

AP - 111

OW - 58

**Twin Wells
Investigation
Work Plan**



**Marathon
Petroleum Company LP**

JUL 19 2019 PM02:21

July 12, 2019

Mr. John E. Kieling, Chief
New Mexico Environment Department 2905
Rodeo Park Drive East, Bldg. 1
Santa Fe, NM 87505-6303

**RE: Notification to Conduct Monitor Well Installations
Investigation Work Plan OW-58 Twin Well
Investigation Work Plan Up-Gradient MKTF Wells
Marathon Petroleum Company LP, Gallup Refinery
(dba Western Refining Southwest, Inc.)
EPA ID# NMD000333211**

Dear Mr. Kieling:

Marathon Petroleum Company LP (dba Western Refining Southwest, Inc.) Gallup Refinery is scheduled to begin well installations on July 30, 2019. These well installations in the referenced work plans include the installation of OW-58 twin well (OW-58A) and five up-gradient MKTF wells. If there are any questions, please contact Brian Moore at 505-726-9745.

Sincerely,
Marathon Petroleum Company LP, Gallup Refinery

Robert S. Hanks

Robert S. Hanks
Refinery General Manager

Enclosure

cc K. Van Horn NMED
C. Chavez NMOCD
B. Moore Marathon Gallup Refinery



**Marathon
Petroleum Company LP**

April 26, 2019

Mr. John E. Kieling, Chief
New Mexico Environmental Department
2905 Rodeo Park Drive East, Bldg. 1
Santa Fe, NM 87505-6303

**Re: Response to Approval with Modifications
[REVISED] INVESTIGATION WORK PLAN OW-58 TWIN WELL
WESTERN REFINING SOUTHWEST INC., GALLUP REFINERY
EPA ID# NMD000333211
HWB-WRG-18-005**

Dear Mr. Kieling:

The Marathon Petroleum Company (MPC), Gallup Refinery is submitting the enclosed responses to New Mexico Environmental Department (NMED) comments dated April 12, 2019 on the referenced Investigation Work Plan. If you have any questions or comments, please call Brian Moore at 505-726-9745.

Certification

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

Sincerely,
Marathon Petroleum Company LP

A handwritten signature in blue ink that reads 'Robert S. Hanks'.

Robert S. Hanks
Refinery General Manager

Enclosure

cc K. Van Horn NMED
C. Chavez NMOCD
L. King EPA Region VI
B. Moore Marathon Gallup Refinery

92 Giant Crossing Road
Gallup, NM 87301

RESPONSE TO COMMENTS

April 12, 2019 Comments on Revised Investigation Work Plan OW-58 Twin Well (March 2019)

NMED Comment 1

The Permittee's response to NMED's Comment 3 states, "[h]owever, to provide better coverage in response to the initial request, Western is already planning to collect SPH samples from all existing wells within the tank farm where SPH is present for fingerprint analysis. This information will be provided in the email response that is due May 7, 2019 pursuant to the aforementioned comments no. 5 and 11." NMED concurs with the Permittee's proposal.

Gallup Response: None required.

NMED Comment 2

The Permittee's response to NMED's Comment 6 states, "[t]herefore, the need to drill a second shallower well with the screen set across the higher interval where SPH was encountered during drilling." The sentence is incomplete. Revise the statement for clarity in a response letter.

Gallup Response: The original response stated, "Regarding the disappearance of the SPH in 2017, we do not believe the SPH has in fact disappeared but simply it is isolated behind the well casing installed in OW-58. Therefore, the need to drill a second shallower well with the screen set across the higher interval where SPH was encountered during drilling." We were attempting to explain that the well screen in OW-58 was set below the interval where SPH was observed during drilling and thus a second well is necessary with the well screen set higher and directly across the interval where SPH was observed during drilling OW-58.

NMED Comment 3

The Permittee's response to NMED's Comment 8 states, "[o]n page 4-7, Section 4.1.7, Chemical Analyses, a provision has been added to specify that SPH will be analyzed by SW-846 Method 8015." The purpose of SPH analysis is to identify potential source of release. Therefore, the analytical method must be accurate enough to distinguish fraction of gasoline, diesel and oil range organics at a minimum. It is not clear whether Method 8015 is capable of identifying these three ranges simultaneously. If appropriate, conduct SPH analysis using the methods that can identify its constituents more accurately (e.g., Paraffin, Isoparaffins, Aromatics, Naphthalene, and Olefins - PIANO analysis). Provide a response in the response letter.

Gallup Response: We have discussed the proper analyses with the laboratory and SW-846 Method 8015 is capable of identifying all three ranges (gasoline, diesel, and motor oil) in the SPH samples. In addition, the chromatograms will be available, which can be compared to standards for various fuels types and crude oil.



Michelle Lujan Grisham
Governor

Howie C. Morales
Lt. Governor

**NEW MEXICO
ENVIRONMENT DEPARTMENT**

Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6313
Phone (505) 476-6000 Fax (505) 476-6030
www.env.nm.gov



James C. Kenney
Cabinet Secretary

Jennifer J. Pruett
Deputy Secretary

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

April 12, 2019

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

**RE: APPROVAL WITH MODIFICATIONS
[REVISED] INVESTIGATION WORK PLAN OW-58 TWIN WELL
WESTERN REFINING SOUTHWEST INC., GALLUP REFINERY
EPA ID # NMD000333211
HWB-WRG-18-005**

Dear Mr. Moore:

The New Mexico Environment Department (NMED) has reviewed the *[Revised] Investigation Work Plan OW-58 Twin Well* (Work Plan), dated March 2019, submitted on behalf of Marathon Petroleum Company LP dba Western Refining Southwest Inc., Gallup Refinery (the Permittee). NMED hereby issues this Approval with Modifications. The Permittee must address the following comments.

Comment 1

The Permittee's response to NMED's Comment 3 states, "[h]owever, to provide better coverage in response to the initial request, Western is already planning to collect SPH samples from all existing wells within the tank farm where SPH is present for fingerprint analysis. This information will be provided in the email response that is due May 7, 2019 pursuant to the aforementioned comments no. 5 and 11." NMED concurs with the Permittee's proposal.

Comment 2

The Permittee's response to NMED's Comment 6 states, "[t]herefore, the need to drill a second shallower well with the screen set across the higher interval where SPH was encountered during drilling." The sentence is incomplete. Revise the statement for clarity in a response letter.

Comment 3

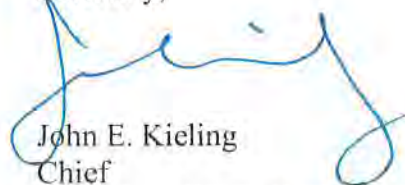
The Permittee's response to NMED's Comment 8 states, "[o]n page 4-7, Section 4.1.7, Chemical Analyses, a provision has been added to specify that SPH will be analyzed by SW-846 Method 8015." The purpose of SPH analysis is to identify potential source of release. Therefore, the analytical method must be accurate enough to distinguish fraction of gasoline, diesel and oil range organics at a minimum. It is not clear whether Method 8015 is capable of identifying these three ranges simultaneously. If appropriate, conduct SPH analysis using the methods that can identify its constituents more accurately (e.g., Paraffin, Isoparaffins, Aromatics, Naphthalene, and Olefins – PIANO analysis). Provide a response in the response letter.

The Permittee must address all comments in this Approval with Modifications and submit a response letter. The response letter must be submitted to NMED no later than **April 30, 2019**.

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

If you have questions regarding this letter, please contact Michiya Suzuki of my staff at 505-476-6059.

Sincerely,

A handwritten signature in blue ink, appearing to read "John E. Kielling", with a large, stylized flourish extending from the end of the signature.

John E. Kielling
Chief
Hazardous Waste Bureau

cc: K. Van Horn, NMED HWB
D. Cobrain, NMED HWB
M. Suzuki, NMED HWB
C. Chavez, OCD
L. King, EPA Region 6
B. Moore, WRG

File: Reading File and WRG 2019 File
HWB-WRG-18-005



**Marathon
Petroleum Company LP**

March 28, 2019

Mr. John E. Kieling, Chief
New Mexico Environmental Department
2905 Rodeo Park Drive East, Bldg. 1
Santa Fe, NM 87505-6303

**RE: Response to Disapproval
Investigation Work Plan OW-58 Twin Wells
Marathon Petroleum Company LP, Gallup Refinery
(dba Western Refining Southwest Inc.)
EPA ID# NMD000333211
HWB-WRG-18-005**

Dear Mr. Kieling:

Marathon Petroleum Company, LP (Marathon), Gallup Refinery is submitting the attached responses to the New Mexico Environmental Department (NMED) comments dated October 19, 2018 regarding the referenced Investigation Work Plan (IWP). The IWP has been revised in response to NMED comments and enclosed for your review. If there are any questions, please call Brian Moore at 505-726-9745.

Certification

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

Sincerely,
Marathon Petroleum Company LP – Gallup Refinery

A handwritten signature in cursive script that reads "Robert S. Hanks".

Robert S. Hanks
Refinery General Manager

Enclosure

cc K. Van Horn NMED
C. Chavez NMOCD
B. Moore Marathon Gallup Refinery
92 Giant Crossing Road
Jamestown, NM 87347

RESPONSE TO COMMENTS

October 19, 2018 Comments on OW-58 Twin Well Investigation Work Plan

NMED Comment No. 1

The Permittee submitted two copies of the Work Plan. One of copies was submitted unbound. Although there are no formal requirements to bind submittals, submittal of bound documents facilitates review and placement in the Hazardous Waste Bureau Administrative Record. Submit all future documents that contain more than 20 pages as bound documents. Refer to Comment 1 in the NMED' s *Approval with Modifications for Revised OW-14 Source Area Investigation Work Plan OW Series Wells and Contaminant Plume Migration*, dated May 12, 2016 as well as NMED' s September 7, 2018 letter, *Document Submittal Requirements*.

Gallup Response No. 1:

None required.

NMED Comment No. 2

In the *Executive Summary* Section, page E1, the Permittee states, "[a]n investigation was conducted in the OW-14 Source Area in September 2016, which included the installation of two new permanent monitoring wells (OW-57 and OW-58)." Since the rationale for installing OW- 58 originates from the OW-14 Source Area investigation, it is essential for NMED to review the OW-14 investigation report. Although the *Revised OW-14 Source Investigation Work Plan* was approved on May 12, 2016, the report documenting the investigation has not been submitted to NMED. Even though some information regarding the investigation was included in separate submittals (e.g., Appendix D in the *Facility Wide Ground Water Monitoring Work Plan - Updates for 2018*), a full and detailed investigation report was not submitted. The Permittee must provide a report that summarizes the results of the OW-14 source investigation so that NMED can conduct an informed review of this Work Plan. The Permittee has not included the report in the investigation implementation schedule shared with NMED. The Permittee must submit the investigation report to NMED before NMED can continue its technical review of this Work Plan. During a May 2018 meeting between the Permittee and NMED, the Permittee indicated that unapproved additional work, conducted at risk, was ongoing regarding the OW-14 source area investigation. It is not clear if the Permittee considers this Work Plan as part of the discussed additional work. A separate report must be submitted for that work plan. Submit the OW-14 source area investigation report for NMED review no later than **November 17, 2018**.

Gallup Response No. 2:

The requested investigation report for the OW-14 Source Area has been submitted.

NMED Comment No. 3

In the Section 2, *Background*, page 2-2, the Permittee states, "[a] possible leak from a seam in an unidentified storage tank located adjacent to Tank 569 was reported to have been repaired in 1995 (Giant, 1997). It is likely that this leaking tank resulted in the observed presence of [separate phase hydrocarbons] SPH instead of the burial of leaded tank bottoms." Currently, Tanks 568, 570, 571, 572, 581, 582, and 716 are located adjacent to Tank 569. Provide information indicating whether the "unidentified storage tank" is one of these tanks; otherwise, provide a figure showing the location of the unidentified storage tank and discuss the current status of the tank in the revised Work Plan. In addition, provide a basis for stating the probable source of SPH is the unidentified storage tank, rather than the burial of leaded tank bottoms in the revised Work Plan. It should be noted that there are multiple potential SPH sources in the source area. Tables previously provided

by the Permittee indicate that Tanks 569, 570, 571, 572, 581, and 582 contain gasoline or gasoline-range hydrocarbons. If hydrocarbon fingerprint analysis was previously conducted for SPH collected from wells in the vicinity of the source area (e.g., RW-1 or RW-2), provide the results of the analysis or reference the submittals where the results were included. Otherwise, propose to collect SPH from all wells in the source area where detected for hydrocarbon fingerprint analysis in the revised Work Plan.

Gallup Response No. 3:

The “unidentified” tank was in fact not identified in the subject document, it merely referred to an adjacent tank. We have attempted to find any additional information to identify the correct adjacent tank, but have not been able to determine to which tank the discussion was referring. While this work plan is focused only on the installation of the twin well for OW-58, you will find additional discussion in the Investigation Report for the OW-14 Source Area which is located very near OW-59. The OW-14 report was submitted to the NMED on January 31, 2019.

We have reviewed the earlier RFI sampling reports and based on the findings related to the burial of leaded tank bottoms believe the volume of separate-phase hydrocarbon (SPH) that has been recovered from RW-1 is not likely to have been sourced from only the leaded tank bottoms. Additional discussion has been added to the first paragraph of page 2-2.

Regarding the request to conduct hydrocarbon fingerprint analyses of SPH samples from existing wells in the vicinity, NMED made a similar request in comments no. 5 and 11 in the March 21, 2019 Disapproval of the 2017 Annual Groundwater Monitoring Report. These comments focused on wells NAPI-1, RW-5, and RW-6, which are in the western portion of the tank farm. However, to provide better coverage in response to the initial request, Western is already planning to collect SPH samples from all existing wells within the tank farm where SPH is present for fingerprint analysis. This information will be provided in the email response that is due May 7, 2019 pursuant to the aforementioned comments no. 5 and 11.

NMED Comment No. 4

In the Section 2, *Background*, page 2-2, the Permittee states, “[t]he borings logs are included in Appendix A and the chemical analyses are included in Table 2.” Table 2, *Groundwater Analyses* presents historical concentrations of constituents in the groundwater samples collected from the relevant wells up to 2016. However, new data that were collected in 2017 and 2018 are not included in the table. Since review of recent data will help NMED to provide more appropriate direction to execute the Work Plan, new data must be provided in the OW-14 source area investigation report required by Comment 2.

Gallup Response No 4:

Table 2 has been revised to include the more recent analyses requested by NMED. We note that the data for 2018 has not yet been submitted to NMED in the Annual Groundwater Monitoring Report, and thus the data validation is still pending. Also, the information in Tables 1 and 3 has been updated with more recent data.

NMED Comment No. 5

In the Section 2, *Background*, page 2-2, the Permittee states, “[t]he boring logs and chemical analyses were also previously provided in the 2018 Update of the Facility-Wide Ground Water Monitoring Work Plan.” It should be noted that the chemical analyses presented in Table 2 were not included in the 2018 *Update of the Facility-Wide Ground Water Monitoring Work Plan* (FWGWMP). Remove this statement from the revised Work Plan.

Gallup Response No. 5:

The reference to the inclusion of the chemical analyses has been removed from page 2-2.

NMED Comment No. 6

In the Section 3.2, *Subsurface Conditions*, page 3-2, the Permittee states, "[fluid level measurements for 2013 through 2016 are included Table 3." The 2018 FWGWMP presents the depth to groundwater (DTW) data from March to December 2017. The Section 4.1, *Investigation*, also provides a DTW data in April 25, 2018. Since new DTW data is available, it must be provided in the OW-14 source area investigation report required by Comment 2. Include all new data in the report. In addition, according to Table 3, well OW-58 was installed in September 22, 2016, and the SPH column thickness was recorded as 0.98 feet in September 30, 2016. However, Appendix C-1 in the 2018 FWGWMP indicates well OW-58 was installed in October 3, 2016, and SPH was non-detect during all four 2017 gauging events. Verify the date of installation and correct the discrepancy. Also, provide an explanation for why SPH detected in September 30, 2016 disappeared in 2017.

Gallup Response No. 6:

The information provided in Table 3 is correct. Well OW-58 was installed (i.e., drilled and well screen set) on September 22, 2016 and the well was gauged on September 30, 2016 with 0.98 feet of SPH measured in the well casing. The refinery requested that the well be completed with a flush mount completion, which was not immediately available, but was installed on October 3, 2016, thus the final "completion date" of October 3, 2016 was reflected in Appendix C-1 of the FWGWMP. We have revised the date in Appendix C-1 to reflect the actual installation date of September 22, 2016 and this will be submitted along with other recent updates to the FWGWMP.

Regarding the disappearance of the SPH in 2017, we do not believe the SPH has in fact disappeared but simply it is isolated behind the well casing installed in OW-58. Therefore, the need to drill a second shallower well with the screen set across the higher interval where SPH was encountered during drilling. As indicated on the well log for OW-58, SPH was first observed on the outside of the core along with a strong odor and elevated PID reading in the 22-24 foot sampling interval. While the boring was open for drilling to the terminal depth of 48.5 feet, SPH could enter the well bore and was still present when the well casing and screen was placed in the well. It was this SPH that was initially gauged in the well prior to well development. After the well was developed, no SPH has been measured in the well, as the screen interval is below the interval where SPH was observed in the soil samples.

NMED Comment No.7

In the Section 4.1.1, *Soil Sample Field Screening and logging*, page 4-1, the Permittee states, "[t]he soil boring will be drilled to a depth of 30 feet and continuously logged and samples field screened." According to the OW-58 boring log in Appendix A, *Boring Logs*, a sand lens appears to be present at a depth around 33 feet below ground surface (bgs). The soil boring must be sampled continuously to a depth of 35 feet bgs. If sand lenses are observed during the process of installation, place the screen interval to intercept the sand lenses. If the proposed well is to be completed at 35 feet bgs due to the presence of sand lenses, the screened interval must be placed from 20 to 35 feet bgs. Revise the Work Plan to propose to advance the boring to 35 feet bgs, as necessary.

Gallup Response No. 7:

The discussion on page 4-1 has been revised to extend the well depth to 35 feet and if the sand layer is present below 30 feet, the well screen will be placed from 20 to 35 feet bgs.

NMED Comment No. 8

In the Section 4.1.3, *Groundwater Sample Collection*, page 4-3, the Permittee states "[g]roundwater samples will be collected within 24 hours of the completion of well purging using disposal bailers." SPH may be present in the well at a time when collecting groundwater samples. If SPH is present, propose to gauge the well for SPH thickness and collect a SPH sample for hydrocarbon fingerprinting analysis in the revised Work Plan.

Gallup Response 8:

Section 4.1.3 on page 4-3 has been revised to note that fluid levels (SPH thickness) will be measured prior to sample collection. If SPH is present, then a sample will be retained for chemical analysis. On page 4-7, Section 4.1.7, Chemical Analyses, a provision has been added to specify that SPH will be analyzed by SW-846 Method 8015.

Investigation Work Plan OW-58 Twin Well



Gallup Refinery
Western Refining Southwest, Inc.
Gallup, New Mexico

EPA ID# NMD000333211

AUGUST 2018

(Revised March 2019)

A handwritten signature in black ink, appearing to read 'Scott Crouch', written over a horizontal line.

Scott Crouch
Senior Geologist



DiSorbo
Environmental Consulting Firm

8501 North Mopac Expy
512.693.4190 (P)

Suite 300
512.279.3118 (F)

Austin, TX 78759
www.disorboconsult.com

Table of Contents

List of Acronyms	i
Executive Summary	E1
Section 1 Introduction	1-1
Section 2 Background	2-1
Section 3 Site Conditions	3-1
3.1 Surface Conditions	3-1
3.2 Subsurface Conditions	3-1
Section 4 Scope of Services	4-1
4.1 Investigation	4-1
4.1.1 Soil Sample Field Screening and Logging	4-1
4.1.2 Drilling Activities	4-3
4.1.3 Groundwater Sample Collection	4-3
4.1.4 Sample Handling	4-4
4.1.5 Collection and Management of Investigation Derived Waste	4-5
4.1.6 Documentation of Field Activities	4-6
4.1.7 Chemical Analyses	4-7
4.1.8 Data Quality Objectives	4-8
Section 5 References	5-1

List of Tables

Table 1	RW-1 Recovery Volumes	5-1
Table 2	Groundwater Analyses	5-1
Table 3	Fluid Level Measurements	5-1

List of Figures

Figure 1	Site Location Map	5-1
Figure 2	Site Map	5-1
Figure 3	Topographic Map	5-1
Figure 4	Alluvium/Chinle GP Interface Water Elevation Map	5-1
Figure 5	Proposed Sample Location Map	5-1

Table of Contents (Continued)

Appendices

Appendix A Boring Logs

Appendix B Investigation Derived Waste Management Plan

List of Acronyms

benzene, toluene, ethylbenzene, and xylene (BTEX)
below ground level (bgl)
Code of Federal Regulations (CFR)
Contract Laboratory Program (CLP)
data quality objective (DQO)
diesel range organics (DRO)
dilution attenuation factor (DAF)
Environmental Protection Agency (EPA)
investigation derived waste (IDW)
Maximum Contaminant Level (MCL)
mean sea level (msl)
monitoring well (MW)
motor oil range organics (MRO)
methyl tert butyl ether (MTBE)
New Mexico Administrative Code (NMAC)
New Mexico Environment Department (NMED)
New Mexico Oil Conservation Division (NMOCD)
photoionization detector (PID)
polynuclear aromatic hydrocarbon (PAH)
polyvinyl chloride (PVC)
quality assurance/quality control (QA/QC)
Resource Conservation and Recovery Act (RCRA)
separate-phase hydrocarbon (SPH)
semi-volatile organic compound (SVOC)
Solid Waste Management Unit (SWMU)
total petroleum hydrocarbon (TPH)
toxicity characteristic leaching procedure (TCLP)
volatile organic compound (VOC)

Executive Summary

The Gallup Refinery, which is located 17 miles east of Gallup, New Mexico, has been in operation since the 1950s. Pursuant to the terms and conditions of the facility Resource Conservation and Recovery Act (RCRA) Post-Closure Care Permit and 20.4.1.500 New Mexico Administrative Code, this Investigation Work Plan has been prepared for the area up-gradient of monitoring well OW-14.

