GW - 032

FACILITY WIDE GW MONITORING WORK PLAN CORRESPONDENCE

2021

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

May 25, 2021

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

RE: DISAPPROVAL
FACILITY WIDE GROUNDWATER MONITORING WORK PLAN – UPDATES FOR 2021
WESTERN REFINING SOUTHWEST INC., GALLUP REFINERY
EPA ID # NMD000333211
HWB-WRG-21-006

Dear Mr. Moore:

The New Mexico Environment Department (NMED) has reviewed the *Facility Wide Groundwater Work Plan* (Work Plan), dated March 31, 2021, submitted on behalf of Marathon Petroleum Company dba Western Refining Southwest Inc., Gallup Refinery (the Permittee). NMED hereby issues this Disapproval with the following comments.

Comment 1

In the Executive Summary, page iii, the Permittee states, "Group E includes 49 permanent monitoring wells installed to delineate the extent of a hydrocarbon plume associated with a seep discovered in 2013 directly west of the crude tanks (T-101, 102)." According to Table 5-1, *Modifications to the Monitoring Network*, pages 3 and 4, a total of 50 wells are listed as Group E. There is a discrepancy in the number of the Group E wells. Resolve the discrepancy in the revised Work Plan.

Comment 2
In Section 2.1, *Historical and Current Site Use*, page 3, the Permittee states, "[t]he Refinery also receives natural gasoline feed stock via a 4-in diameter pipeline that comes in from the west along the Interstate 40 corridor from the Western Refining Southwest, LLC - Wingate Plant (formerly Conoco gas plant)." The statement indicates that the "Wingate Plant" belongs to the Permittee. In a response letter, clarify whether the plant was acquired and currently operated by the Permittee.

Comment 3
In Section 2.4, *Summary of Historical Impacts*, page 9, the Permittee states, "[b]ased on the subsurface soil conditions, there is a possibility that precipitation could cause constituents to leach and reach groundwater." Section 3.3, *Vegetation Types,* page 14, states that average rainfall at the Refinery is less than 7 [inches] per year. Note that northwestern New Mexico is characterized by a semiarid climate and mean annual rainfall is generally low as stated in Section 3.3. Precipitation may not be a significant contributing factor for constituents to leach and reach groundwater. The more prominent contributing factors at the site may include a hydrostatic pressure exerted by fluids that are/were leaking from the sewer pipelines, NAPIS, production wells, sanitary and aeration lagoons. Revise the Work Plan, as necessary.

Comment 4
Section 2.4 includes six subsections, Sections 2.4.1 through 2.4.6. Sections 2.4.1, *Separate Phase Hydrocarbons*, and 2.4.2, *Methyl Tert Butyl Ether*, provide discussion specific to the contaminants while Sections 2.4.3, *NAPIS Unit*, 2.4.4, *Aeration Basin*, 2.4.5, *North Drainage Ditch*, and 2.4.6, *OW-14 Source Area*, provide discussion specific to the areas. Sections 2.4.1 and 2.4.2 and Sections 2.4.3 through 2.4.6 may be separated and grouped for clarity and better organization. Revise the Work Plan, as appropriate.

In addition, Sections 2.4.1 and 2.4.2 provide a discussion regarding two specific types of contaminants, separate phase hydrocarbons (SPH) and methyl tert butyl ether (MTBE); however, the contaminants of concern (COCs) are not limited to SPH and MTBE. Other hydrocarbon constituents such as benzene, toluene, ethylbenzene, total xylenes (BTEX), chlorinated solvents (e.g., 1,2 dichloroethane), and metals have also been detected above the applicable screening levels at the Facility. Acknowledge that there are other COCs. Similarly, although there are multiple Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) at the Facility, the discussion for the only four specific areas is included. Acknowledge that there are other impacted areas. Unless the discussion is inclusive, provide a clarification stating that there are other COCs and SWMUs/AOCs at the Facility. Revise the Work Plan for clarity.

Comment 5
Some discussions provided in Sections 2.4.1 through 2.4.6 are incomplete and do not include the latest information. For example, Section 2.4.4, *Aeration Basin*, page 11, concludes, "[t]he

revised report and response to comments were submitted on January 5, 2021. A due date from the additional work plan will be determined upon approval of the revised report." However, the NMED's *Approval with Modifications Solid Waste Management Unit 1 Revised Investigation Report,* dated January 26, 2021, has already approved the report and provided the due date for the work plan. Revise the sections to update the information.

Comment 6

In Section 4.0, *Monitoring and Sampling Program*, page 17, the Permittee states, "[i]f samples cannot be collected from a location due to environmental concerns, such as elevated hydrogen sulfide, arrangements will be made to collect samples from the affected location(s) during the next sampling or gauging event." Comment 3 of the NMED's *Approval with Modifications Annual Ground Water Monitoring Report Gallup Refinery – 2018,* dated January 22, 2020, states, "[t]he Permittee must conduct the required sampling and change the scheduled sampling dates as necessary, if the H_2S concentrations are too high to allow personnel to conduct the sampling event on the scheduled sampling timeframe." Include this provision in the revised Work Plan.

Comment 7

In Section 5.1, *Modifications in Monitoring Locations*, page 18, the Permittee states, "[e]ight wells and one sample location are proposed for removal from the monitoring network. The eight wells have SPH recovery systems installed (OW-13, OW-14, OW-29, OW-30, RW-1, RW-2, RW-5, and RW-6)." Propose to discontinue operation of the SPH recovery system installed for these wells prior to gauging and sampling events, allow groundwater to equilibrate, and collect data from these wells. Revise the Work Plan accordingly.

Comment 8

In Section 5.1, *Modifications in Monitoring Locations*, page 18, the Permittee states, "[t]he sample location, Boiler Water Inlet to EP-9, is proposed for removal because the Boiler is no longer in service." The proposed change is hereby approved. If the discharged is to be resumed in the future, propose to collect the wastewater samples from the discharge location in a future groundwater monitoring plan update.

Comment 9

In Section 5.1, *Modifications in Monitoring Locations*, page 18, the Permittee states, "OW-13 will be retained at this time to allow for further evaluation." However, well OW-13 is proposed to be removed from the monitoring network in 2021 according to Table 5-1, *Modifications to the Monitoring Network*. Resolve the discrepancy in the revised Work Plan. Regardless, the groundwater data must continue to be collected from well OW-13 and other groundwater monitoring wells where the SPH recovery systems were installed (see also Comment 7).

Comment 10

In Section 5.1, *Modifications in Monitoring Locations*, page 18, the Permittee states, "14 new

monitoring wells are anticipated to be installed and added to the network in 2021." The discussion regarding three new monitoring wells (Sonsela wells near OW-13, between OW-12 and OW-13, and west of OW-1) is provided; however, the remaining 11 wells are not discussed. Provide a discussion regarding the remaining anticipated 11 wells in the revised Work Plan.

Comment 11

In Section 5.1, *Modifications in Monitoring Locations*, page 18, the Permittee states, "[t]o delineate the down-gradient extent of the plume detected at OW-1, a new Sonsela well will be installed approximately 500 ft downgradient of OW-1 to the west. The proposed locations of these wells and other new wells are shown on Figure 5-1." The location of the referenced Sonsela well is depicted approximately 100 feet rather than 500 feet downgradient of well OW-1 in Figure 5-1, *Proposed Well Locations*. Resolve the discrepancy in the revised Work Plan.

Comment 12

In Section 5.1, *Modifications in Monitoring Locations*, page 18, the Permittee states, "MPC will submit an addendum to this Plan within 60 days of the final well completion detailing the new monitoring wells, the proposed sampling schedule, and the proposed analytical suites." The Permittee must not submit the reports as an addendum to this Work Plan. Rather, the Permittee must submit a separate well completion report. Revise the Work Plan accordingly.

Comment 13

In Section 5.2, *Modifications in Monitoring Frequency*, pages 18 and 19, the Permittee states, "sampling frequency for wells BW-4A, BW-4B, BW-5A, BW-5B, BW-5C, PW-3, and PW-4 is proposed to be reduced from quarterly to annual sampling because concentrations have remained consistent since 2016." The proposed change on sampling frequency for wells BW-4A, BW-4B, BW-5A, BW-5B, PW-3, and PW-4 is hereby approved. However, the steady MTBE concentrations in the groundwater samples collected from wells BW-5B and BW-5C potentially indicate that MTBE is migrating offsite. Chlorinated solvents (1,2-dichloroethane, 1,1-dichloroethane) have also been detected from these wells and 1,4-dioxane was detected in the groundwater sample collected from well BW-5C during the October 2019 sampling event. In addition, production well PW-3 is located in the middle of the refinery infrastructure and reportedly leaking. The cause of the leak is currently being investigated. The sampling frequency for wells BW-5B, BW-5C, and PW-3 must remain quarterly at this time. Revise the Work Plan accordingly and incorporate this change for the 2022 Groundwater Monitoring Work Plan Updates.

Comment 14

In Section 5.3, *Modifications in Target Analytes*, page 19, the Permittee states, "[a]nalytes were removed if the analyte had not been detected in the last 3 consecutive years of sampling." Such criterion may be inappropriate for data presentation because removal of analytes that are not detected in the last three consecutive years eliminates potential future detections. For example, benzene, ethylbenzene, and total xylenes have not been detected in the last three

consecutive years of sampling in the groundwater samples collected from well BW-5B; however, MTBE and toluene have been detected frequently in the well. If benzene, ethylbenzene, and total xylenes were removed and only MTBE and toluene were listed in the analytical data tables, it would not be possible to evaluate whether benzene, ethylbenzene, and total xylenes remained undetected or breakthrough has occurred during the future sampling events. A future detection of other hydrocarbon constituents (e.g., benzene) is possible in well BW-5B because MTBE and toluene, which are also hydrocarbon constituents, have been detected. Unless analytical laboratory is directed not to report certain analytes, every compound listed in the analytical method will be reported. The Permittee must report every compound detected above respective detection limit. Remove the criterion from the revised Work Plan.

