITIONS

Operator: Western Refining Southwest LLC 539 South Main Street Findlay, OH 45840	OGRID: 267595
	Action Number: 93224
	Action Type: [UF-DP] NOI Discharge Permit (DISCHARGE PERMIT NOI)

CONDITIONS

Created By	Condition	Condition Date
jburdine	Accepted for Record Retention Purposes-Only	11/29/2022