Groundwater samples collected from monitoring well OW-14 have indicated increasing concentrations of benzene and ethylbenzene since 2009, although the concentrations of ethylbenzene remain below screening levels. Methyl tert butyl ether (MTBE) has been detected at concentrations above the screening level since 2008 and 1-methylnaphthalene has sporadically been reported at concentrations above the screening level. OW-14 is located down-gradient of recovery wells RW-1 (OW-27) and RW-2 (OW-28), which were installed in near Tanks 569 and 576 in 1995 to address the presence of separate-phase hydrocarbon (SPH). An investigation was conducted in the OW-14 Source Area in September 2016, which included the installation of two new permanent monitoring wells (OW-57 and OW-58).

The purpose of this Work Plan is to install a second well near OW-58. The new well will have the screen set at a higher interval to intersect the potentiometric surface.

Section 1

Introduction

The Gallup Refinery is located approximately 17 miles east of Gallup, New Mexico along the north side of Interstate Highway I-40 in McKinley County. The physical address is I-40, Exit #39 Jamestown, New Mexico 87347. The Gallup Refinery is located on 810 acres. Figure 1 presents the refinery location and the regional vicinity.

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

This investigation work plan addresses the area up-gradient of monitoring well OW-14. The area of interest is located in the eastern portion of the refinery tank farm (Figure 2). The purpose of this investigation is to determine the source of the increasing concentrations of primarily benzene that are being observed in monitoring well OW-14. An additional well will be installed near OW-58 to facilitate the investigation of this area. The investigation activities will be conducted in accordance with Section IV.H.5 of the Post-Closure Care Permit.

Section 2

Background

This section presents background information for the area of the refinery property near monitoring well OW-14, including a review of historical waste management activities to identify the following:

- Type and characteristics of all waste and all contaminants handled in the subject areas;
- Known and possible sources of contamination;
- History of operations; and
- Prior investigations.

Monitoring well OW-14 is located immediately north of the main refinery tank farm, which was built in the late 1950s. The *Inventory of Solid Waste Management Units* prepared in June 1985 identified six product storage tanks that contained leaded gasoline (Geoscience Consultants, Ltd., 1985). These six, as well as, additional tanks were subsequently identified as SWMU No. 6 due to the historic practice of disposing of leaded tank bottoms within the tank berms. The practice of cleaning the tanks and burying the leaded tank bottoms was reported to have occurred every five years and was terminated after November 19, 1980.

The three leaded gasoline storage tanks (TK-568, TK-569, and TK-570) closest to OW-14 were investigated as part of SWMU No. 6 in the early to mid 1990s. Impacts to soil and the presence of separate-phase hydrocarbon (SPH) on groundwater was found within the alluvium overlying the Chinle Group. Boring BG-4, which was later identified as OW-27 and RW-1, was drilled east of TK-569 to a depth of 48.5 feet (Figure 2). A water-bearing sand layer was logged at approximately 30 feet with a strong hydrocarbon odor and an elevated PID reading. Subsequently 4-inch well screen was installed in the boring from 40.0 to 25.0 feet. The water level was initially measured at a depth of 28' 7" with an accumulation of 8" of SPH. A second soil boring B-2, which was later identified as OW-28 and RW-2, was drilled southwest of TK-576 to a depth of 38 feet. Saturation was first encountered in a sand layer at a depth of 23.6 feet with additional deeper water-bearing sand/gravel layers extending to top of the Chinle Group at a depth of 32.9 feet. The well screen was set from 36.1 feet to 26.1 feet below ground surface. The water level initially was measured at 24' 3" with 2" of SPH. The boring logs are included in Appendix A.

A possible leak from a seam in an unidentified storage tank located adjacent to Tank 569 was reported to have been repaired in 1995 (Giant, 1997). It is likely that this leaking tank resulted in the observed presence of SPH instead of the burial of leaded tank bottoms. This is based on a review of the earlier RCRA Facility Investigation effort to locate and characterize the buried leaded tank bottoms and the volume of SPH that has been recovered from RW-1 since it was installed. It does not appear that the burial of the leaded tanks bottoms would have resulted in impacts large enough to explain the volume of SPH in groundwater, but rather additional sources (e.g., a leaking tank) have also contributed.

RW-1 had an estimated 2.33 gallons of SPH recovered in 2013 using a submersible bladder pump, while no SPH has been observed in RW-2 since before 2005 (Western, 2016). The recovery volume of SPH remained fairly constant in 2014 and 2015, but increased to 8.5 gallons and 10.5 gallons in 2016 and 2017, respectively. The volume of SPH recovered from RW-1 decreased to 1.5 gallons in 2018. The estimated annual volumes of SPH recovered at RW-1 from 2005 through 2018 are shown in Table 1. The measured thickness of SPH in RW-1 increased in 2013 to over 3 feet, from less than one foot in prior years dating back to 2009. It reached a thickness of 5.01 feet in June 2014 and fluctuated from 1.94 feet to 4.89 feet until showing a significant decline in June 2017. The measured thickness of SPH has since declined to less than one foot in 2018.

Beginning in 2011 groundwater samples have been collected annually from RW-1 and RW-2 and analyzed for dissolved-phase organic constituents and metals. Elevated concentrations of benzene, toluene, ethylbenzene, and xylenes (BTEX) and MTBE have been reported for samples collected at both recovery wells. The concentrations of BTEX are significantly higher at the recovery wells than observed in down-gradient well OW-14. MTBE is also detected at higher concentrations in the up-gradient recovery wells, but the difference is less than what is observed for BTEX. The dissolved-phase concentrations are included in Table 2. The chemical analyses for recovery wells RW-5 and RW-6 are also included in Table 2 as they are located within the refinery main tank farm; however, these wells are over 800 feet southwest of well OW-14 and are unlikely to represent a possible source for the constituents detected at OW-14. BTEX concentrations are less in groundwater samples collected at RW-5 and RW-6 than those collected at RW-1, RW-2, and OW-14.

In September 2016, two new permanent monitoring wells (OW-57 and OW-58) were installed to the south of OW-14 in the northeastern corner of the tank farm. The boring logs are included in Appendix A and the chemical analyses are included in Table 2. The boring logs were also previously provided in the 2018 Update of the *Facility-Wide Ground Water Monitoring Work Plan*. In

correspondence dated June 5, 2018 NMED requested that a new well be installed near OW-58 to address the concern that the water level measured in OW-58 was above the top of the well screen and could hinder the investigation of SPH.

Well OW-58 was drilled to the top of bedrock as specified in the *OW-14 Source Area Investigation work Plan*, which was approved with modifications by NMED on May 12, 2016. As indicated on the enclosed boring log, a saturated sandy gravel interval was encountered from the top of bedrock at 48 feet below ground level (bgl) to 47 feet bgl. This interval had an elevated reading using a Photoionization Detector (PID) and a hydrocarbon odor. The well screen was placed at the bottom of the well to intercept this interval on top of bedrock and extended upward for 10 feet to within a silty clay layer. The silty clay layer extended from 33.5 feet to 40 feet bgl. Significantly higher PID readings were observed above the top of the silty clay layer and evidence of SPH was observed on the outside of the cores from 24 feet to 28 feet in a silty clay interval. Due to concerns over using an excessively long screen length and the possibly of cross-contaminating across zones not otherwise in direct hydraulic connection, the decision was made to screen only the lower interval in OW-58. It was determined that a second well would be necessary to screen the upper interval.

It is noted that SPH was measured in OW-58 immediately after well installation as indicated in Table 3, but no SPH has been detected in the well since well development. This is believed to be due to the fact that the well screen in OW-58 was placed beneath the interval where SPH was observed in soil samples (24 feet to 28 feet bgs).

Section 3

Site Conditions

3.1 Surface Conditions

A topographic map of the area near the monitoring well OW-14 and the refinery main tank farm is included as Figure 3. 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 to 6,860 feet. The area of the site near OW-14 is at an approximate elevation of 6,934 feet above mean sea level (msl).

The soils in the vicinity of OW-14 include two soil types. Surface soils within most of the area of investigation are primarily Rehobeth silty clay loam. To the north are the bordering Simitarq-Celavar sandy loams. Rehobeth soil properties include a pH ranging from 8 to 9 standard units and salinity (naturally occurring and typically measuring up to approximately 8 mmhos/cm). The Simitarq-Celavar soils are well drained with a conservative permeability of 0.20 inches/hour and minimal salinity. Simitarq soils have nearly neutral pH values ranging from 7.2 to 7.4 standard units.

Regional surface water features include the refinery evaporation ponds and a number of small ponds (one cattle water pond and two small unnamed spring fed ponds). The site is located in the Puerco River Valley, north of the Zuni Uplift with overland flows directed northward to the tributaries of the Puerco River. The Puerco River continues to the east to the confluence with the Rio Grande. The South Fork of the Puerco River is intermittent and retains flow only during and immediately following precipitation events.

3.2 Subsurface Conditions

The shallow subsurface soils consist of fluvial and alluvial deposits comprised of clay and silt with minor inter-bedded sand layers. Very low permeability bedrock (e.g., claystones and siltstones) underlie the surface soils and effectively form an aquitard. The Chinle Group, which is Upper Triassic, crops out over a large area on the southern margin of the San Juan Basin. The uppermost recognized local Formation is the Petrified Forest Formation and the Sonsela Sandstone Bed is the uppermost recognized regional aquifer. Aquifer test of the Sonsela Bed northeast of Prewitt indicated a transmissivity of greater than 100 ft²/day (Stone and others, 1983). The Sonsela Sandstone's highest point occurs southeast of the site and slopes downward to the northwest as it

passes under the refinery. The Sonsela Sandstone forms a water-bearing reservoir with artesian conditions throughout the central and western portions of the refinery property.

The diverse properties and complex, irregular stratigraphy of the surface soils across the site cause a wide range of hydraulic conductivity ranging from less than 10^{-2} cm/sec for gravel like sands immediately overlying the Petrified Forest Formation to 10^{-8} cm/sec in the clay soils located near the surface (Western, 2009). Generally, shallow groundwater at the refinery follows the upper contact of the Petrified Forest Formation with prevailing flow from the southeast to the northwest, although localized areas may have varying flow directions (Figure 4). Fluid level measurements for 2013 through 2016 are included in Table 3.

Section 4

Scope of Services

The site investigation of soil and groundwater will be conducted to determine the source of the increasing concentrations of benzene that have been observed in monitoring well OW-14. The investigation will commence upon approval of this investigation work plan by NMED.

4.1 Investigation

An investigation of soil and groundwater conditions in the eastern portion of the Refinery main tank farm is proposed to determine the source of constituents apparently migrating down-gradient towards OW-14. One new permanent monitoring well is proposed a short distance to the northeast of OW-58 (Figure 5). OW-58 is completed within a dirty roadway and the new well will be drilled outside of the roadway to allow use of a stick-up type of completion.

To facilitate the investigation of potential SPH in this area, the well screen in the new well will be placed at a depth to intercept the potentiometric surface as measured in OW-58. On April 25, 2018 the depth to water measured in OW-58 was 24.25 feet below the top of casing. The top of casing is 0.21 feet below ground level, thus the water level is approximately 24.5 feet below ground level. The screen interval will be placed from 20 feet to 35 feet below ground level. This will allow the well to not only intercept the potentiometric surface, but also be open to intervals where SPH was observed on the outside of the cores retrieved while drilling OW-58 (see discussion in Section 2.0).

4.1.1 Soil Sample Field Screening and Logging

The soil boring will be drilled to a depth of 35 feet and continuously logged and samples field screened. Samples obtained from the soil boring will be screened in the field on 2.0 foot intervals for evidence of contaminants. Field screening results will be recorded on the exploratory boring log. Field screening results will be used to aid in selection of soil samples for laboratory analysis. The primary screening methods include: (1) visual examination, (2) olfactory examination, and (3) headspace vapor screening for volatile organic compounds. Additional screening for site- or release-specific characteristics such as pH or for specific compounds using field test kits may be conducted where appropriate.

Visual screening includes examination of soil samples for evidence of staining caused by petroleum-related compounds or other substances that may cause staining of natural soils such as elemental sulfur or cyanide compounds. Headspace vapor screening targets volatile organic compounds and involves placing a soil sample in a plastic sample bag or a foil sealed container allowing space for ambient air. The container will be sealed and then shaken gently to expose the soil to the air trapped in the container. The sealed container will be allowed to rest for a minimum of 5 minutes while vapors equilibrate. Vapors present within the sample bag's headspace will then be measured by inserting the probe of the instrument in a small opening in the bag or through the foil. The maximum value and the ambient air temperature will be recorded on the field boring or test pit log for each sample.

The monitoring instruments will be calibrated each day to the manufacturer's standard for instrument operation. A photoionization detector (PID) equipped with a 10.6 or higher electron volt (eV) lamp or a combustible gas indicator will be used for VOC field screening. Field screening results may be site- and boring-specific and the results may vary with instrument type, the media screened, weather conditions, moisture content, soil type, and type of contaminant, therefore, all conditions capable of influencing the results of field screening will be recorded on the field logs.

Discrete soil samples will be retained for laboratory analysis from within the following intervals:

- From the interval with the greatest apparent degree of contamination in the vadose zone, based on field observations and field screening;
- From the bottom of the borehole;
- From the 0.5 foot interval at the top of saturation; and
- Any additional intervals as determined based on field screening results.

The physical characteristics of the samples (such as mineralogy, ASTM soil classification, moisture content, texture, color, presence of stains or odors, and/or field screening results), depth where each sample was obtained, method of sample collection, and other observations will be recorded in the field log by a qualified geologist or engineer. Detailed logs of each boring will be completed in the field by a qualified engineer or geologist. Additional information, such as the presence of water-bearing zones and any unusual or noticeable conditions encountered during drilling, will be recorded on the log.

Quality Assurance/Quality Control (QA/QC) samples will be collected to monitor the validity of the soil sample collection procedures as follows:

- Field duplicates will be collected at a rate of 10 percent; and
- Equipment blanks will be collected from all sampling apparatus at a frequency of one per day.

4.1.2 Drilling Activities

The soil boring will be drilled using hollow-stem augers. The drilling equipment will be properly decontaminated before drilling each boring. The NMED will be notified as early as practicable if conditions arise or are encountered that do not allow the advancement of borings to the specified depths or at planned sampling locations. Appropriate actions (e.g., installation of protective surface casing or relocation of borings to a less threatening location) will be taken to minimize any negative impacts from investigative borings. Slotted (0.01 inch) PVC well screen will be placed at the bottom of the borings and will extend for 10 feet to ensure that the well is screened across the water table, where water table conditions exist. A 10/20 sand filter pack will be installed to two feet over the top of the well screen.

4.1.3 Groundwater Sample Collection

Prior to sample collection, the fluid level in the well will be measured to determine if SPH is present and to record the SPH thickness, in addition to the potentiometric surface. If SPH is present in the well, then a sample will be retained to chemical analysis. Groundwater samples will be collected within 24 hours of the completion of well purging using disposal bailers. Alternatively, well sampling may also be conducted in accordance with the NMED's Position Paper *Use of Low-Flow and other Non-Traditional Sampling Techniques for RCRA Compliant Groundwater Monitoring* (October 30, 2001, as updated). Sample collection methods will be documented in the field monitoring reports. The samples will be transferred to the appropriate, clean, laboratory-prepared containers provided by the analytical laboratory. Sample handling and chain-of-custody procedures will be in accordance with the procedures presented below in Section 4.1.4.

Groundwater samples intended for metals analysis will be submitted to the laboratory as both total and dissolved metals samples. QA/QC samples will be collected to monitor the validity of the groundwater sample collection procedures as follows:

-
-
- Field duplicate water samples will be obtained at a frequency of ten percent, with a minimum, of one duplicate sample per sampling event;
 - Equipment rinsate blanks will be obtained for chemical analysis at the rate of ten percent or a minimum of one rinsate blank per sampling day. Equipment rinsate blanks will be collected at a rate of one per sampling day if disposable sampling equipment is used. Rinsate samples will be generated by rinsing deionized water through unused or decontaminated sampling equipment. The rinsate sample will be placed in the appropriate sample container and submitted with the groundwater samples to the analytical laboratory for the appropriate analyses; and
 - Trip blanks will accompany laboratory sample bottles and shipping and storage containers intended for VOC analyses. Trip blanks will consist of a sample of analyte-free deionized water prepared by the laboratory and placed in an appropriate sample container. The trip blank will be prepared by the analytical laboratory prior to the sampling event and will be kept with the shipping containers and placed with other water samples obtained from the site each day. Trip blanks will be analyzed at a frequency of one for each shipping container of groundwater samples to be analyzed for VOCs.

4.1.4 Sample Handling

At a minimum, the following procedures will be used at all times when collecting samples during investigation, corrective action, and monitoring activities:

1. Neoprene, nitrile, or other protective gloves will be worn when collecting samples. New disposable gloves will be used to collect each sample;
2. All samples collected of each medium for chemical analysis will be transferred into clean sample containers supplied by the project analytical laboratory with the exception of soil, rock, and sediment samples obtained in Encore® samplers. Sample container volumes and preservation methods will be in accordance with the most recent standard EPA and industry accepted practices for use by accredited analytical laboratories. Sufficient sample volume will be obtained for the laboratory to complete the method-specific QC analyses on a laboratory-batch basis; and
3. Sample labels and documentation will be completed for each sample following procedures discussed below. Immediately after the samples are collected, they will be stored in a cooler with ice or other appropriate storage method until they are delivered to the analytical laboratory. Standard chain-of-custody procedures, as described below, will

be followed for all samples collected. All samples will be submitted to the laboratory soon enough to allow the laboratory to conduct the analyses within the method holding times.

Chain-of-custody and shipment procedures will include the following:

1. Chain-of-custody forms will be completed at the end of each sampling day, prior to the transfer of samples off site.
2. Individual sample containers will be packed to prevent breakage and transported in a sealed cooler with ice or other suitable coolant or other EPA or industry-wide accepted method. The drainage hole at the bottom of the cooler will be sealed and secured in case of sample container leakage. Temperature blanks will be included with each shipping container.
3. Each cooler or other container will be delivered directly to the analytical laboratory.
4. Glass bottles will be separated in the shipping container by cushioning material to prevent breakage.
5. Plastic containers will be protected from possible puncture during shipping using cushioning material.
6. The chain-of-custody form and sample request form will be shipped inside the sealed storage container to be delivered to the laboratory.
7. Chain-of-custody seals will be used to seal the sample-shipping container in conformance with EPA protocol.
8. Signed and dated chain-of-custody seals will be applied to each cooler prior to transport of samples from the site.
9. Upon receipt of the samples at the laboratory, the custody seals will be broken, the chain-of-custody form will be signed as received by the laboratory, and the conditions of the samples will be recorded on the form. The original chain-of-custody form will remain with the laboratory and copies will be returned to the relinquishing party.
10. Copies of all chain-of-custody forms generated as part of sampling activities will be maintained on-site.

4.1.5 Collection and Management of Investigation Derived Waste

Drill cuttings, excess sample material and decontamination fluids, and all other investigation derived waste (IDW) associated with soil borings will be contained and characterized using methods based on

the boring location, boring depth, drilling method, and type of contaminants suspected or encountered. All purged groundwater and decontamination water will be characterized prior to disposal unless it is disposed in the refinery wastewater treatment system upstream of the API Separator. An IDW management plan is included as Appendix B.

Field equipment requiring calibration will be calibrated to known standards, in accordance with the manufacturers' recommended schedules and procedures. At a minimum, calibration checks will be conducted daily, or at other intervals approved by the Department, and the instruments will be recalibrated, if necessary. Calibration measurements will be recorded in the daily field logs. If field equipment becomes inoperable, its use will be discontinued until the necessary repairs are made. In the interim, a properly calibrated replacement instrument will be used.

4.1.6 Documentation of Field Activities

Daily field activities, including observations and field procedures, will be recorded in a field log book. Copies of the completed forms will be maintained in a bound and sequentially numbered field file for reference during field activities. Indelible ink will be used to record all field activities. Photographic documentation of field activities will be performed, as appropriate. The daily record of field activities will include the following:

1. Site or unit designation;
2. Date;
3. Time of arrival and departure;
4. Field investigation team members including subcontractors and visitors;
5. Weather conditions;
6. Daily activities and times conducted;
7. Observations;
8. Record of samples collected with sample designations and locations specified;
9. Photographic log, as appropriate;
10. Field monitoring data, including health and safety monitoring;
11. Equipment used and calibration records, if appropriate;
12. List of additional data sheets and maps completed;
13. An inventory of the waste generated and the method of storage or disposal; and
14. Signature of personnel completing the field record.