Comment 15

In Section 5.3, *Modifications in Target Analytes*, page 19, the Permittee states, "[n]aphthalene, 1-methyl naphthalene, and 2-methyl naphthalene were removed from VOC analysis because these constituents are also analyzed by SVOC analysis." Every compound detected in a sample must be reported. If notable discrepancies in the naphthalene, 1-methyl naphthalene, or 2-methyl naphthalene results between VOC and SVOC analyses are found, the discrepancies must be reported, and the cause must be evaluated. Remove the statement from the revised Work Plan.

Comment 16

In Section 5.3, *Modifications in Target Analytes*, page 19, the Permittee states, "[c]ations analyzed as dissolved metals were removed. Because the anions are analyzed as totals, doing an anion/cation comparison is only relevant if the cations are also analyzed as total." The statement is not clear. The Permittee must continue to report the concentrations of dissolved metals and anions (e.g., nitrate). Previous groundwater monitoring reports do not appear to include total anions or cations data and an associated discussion. Provide a clarification in the response letter and revise the Work Plan for clarity.

Comment 17

In Section 5.3, *Modifications in Target Analytes*, page 19, the Permittee states, "1,4-dioxane was removed from wells OW-54, OW-55, OW-56 because two consecutive sampling events have been conducted, per NMED Disapproval Facility Wide Groundwater Monitoring Plan – Updates for 2019, Comment 22 (July 12, 2019). As such, further monitoring of this analyte is no longer required." If 1,4-dioxane was detected in any of wells OW-54, OW-55, and OW-56 during the sampling events, the Permittee must continue 1,4-dioxane sampling regardless of the level of the concentration. Revise the Work Plan, as appropriate.

Comment 18

In Section 5.3, *Modifications in Target Analytes*, page 20, the Permittee states, "MPC proposes to sample the Group well sets for their complete analyte list every 5 years. Analytes that are

above the applicable standard will be added back into the analyte lists. This will be done to ensure that changes in groundwater chemistry are adequately monitored. The next sampling event in which the complete analyte list will be sampled for is 2026." The Permittee must continue to conduct all required analyses for groundwater samples collected from each well and report all analytes detected from the well regardless of the level of detection. Since the analytical suite is specific to each well rather than the group well sets, the proposal is not applicable. Revise the statement accordingly.

Comment 19

Section 5.3, *Modifications in Target Analytes*, pages 19 and 20, does not address the modifications required by the following comments:

a. Comment 25 of the NMED's *Disapproval Annual Groundwater Monitoring Report Gallup Refinery – 2019,* dated November 23, 2020, states, "[p]ropose to conduct pesticide analysis for the water samples collected from pond EP-2 using EPA Method 8081 in the 2021 Facility-wide Groundwater Monitoring Work Plan."

b. Comment 6 of the NMED's *Disapproval Natural Attenuation Assessment and Proposed Workplan for the Hydrocarbon Seep Area,* dated January 26, 2021, states, "[p]ropose to conduct sulfide analysis for pertinent wells in the next groundwater monitoring work plan update."

c. Comment 9, item c of the NMED's *Disapproval Natural Attenuation Assessment and Proposed Workplan for the Hydrocarbon Seep Area*, dated January 26, 2021, states, "[p]ropose to conduct the analyses of the degradation products of MTBE in the next groundwater monitoring work plan update."

d. Comment 9, item d of the NMED's *Disapproval Natural Attenuation Assessment and Proposed Workplan for the Hydrocarbon Seep Area*, dated January 26, 2021, states, "[p]ropose to conduct the analyses of the daughter products of vinyl chloride in the next groundwater monitoring work plan update."

Address the above comments in the revised Work Plan.

Comment 20

The Work Plan does not provide discussions related to groundwater monitoring and sample collection as required by Permit Section IV.L. Include the following discussion in the revised Work Plan at a minimum:

a. The method for groundwater elevation survey,
b. Purging and sampling method(s) specific to each well (e.g., bailer, low flow purging device, wells with SPH recovery systems, production wells),

c. A collection of field groundwater quality parameters,
d. Groundwater stabilization criteria specific to each sampling method,
e. Sample handling and waste management procedures, and
f. Sample collection quality control and assurance procedures.

The Permittee must submit a revised Work Plan that addresses all comments contained in the letter. Two hard copies and an electronic version of the revised Work Plan must be submitted to the NMED. The Permittee must also include a redline-strikeout version in electronic format showing where all revisions to the Work Plan have been made. The revised Work Plan must be accompanied with a response letter that details where all revisions have been made, cross-referencing NMED's numbered comments. The revised Work Plan must be submitted to NMED no later than **September 24, 2021**.

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

Sincerely,

Dave Cobrain
Program Manager
Hazardous Waste Bureau

cc: M. Suzuki, NMED HWB
T. McDill, OCD
L. King, EPA Region 6 (6LCRRC)

File: Reading File and WRG 2021 File

Western Refining Southwest LLC
A subsidiary of Marathon Petroleum Corporation

I-40 Exit 39
Jamestown, NM 87347

March 31, 2021

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

RE: Facility Wide Groundwater Monitoring Work Plan – Updates for 2021
Marathon Petroleum Company LP, Gallup Refinery
(dba Western Refining Southwest LLC)
EPA ID# NMD000333211

Dear Mr. Pierard:

Marathon Petroleum Company LP (dba Western Refining Southwest LLC) is submitting the *Facility Wide Groundwater Monitoring Work Plan – Updates for 2021* for the Gallup Refinery.

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

Certification

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

Sincerely,
Marathon Petroleum Company LP, Gallup Refinery

Robert S. Hanks
Refinery General Manager

Enclosure

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

Marathon Petroleum Company

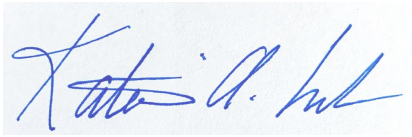
Facility Wide Groundwater Monitoring Work Plan – Updates for 2021

Gallup Refinery
92 Giant Crossing Road
Gallup, NM 87301
(505) 722-3833

Submitted: March 31, 2021

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.



3/31/2021

Kateri Luka

Date

Senior HSE Professional

Executive Summary

Western Refining Southwest, LLC, Gallup Refinery conducts quarterly, semi-annual, and annual groundwater monitoring on a site wide basis. The Groundwater Monitoring Work Plan (Plan) documents any additions or revisions in groundwater monitoring and details the sampling procedures used.

This Plan divides the facility into six monitoring groups. Group A consists of the boundary wells situated along the northwest corner of the Refinery property and monitoring wells around the land treatment area (LTU). Group B consists of a cluster of wells at the aeration basin and at the sanitary treatment pond 1 (STP-1) near the Wastewater Treatment Unit. Group C consists of the observation wells (OW) on the northeast section of the Refinery, including four product recovery wells and OW-58A. Group D includes the process/production wells and the four OWs located on the south-southwest section of the property. Group E includes 49 permanent monitoring wells installed to delineate the extent of a hydrocarbon plume associated with a seep discovered in 2013 directly west of the crude tanks (T-101, 102) Also included in this group is a pre-existing well located directly west of the truck loading terminal. Group F includes the sampling locations required for the evaporation ponds and effluent from the sanitary treatment pond (STP-1).

The Gallup Refinery will periodically review facility-wide monitoring data and assess the monitoring program presented in this Plan. Revisions to the Plan, as necessary, will be presented annually for agency review and approval. These revisions may include, but are not be limited to, a reduction or change in monitoring locations, monitoring frequency, and/or target chemicals to be analyzed. The proposed modifications to the Plan for 2021 and the rationale are presented in Section 6.0.

The Gallup Refinery follows the most current approved sampling/monitoring schedule from the New Mexico Environment Department (NMED): “Approval with Modifications Revised Facility-Wide Ground Water Monitoring Work Plan, Gallup Refinery – Updates for 2020,” HWB WRG 20-012, dated February 16, 2021.

The Gallup Refinery has created a monitoring work plan with quality assurance practices and controls as well as standard procedures for sampling, and a schedule of activities to monitor groundwater and surface water at select locations of the Gallup Refinery. The persons responsible for the implementation and oversight of this plan are:

Refinery General Manager

- Robert S. Hanks

Remediation Project Manager

- Kateri Luka

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List of Acronyms

%	percent
AL	aeration lagoon
AOC	area of concern
API	American Petroleum Institute
cm/s	centimeter per second
DRO	diesel range organics
EP	evaporation pond
ft	feet or foot
GAC	granular activated carbon
GPM	gallons per minute
GRO	gasoline range organics
HWB	Hazardous Waste Bureau
in	inch
in/hr	inches per hour
LDU	Leak Detection Unit
LTU	Land Treatment Unit
MKTF	Market Tank Farm
MPC	Marathon Petroleum Company
MTBE	methyl tert butyl ether
NAPIS	New American Petroleum Institute Separator
NM	New Mexico
NMED	New Mexico Environment Department
No.	number
OAPIS	Old American Petroleum Institute Separator
OW	observation well
OCD	Oil Conservation Division
ORP	oxidation-reduction potential

List of Acronyms – Continued

PVC	polyvinyl chloride
PW	process well
QC	quality control
RW	recovery well
RCRA	Resource Conservation and Recovery Act
SPH	separate phase hydrocarbon
STP	sanitary treatment pond
SVOC	semi-volatile organic compound
SWMU	solid waste management unit
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
WWTP	wastewater treatment plant

1.0 Introduction

This Facility-Wide Groundwater Monitoring Work Plan – Updates for 2021 (Plan) has been prepared for the implementation of the groundwater monitoring program at the Gallup Refinery owned by Marathon Petroleum Company (MPC) and operated by Western Refining Southwest, LLC ("Gallup Refinery", "Refinery", or "Facility").

1.1 Scope of Activities

This Plan has been prepared to collect data that will be used to characterize the nature and extent of potential impacts to groundwater at the Gallup Refinery. The Plan is designed to assist in evaluating any levels of constituents that exceed compliance standards. This Plan divides the Facility into six groups for periodic monitoring, Group A through Group F.

Group A consists of the boundary wells situated along the northwest corner of the Refinery property and the monitoring wells around the land treatment unit (LTU). Group B consists of a cluster of monitoring wells and leak detection units for the New American Petroleum Institute (API) Separator (NAPIS) at the aeration basin and at the sanitary treatment pond. Group C includes the observation wells (OWs) located on the northeast section of the plant and recovery wells from which small quantities of free product have been continually removed. Group D includes the process/production wells and four OWs located on the south-southwest section of the Refinery property. Group E includes monitoring wells installed to delineate a hydrocarbon plume associated with a seep discovered west of the crude tank (Tank 101). Also included in this group is pre-existing well MKTF-45, located directly west of the truck loading terminal. Group F includes sampling locations for the evaporation ponds and for the effluent from the sanitary treatment pond. Designated wells and sample points identified are monitored on a quarterly, semi-annual, and annual basis following the procedures presented in this Plan.

The Gallup Refinery periodically reviews facility-wide monitoring data and evaluates the monitoring program presented in this Plan. Annual revisions to the Plan will be presented for agency review and approval. These revisions may include, but are not be limited to, a reduction or change in monitoring

locations, monitoring frequency, and/or target chemicals to be analyzed. The revisions proposed for 2021 are outlined in Section 6.0.

1.2 Facility Ownership and Operation

This Plan pertains to the Gallup Refinery located at Exit 39 on Interstate I-40 at Jamestown, New Mexico (NM), approximately 17 miles east of Gallup. Figure 1-1 shows the regional location of the Gallup Refinery.

Owner:	Marathon Petroleum Company 539 South Main Street Findlay, Ohio 45840	(Parent Corporation)
Operator:	Western Refining Southwest LLC Gallup Refinery 92 Giant Crossing Road Gallup, NM 87301	(Postal Address)
	Western Refining Southwest LLC Gallup Refinery I-40, Exit 39 (17 Miles East of Gallup, NM) Jamestown, NM 87347	(Physical address)

The following regulatory identification and permit governs the Gallup Refinery:

- Standard Industrial Classification code 2911 (petroleum refining) and North American Industry Classification System code 32411
- United States Environmental Protection Agency (USEPA) ID Number NMD000333211
- NM Oil Conservation Division (OCD) Abatement Plan Number AP-111; and
- 2015 NPDES MSGP, ID #NMR053168.

The Facility status is corrective action/compliance. Quarterly, semi-annual, and annual groundwater sampling is conducted at the Facility to evaluate current groundwater impacts.

The Refinery is situated on an 810-acre irregular shaped tract of land that is largely located within the lower one quarter of Section 28 and throughout Section 33 of Township 15 North, Range 15 West of the New Mexico Prime Meridian. A small component of the property lies within the northeastern one quarter of Section 4 of Township 14 North, Range 15 West. A topographic map showing the general layout of the Refinery in comparison to the local topography is presented on Figure 1-2.

2.0 Background Information

Built in the 1950s, the Gallup Refinery is located within a rural and sparsely populated section of McKinley County in Jamestown, NM, 17 miles east of Gallup, NM. The nearest population centers are the Pilot Flying J Travel Center (Travel Center) refueling plaza, the Interstate 40 highway corridor, and a small cluster of residential homes located on the south side of Interstate 40 approximately 2 miles southwest of the Refinery (Jamestown).

2.1 Historical and Current Site Use

The Refinery is currently indefinitely idled. When the Refinery is operating, it primarily receives crude oil via a two 6-inch (in) diameter pipelines from the Four Corners Area, which enter the Refinery property from the north. In addition, the Refinery also receives natural gasoline feed stock via a 4-in diameter pipeline that comes in from the west along the Interstate 40 corridor from the Western Refining Southwest, LLC - Wingate Plant (formerly Conoco gas plant). Crude oil and other products also arrive at the Facility via railroad cars. These feed stocks are then stored in tanks until refined into products.

When operating, the Gallup Refinery is a crude oil refining and petroleum products manufacturing Facility. There are no organic chemicals, plastics, or synthetic fibers manufactured that contribute to the process flow of wastewater. The Refinery does not manufacture lubricating oils. As a result of the processing steps, the Refinery produces a wide range of petroleum products including propane, butane, unleaded gasoline, diesel, residual fuel, and commercial products of fertilizer and solid elemental sulfur when operating.

When operating, above ground storage tanks are used throughout the Refinery to hold and store crude oil, natural gasoline, intermediate feed stocks, finished products, chemicals, and water. Capacity of these tanks range in size from 80,000 barrels to less than 1,000 barrels. Pumps, valves, and piping systems are used throughout the Refinery to transfer various liquids among storage tanks and processing units. A railroad spur track and a railcar loading rack are used to transfer feed stocks and products from Refinery storage tanks into and out of railcars. Several tank truck loading racks are used at the Refinery to load out finished products and received crude oil, other feed stocks, additives, and chemicals when operating.

When the Refinery is operating, gasoline and diesel are delivered to the Travel Center via tanker truck. Historically, an underground diesel pipeline existed between the Refinery and the Travel Center. In 2013, the underground diesel line from the Refinery to the Travel Center was replaced and an above ground replacement line put in service on February 3, 2014. Due to upgrades that the Travel Center made to its facility, MPC's pipeline was no longer compatible with the Travel Center and the diesel pipeline was taken out of service by the end of 2014. The unused replacement line runs from the marketing area of the Refinery for approximately 150 feet (ft) and continues underground to the Travel Center.

When operating, a firefighting training Facility was used to conduct employee firefighting training. When training was conducted, wastewater from the Facility was pumped into a tank, which was then pumped out by a vacuum truck. The vacuum truck pumped the oily water into a process sewer upstream of the NAPIS.

Even though the Refinery is on an indefinite idle, the process wastewater system remains in operation. The system is a network of curbing, paving, catch basins, and underground piping used to collect wastewater from various processing areas within the Refinery. The wastewater effluent then flows into the equalization tanks and the NAPIS. Prior to Refinery idle, the skimmed slop was passed to a collection chamber where it is pumped back into the Refinery process. Currently, only remediation fluids are processed through the system. The clarified water is routed to a wastewater treatment plant (WWTP) where benzene is removed via granular activated carbon (GAC) canisters that are placed at the effluent of the dissolved gas flotation unit. WWTP operations alternate the configuration of these GAC canisters from a single setup to an in-series setup (i.e. primary and secondary canisters). To help monitor the breakthrough of these GAC canisters, several wastewater samples are taken at the effluent of the last GAC canister. Results from benzene analysis of the wastewater samples are monitored to manage the breakthrough from the GAC canisters. When benzene values exceed 0.4 parts per million, one or more of the following actions are taken: the GAC canister configuration is modified to an in-series set-up; the GAC canister is replaced with fresh carbon; and/or the GAC canister effluent is recirculated back through the WWTP. The treated water flows from the GAC canisters into pond STP-1. STP-1 consists of two bays, north and south, and each bay is equipped with five aerators per bay. Effluent from STP-1 then flows into Evaporation Pond 2 and gravitated to the rest of the ponds.

During episodes of unit upsets or major storm events, the wastewater is held in one of the three equalization tanks, T-35, T-27, and T-28, to handle large process and storm water flows. By holding wastewater in the tanks, flow to the NAPIS could be controlled. These tanks are also used to store wastewater if problems are encountered with the downstream equipment, i.e., NAPIS or the WWTP.

The storm water system is a network of valves, gates, berms, embankments, culverts, trenches, ditches, natural arroyos, and retention ponds that collect, convey, control, and release storm water that falls within or passes through Refinery property. Storm water that falls within the processing areas is considered equivalent to process wastewater. Storm water is sent to tanks T-35, T-27, and T-28 when needed before it reaches the NAPIS, WWTP, STP-1, and into Evaporation Pond 2, where flow is gravitated to the rest of the ponds. Storm water discharge from the Refinery is very infrequent due to the arid, desert-like nature of the surrounding geographical areas.

No wastewater is currently discharged from the Refinery to surface waters of the state. At the evaporation ponds, wastewater is converted into vapor via solar and mechanical wind-effect evaporation via two 80 gallons per minute (GPM), electrically driven evaporation pond spraying snow machines located between ponds 4 and 5. Two additional 66 GPM evaporation pond sprayers were installed in October 2014 between ponds 3 and 4 for a total of four evaporators. Historically, reverse osmosis reject water from the Boiler House area has discharged to Evaporation Pond 9.

In September 2015, the Refinery submitted a Notice of Intent requesting continued coverage under the 2015 National Pollutant Discharge Elimination System Multi-Sector General Permit, which was approved on October 8, 2015 (NMR053168). The Refinery maintains a Storm Water Pollution Prevention Plan that includes best management practices for effective storm water pollution prevention. The Refinery has constructed several new berms in various areas and improved outfalls (installed barrier dams equipped with gate valves) to minimize the possibility of potentially impacted runoff leaving the Facility and also to minimize the stormwater run-on from the I-40 interchange and the Travel Center to the Facility.