4.1.7 Chemical Analyses

All samples collected for laboratory analysis will be submitted to an accredited laboratory. The laboratory will use the most recent standard EPA and industry-accepted analytical methods for target analytes as the testing methods for each medium sampled. Chemical analyses will be performed in accordance with the most recent EPA standard analytical methodologies and extraction methods.

SPH will be analyzed by SW-846 Method 8015. Groundwater and soil samples will be analyzed by the following methods:

- SW-846 Method 8260 for volatile organic compounds;
- SW-846 Method 8270 for semi-volatile organic compounds; and
- SW-846 Method 8015B gasoline range (C5-C10), diesel range (>C10-C28), and motor oil range (>C28-C36) organics.

Groundwater and soil samples will also be analyzed for the following Skinner List metals and iron and manganese using the indicated analytical methods shown. The groundwater samples collected for metals analysis will be analyzed for total and dissolved concentrations. Groundwater samples will also be analyzed for chloride, fluoride, and sulfate.

Inorganic Analytical Methods

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.4/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020

Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020
Iron	SW-846 method 6010/6020
Manganese	SW-846 method 6010/6020

Groundwater field measurements will be obtained for pH, specific conductance, dissolved oxygen concentrations, oxidation-reduction potential, and temperature.

4.1.8 Data Quality Objectives

The Data Quality Objectives (DQOs) were developed to ensure that newly collected data are of sufficient quality and quantity to address the project goals, including Quality Assurance/Quality Control (QA/QC) issues (EPA, 2006). The project goals are established to determine and evaluate the presence, nature, and extent of releases of contaminants at specified SWMUs. The type of data required to meet the project goals includes chemical analyses of soil and groundwater to determine if there has been a release of contaminants.

The quantity of data is location specific and is based on the historical operations at individual locations. Method detection limits should be 20% or less of the applicable background levels, cleanup standards and screening levels.

Additional DQOs include precision, accuracy, representativeness, completeness, and comparability. Precision is a measurement of the reproducibility of measurements under a given set of circumstances and is commonly stated in terms of standard deviation or coefficient of variation (EPA, 1987). Precision is also specific to sampling activities and analytical performance. Sampling precision will be evaluated through the analyses of duplicate field samples and laboratory replicates will be utilized to assess laboratory precision.

Accuracy is a measurement in the bias of a measurement system and may include many sources of potential error, including the sampling process, field contamination, preservation, handling, sample matrix, sample preparation, and analysis techniques (EPA, 1987). An evaluation of the accuracy will be performed by reviewing the results of field/trip blanks, matrix spikes, and laboratory QC samples.

Representativeness is an expression of the degree to which the data accurately and precisely represent the true environmental conditions. Sample locations and the number of samples have been selected to ensure the data is representative of actual environmental conditions. Based on SWMU specific conditions, this may include either biased (i.e., judgmental) locations/depths or

unbiased (systematic grid samples) locations. In addition, sample collection techniques (e.g., field monitoring and decontamination of sampling equipment) will be utilized to help ensure representative results.

Completeness is defined as the percentage of measurements taken that are actually valid measurements, considering field QA and laboratory QC problems. EPA Contract Laboratory Program (CLP) data has been found to be 80-85% complete on a nationwide basis and this has been extrapolated to indicate that Level III, IV, and V analytical techniques will generate data that are approximately 80% complete (EPA, 1987). As an overall project goal, the completeness goal is 85%; however, some samples may be critical based on location or field screening results and thus a sample-by-sample evaluation will be performed to determine if the completeness goals have been obtained.

Comparability is a qualitative parameter, which expresses the confidence with which one data set can be compared to another. Industry standard sample collection techniques and routine EPA analytical methods will be utilized to help ensure data are comparable to historical and future data. Analytical results will be reported in appropriate units for comparison to historical data and cleanup levels.

Section 5

References

EPA, 1987, Data Quality Objectives for Remedial Response Activities; United States Environmental Protection Agency, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, OSWER Directive 9355.0-7B, 85p.

EPA, 2006, Guidance on Systematic Planning Using the Data Quality Objectives Process, United States Environmental Protection Agency, Office of Environmental Information; EPA/240/B-06/001, p. 111.

Geoscience Consultants, Ltd, 1985, Inventory of Solid Waste Management Units, June 14, 1985, p. 22.

Giant Refining Company, 1997, Comprehensive Facility Investigation Work Plan (Stage 1 Abatement Plan), June 30, 1997, p. 7.

NMED, 2017, Risk Assessment Guidance for Site Investigation and Remediation, New Mexico Environment Department.

Stone, W.J., Lyford, F.P., Frenzel, P.F., Mizel, N.H., and Padgett, E.T., 1983, Hydrogeology and Water Resources of San Juan Basin, New Mexico; Hydrogeologic Report 6, New Mexico Bureau of Mines and Mineral Resources, p. 70.

Western, 2009, Facility-wide Groundwater Monitoring Plan: Gallup Refinery, p. 97.

Western, 2016, Annual Ground Water Monitoring Report: Gallup Refinery - 2016, p. 286.

Tables

Table 1	RW-1 Recovery Volumes
Table 2	Groundwater Analyses
Table 3	Fluid Level Measurements

Table 1 - RW-1 Recovery Volumes
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Year	Product Recovered (gallons)	Water Recovered (gallons)
2005	431.5	1,210.5
2006	23.52	1,107.0
2007	1.72	148.5
2008	3.99	152.0
2009	1.78	338.0
2010	0.66	128.0
2011	0.42	165.0
2012	0.97	137.0
2013	2.328	86.0
2014	2.37	83.0
2015	2	54.0
2016	8.5	53.0
2017	10.5	50.0
2018	1.5	3.0
Total	491.758	3,715.0

Recovery volumes are field estimates for RW-1

Table 2 - Groundwater Analyses
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

	Benzene (mg/L)	Toluene (mg/L)	Ethyl Benzene (mg/L)	Total Xylenes (mg/L)	MTBE (mg/L)	1,2,4- Trimethyl benzene (mg/L)	1,3,5- Trimethyl benzene (mg/L)	1,2- Dichloro ethane (EDC) (mg/L)	Naphthale ne (mg/L)	2- Methylna phtthalene (mg/L)	1,1- Dichloroe thane (mg/L)	Isopropyl benzene (mg/L)	n- Butylbenz ene (mg/L)	n- Propylben zene (mg/L)	2,4- Dimethylp henol (mg/L)	Acetone (mg/L)	Sec- butylbenz ene (mg/L)
WQCC 20NMAC 6.2.3103 (DECEMBER 2018)	0.005	1	0.7	0.62	0.1	NE	NE	0.005	0.03	NE	0.025	NE	NE	NE	NE	NE	NE
40 CFR 141.61 MCL (NOVEMBER 2015)	0.005	1	0.7	10	NE	NE	NE	0.005	NE	NE	NE	NE	NE	NE	NE	NE	NE
NMED TAP WATER (FEBRUARY 2019)	0.00455	1.09	0.0149	0.193	0.143	NE	NE	0.0017	0.00165	0.035	0.0275	0.447	NE	NE	0.354	14.06	NE
EPA RSL TAP WATER (NOVEMBER 2018)	0.00046	1.1	0.0015	0.19	0.014	0.056	0.06	0.013	0.00017	0.0011	0.0028	0.45	1	0.66	0.36	14	2
Well ID	DATE SAMPLED																
OW-13		<0.001	<0.001	<0.0015	0.062	<0.001	<0.001	<0.001	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	<0.010	<0.001
	11/06/18	<0.001	<0.001	<0.0015	0.075	<0.001	<0.001	0.00076	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	0.0045	<0.001
	09/11/18	<0.001	<0.001	<0.0015	0.068	<0.001	<0.001	0.00081	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	0.0011	<0.001
	05/15/18	<0.001	<0.001	<0.0015	0.058	<0.001	<0.001	0.00077	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	0.0012	<0.001
	02/28/18	<0.001	<0.001	<0.0015	0.056	<0.001	<0.001	0.00087	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	0.0036	<0.001
	12/11/17	<0.001	<0.001	<0.0015	0.056	<0.001	<0.001	0.00077	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	<0.01	<0.001
	09/06/17	<0.001	<0.001	<0.0015	0.058	<0.001	<0.001	0.00084	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	0.0036	<0.001
	05/31/17	<0.001	<0.001	<0.0015	0.053	<0.001	<0.001	0.00085	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	<0.01	<0.001
	02/27/17	<0.001	<0.001	<0.0015	0.044	<0.001	NA	0.001	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	NA	<0.001
	11/15/16	<0.001	<0.001	<0.0015	0.038	<0.001	NA	0.001	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	NA	<0.001
	08/31/16	0.0001	<0.001	<0.0015	0.036	<0.001	NA	0.00075	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	NA	<0.001
	06/06/16	<0.001	<0.001	<0.0015	0.035	<0.001	NA	0.001	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	NA	<0.001
	03/04/16	<0.001	<0.001	<0.0015	0.035	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	NA	<0.001
	10/27/15	<0.001	<0.001	<0.0016	0.035	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	NA	<0.001
	08/11/15	<0.001	<0.001	<0.0015	0.031	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	NA	<0.001
	06/01/15	<0.001	<0.001	<0.0015	0.025	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	NA	<0.001
		<0.001	<0.001	<0.0015	0.026	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	NA	<0.001
	03/09/15	<0.001	<0.001	<0.0015	0.027	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	NA	<0.001
	11/10/14	<0.001	<0.001	<0.0015	0.023	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	NA	<0.001
	09/15/14	<0.001	<0.001	<0.0015	0.023	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	NA	<0.001
	06/03/14	<0.001	<0.001	<0.0015	0.02	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	NA	<0.001
	03/07/14	<0.001	<0.001	<0.0015	0.023	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	NA	<0.001
	11/11/13	<0.001	<0.001	<0.0015	0.017	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	NA	<0.001
	09/04/13	<0.001	<0.001	<0.0015	0.014	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	NA	<0.001
	06/13/13	<0.001	<0.001	<0.0015	0.015	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	NA	NA	<0.001
	03/19/13	<0.001	<0.001	<0.0015	0.012	<0.005	NA	<0.005	<0.01	<0.004	<0.001	<0.001	<0.003	<0.001	<0.001	<0.001	<0.001
	11/27/12	<0.001	<0.001	<0.0015	0.011	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	<0.001	<0.001	<0.001
	08/23/12	<0.001	<0.001	<0.0015	0.0092	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.003	<0.001	<0.001	<0.001	<0.001
	06/14/12	<0.001	<0.001	<0.0015	0.0079	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	03/21/12	<0.001	<0.001	<0.0015	0.0082	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	12/13/11	<0.001	<0.001	<0.0015	0.0065	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	10/25/11	<0.001	<0.001	<0.0015	0.0062	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.001	<0.001	NA	NA	<0.001
	06/20/11	<0.001	<0.001	<0.0015	0.0048	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.001	<0.001	NA	NA	<0.001
	02/24/11	<0.001	<0.001	<0.0015	0.0040	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.001	<0.001	NA	NA	<0.001
	11/08/10	<0.001	<0.001	<0.0015	0.0038	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.001	<0.001	NA	NA	<0.001
	09/22/10	<0.001	<0.001	<0.0015	0.0031	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.001	<0.001	NA	NA	<0.001
	06/07/10	<0.001	<0.001	<0.0015	0.0027	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.001	<0.001	NA	NA	<0.001
	03/25/10	<0.001	<0.001	<0.0015	0.0023	<0.001	NA	<0.001	<0.002	<0.004	<0.001	<0.001	<0.001	<0.001	NA	NA	<0.001

Table 2 - Groundwater Analyses
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

	Benzene (mg/L)	Toluene (mg/L)	Ethyl Benzene (mg/L)	Total Xylenes (mg/L)	MTBE (mg/L)	1,2,4- Trimethyl benzene (mg/L)	1,3,5- Trimethyl benzene (mg/L)	1,2- Dichloro ethane (EDC) (mg/L)	Naphthale ne (mg/L)	1-Methyl naphthale ne (mg/L)	2- Methylna phthalene (mg/L)	1,1- Dichloroe thane (mg/L)	Isopropyl benzene (mg/L)	n- Butylbenz ene (mg/L)	n- Propylben zene (mg/L)	2,4- Dimethylp henol (mg/L)	Acetone (mg/L)	Sec- butylbenz ene (mg/L)
WQCC 20NMAC 6.2.3103 (DECEMBER 2018)	0.005	1	0.7	0.62	0.1	NE	NE	0.005	0.03	NE	NE	0.025	NE	NE	NE	NE	NE	NE
40 CFR 141.61 MCL (NOVEMBER 2015)	0.005	1	0.7	10	NE	NE	NE	0.005	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
NMED TAP WATER (FEBRUARY 2019)	0.00455	1.09	0.0149	0.193	0.143	NE	NE	0.0017	0.00165	0.0114	0.035	0.0275	0.447	NE	NE	0.354	14.06	NE
EPA RSL TAP WATER (NOVEMBER 2018)	0.00046	1.1	0.0015	0.19	0.014	0.056	0.06	0.013	0.00017	0.0011	0.036	0.0028	0.45	1	0.66	0.36	14	2
Well ID	DATE SAMPLED																	
OW-14	11/06/18	13	<0.05	<0.075	0.60	<0.05	<0.05	<0.05	<0.1	<0.2	<0.2	<0.05	<0.05	<0.15	<0.05	NA	<0.5	<0.05
	09/11/18	17	<0.05	0.042	0.74	<0.05	<0.05	<0.05	0.027	0.026	<0.2	<0.05	0.017	<0.15	0.030	NA	<0.5	<0.05
	05/15/18	15	0.0088	<0.15	0.67	<0.1	<0.1	<0.1	0.017	<0.4	<0.4	<0.1	0.014	<0.3	0.027	NA	<1	<0.1
	02/27/18	14	0.0065	<0.15	0.66	<0.1	<0.1	<0.1	0.044	0.059	<0.4	<0.1	0.012	<0.3	0.032	NA	<1	<0.1
	12/11/17	13	0.013	0.052	0.63	0.013	0.0021	<0.01	0.037	0.033	<0.04	<0.01	0.016	0.003	0.028	NA	<0.1	0.0032
	09/06/17	12	0.0091	0.033	0.66	0.012	0.0016	<0.005	0.038	0.038	0.0017	<0.005	0.014	0.0021	0.025	NA	0.013	0.0027
	05/30/17	13	0.004	0.47	0.7	0.011	<0.05	<0.05	0.028	0.037	<0.2	<0.05	0.014	<0.15	0.021	NA	<0.5	<0.05
	02/27/17	12	0.0062	<0.075	0.81	0.0074	<0.05	<0.05	0.024	0.035	<0.2	<0.05	0.0083	<0.15	0.014	NA	<0.5	<0.05
	11/15/16	8.7	0.0057	0.3	0.013	0.5	0.0084	0.0015	0.02	0.03	NA	<0.01	0.01	0.0034	0.013	NA	NA	0.0041
	08/31/16	8.1	0.0029	0.25	0.008	0.0071	0.0008	<0.005	0.018	0.034	NA	<0.005	0.0085	0.0013	0.011	NA	NA	0.0022
	06/06/16	7.8	0.0026	0.23	0.012	0.008	0.0017	<0.01	0.019	0.033	NA	0.0033	0.0096	<0.03	0.011	NA	NA	0.0031
	03/04/16	6.5	<0.05	<0.075	0.68	<0.05	NA	<0.05	0.017	0.03	NA	<0.05	<0.05	<0.15	<0.05	NA	NA	<0.05
	10/27/15	6.2	<0.02	0.15	0.57	<0.02	NA	<0.02	<0.04	<0.08	NA	<0.02	<0.02	<0.06	<0.02	NA	NA	<0.02
	08/10/15	5.4	<0.01	0.16	0.78	<0.01	NA	<0.01	<0.04	<0.04	NA	<0.04	<0.01	<0.03	<0.01	NA	NA	<0.01
	06/01/15	4.6	<0.02	<0.03	0.74	<0.02	NA	<0.02	<0.04	<0.08	NA	<0.02	<0.02	<0.06	<0.02	NA	NA	<0.02
	03/09/15	3.9	<0.02	<0.03	0.76	<0.02	NA	<0.02	<0.04	<0.08	NA	<0.02	<0.02	<0.06	<0.02	NA	NA	<0.02
	11/10/14	3.6	0.015	<0.015	0.81	<0.01	NA	<0.01	<0.02	0.044	NA	<0.01	<0.01	<0.03	<0.01	NA	NA	<0.01
	09/15/14	3.8	<0.02	<0.03	0.82	<0.02	NA	<0.02	<0.04	0.016	NA	<0.02	<0.02	<0.06	<0.02	NA	NA	<0.02
	06/03/14	3.7	<0.02	<0.03	0.93	<0.02	NA	<0.02	<0.04	<0.08	NA	<0.08	<0.02	<0.06	<0.02	NA	NA	<0.02
	03/07/14	4.0	0.026	0.14	0.032	<0.01	NA	<0.01	<0.02	<0.04	NA	<0.04	<0.01	<0.03	<0.01	NA	NA	<0.01
	11/11/13	3.3	0.046	0.13	0.019	1.1	<0.005	<0.005	<0.01	0.027	NA	<0.005	0.0066	<0.015	<0.005	NA	NA	<0.005
	9/4/2013 ²	2.6	<0.005	<0.0075	0.94	<0.005	NA	<0.005	<0.01	0.024	NA	<0.005	0.006	<0.015	<0.005	NA	NA	<0.005
	06/13/13	3.4	<0.01	<0.015	1.3	<0.01	NA	<0.01	<0.02	<0.04	NA	<0.01	<0.01	<0.03	<0.01	NA	NA	<0.01
	03/19/13	2.8	<0.01	<0.015	1.3	<0.01	NA	<0.01	<0.02	<0.04	NA	<0.01	<0.01	<0.03	<0.01	NA	NA	<0.01
	11/27/12	2.7	<0.01	<0.015	1.4	<0.01	NA	<0.01	<0.02	<0.04	NA	<0.01	<0.01	<0.03	<0.01	NA	NA	<0.01
	08/23/12	2.1	<0.01	<0.015	1.6	<0.01	NA	<0.01	<0.02	<0.04	NA	<0.01	<0.01	<0.03	<0.01	NA	NA	<0.01
	06/14/12	2.6	<0.01	<0.015	1.2	<0.01	NA	<0.01	<0.02	<0.04	NA	<0.01	<0.01	<0.03	<0.01	NA	NA	<0.01
	03/21/12	2.3	<0.01	<0.015	1.4	<0.01	NA	<0.01	<0.02	<0.04	NA	<0.01	<0.01	<0.03	<0.01	NA	NA	<0.01
	12/13/11	1.5	<0.005	<0.0075	1.3	<0.005	NA	<0.005	<0.01	0.021	NA	<0.005	0.007	<0.005	<0.005	NA	NA	<0.005
	10/24/11	1.4	<0.005	<0.0075	1.4	<0.005	NA	<0.005	<0.01	0.022	NA	<0.005	0.008	<0.005	<0.005	NA	NA	<0.005
	06/20/11	1.8	0.0015	<0.0015	1.6	0.001	NA	0.002	0.002	0.020	NA	0.001	0.007	<0.001	0.002	NA	NA	0.002
	02/24/11	1.3	0.0019	<0.0015	1.4	0.001	NA	0.002	<0.002	0.019	NA	<0.001	0.005	<0.001	0.001	NA	NA	0.003
	11/08/10	0.63	<0.001	<0.0015	1.3	0.001	NA	0.002	<0.002	0.022	NA	<0.001	0.004	<0.001	<0.001	NA	NA	0.003
	09/22/10	0.47	<0.001	<0.0015	1.4	<0.001	NA	0.002	<0.002	0.022	NA	<0.001	0.003	<0.001	<0.001	NA	NA	0.003
	06/07/10	0.33	0.0018	<0.0015	1.4	0.001	NA	0.002	<0.002	0.020	NA	<0.001	0.003	<0.001	<0.001	NA	NA	0.002
	03/24/10	0.25	<0.005	<0.0075	1.5	<0.005	<0.005	<0.005	<0.01	<0.02	<0.005	<0.005	<0.005	<0.005	<0.005	NA	NA	<0.005

Table 2 - Groundwater Analyses
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