2.2 Potential Receptors

Potential receptors at the Facility include those that occur from current land use and may arise from future land uses. Currently, these include on-site workers, nearby residents, wildlife, and livestock. The major route to exposure of humans would be from constituents reaching a drinking water well. Other routes could include using impacted groundwater for showering, cooking, raising crops and vegetables, fishing in surface water, or touching soils and/or plants that contacted impacted groundwater. Fluctuating groundwater elevations can smear inorganic and organic constituents into subsurface soil and rocks, and there is a possibility that plant roots could reach potentially impacted soils and bio-concentrate those constituents. This could create another route of exposure to potential receptors, such as birds and animals that eat the plants. No food crops are currently grown at the Facility.

At this time, the nearest drinking water wells are located on-site in the southwest areas of the Facility at depths of approximately 1,000 ft. These wells are identified as process or production (PW) wells and are designated as PW-2, PW-3, and PW-4 (Figure 2-1). These wells are operated by the Facility to provide process water for refinery operations and drinking water to nearby Refinery-owned houses, Refinery, and Travel Center. Currently, PW-2 is sampled every three years and PW-3 and PW-4 are sampled on a quarterly basis. The analytical results of these and the other water samples collected under this Plan are discussed in the annual facility-wide groundwater monitoring reports.

Other than the on-site wells, there are no known drinking water wells located within a 4-mile radius of the Refinery. The nearest drinking water wells that could be used by off-site residents are located to the northwest of the Refinery at a distance slightly greater than 4 miles, located within the Navajo community of Iyanbito. These wells are northwest of the South Fork of the Rio Puerco, which flows towards the southwest from immediately north of the Facility. The Cibola National Forest lies to the southeast and there are no wells or residents in this protected area.

No surface water at the Facility is used for human consumption, primary contact (such as immersion), or secondary contact (such as recreation). The man-made ponds at the Facility are routinely monitored and are a part of this Plan. Therefore, if they are in contact with shallow groundwater exhibiting elevated levels of constituents, the Plan will detect any commingling of groundwater and surface waters.

2.3 Waste Contaminant Types, Characteristics, and Possible Sources

The types of waste present at the Refinery likely include volatile and semi-volatile organic compounds (VOCs and SVOCs, respectively), primarily hydrocarbon constituents, but could include other industrial chemicals such as solvents, acids, spent caustic solutions, and heavy metals. These wastes could be in the form of wastewater, sludge, dry solids, or spent chemicals destined for off-site shipping and disposal packed in drums.

Most of the wastes and constituents that could possibly reach groundwater could biodegrade and naturally attenuate. However, any heavy metals present in soil or sludge could leach into groundwater and would not biodegrade. It is possible that certain long-lived chemicals would not biodegrade, or if they did it would be at a very slow rate. Possible sources include leaks from buried pipes, tanks, surface spills, and historical dumping of wastes on-site.

All above-ground large tanks have leak detection or equivalent systems, such as radar gauges. Pumps that could leak hydrocarbons are within containment areas and all tanks are located inside earthen bermed areas to contain spills. The NAPIS has double walls and a leak detection system installed.

Similarly, surface impoundments can serve as a source of possible groundwater impacts. Historically, wastewater from the railroad loading rack flowed to a settling and separation lagoon north of the rack. Wastewater flow exited at the north end, where the water was distributed across a flat open site known as the fan-out area. The free flow of liquids led to subsurface soil impacts. This area is identified as Solid Waste Management Unit (SWMU) Number (No.) 8 and has been remediated and granted Corrective Action Complete with Controls status. Disposal of wastewater into open fields is not practiced at the Refinery.

There are 14 SWMUs identified at the Refinery and one closed LTU. On December 31, 2013, the Resource Conservation and Recovery Act (RCRA) Post-Closure Care Permit ("RCRA Permit") became effective under the New Mexico Administrative Code §20.4.1.901A(10). The RCRA Permit identified an additional 20 Areas of Concern (AOCs) requiring corrective action. These units are listed below.

RCRA Regulated Units

- LTU

SWMUs

- SWMU 1 – Aeration Basin
- SWMU 2 – Evaporation Ponds
- SWMU 3 – Empty Container Storage Area
- SWMU 4 – Old Burn Pit
- SWMU 5 – Landfill Areas
- SWMU 6 – Tank Farm
- SWMU 7 – Fire Training Area
- SWMU 8 – Railroad Rack Lagoon
- SWMU 9 – Drainage Ditch and the Inactive Land farm
- SWMU 10 – Sludge Pits
- SWMU 11 – Secondary Oil Skimmer
- SWMU 12 – Contact Wastewater Collection System
- SWMU 13 – Drainage Ditch between North and South Evaporation Ponds
- SWMU 14 –API Separator

AOCs

- AOC 15 – New API Separator
- AOC 16 – New API Separator Overflow Tanks
- AOC 17 – Railroad Loading/Unloading Facility
- AOC 18 – Asphalt Tank Farm (tanks 701-709, 713, 714)
- AOC 19 – East Fuel Oil Loading Rack
- AOC 20 – Crude Slop and Ethanol Unloading Facility
- AOC 21 – Main Loading Racks
- AOC 22 – Loading Rack Additive Tank Farm
- AOC 23 – Retail Fuel Tank Farm (tanks 1-7, 912, 913, 1001, 1002)
- AOC 24 – Crude Oil Tank Farm (tanks 101 and 102)
- AOC 25 – Tank 573 (Kerosene Tank)
- AOC 26 – Process Units
- AOC 27 – Boiler and Cooling Unit Area
- AOC 28 – Warehouse and Maintenance Shop Area
- AOC 29 – Equipment Yard and Drum Storage Area
- AOC 30 – Laboratory
- AOC 31 – Tanks 27 and 28
- AOC 32 – Flare and Ancillary Tanks (tanks Z85V2, Z85V3, Z84-T105)
- AOC 33 – Storm Water Collection System
- AOC 34 – Scrap Yard

Existing groundwater monitoring wells effectively surround the LTU, SWMUs, and AOCs. The RCRA Permit was subsequently modified in September 2017, with SWMU 8 and AOCs 19 and 25 granted Corrective Action Complete status. AOC 32 was combined with SWMU 14; AOC 33 was combined with SWMU 12. AOCs 20, 21, 22, and 23 were combined to make AOC 35. The schedule in the RCRA Permit Appendix E, Table E-1 was amended to reflect prior submittals and revised due dates and deferral of other units. A new Consent Order was executed in January 2017, which resulted in 11 AOCs (AOC 16, 17, 18, 24, 26, 27, 28, 29, 30, 31, and 34) being removed from the RCRA Permit and transferred to the Consent Order for further evaluation.

2.4 Summary of Historical Impacts

Spills and leaks are known to have occurred on site. If a release occurs, immediate action is taken to address the cause and to limit impacts to the subsurface. Based on the subsurface soil conditions, there is a possibility that precipitation could cause constituents to leach and reach groundwater.

2.4.1 Separate Phase Hydrocarbons

Separate phase hydrocarbons (SPHs) have been found in multiple locations within the Refinery. These locations include the Main Tank Farm, Hydrocarbon Seep Area, Aeration Basin, French Drain, Truck Loading Rack, and NAPIS Unit areas.

In the Main Tank Farm area, SPH was found floating on shallow groundwater in the mid-1990s. A series of recovery wells (RWs) were installed and SPH has been recovered since the initial discovery. Recovery wells in the Main Tank Farm and the down-gradient area are RW-1, RW-2, RW-5, RW-6, OW-14, OW-30, OW-55, OW-58. In the Hydrocarbon Seep area, data regarding the liquid recovered from the sumps and retention ditch is available in the quarterly Hydrocarbon Seep Reports. In the Aeration Basin, SPH has been detected in GWM-1 since the third quarter sampling event in 2015 through December 2020. Thickness ranged from 0.13 in November 2019 to 1.0 in December 2017. In the French Drain area, a mixture of hydrocarbon and water spilled in 2018. Five monitoring wells (OW-61 thru OW-65) were installed in an effort to delineate the hydrocarbon plume that had been discharging from the PVC pipe. During 2020 quarterly gauging, SPH was detected in OW-61, OW-62, and OW-65 during each event. In the Truck Loading Rack area, a gasoline release was observed in 2019. The source of the release was

determined to be an underground transfer line on the north side of the Truck Loading Rack. In the NAPIS unit area, SPH was detected in NAPIS-1 from 2017 to the third quarter of 2020. SPH was not detected in NAPIS-1 during the fourth quarter of 2020. The source of the SPH is suspected to be an unspecified release from the Refinery.

2.4.2 Methyl Tert Butyl Ether

Methyl tert butyl ether (MTBE) has not been used at the Refinery since April 2006. Several monitoring wells were installed at various depths to monitor SPH and MTBE contaminant constituent plumes from historical contamination impacts. Historical analytical data for the observation wells (OWs) (OW-14, 29, and 30) indicate the MTBE concentration has slowly been increasing over the years in these wells. Based on the information collected, New Mexico Environment Department (NMED) – Hazardous Waste Bureau (HWB) requested two Work Plans to further investigate the known MTBE plume at the Facility and investigate a suspected plume north of the main tank farm (SWMU 6). These observation wells (OWs) monitored for SPH and MTBE are located downstream on the northeast section of the plant and are OW-13, OW-14, OW-29, OW-30, OW-50, OW-52, OW-53, OW-54, OW-55, OW-56.

2.4.3 NAPIS Unit

The NAPIS is located at the southwest end of the Facility and is used to recover and recycle oil back into the process. The NAPIS has caused some MTBE and hydrocarbon impacts in shallow groundwater through leakage and spills. The NAPIS unit was put into service in October 2004. The NAPIS has one up-gradient well, NAPIS-1, located on the east side and three down-gradient shallow monitoring wells and NAPIS-2, NAPIS-3, and KA-3 which are located along the west side. The NAPIS unit is also equipped with three leak detection units (LDU) on the east and west bays, including the oil sump section on the east bay and are designated as East LDU, West LDU, and oil sump LDU.

2.4.4 Aeration Basin

The aeration basin (SWMU No. 1) in the Facility's RCRA Permit, includes three cells known as aeration lagoon (AL)-1, AL-2 and holding pond 1 (currently referred to as EP-1). EP-1 is not an evaporation pond and is not part of the area covered by SWMU No. 2 – Evaporation Ponds. These three cells have not been in service since the startup of the WWTP in 2012. All Refinery wastewater flow was diverted to the WWTP

bypassing the lagoons and pond 1. The Refinery experienced intermittent discharges of oil and oily water into the lagoons and spills to the ground surface while the aeration basin was in operation. Most of these occurrences were the result of unit upsets and/or large storm events affecting the old API Separator (OAPIS).

Wells in the aeration basin include GWM-1, GWM-2, GWM-3, and OAPIS-1. GWM-1 and GWM-2 were installed immediately down gradient of the aeration lagoons in 2004 and 2005 to detect potential leakage from the aeration basin.

Analysis of groundwater samples collected at GWM-1 and GWM-2 have indicated several organic constituents at concentrations above the screening levels in groundwater, which would indicate a potential for historical releases from the lagoons. NMED was notified of this finding and the Gallup Refinery was instructed to collect a hydrocarbon sample for fingerprint analysis (Diesel Range Organics/Gasoline Range Organics [DRO/GRO] and Motor Oil Range Organics). Gallup was also instructed to purge and gauge the well on a weekly basis to check the recharge rate. The initial measurement was made without the use of an oil/interface probe and the thickness of the hydrocarbon layer in the well was not immediately known. Measured SPH thickness ranged from 0.35 to 0.45 ft in September, October, and November 2015. On December 10, 2015, the Refinery sent a response to NMED–HWB concurring that the source of the hydrocarbons observed in GWM-1 was from the adjacent aeration lagoon.

MPC submitted the "Solid Waste Management Unit 1 Investigation Report" on March 31, 2020, detailing a SWMU No. 1 sampling event that took place the week of January 13, 2020. The sampling was conducted for the purposes of soil and sediment volume determination and chemical characterization for future SWMU No. 1 excavation, disposal, and closure. In the response titled, "Disapproval SWMU-1 Investigation Report," dated August 31, 2020, NMED requested a revised report and an additional work plan to further delineate horizontal and vertical extents of contamination in the area of SWMU No 1. The revised report and response to comments were submitted on January 5, 2021. A due date from the additional work plan will be determined upon approval of the revised report.

2.4.5 North Drainage Ditch

On April 22, 2015, the Refinery notified NMED-HWB of the discovery of SPH in a drainage ditch in the northern portion of the property. Surface water samples were collected from the standing water in the drainage ditch and concentrations of benzene, toluene, ethylbenzene, and xylenes were detected as well as MTBE, GRO and DRO. An investigation was conducted in May 2016 with installation of well OW-56.

2.4.6 OW-14 Source Area

In correspondence dated May 11, 2015, NMED requested submittal of a work plan to investigate the source of constituents present in groundwater monitoring well OW-14. Subsequently, wells OW-57 and OW-58 were installed in 2016 pursuant to NMED's May 12, 2016 "Approval with Modifications, Revised OW-14 Source Area Investigation Work Plan" (NMED 2016). Well OW-58A was installed in 2019 adjacent to OW-58 to screen a higher interval than was screened in OW-58.

3.0 Site Conditions

The Refinery is located within a rural and sparsely populated section of McKinley County. It is situated in the high desert plain on the western flank of the Continental Divide approximately 17 miles east of Gallup, NM. The surrounding land is comprised primarily of public and private lands used for cattle and sheep grazing.

3.1 Current Site Topography and Location of Natural and Manmade Structures

Local topography consists of a gradually inclined down-slope from high ground in the southeast to a lowland fluvial plain in the northwest. The highest point on Refinery property is located at the southeast corner boundary (elevation approximately 7,040 ft) and the lowest point is located at the northwest corner boundary (elevation approximately 6,860 ft). The Refinery is located on a flat man-made terrace at an elevation of approximately 6,950 ft.

3.2 Drainages

Surface water in the region consists of the man-made evaporation ponds and aeration basins located within the Refinery, a livestock watering pond (Jon Myer's Pond) located east of the Refinery, two small unnamed spring fed ponds located south of the Refinery, and the South Fork of the Rio Puerco and its tributary arroyos. The various ponds and basins typically contain water throughout the year. The South Fork of the Rio Puerco and its tributaries are intermittent and generally contain water only during and immediately after precipitation.

There are several storm water conveyance ditches located throughout the Refinery. These ditches are directed to discharge into contained basins where storm water is collected and recycled for use as process water, collected and allowed to evaporate, diverted around regulated industrial activity, or discharged into two designated outfalls located on the east and west section of the property, identified as Outfall 001 and Outfall 002 (Figure 3-1). Outfall 001 is located directly south of evaporation pond 8 on the western edge of the Refinery's property boundary and equipped with four separate small diameter overflow pipelines, each with a manual flow valve for independent control. Outfall 002 is located north of the railroad loading

rack on the eastern section of the Facility. This outfall consists of a concrete barrier with a valve to control discharges from a deep ditch that collects/ponds the runoff from the rail rack loading area.

Directly west of the crude tank area, there is a concrete barrier with a control valve that discharges from a culvert that carries storm water flow from the Truck Loading Rack area. This concrete barrier is located downstream of the "hydrocarbon seep area." The flow from this concrete barrier continues in a north-northwest direction alongside the southern bermed areas of evaporation ponds 3, 4, 5, and 6 and outward towards the Outfall 001 area. At the new WWTP, there are three storm drains located on the south, southwest, and west side of the WWTP. These drains are connected to an underground storm culvert that exits on the northwest section of STP-1 into a conveyance ditch along the northern edge of pond 2 and into a holding pond equipped with manual flow valves, located north of evaporation pond 3. The discharge from this holding pond then flows north-northwest towards the Outfall 001 area.

3.3 Vegetation Types

Surface vegetation consists of native xerophytic vegetation, including grasses, shrubs, small junipers, and prickly pear cacti. Average rainfall at the Refinery is less than 7-in per year, although it can vary to slightly higher levels elsewhere in the county depending on elevation.

In alluvial fans on valley sides and drainage ways, the existing vegetation is alkali sacaton, western wheatgrass, Indian rice grass, blue grama, bottlebrush squirreltail, broom snakeweed, fourwing saltbush, threeawn, winterfat, mat muhly, and spike muhly. On fan remnants on valley sides, blue grama, western wheatgrass, Indian ricegrass, big sagebrush, galleta, bottlebrush squirreltail, fourwing saltbrush, needle and thread, one seed juniper, sand dropseed, spineless horsebrush, rabbitbrush, and two-needle pinyon are found. Cattails have been observed in isolated areas and are generally associated with wetlands.

3.4 Erosion Features

The impacts of historic overgrazing are visible at the north-side of the Facility. Arroyos have formed when surface run-off eroded sediments that were not able to hold water due to ground cover loss by overgrazing. Now that the Facility is fenced and no livestock grazing occurs on the site, vegetation has

recovered in these areas. The formation and deepening of erosional features on its land has decreased with Refinery effort to recover vegetation in undeveloped areas.

3.5 Subsurface Conditions

The following subsections discuss the subsurface conditions found at the Refinery.

3.5.1 Soil Types and Associations

Most of the soils found at the surface of on-site wells consist of the Gish-Mentmore complex (USDA 2021). These soils occur in alluvial fans and fan remnants. The parent material for these soils is derived from sandstone and shale. The soils are well drained with moderately slow (0.2 inches per hour [in/hr]) to slow permeability (0.06 in/hr). In the Gish-Mentomore complex, the Gish and similar soils make up about 45 percent (%), the Mentmore and similar soils 35%, and minor components 20%. These minor components include Berryhill and similar soils at 10% and Anodize and similar soils at 10%. The typical profile for these soils is 0- to 2-in fine sandy loam and 2- to 72-in of various clay loam.

Drill logs for various wells have been provided electronically to the NMED-HWB. From the well logs, the soils in the subsurface are generally composed of clays starting at the immediate subsurface, interbedded with narrow sand and silt layers. At about 100 to 150 ft, layers of mudstone, sandstone (from the Chinle Group, Petrified Forest Formation), and siltstone start to appear. Figure 3-2 shows a generalized relationship of soils in and around the Refinery.

3.5.2 Stratigraphy

The 810-acre Refinery property is located on a layered geologic formation. Surface soils consist of fluvial and alluvial deposits, primarily clay and silt with minor inter-bedded sand layers. Below this is the Chinle Group, which consists of low permeability clay stones and siltstones. The Chinle Group (Petrified Forest Formation) effectively serves as an aquiclude. Inter-bedded within the Chinle Group is the Sonsela Sandstone bed, which represents the uppermost potential aquifer in the region.

The Sonsela Sandstone bed lies within and parallels the dip of the Chinle Group. Its high point is located southeast of the Refinery and slopes downward to the northwest as it passes under the Refinery. Due to

the confinement of the Petrified Forest Formation aquitard, the Sonsela Sandstone bed acts as a water-bearing reservoir and is artesian at its lower extremis. Artesian conditions exist through much of the central and western portions of the Refinery.

3.5.3 Presence and Flow Direction of Groundwater

Groundwater flow within the Petrified Forest Formation is extremely slow and typically averages less than 10^{-10} centimeters per second (cm/s) or less than 0.01 ft per year. Groundwater flow within the surface soil layer above the Petrified Forest Formation is highly variable due to the presence of complex and irregular stratigraphy, including sand stringers, cobble beds, and dense clay layers. Hydraulic conductivity may range from less than 10^{-2} cm/s in the gravelly sands immediately overlying the Petrified Forest Formation down to 10^{-8} cm/s in the clay soil layers located near the surface.