		Benzene (mg/L)	Toluene (mg/L)	Ethyl Benzene (mg/L)	Total Xylenes (mg/L)	MTBE (mg/L)	1,2,4- Trimethyl benzene (mg/L)	1,3,5- Trimethyl benzene (mg/L)	1,2- Dichloro ethane (EDC) (mg/L)	Naphthale ne (mg/L)	1-Methyl naphthale ne (mg/L)	2- Methylna phtthalene (mg/L)	1,1- Dichloroe thane (mg/L)	Isopropyl benzene (mg/L)	n- Butylbenz ene (mg/L)	n- Propylben zene (mg/L)	2,4- Dimethylp henol (mg/L)	Acetone (mg/L)	Sec- butylbenz ene (mg/L)
WQCC 20NMAC 6.2.3103 (DECEMBER 2018) 40 CFR 141.61 MCL (NOVEMBER 2015)		0.005	1	0.7	0.62	0.1	NE	NE	0.005	0.03	NE	NE	0.025	NE	NE	NE	NE	NE	NE
		0.005	1	0.7	10	NE	NE	NE	0.005	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
	NMED TAP WATER (FEBRUARY 2019)	0.00455	1.09	0.0149	0.193	0.143	NE	NE	0.0017	0.00165	0.0114	0.035	0.0275	0.447	NE	NE	0.354	14.06	NE
	EPA RSL TAP WATER (NOVEMBER 2018)	0.00046	1.1	0.0015	0.19	0.014	0.056	0.06	0.013	0.00017	0.0011	0.036	0.0028	0.45	1	0.66	0.36	14	2
	Well ID																		
OW-57	DATE SAMPLED																		
	11/29/18	11	0.061	0.51	0.110	0.1	<0.02	<0.02	<0.02	0.120	0.082	0.024	<0.02	0.014	<0.06	0.040	<0.01	<0.2	<0.02
	08/28/18	12	0.041	0.57	0.120	0.120	<0.02	<0.02	<0.02	0.120	0.086	0.022	<0.02	0.015	0.0062	0.045	<0.01	0.085	<0.02
	05/08/18	12	0.030	0.56	0.110	0.120	<0.1	<0.1	<0.1	0.110	0.120	<0.4	<0.1	0.011	<0.3	0.031	<0.01	<1	<0.1
	02/20/18	12	0.035	0.58	0.110	0.120	<0.05	<0.05	<0.05	0.120	0.090	0.033	<0.05	0.015	0.008	0.045	<0.01	0.097	<0.05
	12/06/17	11	0.024	0.52	0.083	0.098	<0.1	<0.1	<0.1	0.045	0.045	<0.400	<0.1	0.012	<0.3	0.029	<0.01	<1	<0.1
	09/19/17	9.4	0.025	0.46	0.096	0.12	<0.05	<0.05	<0.05	0.096	0.09	0.020	<0.05	0.014	<0.15	0.033	<0.05	<0.5	<0.05
	06/21/17	14	0.03	0.54	0.11	0.15	<0.05	<0.05	<0.05	0.11	0.076	0.030	<0.05	0.015	<0.15	0.034	<0.01	<0.5	<0.05
	03/30/17	8.6	0.024	0.38	0.1	0.1	<0.05	<0.05	<0.05	0.13	0.088	0.061	<0.05	0.02	<0.15	0.045	<0.01	<0.5	<0.05
	10/01/16	11	0.054	0.57	0.14	0.18	0.007	<0.005	<0.005	0.220	0.150	0.140	<0.005	0.022	0.009	0.048	NA	<0.245	<0.006
OW-58	11/29/18	35	0.11	1.2	0.19	2.5	0.015	<0.05	<0.05	0.160	0.060	0.042	<0.05	0.030	<0.15	0.097	<0.1	<0.5	<0.05
	08/28/18	38	0.097	1.2	0.19	2.9	0.028	<0.05	<0.05	0.150	0.059	0.045	<0.05	0.032	<0.15	0.098	<0.01	<0.5	<0.05
	05/08/18	38	0.084	1.2	0.18	2.8	0.030	<0.1	<0.1	0.170	0.100	0.054	<0.1	0.032	<0.3	0.100	<0.01	<1	<0.1
	02/20/18	33	0.1	1.2	0.13	2.9	0.023	<0.1	<0.1	0.170	0.095	0.073	<0.1	0.029	0.016	0.095	<0.01	<1	<0.1
	12/06/17	32	0.04	1.2	0.12	2.9	0.024	<0.1	<0.1	0.11	0.038	<0.400	<0.1	0.033	<0.3	0.089	<0.01	<1	<0.1
	09/19/17	29	0.22	1.1	0.37	3.1	0.11	0.039	<0.1	0.15	0.082	0.057	<0.1	0.036	<0.3	0.092	<0.01	<1	<0.1
	06/21/17	38	0.16	1.2	0.36	3.7	0.1	0.038	<0.1	0.15	0.085	0.068	<0.1	0.038	0.016	0.098	<0.01	<1	<0.1
	03/29/17	31	0.83	1.1	0.97	3	0.17	0.044	<0.1	0.18	0.07	0.055	<0.1	0.026	<0.3	0.09	<0.01	<1	<0.1
RW 1	09/30/16	32	6.6	1.5	4.4	3.3	0.690	0.210	<0.005	0.240	0.099	0.097	<0.005	0.072	0.021	0.15	NA	<0.245	0.018
	2018	Not Sampled - Separate Phase Hydrocarbon Detected																	
	2017	Not Sampled - Separate Phase Hydrocarbon Detected																	
	2016	Not Sampled - Separate Phase Hydrocarbon Detected																	
	2015	Not Sampled - Separate Phase Hydrocarbon Detected																	
RW 2	09/18/14	37	35	1.8	10	1.2	<1.0	<1.0	NA	<2	<4	<4	NA	<1.0	NA	<1	0.037	NA	<1
	09/16/13	54	35	2.4	13	2.2	1.3	<1.0	NA	<2	<4	<4	NA	<1.0	NA	<1	0.087	NA	<1
	08/23/12	45	82	4.9	31	3.1	2.8	<1.0	NA	<2	<4	<4	NA	<0.01	NA	<0.01	0.21	NA	NA
	10/03/11	51	37	3.7	23	2.9	5.8	0.98	NA	0.6	0.15	0.15	NA	<0.01	NA	0.4	<0.1	NA	NA
	4th Quarter 2018	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	08/28/18	48	4	1.5	3.8	1.1	0.31	0.043	<0.1	0.1	0.04	<0.4	<0.1	0.024	<0.3	0.056	NA	<1	<0.1
	05/08/18	46	5	1.5	4.2	1.2	0.34	0.031	<0.2	0.095	<0.8	<0.8	<0.2	0.013	<0.6	0.042	NA	<2	<0.2
	02/20/18	42	3.7	1.5	3.8	1.2	0.32	0.038	<0.1	0.14	0.076	0.053	<0.1	0.019	0.014	0.059	NA	<1	<0.1
	12/06/17	38	2.9	1.5	3.6	1.3	0.28	0.026	<0.1	0.069	0.021	<0.4	<0.4	0.019	<0.3	0.042	NA	<1	<0.1
	09/19/17	37	6.7	1.2	4	1.3	0.27	0.046	<0.1	0.11	0.055	<0.4	<0.4	0.018	<0.3	0.037	NA	<1	<0.1
RW 2	06/20/17	47	9	1.4	4.6	1.7	0.28	0.058	<0.1	0.11	0.063	0.042	<0.1	0.021	<0.3	0.043	NA	0.13	<0.1
	03/16/17	37	2.3	1.3	3.1	1.6	0.2	0.04	<0.1	0.15	0.13	0.11	<0.1	0.025	<0.3	0.044	NA	<1	<0.1
	11/16/16	38	3.4	1.2	3.2	1.7	0.2	0.049	NA	0.15	0.13	<0.8	NA	<0.2	NA	0.063	NA	NA	NA
	09/13/16	38	3.8	1.2	3.1	1.6	0.21	0.044	NA	0.14	0.088	<0.8	NA	0.03	NA	0.056	NA	NA	NA
	06/08/16	36	2.9	1.1	3.1	1.7	0.23	0.12	NA	0.18	0.17	<2.0	NA	<0.5	NA	0.071	NA	NA	NA
	03/07/16	46	4.1	1.2	3.5	1.9	0.18	0.028	NA	0.1	0.069	0.028	NA	0.011	NA	0.045	NA	NA	NA
	08/23/15	42	6.9	1.1	3.7	1.8	0.21	<0.2	NA	<0.4	<0.8	<0.8	NA	<0.2	NA	<0.6	NA	NA	NA
	09/18/14	40	4.5	0.86	2.5	1.9	0.15	<0.1	NA	<0.2	<0.4	<0.4	NA	<0.1	NA	<0.1	0.084	NA	NA
	09/16/13	48	3.4	0.87	2.3	2.8	0.13	<0.1	NA	<0.2	<0.4	<0.4	NA	<0.1	NA	<0.1	0.15	NA	NA
	08/23/12	42	2.6	0.59	1.7	3.3	<0.1	<0.1	NA	<0.2	<0.4	<0.4	NA	<0.1	NA	<0.1	0.22	NA	NA
RW 2	10/03/11	39	5.3	0.57	1.5	3.7	0.098	0.024	NA	0.057	0.054	<0.04	NA	<0.01	NA	0.036	0.16	NA	NA

Table 2 - Groundwater Analyses
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

	Benzene (mg/L)	Toluene (mg/L)	Ethyl Benzene (mg/L)	Total Xylenes (mg/L)	MTBE (mg/L)	1,2,4- Trimethyl benzene (mg/L)	1,3,5- Trimethyl benzene (mg/L)	1,2- Dichloro ethane (EDC) (mg/L)	Naphthalene (mg/L)	1-Methyl naphthalene (mg/L)	2- Methyl phthalene (mg/L)	1,1- Dichloro ethane (mg/L)	Isopropyl benzene (mg/L)	n- Butylbenzene (mg/L)	n- Propylbenzene (mg/L)	2,4- Dimethyl phenol (mg/L)	Acetone (mg/L)	Sec- butylbenzene (mg/L)
WQCC 20NMAC 6.2.3103 (DECEMBER 2018)	0.005	1	0.7	0.62	0.1	NE	NE	0.005	0.03	NE	NE	0.025	NE	NE	NE	NE	NE	NE
40 CFR 141.61 MCL (NOVEMBER 2015)	0.005	1	0.7	10	NE	NE	NE	0.005	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
NMED TAP WATER (FEBRUARY 2019)	0.00455	1.09	0.0149	0.193	0.143	NE	NE	0.0017	0.00165	0.0114	0.035	0.0275	0.447	NE	NE	0.354	14.06	NE
EPA RSL TAP WATER (NOVEMBER 2018)	0.00046	1.1	0.0015	0.19	0.014	0.056	0.06	0.013	0.00017	0.0011	0.036	0.0028	0.45	1	0.66	0.36	14	2
Well ID	DATE SAMPLED																	
RW 5	2018																	
	Not Sampled - Separate Phase Hydrocarbon Detected																	
	4th Quarter 2017																	
	Not Sampled - Separate Phase Hydrocarbon Detected																	
	3rd Quarter 2017																	
	Not Sampled - Separate Phase Hydrocarbon Detected																	
	2nd Quarter 2017																	
	Not Sampled - Separate Phase Hydrocarbon Detected																	
	03/16/17	0.64	0.0028	0.41	0.094	0.0077	0.033	0.011	0.14	0.12	0.12	<0.005	0.025	0.013	0.06	NA	0.0067	0.0083
	11/16/16	0.72	0.0035	0.34	0.13	0.0012	0.062	0.014	0.14	0.12	0.12	NA	0.02	0.012	0.043	NA	<0.05	0.0071
	09/13/16	0.57	0.0035	0.26	0.12	<0.005	0.049	0.013	0.13	0.097	0.12	NA	0.016	0.012	0.037	NA	<0.05	0.0075
	06/07/16	0.54	0.0038	0.15	0.11	0.0042	0.046	0.017	0.13	0.13	0.15	NA	0.01	0.016	0.026	NA	<0.1	0.0079
	03/07/16	0.39	0.0024	0.15	0.086	0.0026	0.041	0.013	0.12	0.11	0.12	NA	0.012	0.014	0.032	NA	NA	0.01
	10/29/15	0.5	<0.01	0.13	0.095	<0.01	0.048	0.015	0.17	0.11	0.13	NA	<0.01	NA	0.027	NA	NA	<0.01
	08/23/15	0.43	<0.005	0.037	0.07	<0.005	0.041	0.012	0.085	0.067	0.083	NA	<0.005	NA	<0.005	NA	NA	<0.005
	09/18/14	0.35	<0.01	0.11	0.056	<0.01	0.045	0.011	0.1	0.084	0.11	NA	0.012	NA	0.039	<0.01	NA	0.01
	09/16/13	0.37	<0.01	0.11	0.089	<0.01	0.09	0.022	0.12	0.097	0.13	NA	<0.01	NA	0.031	<0.01	NA	<0.01
	08/23/12	0.19	<0.01	0.26	0.091	0.032	0.054	0.016	0.11	0.11	0.17	NA	<0.01	NA	0.068	<0.01	NA	0.013
	10/03/11	0.56	<0.01	0.21	0.26	0.095	0.13	0.046	0.17	0.11	0.16	NA	0.01	NA	0.04	<0.01	NA	NA
RW 6	2018																	
	Not Sampled - Separate Phase Hydrocarbon Detected																	
	4th Quarter 2017																	
	Not Sampled - Separate Phase Hydrocarbon Detected																	
	3rd Quarter 2017																	
	Not Sampled - Separate Phase Hydrocarbon Detected																	
	2nd Quarter 2017																	
	Not Sampled - Separate Phase Hydrocarbon Detected																	
	03/16/17	0.28	0.28	0.63	1.4	0.025	0.061	0.13	0.59	0.27	0.29	<0.01	0.044	0.022	0.096	NA	<0.1	0.012
	11/16/16	0.27	0.12	0.29	0.78	0.014	0.06	0.1	0.61	0.33	0.35	NA	0.024	0.015	0.048	NA	<0.1	0.0088
	09/13/16	0.28	0.11	0.29	0.81	0.017	0.064	0.12	0.55	0.28	0.37	NA	0.028	0.02	0.055	NA	<0.1	0.011
	03/07/16	0.39	0.19	0.51	0.086	0.021	0.075	0.13	0.59	0.28	0.33	NA	0.012	0.014	0.032	NA	<0.1	0.01
	10/29/15	0.34	0.11	0.28	0.85	0.043	0.09	0.1	0.68	0.32	0.41	NA	0.025	NA	0.044	NA	0.035	<0.01
	08/23/15	0.36	0.071	0.093	0.67	0.05	0.095	0.11	0.41	0.22	0.29	NA	<0.01	NA	0.012	NA	NA	<0.01
	09/18/14	0.47	0.23	0.45	1.3	0.046	0.17	0.17	0.57	0.19	0.28	NA	0.045	NA	0.11	<0.01	NA	<0.01
	09/16/13	0.68	<0.05	0.18	1.1	<0.05	0.28	0.14	0.48	0.2	0.27	NA	<0.05	NA	<0.05	<0.01	NA	<0.05
	08/23/12	0.74	0.052	0.4	1.6	0.073	0.38	0.17	0.58	0.22	0.36	NA	<0.05	NA	0.074	<0.01	NA	<0.05
	10/03/11	0.87	0.029	0.33	<0.015	<0.01	0.42	0.16	0.52	0.21	0.31	NA	0.043	NA	0.078	<0.1	NA	NA
All values expressed in milligrams per liter																		
DEFINITIONS																		
NE = Not established																		
NA = Not analyzed																		
NS - Not sampled																		
Bold and highlighted values represent values above the applicable standards																		
Bold screening level is applicable screening under RCRA Permit																		
STANDARDS																		
WQCC 20 NMAC 6.2.3103 - Standards for Ground Water of 10,000 mg/l TDS Concentration or Less.																		
a) Human Health Standards; b) Other Standards for Domestic Water																		
40 CFR 141.62 Maximum Contaminant Levels																		

Table 3 - Fluid Level Measurements
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Date of Installation	Well ID Number	Inspection or Sample Date	Casing Diameter (Inch)	Ground Level Elevations (ft)	Well Casing Rim Elevations (ft)	Stick-up length (ft)	Well Casing Bottom Elevations (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH ¹ Column Thickness (ft)	Depth to Water (ft)	Ground water Elevation ² (ft)	Corrected Water Table ³ Elevation (factor 0.8) (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
12/10/80	OW-13	06/24/05	4.00	6,918.95	6,920.07	1.12	6,820.92	100.00	ND	NA	23.70	6,896.37	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	10/24/06	4.00	6,918.95	6,920.07	1.12	6,820.92	100.00	ND	NA	24.36	6,895.71	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	12/12/07	4.00	6,918.95	6,920.07	1.12	6,820.92	100.00	ND	NA	24.55	6,895.52	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	08/18/08	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	24.41	6,895.66	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	02/24/09	4.00	6,918.95	6,920.07	1.12	6,820.92	98.03	ND	NA	23.93	6,896.14	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	05/14/09	4.00	6,918.95	6,920.07	1.12	6,820.92	98.03	ND	NA	23.74	6,896.33	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	07/28/09	4.00	6,918.95	6,920.07	1.12	6,820.92	98.03	ND	NA	24.02	6,896.05	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	11/03/09	4.00	6,918.95	6,920.07	1.12	6,820.92	98.03	ND	NA	24.01	6,896.06	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	03/25/10	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	23.79	6,896.28	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	06/02/10	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	23.81	6,896.26	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	09/22/10	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	23.78	6,896.29	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	11/08/10	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	23.41	6,896.66	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	02/24/11	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	23.32	6,896.75	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	06/20/11	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	23.19	6,896.88	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	10/25/11	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	23.14	6,896.93	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	12/13/11	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	23.00	6,897.07	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	03/21/12	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	22.50	6,897.57	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	06/14/12	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	22.64	6,897.43	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	08/23/12	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	23.10	6,896.97	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	11/27/12	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	22.90	6,897.17	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	03/19/13	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	22.54	6,897.53	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	06/13/13	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	22.74	6,897.33	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	09/03/13	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	22.80	6,897.27	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	11/11/13	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	22.38	6,897.69	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	03/07/14	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	21.77	6,898.30	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	06/03/14	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	21.95	6,898.12	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	09/15/14	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	22.61	6,897.46	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	11/10/14	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	22.45	6,897.62	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	03/09/15	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	21.92	6,898.15	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	06/01/15	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	21.76	6,898.31	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	08/10/15	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	22.14	6,897.93	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	10/27/15	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	22.10	6,897.97	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	10/27/15	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	22.10	6,897.97	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	03/04/16	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	21.43	6,898.64	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	06/06/16	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	21.45	6,898.62	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	08/31/16	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	21.94	6,898.13	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	02/27/17	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	21.11	6,898.96	NA	78.2 - 98.2	Sonsela Sandstone

Table 3 - Fluid Level Measurements
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Date of Installation	Well ID Number	Inspection or Sample Date	Casing Diameter (Inch)	Ground Level Elevations (ft)	Well Casing Rim Elevations (ft)	Stick-up length (ft)	Well Casing Bottom Elevations (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH ¹ Column Thickness (ft)	Depth to Water (ft)	Ground water Elevation ² (ft)	Corrected Water Table ³ Elevation (factor 0.8) (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
12/17/80	OW-13	05/31/17	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	21.45	6,898.62	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	09/06/17	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	21.41	6,898.66	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	12/11/17	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	21.00	6,899.07	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	02/28/18	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	20.50	6,899.57	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	04/26/18	4.00	6,918.95	6,920.07	1.12	6,820.92	99.00	ND	NA	20.41	6,899.66	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	08/14/18	4.00	6,918.95	6,920.07	1.12	6,820.92	102.00	ND	NA	20.70	6,899.37	NA	78.2 - 98.2	Sonsela Sandstone
	OW-13	11/06/18	4.00	6,918.95	6,920.07	1.12	6,820.92	99.15	ND	NA	20.70	6,899.37	NA	78.2 - 98.2	Sonsela Sandstone
	OW-14	06/24/05	4.00	6,924.55	6,926.65	2.10	6,880.13	45.00	ND	NA	27.15	6,899.50	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	10/24/06	4.00	6,924.55	6,926.65	2.10	6,880.13	45.00	ND	NA	27.38	6,899.27	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	12/12/07	4.00	6,924.55	6,926.65	2.10	6,880.13	45.00	ND	NA	27.41	6,899.24	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	08/21/08	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	27.13	6,899.52	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	02/23/09	4.00	6,924.55	6,926.65	2.10	6,880.13	44.42	ND	NA	26.73	6,899.92	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	05/12/09	4.00	6,924.55	6,926.65	2.10	6,880.13	44.42	ND	NA	26.55	6,900.10	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	07/30/09	4.00	6,924.55	6,926.65	2.10	6,880.13	44.42	ND	NA	26.74	6,899.91	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	11/02/09	4.00	6,924.55	6,926.65	2.10	6,880.13	44.42	ND	NA	26.66	6,899.99	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	03/24/10	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	26.34	6,900.31	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	06/06/10	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	26.34	6,900.31	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	09/22/10	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	26.17	6,900.48	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	11/08/10	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	25.93	6,900.72	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	02/24/11	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	25.69	6,900.96	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	06/20/11	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	25.45	6,901.20	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	10/24/11	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	25.38	6,901.27	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	12/13/11	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	25.19	6,901.46	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	03/21/12	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	24.92	6,901.73	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	06/14/12	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	24.93	6,901.72	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	08/23/12	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	25.11	6,901.54	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	11/27/12	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	25.05	6,901.60	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	03/19/13	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	24.79	6,901.86	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	06/13/13	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	24.89	6,901.76	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	09/03/13	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	24.92	6,901.73	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	11/11/13	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	24.59	6,902.06	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	03/07/14	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	24.12	6,902.53	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	06/03/14	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	24.15	6,902.50	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	09/15/14	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	24.40	6,902.25	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	11/10/14	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	24.25	6,902.40	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	03/09/15	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	23.95	6,902.70	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	06/01/15	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	23.88	6,902.77	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	08/10/15	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	23.96	6,902.69	NA	35 - 45	Chinle/Alluvial Interface