Shallow groundwater located under the Refinery generally flows along the upper contact of the Petrified Forest Formation. The prevailing flow direction is from the southeast and toward the northwest.

4.0 Monitoring and Sampling Program

The primary objective of groundwater monitoring is to provide data to assess groundwater quality at and near the Facility. Groundwater elevation data will be collected to evaluate groundwater flow conditions. The groundwater monitoring program for the Facility will consist of sample collection and analysis from a series of monitoring wells, recovery wells, outfalls, and evaporation pond locations.

The monitoring network is divided into six investigation areas (Groups A, B, C, D, E, and F). The sampling frequency, analyses, and target analytes will vary for each investigation area. The combined data from these investigation areas will be used to assess groundwater quality beneath and immediately down-gradient of the Facility and evaluate local groundwater flow conditions. Section 5 outlines the sampling locations and analyte list for 2021.

Samples will not be collected from monitoring wells that have measurable SPH. For wells that are purged dry, samples will be collected if recharge volume is sufficient for sample collection within 24 hours. Wells not sampled due to insufficient recharge will be documented in the field log. If samples cannot be collected from a location due to environmental concerns, such as elevated hydrogen sulfide, arrangements will be made to collect samples from the affected location(s) during the next sampling or gauging event. Appendix A provides the methods used for sample collection and analysis.

5.0 Monitoring Program Revisions

The proposed modifications to the Plan for 2021 and the rationale are presented in Tables 5-1 through 5-5 and discussed in the following sections.

5.1 Modifications in Monitoring Locations

Proposed changes to current monitoring locations are presented in Table 5-1. Eight wells and one sample location are proposed for removal from the monitoring network. The eight wells have SPH recovery systems installed (OW-13, OW-14, OW-29, OW-30, RW-1, RW-2, RW-5, and RW-6). The sample location, Boiler Water Inlet to EP-9, is proposed for removal because the Boiler is no longer in service.

Although 9 sample locations are proposed for removal from the monitoring network, 14 new monitoring wells are anticipated to be installed and added to the network in 2021. A well will be installed near OW-13 to address concerns that OW-13 may be a migration pathway for constituents (e.g., MTBE) to move vertically downward to the Sonsela aquifer; OW-13 will be retained at this time to allow for further evaluation. To evaluate the potential migration of MTBE within the Sonsela aquifer, an additional well will be located approximately halfway between OW-12 and OW-13. To delineate the down-gradient extent of the plume detected at OW-1, a new Sonsela well will be installed approximately 500 ft down-gradient of OW-1 to the west. The proposed locations of these wells and other new wells are shown on Figure 5-1.

The new monitoring wells anticipated to be installed in 2021 have not been included in Table 5-1. Details for the anticipated wells have not been confirmed at the time of this Plan. MPC will submit an addendum to this Plan within 60 days of the final well completion detailing the new monitoring wells, the proposed sampling schedule, and the proposed analytical suites.

5.2 Modifications in Monitoring Frequency

The current monitoring frequency has been evaluated for the 2021 sampling events. The changes made to the monitoring frequency are presented in Table 5-2. In summary, sampling frequency for wells BW-4A,

BW-4B, BW-5A, BW-5B, BW-5C, PW-3, and PW-4 is proposed to be reduced from quarterly to annual sampling because concentrations have remained consistent since 2016.

5.3 Modifications in Target Analytes

The target analytes have been evaluated for the 2021 analyte list. Table 5-3 presents the 2020 analyte list. The list was evaluated for analyte modifications by well sets within each of the Refinery groups (A, B, C, D, E, and F). The modification criteria were based on several factors:

- Analytes were removed if the analyte had not been detected in the last 3 consecutive years of sampling.
- Naphthalene, 1-methyl naphthalene, and 2-methyl naphthalene were removed from VOC analysis because these constituents are also analyzed by SVOC analysis.
- Cations analyzed as dissolved metals were removed. Because the anions are analyzed as totals, doing an anion/cation comparison is only relevant if the cations are also analyzed as total.
- 1,4-dioxane was removed from wells OW-54, OW-55, OW-56 because two consecutive sampling events have been conducted, per NMED Disapproval Facility Wide Groundwater Monitoring Plan – Updates for 2019, Comment 22 (July 12, 2019). As such, further monitoring of this analyte is no longer required.
- Total and dissolved uranium was removed from all wells per NMED Disapproval Facility-Wide Annual Groundwater Report – 2019, Comment 21 (November 23, 2020).
- PFAS was added to OW-63 per NMED Disapproval Facility-Wide Annual Groundwater Report - 2019, Comment 30 (November 23, 2020).
- Pesticides were removed from EP-3, EP-12A, and EP-12B per NMED Disapproval Facility-Wide Annual Groundwater Report – 2019, Comment 26 (November 23, 2020).
- 1,2-Dibromomethane and 1,4-dioxane was added to OW-11 per NMED Disapproval Facility-Wide Annual Groundwater Report -2019, Comment 22 (November 23, 2020).
- 1,4-dioxane was added to MW-1, SWM-4, GWM-1, West LDU, OW-50, OW-52, OW-13, OW-14, OW-29, OW-30, PW-2, OW-1, OW-10, OW-11, MKTF-01, MKTF-03, MKTF-05 through MKTF-08, MKTF-12 through MKTF-17, MKTF-19 through MKTF23, MKTF-26, MKTF-33, MKTF-36, MKTF-37,

MKTF-45 for two consecutive sampling events per NMED Disapproval Facility Wide Groundwater Monitoring Plan – Updates for 2019, Comment 22 (July 12, 2019).

MPC proposes to sample the Group well sets for their complete analyte list every 5 years. Analytes that are above the applicable standard will be added back into the analyte lists. This will be done to ensure that changes in groundwater chemistry are adequately monitored. The next sampling event in which the complete analyte list will be sampled for is 2026.

Table 5-4 presents the proposed changes to the target analyte list. The final analyte list for 2021 is in Table 5-5.

6.0 References

NMED. 2016. Approval with Modifications, Revised OW-14 Source Area Investigation Work Plan, OW Series Wells and Contaminant Plume Migration. May 12.

United States Department of Agriculture (USDA). 2021. Soil Survey of McKinley County Area, New Mexico, McKinley County and Parts of Cibola and San Juan Counties. March 15. Available from: https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/new_mexico/NM692/0/McKinley.Area%20NM.pdf

TABLES

TABLE 5-1. MODIFICATIONS TO THE MONITORING NETWORK
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2021 Network	Justification
GROUP A		
BW-1A	Sample	NC
BW-1B	Sample	NC
BW-1C	Sample	NC
BW-2A	Sample	NC
BW-2B	Sample	NC
BW-2C	Sample	NC
BW-3A	Sample	NC
BW-3B	Sample	NC
BW-3C	Sample	NC
BW-4A	Sample	NC
BW-4B	Sample	NC
BW-5A	Sample	NC
BW-5B	Sample	NC
BW-5C	Sample	NC
MW-1	Sample	NC
MW-2	Sample	NC
MW-4	Sample	NC
MW-5	Sample	NC
SMW-2	Sample	NC
SMW-4	Sample	NC
GROUP B		
GWM-1	Sample	NC
GWM-2	Sample	NC
GWM-3	Sample	NC
NAPIS-1	Sample	NC
NAPIS-2	Sample	NC
NAPIS-3	Sample	NC
KA-3	Sample	NC
OAPIS-1	Sample	NC
STP1-NW	Sample	NC
STP1-SW	Sample	NC
OW-59	Sample	NC
OW-60	Sample	NC
OW-62	Sample	NC
East LDU	Sample	NC
West LDU	Sample	NC
Oil Sump LDU	Sample	NC

TABLE 5-1. MODIFICATIONS TO THE MONITORING NETWORK
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2021 Network	Justification
GROUP C		
OW-13	Remove from List	Recovery system installed
OW-14	Remove from List	Recovery system installed
OW-29	Remove from List	Recovery system installed
OW-30	Remove from List	Recovery system installed
OW-50	Sample	NC
OW-52	Sample	NC
OW-53	Sample	NC
OW-54	Sample	NC
OW-55	Sample	NC
OW-56	Sample	NC
OW-57	Sample	NC
OW-58	Sample	NC
OW-58A	Sample	NC
OW-61	Sample	NC
OW-63	Sample	NC
OW-64	Sample	NC
OW-65	Sample	NC
RW-1	Remove from List	Recovery system installed
RW-2	Remove from List	Recovery system installed
RW-5	Remove from List	Recovery system installed
RW-6	Remove from List	Recovery system installed
GROUP D		
PW-2	NS	Sampled on 3-year intervals; next event is 2023
PW-3	Sample	NC
PW-4	Sample	NC
OW-1	Sample	NC
OW-10	Sample	NC
OW-11	Sample	NC
OW-12	Sample	NC

TABLE 5-1. MODIFICATIONS TO THE MONITORING NETWORK
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2021 Network	Justification
GROUP E		
MKTF-01	Sample	NC
MKTF-02	Sample	NC
MKTF-03	Sample	NC
MKTF-04	Sample	NC
MKTF-05	Sample	NC
MKTF-06	Sample	NC
MKTF-07	Sample	NC
MKTF-08	Sample	NC
MKTF-09	Sample	NC
MKTF-10	Sample	NC
MKTF-11	Sample	NC
MKTF-12	Sample	NC
MKTF-13	Sample	NC
MKTF-14	Sample	NC
MKTF-15	Sample	NC
MKTF-16	Sample	NC
MKTF-17	Sample	NC
MKTF-18	Sample	NC
MKTF-19	Sample	NC
MKTF-20	Sample	NC
MKTF-21	Sample	NC
MKTF-22	Sample	NC
MKTF-23	Sample	NC
MKTF-24	Sample	NC
MKTF-25	Sample	NC
MKTF-26	Sample	NC
MKTF-27	Sample	NC
MKTF-28	Sample	NC
MKTF-29	Sample	NC
MKTF-30	Sample	NC
MKTF-31	Sample	NC
MKTF-32	Sample	NC
MKTF-33	Sample	NC
MKTF-34	Sample	NC
MKTF-35	Sample	NC
MKTF-36	Sample	NC
MKTF-37	Sample	NC
MKTF-38	Sample	NC
MKTF-39	Sample	NC