Table 3 - Fluid Level Measurements
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Date of Installation	Well ID Number	Inspection or Sample Date	Casing Diameter (Inch)	Ground Level Elevations (ft)	Well Casing Rim Elevations (ft)	Stick-up length (ft)	Well Casing Bottom Elevations (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH ¹ Column Thickness (ft)	Depth to Water (ft)	Ground water Elevation ² (ft)	Corrected Water Table ³ Elevation (factor 0.8) (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
09/21/16	OW-14	10/27/15	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	23.69	6,902.96	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	10/27/15	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	23.69	6,902.96	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	03/04/16	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	23.20	6,903.45	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	06/06/16	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	23.18	6,903.47	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	08/31/16	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	23.50	6,903.15	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	02/27/17	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	22.83	6,903.82	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	05/30/17	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	23.18	6,903.47	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	09/06/17	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	22.56	6,904.09	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	12/11/17	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	22.20	6,904.45	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	02/27/18	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	21.80	6,904.85	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	04/26/18	4.00	6,924.55	6,926.65	2.10	6,880.13	46.75	ND	NA	21.75	6,904.90	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	08/14/18	4.00	6,924.55	6,926.65	2.10	6,880.13	46.78	ND	NA	21.95	6,904.70	NA	35 - 45	Chinle/Alluvial Interface
	OW-14	11/06/18	4.00	6,924.55	6,926.65	2.10	6,880.13	46.52	ND	NA	21.82	6,904.83	NA	35 - 45	Chinle/Alluvial Interface
	OW-57	03/30/17	2.00	6,930.64	6,933.10	2.46	6,958.99	28.35	NM	NA	NM	NA	NA	15 - 25	Chinle/Alluvial Interface
09/22/16	OW-57	06/20/17	2.00	6,930.64	6,933.10	2.46	6,958.99	28.35	ND	NA	20.52	6,912.58	NA	15 - 25	Chinle/Alluvial Interface
	OW-57	09/19/17	2.00	6,930.64	6,933.10	2.46	6,958.99	28.35	ND	NA	20.15	6,912.95	NA	15 - 25	Chinle/Alluvial Interface
	OW-57	12/05/17	2.00	6,930.64	6,933.10	2.46	6,958.99	28.35	ND	NA	20.11	6,912.99	NA	15 - 25	Chinle/Alluvial Interface
	OW-57	02/19/18	2.00	6,930.64	6,933.10	2.46	6,958.99	28.35	ND	NA	19.88	6,913.22	NA	15 - 25	Chinle/Alluvial Interface
	OW-57	04/25/18	2.00	6,930.64	6,933.10	2.46	6,958.70	28.06	ND	NA	20.02	6,913.08	NA	15 - 25	Chinle/Alluvial Interface
	OW-57	08/15/18	2.00	6,930.64	6,933.10	2.46	6,958.71	28.07	ND	NA	20.16	6,912.94	NA	15 - 25	Chinle/Alluvial Interface
	OW-57	11/29/18	2.00	6,930.64	6,933.10	2.46	6,958.99	28.35	ND	NA	20.30	6,912.80	NA	15 - 25	Chinle/Alluvial Interface
	OW-58	03/29/17	2.00	6,934.71	6,934.50	-0.21	6,982.26	47.55	ND	NA	26.00	6,908.50	NA	38 - 48	Chinle/Alluvial Interface
	OW-58	06/21/17	2.00	6,934.71	6,934.50	-0.21	6,982.26	47.55	ND	NA	25.14	6,909.36	NA	38 - 48	Chinle/Alluvial Interface
	OW-58	09/19/17	2.00	6,934.71	6,934.50	-0.21	6,982.26	47.55	ND	NA	25.04	6,909.46	NA	38 - 48	Chinle/Alluvial Interface
	OW-58	12/06/17	2.00	6,934.71	6,934.50	-0.21	6,982.21	47.50	ND	NA	24.67	6,909.83	NA	38 - 48	Chinle/Alluvial Interface
	OW-58	02/20/18	2.00	6,934.71	6,934.50	-0.21	6,982.33	47.62	ND	NA	24.52	6,909.98	NA	38 - 48	Chinle/Alluvial Interface
	OW-58	04/25/18	2.00	6,934.71	6,934.50	-0.21	6,982.21	47.50	ND	NA	24.25	6,910.25	NA	38 - 48	Chinle/Alluvial Interface
	OW-58	08/16/18	2.00	6,934.71	6,934.50	-0.21	6,982.20	47.49	ND	NA	24.48	6,910.02	NA	38 - 48	Chinle/Alluvial Interface
	OW-58	11/29/18	2.00	6,934.71	6,934.50	-0.21	6,982.21	47.50	ND	NA	24.27	6,910.23	NA	38 - 48	Chinle/Alluvial Interface
03/28/95	RW-1	02/22/05	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	32.46	4.04	36.50	6,909.56	6,912.79	25 - 40	Chinle/Alluvial Interface
	RW-1	03/02/05	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	32.42	4.02	36.44	6,909.62	6,912.84	25 - 40	Chinle/Alluvial Interface
	RW-1	03/08/05	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	31.92	4.43	36.35	6,909.71	6,913.25	25 - 40	Chinle/Alluvial Interface
	RW-1	03/09/05	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	31.92	5.58	37.50	6,908.56	6,913.02	25 - 40	Chinle/Alluvial Interface
	RW-1	04/05/05	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	34.75	4.17	38.92	6,907.14	6,910.48	25 - 40	Chinle/Alluvial Interface
	RW-1	06/28/05	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	32.46	0.79	33.25	6,912.81	6,913.44	25 - 40	Chinle/Alluvial Interface
	RW-1	09/16/05	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	36.46	0.08	36.54	6,909.52	6,909.58	25 - 40	Chinle/Alluvial Interface
	RW-1	12/05/05	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	31.92	2.79	34.71	6,911.35	6,913.58	25 - 40	Chinle/Alluvial Interface
	RW-1	03/16/06	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	32.23	2.25	34.48	6,911.58	6,913.38	25 - 40	Chinle/Alluvial Interface
	RW-1	06/06/06	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	32.40	2.14	34.54	6,911.52	6,913.23	25 - 40	Chinle/Alluvial Interface
	RW-1	07/31/06	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	31.92	1.56	33.48	6,912.58	6,913.83	25 - 40	Chinle/Alluvial Interface
	RW-1	02/22/05	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	32.46	4.04	36.50	6,909.56	6,912.79	25 - 40	Chinle/Alluvial Interface
	RW-1	03/02/05	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	32.42	4.02	36.44	6,909.62	6,912.84	25 - 40	Chinle/Alluvial Interface
	RW-1	03/08/05	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	31.92	4.43	36.35	6,909.71	6,913.25	25 - 40	Chinle/Alluvial Interface

Table 3 - Fluid Level Measurements
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Date of Installation	Well ID Number	Inspection or Sample Date	Casing Diameter (Inch)	Ground Level Elevations (ft)	Well Casing Rim Elevations (ft)	Stick-up length (ft)	Well Casing Bottom Elevations (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH ¹ Column Thickness (ft)	Depth to Water (ft)	Ground water Elevation ² (ft)	Corrected Water Table ³ Elevation (factor 0.8) (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
	RW-1	12/21/06	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	32.46	0.94	33.40	6,912.66	6,913.41	25 - 40	Chinle/Alluvial Interface
	RW-1	02/21/07	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	33.42	1.08	34.50	6,911.56	6,912.42	25 - 40	Chinle/Alluvial Interface
	RW-1	06/05/07	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	32.48	0.23	32.71	6,913.35	6,913.53	25 - 40	Chinle/Alluvial Interface
	RW-1	07/31/07	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	32.48	0.23	32.71	6,913.35	6,913.53	25 - 40	Chinle/Alluvial Interface
	RW-1	11/26/07	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	30.76	5.69	36.45	6,909.61	6,914.16	25 - 40	Chinle/Alluvial Interface
	RW-1	02/18/08	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	30.18	4.59	34.77	6,911.29	6,914.96	25 - 40	Chinle/Alluvial Interface
	RW-1	05/21/08	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	30.40	4.17	34.57	6,911.49	6,914.83	25 - 40	Chinle/Alluvial Interface
	RW-1	09/12/08	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	30.03	4.56	34.59	6,911.47	6,915.12	25 - 40	Chinle/Alluvial Interface
	RW-1	11/03/08	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	30.02	4.61	34.63	6,911.43	6,915.12	25 - 40	Chinle/Alluvial Interface
	RW-1	02/11/09	4.00	6,942.86	6,946.06	3.20	6,903.02	39.84	30.21	1.51	31.72	6,914.34	6,915.55	25 - 40	Chinle/Alluvial Interface
	RW-1	05/02/09	4.00	6,942.86	6,946.06	3.20	6,903.02	39.84	30.22	0.58	30.80	6,915.26	6,915.72	25 - 40	Chinle/Alluvial Interface
	RW-1	08/10/09	4.00	6,942.86	6,946.06	3.20	6,903.02	39.84	30.69	0.33	31.02	6,915.04	6,915.30	25 - 40	Chinle/Alluvial Interface
	RW-1	10/28/09	4.00	6,942.86	6,946.06	3.20	6,903.02	39.84	30.56	0.19	30.75	6,915.31	6,915.46	25 - 40	Chinle/Alluvial Interface
	RW-1	03/03/10	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	30.89	0.16	31.05	6,915.01	6,915.14	25 - 40	Chinle/Alluvial Interface
	RW-1	06/03/10	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	30.99	0.10	31.09	6,914.97	6,915.05	25 - 40	Chinle/Alluvial Interface
	RW-1	09/20/10	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	29.91	0.15	30.06	6,916.00	6,916.12	25 - 40	Chinle/Alluvial Interface
	RW-1	11/03/10	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	30.02	0.99	31.01	6,915.05	6,915.84	25 - 40	Chinle/Alluvial Interface
	RW-1	03/09/11	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	30.04	0.11	30.15	6,915.91	6,916.00	25 - 40	Chinle/Alluvial Interface
	RW-1	06/27/11	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	30.52	0.11	30.63	6,915.43	6,915.52	25 - 40	Chinle/Alluvial Interface
	RW-1	10/03/11	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	30.81	0.09	30.90	6,915.16	6,915.23	25 - 40	Chinle/Alluvial Interface
	RW-1	11/28/11	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	30.77	0.08	30.85	6,915.21	6,915.27	25 - 40	Chinle/Alluvial Interface
	RW-1	03/15/12	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	29.31	0.03	29.34	6,916.72	6,916.74	25 - 40	Chinle/Alluvial Interface
	RW-1	06/04/12	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	29.39	0.02	29.41	6,916.65	6,916.67	25 - 40	Chinle/Alluvial Interface
	RW-1	08/13/12	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	29.54	0.59	30.13	6,915.93	6,916.40	25 - 40	Chinle/Alluvial Interface
	RW-1	08/23/12	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	NA	NA	32.51	6,913.55	NA	25 - 40	Chinle/Alluvial Interface
	RW-1	10/08/12	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	29.28	0.90	30.18	6,915.88	6,916.60	25 - 40	Chinle/Alluvial Interface
	RW-1	03/26/13	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	29.11	3.49	32.60	6,913.46	6,916.25	25 - 40	Chinle/Alluvial Interface
	RW-1	06/17/13	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	29.37	3.73	33.10	6,912.96	6,915.94	25 - 40	Chinle/Alluvial Interface
	RW-1	09/16/13	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	28.75	4.34	33.09	6,912.97	6,916.44	25 - 40	Chinle/Alluvial Interface
	RW-1	11/12/13	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	28.73	4.38	33.11	6,912.95	6,916.45	25 - 40	Chinle/Alluvial Interface
	RW-1	03/14/14	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	28.11	3.54	31.65	6,914.41	6,917.24	25 - 40	Chinle/Alluvial Interface
	RW-1	06/09/14	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	28.05	5.01	33.06	6,913.00	6,917.01	25 - 40	Chinle/Alluvial Interface
	RW-1	09/18/14	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	28.31	NA	NA	NA	NA	25 - 40	Chinle/Alluvial Interface
	RW-1	11/13/14	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	28.15	4.89	33.04	6,913.02	6,916.93	25 - 40	Chinle/Alluvial Interface
	RW-1	03/23/15	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	28.10	4.70	32.80	6,913.26	6,917.02	25 - 40	Chinle/Alluvial Interface
	RW-1	06/09/15	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	27.70	4.40	32.10	6,913.96	6,917.48	25 - 40	Chinle/Alluvial Interface
	RW-1	08/23/15	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	28.08	1.94	30.02	6,916.04	6,917.59	25 - 40	Chinle/Alluvial Interface
	RW-1	10/29/15	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	27.65	2.45	30.10	6,915.96	6,917.92	25 - 40	Chinle/Alluvial Interface
	RW-1	10/29/15	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	27.65	2.45	30.10	6,915.96	6,917.92	25 - 40	Chinle/Alluvial Interface
	RW-1	03/04/16	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	28.05	2.50	30.55	6,915.51	6,917.51	25 - 40	Chinle/Alluvial Interface

Table 3 - Fluid Level Measurements
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Date of Installation	Well ID Number	Inspection or Sample Date	Casing Diameter (Inch)	Ground Level Elevations (ft)	Well Casing Rim Elevations (ft)	Stick-up length (ft)	Well Casing Bottom Elevations (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH ¹ Column Thickness (ft)	Depth to Water (ft)	Ground water Elevation ² (ft)	Corrected Water Table ³ Elevation (factor 0.8) (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
03/29/95	RW-1	06/08/16	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	27.98	3.82	31.80	6,914.26	6,917.32	25 - 40	Chinle/Alluvial Interface
	RW-1	09/13/16	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	27.90	4.14	32.04	6,914.02	6,917.33	25 - 40	Chinle/Alluvial Interface
	RW-1	03/16/17	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	27.05	3.50	30.55	6,915.51	6,918.31	25 - 40	Chinle/Alluvial Interface
	RW-1	06/20/17	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	26.77	1.65	28.42	6,917.64	6,918.96	25 - 40	Chinle/Alluvial Interface
	RW-1	09/19/17	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	26.52	1.08	27.60	6,918.46	6,919.32	25 - 40	Chinle/Alluvial Interface
	RW-1	12/12/17	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	26.50	1.00	27.50	6,918.56	6,919.36	25 - 40	Chinle/Alluvial Interface
	RW-1	02/13/18	4.00	6,942.86	6,946.06	3.20	6,903.02	43.04	26.94	0.28	27.22	6,918.84	6,919.06	25 - 40	Chinle/Alluvial Interface
	RW-1	04/25/18	4.00	6,942.86	6,946.06	3.20	6,903.02	43.35	26.94	0.27	27.21	6,918.85	6,919.07	25 - 40	Chinle/Alluvial Interface
	RW-1	08/16/18	4.00	6,942.86	6,946.06	3.20	6,903.02	43.45	27.44	0.26	27.70	6,918.36	6,918.57	25 - 40	Chinle/Alluvial Interface
	RW-1	11/07/18	4.00	6,942.86	6,946.06	3.20	6,903.02	NM	NM	NA	NM	NA	NA	25 - 40	Chinle/Alluvial Interface
	RW-2	02/22/05	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	ND	NA	27.79	6,900.74	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	06/28/05	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	ND	NA	27.77	6,900.76	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	09/16/05	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	ND	NA	28.25	6,900.28	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	12/05/05	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	ND	NA	27.92	6,900.61	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	03/16/06	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	ND	NA	27.90	6,900.63	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	06/01/06	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	ND	NA	27.98	6,900.55	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	07/26/06	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	ND	NA	28.23	6,900.30	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	10/13/06	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	ND	NA	28.23	6,900.30	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	02/08/07	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	ND	NA	27.90	6,900.63	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	04/30/07	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	ND	NA	27.98	6,900.55	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	07/10/07	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	ND	NA	28.23	6,900.30	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	11/26/07	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	ND	NA	28.23	6,900.30	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	02/18/08	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	ND	NA	28.16	6,900.37	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	05/21/08	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	ND	NA	27.22	6,901.31	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	09/12/08	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	ND	NA	27.03	6,901.50	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	11/03/08	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	ND	NA	27.10	6,901.43	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	02/11/09	4.00	6,926.40	6,928.53	2.13	6,888.73	37.67	ND	NA	26.95	6,901.58	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	05/05/09	4.00	6,926.40	6,928.53	2.13	6,888.73	37.67	ND	NA	26.74	6,901.79	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	08/10/09	4.00	6,926.40	6,928.53	2.13	6,888.73	37.67	ND	NA	26.87	6,901.66	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	10/28/09	4.00	6,926.40	6,928.53	2.13	6,888.73	37.67	ND	NA	26.64	6,901.89	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	03/03/10	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	ND	NA	26.52	6,902.01	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	06/03/10	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	ND	NA	26.42	6,902.11	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	09/20/10	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	ND	NA	26.87	6,901.66	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	11/03/10	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	ND	NA	26.64	6,901.89	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	03/09/11	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	ND	NA	25.68	6,902.85	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	06/27/11	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	ND	NA	26.71	6,901.82	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	10/03/11	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	ND	NA	25.36	6,903.17	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	11/28/11	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	ND	NA	31.65	6,896.88	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	03/15/12	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	0.00	0.00	24.54	6,903.99	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	06/04/12	4.00	6,926.40	6,928.53	2.13	6,888.73	39.80	0.00	0.00	24.66	6,903.87	NA	26.1 - 36.1	Chinle/Alluvial Interface

Table 3 - Fluid Level Measurements
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Date of Installation	Well ID Number	Inspection or Sample Date	Casing Diameter (Inch)	Ground Level Elevations (ft)	Well Casing Rim Elevations (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH ¹ Column Thickness (ft)	Depth to Water (ft)	Ground water Elevation ² (ft)	Corrected Water Table ³ Elevation (factor 0.8) (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
08/27/97	RW-2	08/13/12	4.00	6,926.40	6,928.53	39.80	0.00	0.00	24.71	6,903.82	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	08/24/12	4.00	6,926.40	6,928.53	39.80	0.00	0.00	27.89	6,900.64	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	10/08/12	4.00	6,926.40	6,928.53	39.80	0.00	0.00	24.87	6,903.66	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	03/26/13	4.00	6,926.40	6,928.53	39.80	ND	NA	24.74	6,903.79	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	06/17/13	4.00	6,926.40	6,928.53	39.80	ND	NA	24.80	6,903.73	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	09/16/13	4.00	6,926.40	6,928.53	39.80	ND	NA	24.64	6,903.89	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	11/12/13	4.00	6,926.40	6,928.53	39.80	ND	NA	24.66	6,903.87	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	03/17/14	4.00	6,926.40	6,928.53	39.80	ND	NA	24.59	6,903.94	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	06/09/14	4.00	6,926.40	6,928.53	39.80	ND	NA	23.79	6,904.74	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	09/18/14	4.00	6,926.40	6,928.53	39.80	ND	NA	23.95	6,904.58	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	11/13/14	4.00	6,926.40	6,928.53	39.80	ND	NA	23.90	6,904.63	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	03/23/15	4.00	6,926.40	6,928.53	39.80	ND	NA	23.52	6,905.01	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	06/09/15	4.00	6,926.40	6,928.53	39.80	ND	NA	23.02	6,905.51	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	08/23/15	4.00	6,926.40	6,928.53	39.80	ND	NA	23.37	6,905.16	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	10/29/15	4.00	6,926.40	6,928.53	39.80	ND	NA	22.80	6,905.73	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	10/29/15	4.00	6,926.40	6,928.53	39.80	ND	NA	22.80	6,905.73	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	03/04/16	4.00	6,926.40	6,928.53	39.80	ND	NA	22.45	6,906.08	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	06/08/16	4.00	6,926.40	6,928.53	39.80	ND	NA	22.31	6,906.22	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	09/13/16	4.00	6,926.40	6,928.53	39.80	ND	NA	22.47	6,906.06	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	03/16/17	4.00	6,926.40	6,928.53	39.80	ND	NA	21.65	6,906.88	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	06/20/17	4.00	6,926.40	6,928.53	39.80	ND	NA	21.19	6,907.34	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	09/19/17	4.00	6,926.40	6,928.53	39.80	ND	NA	20.71	6,907.82	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	12/05/17	4.00	6,926.40	6,928.53	40.00	ND	NA	20.34	6,908.19	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	02/19/18	4.00	6,926.40	6,928.53	40.00	ND	NA	20.00	6,908.53	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	04/25/18	4.00	6,926.40	6,928.53	39.99	ND	NA	20.03	6,908.50	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	08/16/18	4.00	6,926.40	6,928.53	40.00	ND	NA	20.10	6,908.43	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-2	11/07/18	4.00	6,926.40	6,928.53	NM	NM	NA	NM	NA	NA	26.1 - 36.1	Chinle/Alluvial Interface
	RW-5	02/22/05	4.00	6,941.53	6,943.57	39.59	32.92	1.16	34.08	6,909.49	6,910.42	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	03/03/05	4.00	6,941.53	6,943.57	39.59	33.00	0.75	33.75	6,909.82	6,910.42	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	03/08/05	4.00	6,941.53	6,943.57	39.59	33.08	0.34	33.42	6,910.15	6,910.42	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	06/24/05	4.00	6,941.53	6,943.57	39.59	32.96	1.12	34.08	6,909.49	6,910.39	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	09/16/05	4.00	6,941.53	6,943.57	39.59	32.83	1.02	33.85	6,909.72	6,910.54	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	12/05/05	4.00	6,941.53	6,943.57	39.59	32.52	0.67	33.19	6,910.38	6,910.92	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	03/16/06	4.00	6,941.53	6,943.57	39.59	32.58	0.42	33.00	6,910.57	6,910.91	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	06/01/06	4.00	6,941.53	6,943.57	39.59	32.79	0.38	33.17	6,910.40	6,910.70	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	07/26/06	4.00	6,941.53	6,943.57	39.59	32.90	0.41	33.31	6,910.26	6,910.59	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	10/16/06	4.00	6,941.53	6,943.57	39.59	32.73	0.69	33.42	6,910.15	6,910.70	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	02/13/07	4.00	6,941.53	6,943.57	39.59	32.17	1.62	33.79	6,909.78	6,911.08	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	04/30/07	4.00	6,941.53	6,943.57	39.59	33.00	0.83	33.83	6,909.74	6,910.40	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	07/10/07	4.00	6,941.53	6,943.57	39.59	33.10	0.82	33.92	6,909.65	6,910.31	29.5 - 39.5	Chinle/Alluvial Interface

Table 3 - Fluid Level Measurements
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Date of Installation	Well ID Number	Inspection or Sample Date	Casing Diameter (Inch)	Ground Level Elevations (ft)	Well Casing Rim Elevations (ft)	Stick-up length (ft)	Well Casing Bottom Elevations (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH ¹ Column Thickness (ft)	Depth to Water (ft)	Ground water Elevation ² (ft)	Corrected Water Table ³ Elevation (factor 0.8) (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
	RW-5	11/26/07	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	33.13	0.76	33.89	6,909.68	6,910.29	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	02/18/08	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	33.19	0.76	33.95	6,909.62	6,910.23	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	05/21/08	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	32.77	1.07	33.84	6,909.73	6,910.59	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	09/10/08	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	32.62	0.23	32.85	6,910.72	6,910.90	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	11/03/08	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	31.05	1.29	32.34	6,911.23	6,912.26	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	02/11/09	4.00	6,941.53	6,943.57	2.04	6,903.98	37.55	32.08	1.07	33.15	6,910.42	6,911.28	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	05/05/09	4.00	6,941.53	6,943.57	2.04	6,903.98	37.55	NA	NA	32.77	6,910.80	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	08/10/09	4.00	6,941.53	6,943.57	2.04	6,903.98	37.55	NA	NA	31.94	6,911.63	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	10/28/09	4.00	6,941.53	6,943.57	2.04	6,903.98	37.55	NA	NA	31.71	6,911.86	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	03/03/10	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	NA	NA	31.63	6,911.94	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	06/03/10	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	NA	NA	31.37	6,912.20	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	09/20/10	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	31.94	0.68	32.62	6,910.95	6,911.49	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	11/03/10	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	31.05	0.89	31.94	6,911.63	6,912.34	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	03/09/11	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	30.05	6,913.52	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	06/27/11	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	30.11	6,913.46	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	10/03/11	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	29.89	6,913.68	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	11/28/11	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	29.85	6,913.72	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	03/15/12	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	29.32	6,914.25	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	06/04/12	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	29.37	6,914.20	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	08/13/12	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	29.49	6,914.08	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	08/23/12	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	29.46	6,914.11	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	10/08/12	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	29.58	6,913.99	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	03/26/13	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	29.45	6,914.12	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	06/17/13	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	29.44	6,914.13	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	09/16/13	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	28.98	6,914.59	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	11/12/13	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	28.96	6,914.61	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	03/14/14	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	27.92	6,915.65	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	06/09/14	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	28.80	6,914.77	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	09/18/14	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	28.81	6,914.76	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	11/13/14	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	28.70	6,914.87	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	03/23/15	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	29.10	6,914.47	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	06/09/15	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	28.80	6,914.77	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	08/23/15	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	29.08	6,914.49	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	10/29/15	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	27.97	6,915.60	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	10/29/15	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	27.97	6,915.60	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	03/04/16	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	28.22	6,915.35	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	06/07/16	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	28.22	6,915.35	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	09/13/16	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	27.70	6,915.87	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	03/16/17	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	ND	NA	27.53	6,916.04	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	06/20/17	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	25.30	8.00	33.30	6,910.27	6,916.67	29.5 - 39.5	Chinle/Alluvial Interface

Table 3 - Fluid Level Measurements
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Date of Installation	Well ID Number	Inspection or Sample Date	Casing Diameter (Inch)	Ground Level Elevations (ft)	Well Casing Rim Elevations (ft)	Stick-up length (ft)	Well Casing Bottom Elevations (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH ¹ Column Thickness (ft)	Depth to Water (ft)	Ground water Elevation ² (ft)	Corrected Water Table ³ Elevation (factor 0.8) (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
08/27/97	RW-5	09/19/17	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	25.46	6.19	31.65	6,911.92	6,916.87	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	12/12/17	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	24.75	9.25	34.00	6,909.57	6,916.97	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	02/09/18	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	25.50	8.10	33.60	6,909.97	6,916.45	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	04/25/18	4.00	6,941.53	6,943.57	2.04	6,903.98	39.59	26.62	5.72	32.34	6,911.23	6,915.81	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	08/16/18	4.00	6,941.53	6,943.57	2.04	6,903.98	39.51	27.20	5.38	32.58	6,910.99	6,915.29	29.5 - 39.5	Chinle/Alluvial Interface
	RW-5	11/07/18	4.00	6,941.53	6,943.57	2.04	6,903.98	NM	NM	NA	NM	NA	NA	29.5 - 39.5	Chinle/Alluvial Interface
	RW-6	02/22/05	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	33.13	1.37	34.50	6,909.51	6,910.61	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	03/03/05	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	33.19	1.19	34.38	6,909.63	6,910.58	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	03/08/05	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	33.15	0.85	34.00	6,910.01	6,910.69	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	06/24/05	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	33.31	1.15	34.46	6,909.55	6,910.47	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	09/16/05	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	32.98	1.35	34.33	6,909.68	6,910.76	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	12/05/05	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	32.69	1.06	33.75	6,910.26	6,911.11	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	03/17/06	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	32.67	1.08	33.75	6,910.26	6,911.12	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	06/07/06	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	32.92	1.12	34.04	6,909.97	6,910.87	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	07/26/06	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	33.00	1.12	34.12	6,909.89	6,910.79	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	10/16/06	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	33.71	0.93	34.64	6,909.37	6,910.11	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	02/21/07	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	33.29	1.21	34.50	6,909.51	6,910.48	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	04/30/07	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	33.58	1.06	34.64	6,909.37	6,910.22	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	07/10/07	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	33.29	1.29	34.58	6,909.43	6,910.46	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	11/28/07	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	33.25	1.22	34.47	6,909.54	6,910.52	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	02/18/08	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	33.44	0.92	34.35	6,909.66	6,910.39	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	05/21/08	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	33.02	1.10	34.12	6,909.89	6,910.77	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	09/10/08	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	32.83	0.29	33.12	6,910.89	6,911.12	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	11/03/08	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	32.46	0.23	32.69	6,911.32	6,911.50	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	02/11/09	4.00	6,941.96	6,944.01	2.05	6,903.11	38.85	32.19	0.16	32.35	6,911.66	6,911.79	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	05/05/09	4.00	6,941.96	6,944.01	2.05	6,903.11	38.85	32.08	0.18	32.26	6,911.75	6,911.89	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	08/10/09	4.00	6,941.96	6,944.01	2.05	6,903.11	38.85	32.04	0.24	32.28	6,911.73	6,911.92	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	10/28/09	4.00	6,941.96	6,944.01	2.05	6,903.11	38.85	31.81	0.22	32.03	6,911.98	6,912.16	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	03/03/10	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	31.78	0.23	32.01	6,912.00	6,912.18	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	06/03/10	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	31.61	0.09	31.70	6,912.31	6,912.38	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	09/20/10	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	32.04	0.24	32.28	6,911.73	6,911.92	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	11/03/10	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	32.10	0.36	32.46	6,911.55	6,911.84	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	03/09/11	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	30.24	0.02	30.26	6,913.75	6,913.77	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	06/27/11	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	30.11	0.04	30.15	6,913.86	6,913.89	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	10/04/11	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	29.91	0.03	29.94	6,914.07	6,914.09	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	11/28/11	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	29.90	0.03	29.93	6,914.08	6,914.10	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	03/15/12	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	ND	NA	29.46	6,914.55	NA	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	06/04/12	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	ND	NA	29.54	6,914.47	NA	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	08/13/12	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	ND	NA	29.57	6,914.44	NA	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	08/23/12	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	ND	NA	29.56	6,914.45	NA	28.5 - 38.5	Chinle/Alluvial Interface

Table 3 - Fluid Level Measurements
Marathon Petroleum Company - Gallup Refinery
Gallup, New Mexico

Date of Installation	Well ID Number	Inspection or Sample Date	Casing Diameter (Inch)	Ground Level Elevations (ft)	Well Casing Rim Elevations (ft)	Stick-up length (ft)	Well Casing Bottom Elevations (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH ¹ Column Thickness (ft)	Depth to Water (ft)	Ground water Elevation ² (ft)	Corrected Water Table ³ Elevation (factor 0.8) (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
	RW-6	10/08/12	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	ND	NA	29.62	6,914.39	NA	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	03/26/13	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	ND	NA	29.59	6,914.42	NA	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	06/17/13	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	ND	NA	29.52	6,914.49	NA	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	09/16/13	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	ND	NA	29.13	6,914.88	NA	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	11/12/13	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	ND	NA	29.10	6,914.91	NA	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	03/17/14	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	ND	NA	28.04	6,915.97	NA	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	06/23/14	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	ND	NA	28.85	6,915.16	NA	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	09/18/14	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	ND	NA	28.89	6,915.12	NA	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	11/13/14	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	ND	NA	28.83	6,915.18	NA	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	03/23/15	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	ND	NA	29.18	6,914.83	NA	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	06/09/15	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	ND	NA	28.68	6,915.33	NA	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	08/23/15	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	ND	NA	29.06	6,914.95	NA	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	10/29/15	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	ND	NA	27.97	6,916.04	NA	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	10/29/15	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	ND	NA	27.97	6,916.04	NA	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	03/04/16	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	ND	NA	28.25	6,915.76	NA	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	06/07/16	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	ND	NA	28.24	6,915.77	NA	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	09/13/16	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	ND	NA	27.99	6,916.02	NA	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	03/16/17	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	ND	NA	27.57	6,916.44	NA	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	06/20/17	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	25.50	8.12	33.62	6,910.39	6,916.89	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	09/19/17	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	25.89	5.08	30.97	6,913.04	6,917.10	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	12/12/17	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	24.83	9.02	33.85	6,910.16	6,917.38	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	02/09/18	4.00	6,941.96	6,944.01	2.05	6,903.11	40.90	25.65	7.40	33.05	6,910.96	6,916.88	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	04/25/18	4.00	6,941.96	6,944.01	2.05	6,903.11	40.83	26.93	4.76	31.69	6,912.32	6,916.13	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	08/16/18	4.00	6,941.96	6,944.01	2.05	6,903.11	40.85	27.43	4.35	31.78	6,912.23	6,915.71	28.5 - 38.5	Chinle/Alluvial Interface
	RW-6	11/07/18	4.00	6,941.96	6,944.01	2.05	6,903.11	NM	NM	NA	NM	NA	NA	28.5 - 38.5	Chinle/Alluvial Interface

DEFINITIONS:

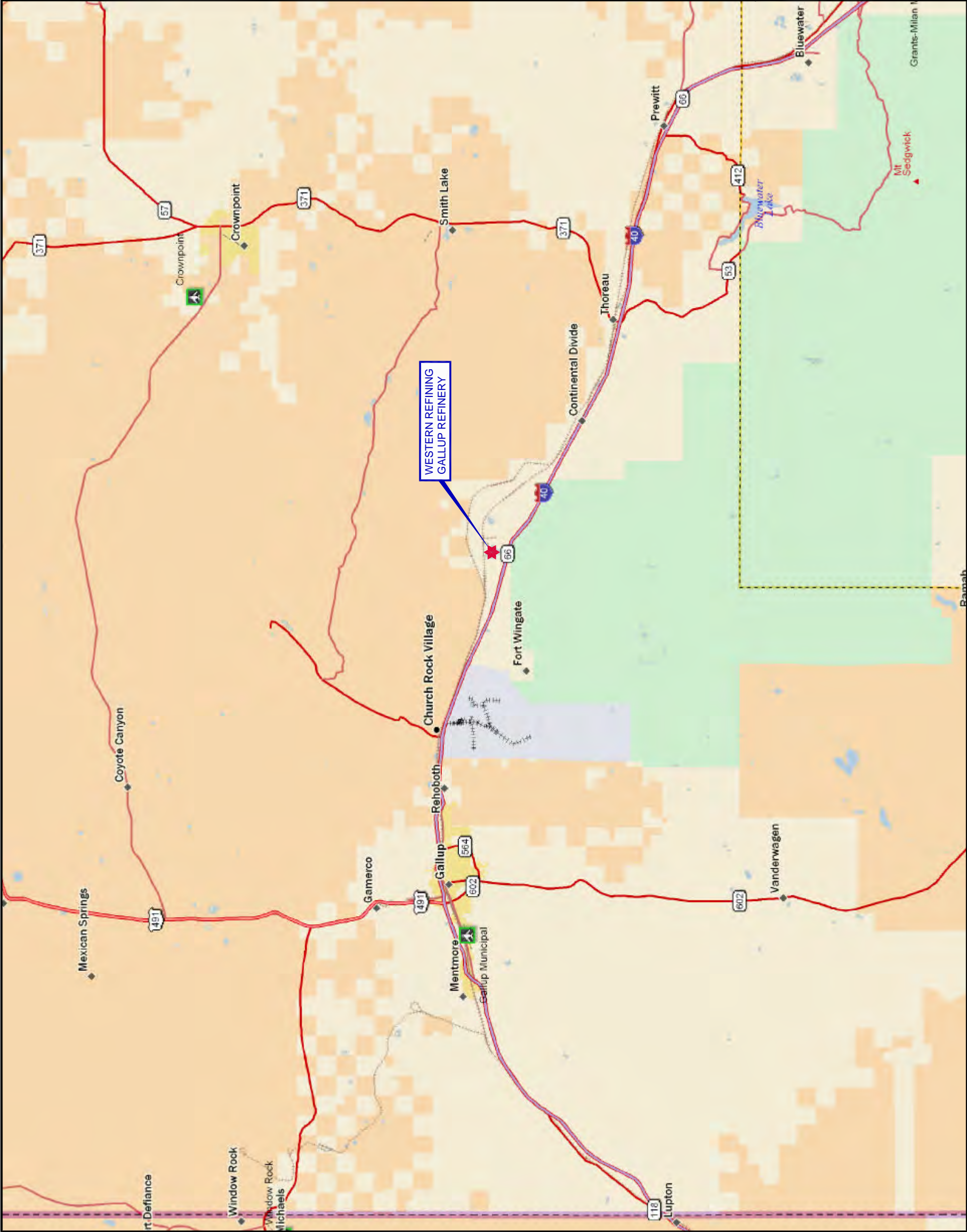
- NA - Not applicable
SPH = Separate Phase Hydrocarbons
ND - Not detected
NR - Not recorded
NM - not measured

NOTES:

1. Ground water elevation - Depth to SPH = SPH Column Thickness.
2. Well casing rim elevation - depth to water measurement.
3. Corrected Water Table Elevation applies only if SPH thickness column measurement exists. (0.8 X SPH thickness + Ground Water Elevation)

Figures

- Figure 1 Site Location Map**
- Figure 2 Site Map**
- Figure 3 Topographic Map**
- Figure 4 Alluvium/Chinle GP Interface Water Elevation Map**
- Figure 5 Proposed Sample Location Map**
-
-



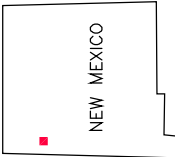
PROJ. NO.: Western Refining DATE: 07/13/14 FILE: WestRef-B198

FIGURE 1
SITE LOCATION MAP
GALLUP REFINERY

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



FIGURE 2
SITE MAP



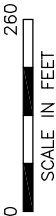
GALLUP SITE LOCATION

LEGEND

- OW-14

CHINLE/ALLUVIUM INTERFACE WELL LOCATION AND IDENTIFICATION NUMBER
- OW-13

SONSELA MONITORING WELL LOCATION AND IDENTIFICATION NUMBER



Aerial Map Source: Google Map, 01/05/2014.

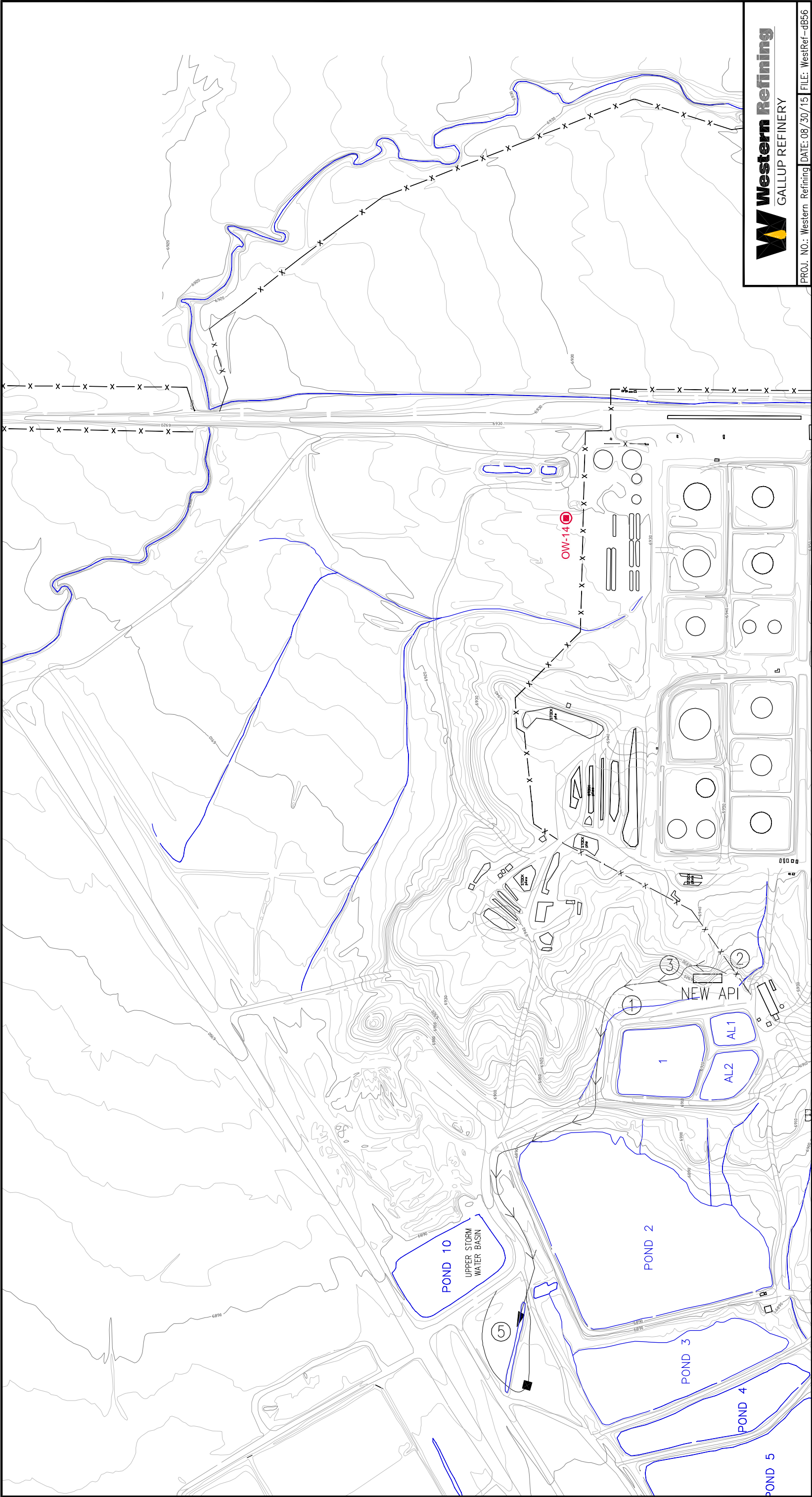
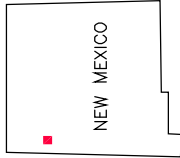


FIGURE 3
TOPOGRAPHIC MAP

LEGEND

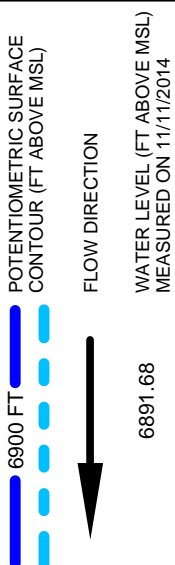
CHINLE/ALLUVIUM INTERFACE WELL LOCATION
AND IDENTIFICATION NUMBER

Source: psi / Western Refining Southwest Inc. - Facility Wide
Ground Water Monitoring Work Plan - 2014 Updates for 2015.