TABLE 5-1. MODIFICATIONS TO THE MONITORING NETWORK
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2021 Network	Justification
MKTF-40	Sample	NC
MKTF-41	Sample	NC
MKTF-42	Sample	NC
MKTF-43	Sample	NC
MKTF-44	Sample	NC
MKTF-45	Sample	NC
MKTF-46	Sample	NC
MKTF-47	Sample	NC
MKTF-48	Sample	NC
MKTF-49	Sample	NC
MKTF-50	Sample	NC
GROUP F		
EP-2	Sample	NC
EP-3	Sample	NC
EP-4	Sample	NC
EP-5	Sample	NC
EP-6	Sample	NC
EP-7	Sample	NC
EP-8	Sample	NC
EP-9	Sample	NC
EP-11	Sample	NC
EP-12A	Sample	NC
EP-12B	Sample	NC
STP-1 to EP-2	Sample	NC
Boiler Water Inlet to EP-9	Remove from List	Boiler no longer in service

Notes:
NC - No change
NS - Not sampled

TABLE 5-2. MODIFICATIONS TO MONITORING FREQUENCY
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2020 Frequency	2021 Frequency
GROUP A		
BW-1A	Annual	NC
BW-1B	Annual	NC
BW-1C	Annual	NC
BW-2A	Annual	NC
BW-2B	Annual	NC
BW-2C	Annual	NC
BW-3A	Annual	NC
BW-3B	Annual	NC
BW-3C	Annual	NC
BW-4A	Quarterly	Annual; constituents have remained consistent since 2018
BW-4B	Quarterly	Annual; constituents have remained consistent since 2018
BW-5A	Quarterly	Annual; constituents have remained consistent since 2018
BW-5B	Quarterly	Annual; constituents have remained consistent since 2018
BW-5C	Quarterly	Annual; constituents have remained consistent since 2018
MW-1	Annual	NC
MW-2	Annual	NC
MW-4	Annual	NC
MW-5	Annual	NC
SMW-2	Annual	NC
SMW-4	Annual	NC
GROUP B		
GWM-1	Quarterly	NC
GWM-2	Quarterly	NC
GWM-3	Quarterly	NC
NAPIS-1	Quarterly	NC
NAPIS-2	Quarterly	NC
NAPIS-3	Quarterly	NC
KA-3	Quarterly	NC
OAPIS-1	Quarterly	NC
STP1-NW	Quarterly	NC
STP1-SW	Quarterly	NC
OW-59	Quarterly	NC
OW-60	Quarterly	NC
OW-62	Quarterly	NC
East LDU	Quarterly	NC
West LDU	Quarterly	NC
Oil Sump LDU	Quarterly	NC

TABLE 5-2. MODIFICATIONS TO MONITORING FREQUENCY
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2020 Frequency	2021 Frequency
GROUP C		
OW-13	Quarterly	Removed from list, recovery system installed
OW-14	Quarterly	Removed from list, recovery system installed
OW-29	Quarterly	Removed from list, recovery system installed
OW-30	Quarterly	Removed from list, recovery system installed
OW-50	Quarterly	NC
OW-52	Quarterly	NC
OW-53	Quarterly	NC
OW-54	Quarterly	NC
OW-55	Quarterly	NC
OW-56	Quarterly	NC
OW-57	Quarterly	NC
OW-58	Quarterly	NC
OW-58A	Quarterly	NC
OW-61	Quarterly	NC
OW-63	Quarterly	NC
OW-64	Quarterly	NC
OW-65	Quarterly	NC
RW-1	Quarterly	Removed from list, recovery system installed
RW-2	Quarterly	Removed from list, recovery system installed
RW-5	Quarterly	Removed from list, recovery system installed
RW-6	Quarterly	Removed from list, recovery system installed
GROUP D		
PW-2	NS[1]	Every 3 Years
PW-3	Quarterly	Annual; constituents have remained consistent since 2016
PW-4	Quarterly	Annual; constituents have remained consistent since 2016
OW-1	Quarterly	NC
OW-10	Quarterly	NC
OW-11	Annual	NC
OW-12	Annual	NC

TABLE 5-2. MODIFICATIONS TO MONITORING FREQUENCY
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2020 Frequency	2021 Frequency
GROUP E		
MKTF-01	Quarterly	NC
MKTF-02	Quarterly	NC
MKTF-03	Quarterly	NC
MKTF-04	Quarterly	NC
MKTF-05	Quarterly	NC
MKTF-06	Quarterly	NC
MKTF-07	Quarterly	NC
MKTF-08	Quarterly	NC
MKTF-09	Quarterly	NC
MKTF-10	Quarterly	NC
MKTF-11	Quarterly	NC
MKTF-12	Quarterly	NC
MKTF-13	Quarterly	NC
MKTF-14	Quarterly	NC
MKTF-15	Quarterly	NC
MKTF-16	Quarterly	NC
MKTF-17	Quarterly	NC
MKTF-18	Quarterly	NC
MKTF-19	Quarterly	NC
MKTF-20	Quarterly	NC
MKTF-21	Quarterly	NC
MKTF-22	Quarterly	NC
MKTF-23	Quarterly	NC
MKTF-24	Quarterly	NC
MKTF-25	Quarterly	NC
MKTF-26	Quarterly	NC
MKTF-27	Quarterly	NC
MKTF-28	Quarterly	NC
MKTF-29	Quarterly	NC
MKTF-30	Quarterly	NC
MKTF-31	Quarterly	NC
MKTF-32	Quarterly	NC
MKTF-33	Quarterly	NC
MKTF-34	Quarterly	NC
MKTF-35	Quarterly	NC
MKTF-36	Quarterly	NC
MKTF-37	Quarterly	NC
MKTF-38	Quarterly	NC
MKTF-39	Quarterly	NC
MKTF-40	Quarterly	NC

TABLE 5-2. MODIFICATIONS TO MONITORING FREQUENCY
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2020 Frequency	2021 Frequency
MKTF-41	Quarterly	NC
MKTF-42	Quarterly	NC
MKTF-43	Quarterly	NC
MKTF-44	Quarterly	NC
MKTF-45	Quarterly	NC
MKTF-46	Quarterly	NC
MKTF-47	Quarterly	NC
MKTF-48	Quarterly	NC
MKTF-49	Quarterly	NC
MKTF-50	Quarterly	NC
GROUP F		
EP-2	Semiannual	NC
EP-3	Semiannual	NC
EP-4	Semiannual	NC
EP-5	Semiannual	NC
EP-6	Semiannual	NC
EP-7	Semiannual	NC
EP-8	Semiannual	NC
EP-9	Semiannual	NC
EP-11	Semiannual	NC
EP-12A	Semiannual	NC
EP-12B	Semiannual	NC
STP-1 to EP-2	Quarterly	NC
Boiler Water Inlet to EP-9	Semiannual	Removed from list, Boiler no longer in service

NC - No change
NS - Not sampled

[1] Not sampled; next event is 2023.

TABLE 5-3. 2020 GROUNDWATER MONITORING SCHEDULE
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP A	BTEX (8260B) + MTBE (8260B)	Cations (200.7) + Anions (300)	General Organics (8015D)	Total Metals (200.7) + Cyanide (E335.4)	Dissovled Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)
BW-1A	BTEX, MTBE	F, Cl, Br, NO-2, NO-3, P, SO4	DRO, GRO, MRO	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Hg, Se, U, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, U, Zn	Acetone, EDC, 1,1-DCA, EDB, Carbon disulfide	Benzoic Acid, BEHP, Di-n-octyl phthalate	NA
BW-1B								
BW-1C								
BW-2A								
BW-2B								
BW-2C								
BW-3A								
BW-3B								
BW-3C								
BW-4A								
BW-4B								
BW-5A								
BW-5B								
BW-5C								X
MW-1	BTEX, MTBE	F, Cl, Br, NO-2, NO-3, P, SO4	DRO, GRO, MRO	As, Ba, Cr, Fe, Pb, Mn, Se, Ag, Hg, U, Zn, CN-	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, U, Zn	Acetone, Methylene Chloride	Benzoic Acid, BEHP, Di-n-octyl phthalate, Diethyl phthalate, Dimethyl phthalate, Pyrene	NA
MW-2								
MW-4								
MW-5								
SMW-2	BTEX, MTBE	F, Cl, Br, NO-2, NO-3, SO4	DRO, GRO, MRO	As, Ba, Cd, Cr, Co, Cu, Fe, Hg, Pb, Mn, Ni, Se, U, V, Zn, CN-	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, U, Zn	Acetone	Benzoic Acid, BEHP, Di-n-octyl phthalate, Diethyl phthalate, Dimethyl phthalate, Phenol, Pyrene	NA
SMW-4								