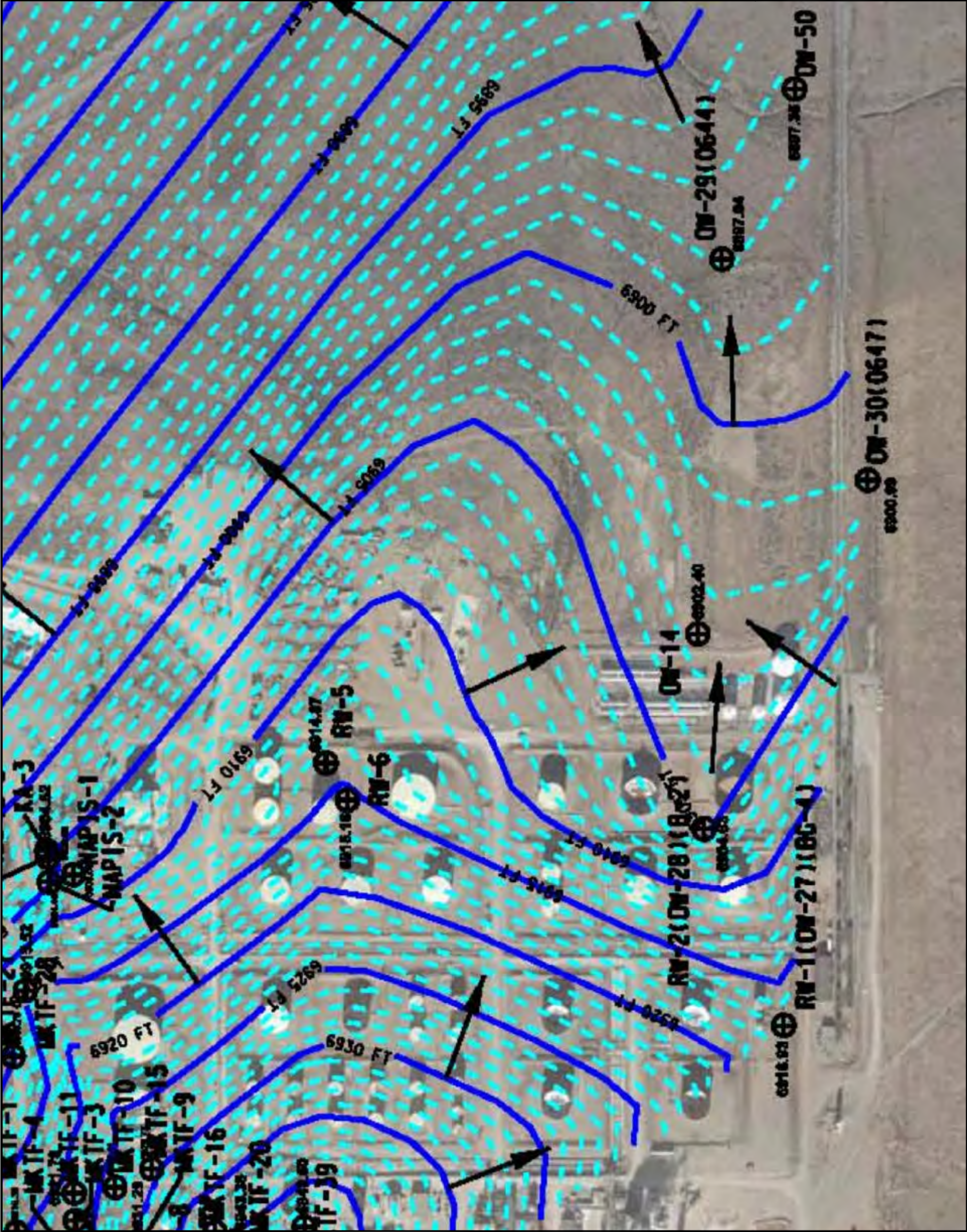
GALLUP SITE LOCATION

LEGEND



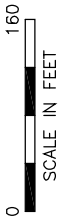
PROJ. NO.: Western Refining DATE: 08/30/15 FILE: WestRef-dB57

FIGURE 4
ALLUVIUM / CHINLE GP INTERFACE
WATER ELEVATION MAP

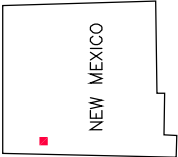




Aerial Map Source: Google Map, 01/05/2014.



- LEGEND**
- OW-14 CHINLE/ALLUVIUM INTERFACE WELL LOCATION AND IDENTIFICATION NUMBER
 - PROPOSED PERMANENT WELL LOCATION



GALLUP SITE LOCATION



PROJ. NO.: Western Refining | DATE: 07/29/16 | FILE: WestRef - dB168

FIGURE 5
PROPOSED WELL LOCATION MAP

Disorbo
Environmental Consulting Firm

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

Appendix A

Boring Logs

PRECISION ENGINEERING, INC.

FILE #: 95-018
 ELEVATION: 6943.7
 TOTAL DEPTH: 48.5
 LOGGED BY: WHK
 DATE: 3-28-95
 STATIC WATER: 28.0
 BORING ID: BG4
 PAGE: 1

PROJECT: Tank 569
 LOCATION: See Boring Plan

LOG OF TEST BORINGS

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
0.0-0.3	*****		C	Sand, fine, dry, brown, loose	
0.3-0.4	xxxxxxxx	1.0	C	Asphalt Cement Concrete	11.0
0.4-5.0	////		C	Clay, sandy, wet, brown, firm, (fill), odor below 3.9', water saturated @ 4.8'	>1438
	////		C	bottom of fill is at 4.8'	
	////		C		
	////		C		
	////		C		
	////		C		
5.0-11.8	///--	5.0	C	Clay, silty, blocky, wet, brown, firm, scattered carbonate filaments, some	0.0
	///--		C	nodules, native, no odor, redder >10'	
	///--		C		
	///--		C		
	///--		C		
	///--		C		
	///--		C		
	///--		C		
	///--		C		
	///--		C		
	///--		C		
	///--	11	C		
11.8-13.0	///	12	C	Clay, sandy, very fine, wet, red brown to brown, soft	0.0
	///		C		
13.0-14.1	///+	13	C	Clay, stiff, fissured, wet, brown, some carbonate nodules	0.0
	///+		C		
14.1-14.6	*****	14	C	Sand, fine, clean, damp, white, loose	0.0
14.6-15.0	///+0		C	Clay, sandy, slightly gravelly, wet, brown, very stiff to hard	0.0
15.0-16.9	///	15	C	Clay, very fine sandy, laminar bedded, wet, brown, soft	0.0
	///		C		
	///		C		
	///		C		
16.9-18.1	///	17	C	Clay, very fine sandy, slightly less than above, slightly blocky, wet, brown, firm	0.0
	///		C		
	///	18	C		
18.1-19.8	****		C	Sand, some clay, sandy in bands, moist to wet, brown, moderately dense to soft	0.0
	****		C	interbedded with finer soil	
19.8-21.3	000***000		C	Gravel, sandy, moist, light grey to white, dense, subrounded	0.0
	000***000	20	C		
	000***000		C		
	000***000	21	C		
21.3-21.8	///		C	Clay, sandy, wet, brown, soft	
21.8-25.5	000**/000	22	C	Gravel, slightly sandy, some clay as binder, moist, grey to brown, dense	20 @ 22.5'
	000**/000		C	odor @ 24.4'	
	000**/000		C		

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4'-1/4" HSA

PRECISION ENGINEERING, INC.

FILE #: 95-018
 ELEVATION: 6943.7
 TOTAL DEPTH: 48.5
 LOGGED BY: WHK
 DATE: 3-28-95
 STATIC WATER: 28.0
 BORING ID: BG4
 PAGE: 2

PROJECT: Tank 569
 LOCATION: See Boring Plan

LOG OF TEST BORINGS

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAIN SIZE, ETC.)	PID (ppm)
	000**/000		C	continued from page 1	
	000**/000	24	C		
	000**/000		C		160 @ 24.4'
	000**/000	25	C		
25.5-29.4	*****		C	<u>Sand</u> , fine, clean of silt and clay, moist, brown, loose	45.0
	*****	26	C		
	*****		C		
	*****		C		
	*****		C		
	*****		C		
	*****	29	C		
29.4-30.5	*****		C	<u>Sand</u> as above but <u>very weakly water bearing @ 29.4'</u> , grey to black, strong odor	1100
	*****	30	C		
30.5-31.2	////+////		C	<u>Clay</u> , sandy, wet, brown, soft, odor	770
	////+////	31	C		
31.2-34.0	////+////		C	<u>Clay</u> , blocky, wet, very stiff, numerous carbonate filaments, brown, slightly fissured, odor	770
	////+////		C		
	////+////		C		
	////+////		C		
	////+////		C		
34.0-35.0	*****	34	C	<u>Sand</u> , silty, very fine, does not appear water bearing, but sample covered with	700
	*****		C	water from above, very dark brown to black, soft, strong odor	
35.0-37.3	****//***	35	C	<u>Sand</u> , very fine, clayey, <u>saturated, water bearing zones--2" thick</u> , gradational to	1000
	****//***		C	clay below, brown, strong odor	
	****//***		C		
	****//***		C		
	****//***	37	C		
37.3-39.2	////+////		C	<u>Clay</u> , wet, brown, stiff, carbonate filaments, soft to firm, not blocky or fissured	320
	////+////		C		
	////+////		C		
	////+////	39	C		
39.2-40.9	000**/000		C	<u>Gravel</u> , sandy, slightly clayey, <u>water bearing</u> , brown, dense, rounded to subrounded	800
	000**/000		C	odor	
	000**/000		C		
40.9-45.0	-----	41	C	<u>CHINLE FORMATION</u>	
	-----		C	<u>Shale</u> , slightly sandy, fissile, fissured, slightly blocky, moist, red brown, hard	2.0
	-----		C	some grey green banding, no odor	
	-----		C		
	-----		C		
	-----		C		
	-----		C		
45.0-48.5	-----	45	C	<u>Shale</u> , sandy, fissile, moist to damp, hard, water from above runs into fissile	
	-----		C	partings (dry on interior of sample) difficult to obtain uncontaminated sample	
	-----		C	dark red brown, suspect samples taken may be contaminated by water from above	

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4'-1/4" HSA

PRECISION ENGINEERING, INC.

FILE #: 95-018
 ELEVATION: 6943.7
 TOTAL DEPTH: 48.5
 LOGGED BY: WHK
 DATE: 3-28-95
 STATIC WATER: 28'-7"
 BORING ID: BG4
 PAGE: 3

PROJECT: Tank 569

LOCATION: See Boring Plan

LOG OF TEST BORINGS

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAIN SIZE, ETC.)	PID (ppm)
	----		C	continued from page 2	
	----	47	C		23 @ 47.0'
	----		C		
	----	48	C		
	----		C		12 @ 48.5'
TD				stop drilling 11:05a water @ 18.8' @ 11:30a -- 8" of hydrocarbon on water @ 2:00p water level @ 28'-7" completed 4" well, screened from 25' to 40' (see attached completion diagram)	

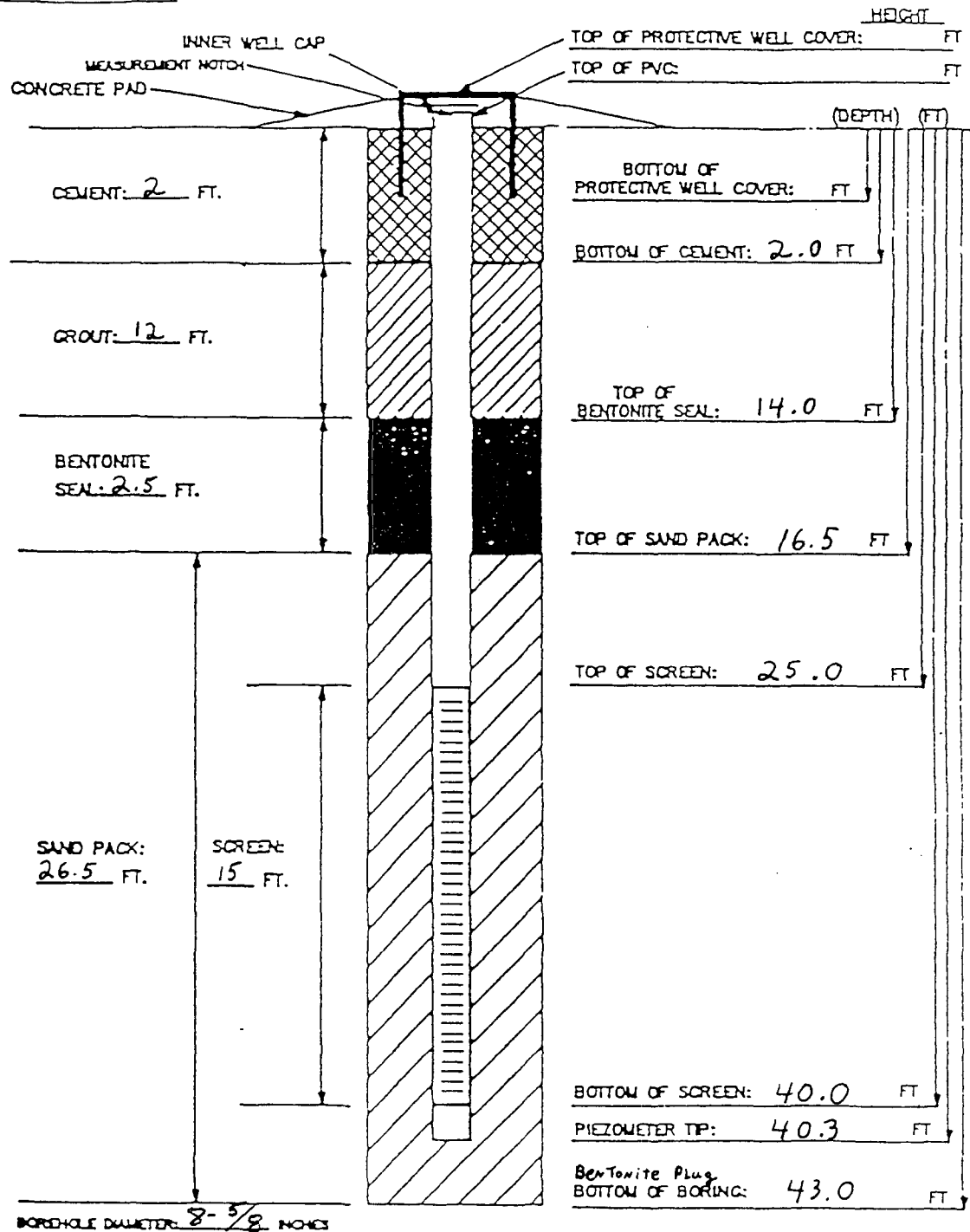
LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4'-1/4" HSA

INSTALLATION DATE: 032895

INSTALLATION DIAGRAM
MONITORING WELL NO.

B6-4



MATERIALS USED:

SAND TYPE AND QUANTITY: 20-40
BENTONITE PELLETS (5-GALLON BUCKETS): 1
BAGS OF GROUT: 1
AMOUNT OF CEMENT: 8-94# Bags + 75# Gel
AMOUNT OF WATER USED: 8 gal
OTHER:

Bottom Cap Used? YES
Screen Lengths: 15'
Riser Used: 30'
Top Cap Used?
Well Size: 4" Dia.

J-Plug Used? YES
Flush Mount Vault
Above Ground Vault YES
Bollards, No. & Size:

TASK: Tank 569

GEOLOGIST/ENGINEER: W H K

PRECISION ENGINEERING, INC.

FILE #: 95-018
 ELEVATION: 6927.3
 TOTAL DEPTH: 38.0
 LOGGED BY: WHK
 DATE: 3-29-95
 STATIC WATER: 24'-3"
 BORING ID: B2
 PAGE: 1

PROJECT: Tank 569
 LOCATION: See Boring Plan
 Tank 576

LOG OF TEST BORINGS

DEPTH	T	E	E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
0.0-5.0	///-+////		C	start at 10:00a	
	///-+////		C	Clay, slightly silty, little sand, wet, brown, soft to firm, no odor	0.0
	///-+////		C		
	///-+////		C		
	///-+////		C		
	///-+////		C		
	///-+////		C		
	///-+////		C		
	///-+////		C		
	///-+////	5.0	C		
	///-+////		C		
	///-+////		C		
	///-+////		C		
	///-+////		C		
	///-+////		C		
	///-+////	8.0	C		
8.4-10.6	///+////		C	Clay, fine sandy, gradational fine above and to below, wet, brown, firm, no odor	0.0
	///+////		C		
	///+////		C		
	///+////	10	C		
10.6-12.0	+++-----		C	Sand, silty, fine, moist, light red brown, loose, no odor	0.0
	+++-----		C		
	+++-----		C		
12.0-12.5	+++OOO+++	12	C	Sand, very gravelly, to 2", moist, light red brown, dense, slightly rounded rock	0.0
12.5-13.1	+++-----		C	Sand, silty, moist, light red brown, loose, no odor	0.0
13.1-15.0	///+---//	13	C	Clay, sandy, silty, moist, red brown, firm to stiff, some root filaments	0.0
	///+---//		C		
	///+---//		C		
	///+---//		C		
15.0-16.8	+++//+++	15	C	Sand, clayey, fine, moist, red brown, moderately dense, no odor	0.0
	+++//+++		C		
	+++//+++		C		
	+++//+++		C		
16.8-19.1	///+---//	17	C	Clay, silty grading to very fine sandy, moist to wet, red brown, stiff, no odor	0.0
	///+---//		C	carbonate filaments common	
	///+---//		C		
	///+---//		C		
	///+---//	19	C		
19.1-20.0	///--OO++/		C	Clay, silty, large gravel present (2"), wet, dark brown, hard, no odor	0.0
	///--OO++/	20	C	numerous carbonate filaments	
20.0-23.6	///--++///		C	Clay, silty, brown, stiff, slightly blocky, no odor, carbonate filaments	0.0
	///--++///		C		
	///--++///		C		
	///--++///		C		
	///--++///		C		
	///--++///		C		540 @ 22.6'

LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4'-1/4" HSA

PRECISION ENGINEERING, INC.

FILE #: 95-018
 ELEVATION: 6927.3
 TOTAL DEPTH: 38.0
 LOGGED BY: WHK
 DATE: 3-29-95
 STATIC WATER: 24'-3"
 BORING ID: B2
 PAGE: 2

PROJECT: Tank 569
 LOCATION: See Boring Plan

LOG OF TEST BORINGS

DEPTH	P L O T	S C A L E	S A M P L E	MATERIAL CHARACTERISTICS (MOISTURE, CONDITION, COLOR, GRAINSIZE, ETC.)	PID (ppm)
23.6-24.2	***00****		C	<u>Sand</u> , coarse, some fine gravel, saturated but does not appear water bearing, brown	1000
	00*	24	C	dense, hydrocarbon odor	
24.2-25.5	//////////		C	<u>Clay</u> , wet, not water bearing, brown, stiff, hydrocarbon odor	1060
	//////////	25	C		
25.5-27.1	***//****		C	<u>Sand</u> , clayey, <u>water bearing</u> , brown, odor	610
	//*		C		
	//*		C		
27.1-28.5	//////////	27	C	<u>Clay</u> , some sand @ 28'-28.5', wet, brown, soft, slightly blocky, hydrocarbon odor	
	//////////		C	saturated but not water bearing	
	//////////	28	C		
28.5-30.9	///****//		C	<u>Clay</u> , sandy, some laminations, wet, brown, stiff	60
	///****//		C		
	///****//		C		
	///****//		C		
	///****//		C		
30.9-32.9	000**0000	31	C	<u>Gravel</u> , some sand, silica rock, <u>water bearing</u> , brown, dense, rounded to subrounded	1030
	000**0000		C		
	000**0000		C		
	000**0000		C		
32.9-35.0	-----	33	C	<u>CHINLE FORMATION</u>	
	-----		C	<u>Shale</u> , weathered, wet to moist, some green mottling, red brown overall, stiff	20
	-----		C	weak odor	
	-----		C		
35.0-38.0	-----	35	C	<u>Shale</u> , as above, slightly more sand, blocky, dark red brown, wet to moist	57
	-----		C	suspect contamination by water flowing from gravel above--gravel produces more	
	-----		C	water at this location than previous drilling	
	-----		C		
	-----		C		
	-----		C		
	-----	38	C		
TD				stop drilling 11:25a completed 4" well - see attached well completion diagram 24'-3" to water 2" product on water	

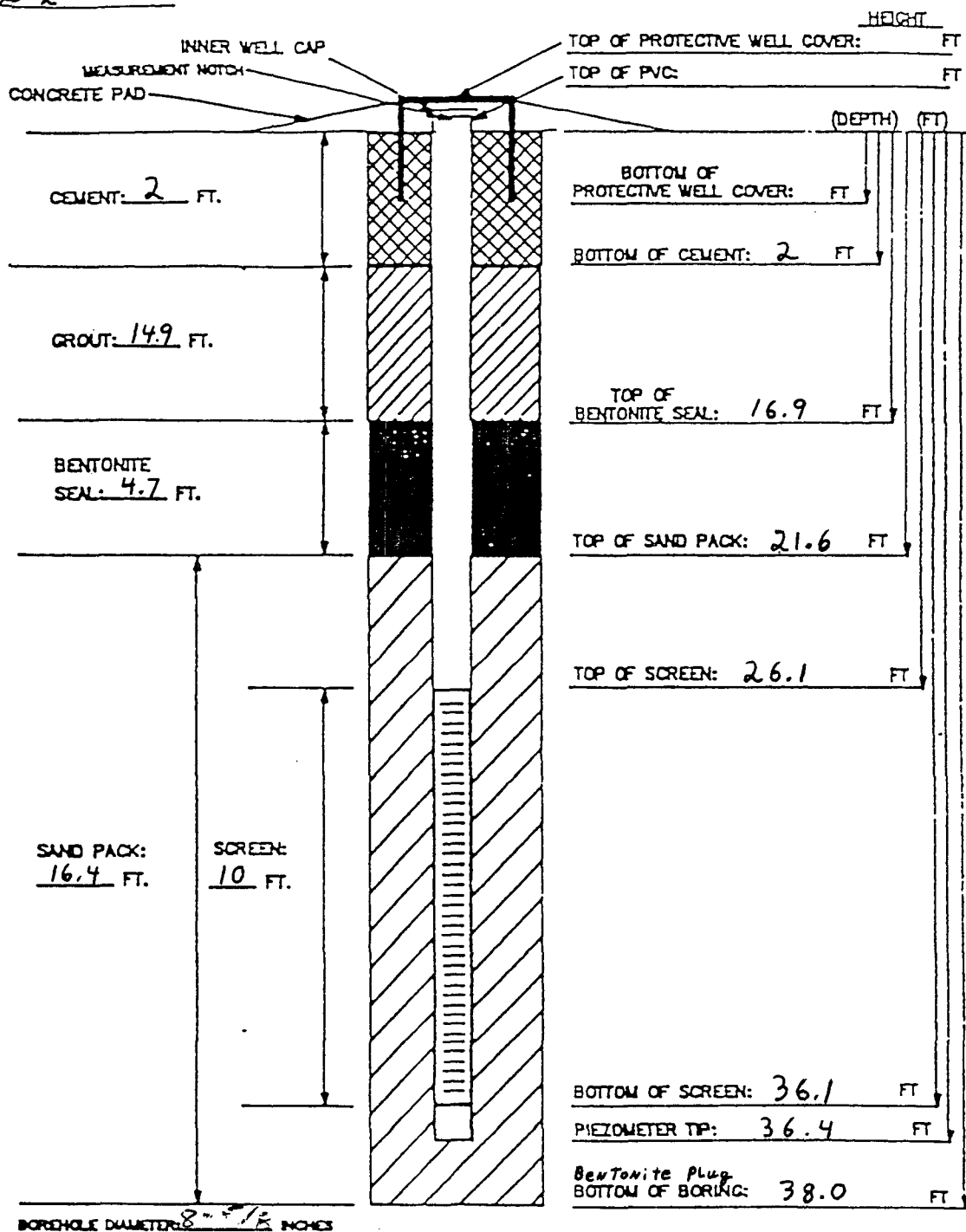
LOGGED BY: WHK

SIZE AND TYPE OF BORING: 4'-1/4" HSA

INSTALLATION DATE: 032995

INSTALLATION DIAGRAM
MONITORING WELL NO.

B-2



MATERIALS USED:

SAND TYPE AND QUANTITY: 20-40
BENTONITE PELLETS (5-GALLON BUCKETS): 2
BAGS OF GROUT:
AMOUNT OF CEMENT: 8-94# Bags + 75#
AMOUNT OF WATER USED: 8 Gal
OTHER:

Bottom Cap Used? YES
Screen Lengths: 10'
Riser Used: 30'
Top Cap Used?
Well Size: 4" Dia.

J-Plug Used? YES
Flush Mount Vault
Above Ground Vault YES
Bollards, No. & Size:

TASK: Tank 569

GEOLOGIST/ENGINEER: WHK

Western Refining SW, Inc.
Gallup Refinery - OW-14 Area Investigation
Job No. WEST16006

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc. / Cohagan
Drilling Rig : CME 75
Drilling Method : Hollow Stem Auger 7.5"
Sampling Method : 2' Split Spoon - 2" Diameter
Comments : N 35° 29.493' / W 108° 25.501'
Total Depth : 27'
Ground Water : 18'
Start Date : 09/21/2016
Finish Date : 09/21/2016

WELL NO. OW-57

(Sheet 1 of 2)

Elev., TOC (ft.msl) : 6933.10
Elev., PAD (ft. msl) : 6930.64
Elev., GL (ft. msl) :
Site Coordinates :
N : N 1634751.52
E : E 2546961.79

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	DESCRIPTION	Completion Results OW-57
-3									
-2									
-1									
0									
1	0.6			CL	100			SILTY CLAY, moderate, firm, damp, brown, no odor,	
2								SILTY CLAY, SIMILAR TO ABOVE (STA),	
3	0.6			CL	100			SILTY CLAY, STA,	
4									
5	2.6			CL	100				
6								SILTY CLAY, STA, darker brown,	
7	6.2			CL	100				
8								SILTY CLAY, STA, no odor,	
9	23.7			CL	90				
10								SANDY CLAY, low, soft, damp, brown, odor,	
11	118			CL	90				
12								SANDY CLAY, STA, brown/tan silt at base, odor,	
13	85			CL					

1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

Western Refining SW, Inc.
Gallup Refinery - OW-14 Area Investigation
Job No. WEST16006

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc. / Cohagan
Drilling Rig : CME 75
Drilling Method : Hollow Stem Auger 7.5"
Sampling Method : 2' Split Spoon - 2" Diameter
Comments : N 35° 29.493' / W 108° 25.501'
Total Depth : 27'
Ground Water : 18'
Start Date : 09/21/2016
Finish Date : 09/21/2016

WELL NO. OW-57

(Sheet 2 of 2)

Elev., TOC (ft.msl) : 6933.10
Elev., PAD (ft. msl) : 6930.64
Elev., GL (ft. msl) :
Site Coordinates :
N : N 1634751.52
E : E 2546961.79

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation	Completion Results OW-57
							DESCRIPTION	
13	85			CL	80			
14							CLAYEY SILT, very fine, soft, damp, brown and tan, odor,	
15	197			ML	90			
16							SILTY CLAY, low, firm, tan and brown, damp, odor,	
17	205			CL	60			
18							GRAVELLY CLAY, low, soft, damp to slightly moist to saturated, sandstone gravel, sandy, odor,	
19	58			CL	20			
20							SANDSTONE/SAND, fine, dense, light greenish white, very moist to saturated,	
21	243			SS	10			
22							GRAVELLY SANDY CLAY, low, soft, very moist to saturated, grey, green sandstone, calcareous, odor,	
23	846			CL	70			
24				CL	70			
25	44			CL/ST	70		CLAYSTONE, very dense, dry, purple, grey at base, faint odor,	
26	39			CL/ST	30		CLAYSTONE, STA, faint odor.	
27								
28								
29								

2" Sch 40 PVC
w/Threaded Joints

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

2" Flush Threaded
Sch 40 PVC Cap

DiSorbo Consulting, LLC

1010 Travis Street
Houston, Texas 77002
713-955-1230

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190



Western Refining SW, Inc.
Gallup Refinery - OW-14 Area Investigation
Job No. WEST16006

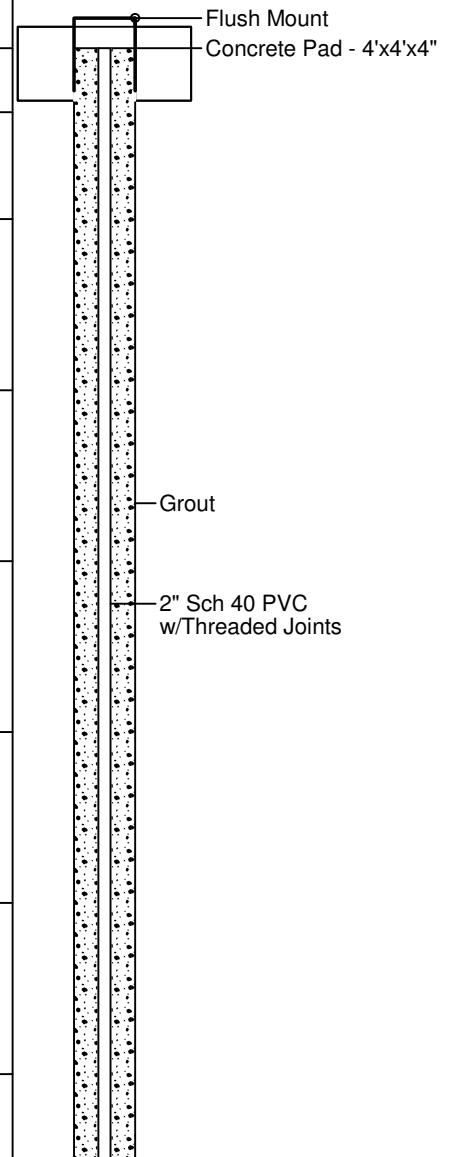
Geologist : Tracy Payne
Driller : Enviro-Drill, Inc. / Cohagan
Drilling Rig : CME 75
Drilling Method : Hollow Stem Auger 7.5"
Sampling Method : 2' Split Spoon - 2" Diameter
Comments : N 35° 29.500' / W 108° 28.410'
Total Depth : 48.5'
Ground Water : 29'
Start Date : 09/22/2016
Finish Date : 09/22/2016

WELL NO. OW-58

(Sheet 1 of 4)

Elev., TOC (ft.msl) : 6934.50
Elev., PAD (ft. msl): 6934.71
Elev., GL (ft. msl) :
Site Coordinates :
N : N 1634800.15
E : E 2547414.91

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation ▽ Saturation	Completion Results OW-58
							DESCRIPTION	
-1								
0				AR	100		ASPHALT/BASE,	Flush Mount Concrete Pad - 4'x4'x4"
1	110			CL	100		SILTY CLAY, moderate, firm to stiff, damp, brown, odor,	
2							SILTY CLAY, SIMILAR TO ABOVE (STA),	
3	40			CL	100			
4							SILTY CLAY, STA, moist, faint odor,	
5	11.2			CL	100			
6							SILTY CLAY, low, soft, damp, brown, faint odor,	
7	2.2			CL	90			Grout
8							SILTY CLAY, STA, no odor,	
9	5.3			CL	60			
10							SILTY CLAY, STA, sticky, black discoloration, odor,	
11	37			CL	80			
12							SILTY CLAY, STA,	
13	42			CL				



1010 Travis Street
Houston, Texas 77002
713-955-1230

DiSorbo Consulting, LLC

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190






Western Refining SW, Inc.
Gallup Refinery - OW-14 Area Investigation
Job No. WEST16006

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc. / Cohagan
Drilling Rig : CME 75
Drilling Method : Hollow Stem Auger 7.5"
Sampling Method : 2' Split Spoon - 2" Diameter
Comments : N 35° 29.500' / W 108° 28.410'
Total Depth : 48.5'
Ground Water : 29'
Start Date : 09/22/2016
Finish Date : 09/22/2016

WELL NO. OW-58

(Sheet 2 of 4)

Elev., TOC (ft.msl) : 6934.50
Elev., PAD (ft. msl): 6934.71
Elev., GL (ft. msl) :
Site Coordinates :
N : N 1634800.15
E : E 2547414.91

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation ▽ Saturation	Completion Results OW-58
							DESCRIPTION	
13	42			CL	70			 Grout  2" Sch 40 PVC w/Threaded Joints
14					SILTY CLAY, low, stiff, damp, brown with black discoloration, faint odor,			
15	25		CL	60				
16						SANDY CLAY, low, stiff, very fine grain sand, damp, brown, odor,		
17	226		CL	60				
18						SANDY CLAY, STA, odor,		
19	240		CL	50				
20						SANDY CLAY, STA, odor,		
21	200		CL	60				
22							SILTY CLAY, low, very stiff, damp, brown, tan silt pockets/seams present, odor,	
23	2020	CL	90					
24						SILTY CLAY, low, firm, soft/ crumbly, damp, brown, strong odor, outside of core is oily/phase separated hydrocarbon (PSH),		
25	1980	CL	90					
26						SILTY CLAY, STA, firm to stiff, odor, outside of core is oily/PSH,		
27	973	CL						

Grout

2" Sch 40 PVC
w/Threaded Joints

DiSorbo Consulting, LLC

1010 Travis Street
Houston, Texas 77002
713-955-1230

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

Western Refining SW, Inc.
Gallup Refinery - OW-14 Area Investigation
Job No. WEST16006

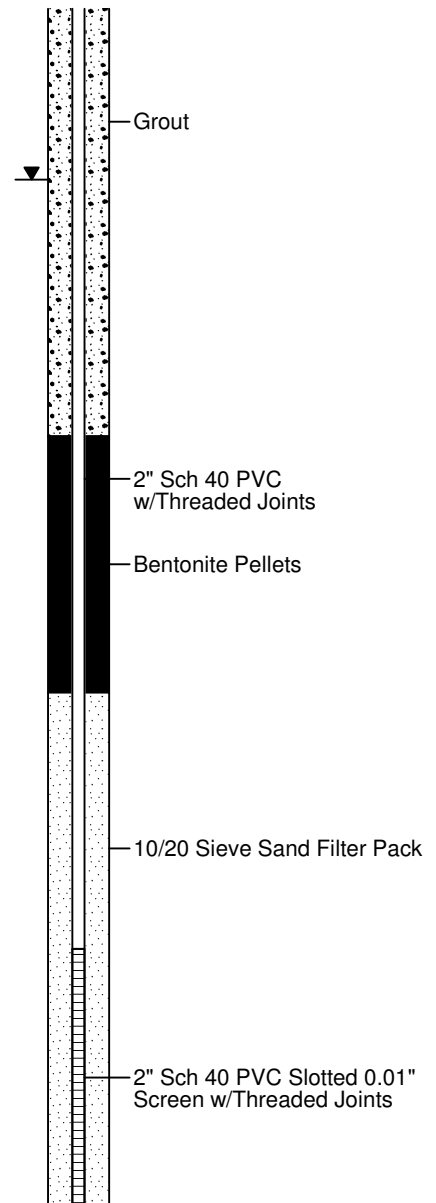
Geologist : Tracy Payne
Driller : Enviro-Drill, Inc. / Cohagan
Drilling Rig : CME 75
Drilling Method : Hollow Stem Auger 7.5"
Sampling Method : 2' Split Spoon - 2" Diameter
Comments : N 35° 29.500' / W 108° 28.410'
Total Depth : 48.5'
Ground Water : 29'
Start Date : 09/22/2016
Finish Date : 09/22/2016

WELL NO. OW-58

(Sheet 3 of 4)

Elev., TOC (ft.msl) : 6934.50
Elev., PAD (ft. msl) : 6934.71
Elev., GL (ft. msl) :
Site Coordinates :
N : N 1634800.15
E : E 2547414.91

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	Saturation ▼ Saturation ▽ Saturation	Completion Results
							DESCRIPTION	
27	973			CL	90			<div>OW-58</div> <div><div></div><div>Grout</div><div>▼</div><div>2" Sch 40 PVC w/Threaded Joints</div><div>Bentonite Pellets</div><div>10/20 Sieve Sand Filter Pack</div><div>2" Sch 40 PVC Slotted 0.01" Screen w/Threaded Joints</div></div>
28				CL	90		SILTY CLAY, STA, damp to moist, odor,	
29	2784	▼		CL/SC	90		SANDY CLAY/CLAYEY SAND, low, soft, very moist to saturated, dark brown, odor,	
30							SANDY SILTY CLAY, low, firm, damp, saturated sand at base, grey/brown, odor,	
31	2350			CL	90			
32							SILTY SAND, fine, loose, saturated, grey/brown, odor,	
33	1775			SM	90			
34				CL	90		SILTY CLAY, low, soft, damp, greyish brown, odor,	
35	575			CL	90		SILTY CLAY, STA, damp to very moist, odor,	
36							SILTY CLAY, low, firm, damp, greyish brown, odor,	
37	227			CL	80			
38							SILTY CLAY, STA, brown, odor,	
39	545			CL	50			
40							CLAY, high, firm, damp, brown, odor,	
41	531			CH				



Western Refining SW, Inc.
Gallup Refinery - OW-14 Area Investigation
Job No. WEST16006

Geologist : Tracy Payne
Driller : Enviro-Drill, Inc. / Cohagan
Drilling Rig : CME 75
Drilling Method : Hollow Stem Auger 7.5"
Sampling Method : 2' Split Spoon - 2" Diameter
Comments : N 35° 29.500' / W 108° 28.410'
Total Depth : 48.5'
Ground Water : 29'
Start Date : 09/22/2016
Finish Date : 09/22/2016

WELL NO. OW-58

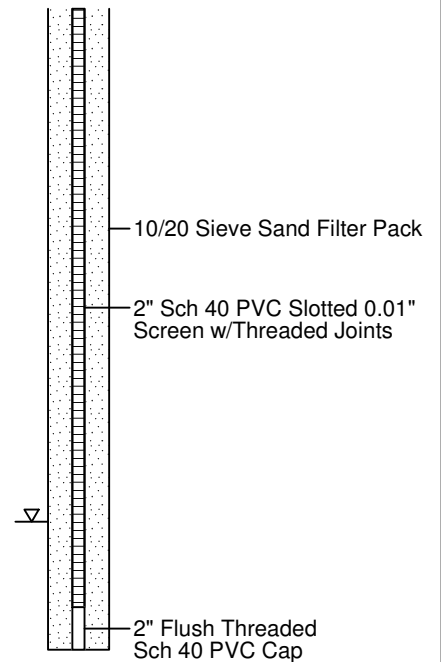
(Sheet 4 of 4)

Elev., TOC (ft.msl) : 6934.50
Elev., PAD (ft. msl): 6934.71
Elev., GL (ft. msl) :
Site Coordinates :
N : N 1634800.15
E : E 2547414.91

Depth (ft.)	PID (ppm)	Saturation	Lithology	USCS	Recovery (%)	Sample	DESCRIPTION
41	531			CH	50		
42				CH	50		CLAY, STA, odor,
43	288			CH	50		
44				CL	50		SILTY CLAY, low to moderate, firm, occasional gravel, damp, brown, odor,
45	357			CL	50		
46				CL	50		SILTY CLAY, STA, odor,
47	204			SP	50		SANDY GRAVEL, medium to coarse sand with 1/4 to 1/2 inch gravel, very moist to saturated, trace silt/clay, brown, odor,
48	250			SH	10		SHALE, very dense/hard, dry, dark grey, odor.
49							
50							
51							
52							
53							
54							
55							

Completion Results

OW-58



DiSorbo Consulting, LLC

1010 Travis Street
Houston, Texas 77002
713-955-1230

8501 N. MoPac Expy, Suite 300
Austin, Texas 78759
512-693-4190

Appendix B

Investigation Derived Waste Management Plan

Investigation Derived Waste (IDW) Management Plan

All IDW will be properly characterized and disposed of in accordance with all federal, State, and local rules and regulations for storage, labeling, handling, transport, and disposal of waste. The IDW may be characterized for disposal based on the known or suspected contaminants potentially present in the waste.

A dedicated decontamination area will be setup prior to any sample collection activities. The decontamination pad will be constructed so as to capture and contain all decontamination fluids (e.g., wash water and rinse water) and foreign materials washed off the sampling equipment. The fluids will be pumped directly into suitable storage containers (e.g., labeled 55-gallon drums), which will be located at satellite accumulation areas until the fluids are disposed in the refinery wastewater treatment system upstream of the API separator. The solids captured in the decontamination pad will be shoveled into 55-gallon drums and stored at the designated satellite accumulation area pending proper waste characterization for off-site disposal.

Drill cuttings generated during installation of soil borings will be placed directly into 55-gallon drums and staged in the satellite accumulation area pending results of the waste characterization sampling. The portion of soil cores, which are not retained for analytical testing, will be placed into the same 55-gallon drums used to store the associated drill cuttings.

The solids (e.g., drill cuttings and used soil cores) will be characterized by testing to determine if there are any hazardous characteristics in accordance with 40 Code of Federal Regulations (CFR) Part 261. This includes tests for ignitability, corrosivity, reactivity, and toxicity. If the materials are not characteristically hazardous, then further testing will be performed pursuant to the requirements of the facility to which the materials will be transported. Depending upon the results of analyses for individual investigation soil samples, additional analyses may include VOCs, TPH and polynuclear aromatic hydrocarbons (PAHs).