TABLE 5-3. 2020 GROUNDWATER MONITORING SCHEDULE
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP B	BTEX (8260B) + MTBE (8260B)	Cations (200.7) + Anions (300)	General Organics (8015D)	Total Metals (200.7) + Cyanide (E335.4)	Dissovled Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)
GWM-1	BTEX, MTBE	Ca (Dis), Mg (Dis), K (Dis), Na (Dis) F, Cl, Br, NO-2, NO-3	DRO, GRO, MRO	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Hg, Se, U, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, U, Zn	Acetone, EDC, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Isopropylbenzene, n-Butylbenzene, n-Propylbenzene	Benz(a)anthracene, BAP, Benzo(g,h,i)perylene, Chrysene, 2,4-Dimethylphenol, Fluorene, 1-MN, 2-MN, Naphthalene, Phenanthrene, Pyrene	NA
GWM-2								
GWM-3								
NAPIS-1	BTEX, MTBE	Fl, Cl, NO-2, NO-3, P, SO4	DRO, GRO, MRO	As, Ba, Cr, Cu, Fe, Pb, Mn, Hg, Se, U, Zn	As, Cr, Cu, Fe, Pb, Mn, Se, U, Zn	Acetone, EDC, EDB, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Bromodichloromethane, cis-1,2-DCE, 4-Chlorotoluene, 1,1-DCA, 1,1-DCE, Isopropylbenzene, 4-Isopropyltoluene, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, tert-Butylbenzene	Acenaphthene, Aniline, Anthracene, Benz(a)anthracene, Benzoic Acid, BEHP, Fluorene, 1-MN, 2-MN, 2-Methylphenol, 3,4-Methylphenol, Naphthalene, Phenanthrene, Phenol	NA
NAPIS-2								X
NAPIS-3								X
KA-3								X
OAPIS-1	BTEX, MTBE	Fl, Cl, NO-2, NO-3, SO4	DRO, GRO, MRO	As, Ba, CN-, Cr, Cu, Fe, Pb, Mn, Hg, Se, U, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	Acetone, EDC, EDB, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, 2-Butanone, 1,1-DCA, Isopropylbenzene, 4-Isopropyltoluene, 4-Methyl-2-Chloride, Methylene Chloride, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene	Acenaphthene, Anthracene, Benzoic Acid, BEHP, Di-n-octylphthalate, Dimethylphthalate, 2,4-Dimethylphenol, Fluorene, 1-MN, Naphthalene, Phenanthrene, Phenol	X

TABLE 5-3. 2020 GROUNDWATER MONITORING SCHEDULE
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP B	BTEX (8260B) + MTBE (8260B)	Cations (200.7) + Anions (300)	General Organics (8015D)	Total Metals (200.7) + Cyanide (E335.4)	Dissovled Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)
STP1-NW	BTEX, MTBE	Fl, Cl, NO-2, NO-3, SO4	DRO, GRO, MRO	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Hg, Se, Ag, U, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	Acetone, Isopropyl-benzene, n-Butylbenzene, n-Propyl-benzene, Sec-butylbenzene, 1,2,4-Trimethyl-benzene, 1,3,5-Trimethyl-benzene	Benzoic Acid, BEHP, Naphthalene, 1-MN, 2-MN, Phenol	NA
STP1-SW[1]								
OW-59								
OW-60								
OW-62								
East LDU	BTEX, MTBE	NA	DRO, GRO, MRO	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, Hg, U, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	Acetone, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, 2-Butanone, Carbon Disulfide, Isopropylbenzene, 4-Isopropyltoluene, 4-Methyl-2-Chloride, Methylene Chloride, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, Tert-Butylbenzene, TCE	NA	NA
West LDU								
Oil Sump LDU								

TABLE 5-3. 2020 GROUNDWATER MONITORING SCHEDULE
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP C	BTEX (8260B) + MTBE (8260B)	Cations (200.7) + Anions (300)	General Organics (8015D)	Total Metals (200.7) + Cyanide (E335.4)	Dissovled Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)
OW-13	BTEX, MTBE	F, Cl, Br, NO-2 + NO-3 as N, SO4	DRO, GRO, MRO	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, Hg, U, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	Acetone, EDC, EDB, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-Butanone, Chloroethane, 1,1-DCA, Isopropylbenzene, Methylene Chloride, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene	NA	NA
OW-14								
OW-29								
OW-30								
OW-50	BTEX, MTBE	F, Cl, NO-2, NO-3, SO4	DRO, GRO, MRO	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, Hg, U, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, EDC, EDB, Naphthalene, 1-MN, 2-MN, Acetone, 2-Butanone, Chloroethane, 1,1-Dichloroethane, Isopropyl benzene, 4-Isopropyltoluene, Methylene Chloride, n-Butyl benzene, n-Propyl benzene, sec-butylbenzene, tert-butylbenzene	Acenaphthene, Benzoic Acid, BEHP, Carbazole, Di-n-octylphalate, dimethylphthalate, 2-4-Dimethylphenol, Flourene, Flouranthene, 1-MN, 2-MN, 2-Methylphenol, 3+4-Methyphenol, Naphthalene, Phenanthrene, Phenol, Pyrene, Dibenzofuran	NA
OW-52								
OW-53								
OW-54								X
OW-55								X
OW-56								X
OW-57								NA
OW-58								
OW-58A								
OW-61								
OW-63								
OW-64								
OW-65								
RW-1	BTEX, MTBE	Ca (Dis), Mg (Dis), K (Dis), Na (Dis) F, Cl, Br, NO-2, NO-3, P, SO4	DRO, GRO, MRO	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, Hg, U, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Acetone, 2-Butanone, Chloromethane, Isopropylbenzene, 4-Isopropyltoluene, n-Butylbenzene, n-Propylbenzene, sec-butylbenzene, Styrene, tert-butylbenzene	Aniline, Benzoic Acid, Benzyl Alcohol, 2,4-Dimethyl phenol, 1-MN, 2-MN, 2-Methylphenol, 3,4-Methylphenol, Naphthalene, Phenanthrene, Phenol, Pyridine	NA
RW-2								
RW-5								
RW-6								

TABLE 5-3. 2020 GROUNDWATER MONITORING SCHEDULE
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP D	BTEX (8260B) + MTBE (8260B)	Cations (200.7) + Anions (300)	General Organics (8015D)	Total Metals (200.7) + Cyanide (E335.4)	Dissovled Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)
PW-2	BTEX, MTBE	NO-2	DRO, GRO, MRO	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, U, Zn, CN-	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, U, Zn	1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Acetone, n-Propyl benzene, PCE	Benzoic acid, BEHP, Di-n-octylphthalate, Diethyl phthalate, Dimethyl phthalate, 2,4-Dimethyl phenol, 2-Methylphenol, 3,4-Methylphenol, Phenanthrene, Phenol, Naphthalene, 1-MN, 2-MN	NA
PW-3								
PW-4								
OW-1	BTEX, MTBE	F, Cl, NO-2, NO-3, SO4	DRO, GRO, MRO	As, Ba, Cd, Cr, Fe, Pb, Mn, Se, Hg, Ag, U, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	1,2,4-Trimethylbenzene, EDC, EDB, Acetone, cis-1,2-DCE, 1,1-Dichloroethane, 1,1-Dichloroethene, Methylene Chloride	Benzoic acid	NA
OW-10								
OW-11	BTEX, MTBE	F, Cl, Br, NO-2, NO-3, P, SO4	DRO, GRO, MRO	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, U, Zn	As, Ba, Cu, Fe, Pb, Mn, Se, U, Zn	Acetone, 1,2,4-Trimethylbenzene, EDC	BEHP	NA
OW-12								

TABLE 5-3. 2020 GROUNDWATER MONITORING SCHEDULE
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP E	BTEX (8260B) + MTBE (8260B)	Cations (200.7) + Anions (300)	General Organics (8015D)	Total Metals (200.7) + Cyanide (E335.4)	Dissovled Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)
MKTF-01[2]	BTEX, MTBE	F, Cl, NO-2, NO-3, SO4	DRO, GRO, MRO	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, Ag, U, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, Ag, U, Zn	Acetone, EDC, EDB, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Bromomethane, 2-Butanone, Chlorobenzene, Chloroethane, Chloroform, Chloromethane, cis-1,2-DCE, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 1,1-DCA, 1,1-DCE, 1,2-Dichloropropane, 2-Hexanone, Isopropylbenzene, 4-Isopropyltoluene, 4-Methyl-2-pentanone, Methylene Chloride, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, Styrene, tert-Butylbenzene, PCE, TCE, 1,2,4-Trichlorobenzene, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, Vinyl Chloride	Acenaphthene, Aniline, Anthracene, Benz(a)anthracene, Benzoic Acid, Benzyl Alcohol, BEHP, Butylbenzylphthalate, Carbazole, Chryzene, Di-n-octylphthalate, Dibenzofuran, 1,4-Dichloro benzene, Diethyl phthalate, Dimethylphthalate, 2,4-Dimethyl phenol, Fluorene, 1-MN, 2-MN, 2-Methylphenol, 3,4-Methylphenol, Naphthalene, Pentachlorophenol, Phenanthrene, Phenol, Pyrene, Pyridine, 1,4,6-Trichlorophenol	NA
MKTF-02								X
MKTF-03[2]								NA
MKTF-04								X
MKTF-05[2]								NA
MKTF-06[2]								
MKTF-07[2]								
MKTF-08[2]								
MKTF-09								X
MKTF-10								NA
MKTF-11								X
MKTF-12[2]								NA
MKTF-13								X
MKTF-14[2]								NA
MKTF-15								
MKTF-16								X
MKTF-17								X
MKTF-18								X
MKTF-19								X
MKTF-20								X
MKTF-21								X
MKTF-22								X
MKTF-23								NA
MKTF-24								X
MKTF-25								X
MKTF-26[2]								NA
MKTF-27								X
MKTF-28								X
MKTF-29								X
MKTF-30								X
MKTF-31								X
MKTF-32								X
MKTF-33								X
MKTF-34								X
MKTF-35								X
MKTF-36								NA
MKTF-37								
MKTF-38								X
MKTF-39								X
MKTF-40								X
MKTF-41								X
MKTF-42								X
MKTF-43								X
MKTF-44								X
MKTF-45[2]								NA
MKTF-46								X
MKTF-47								X
MKTF-48								X
MKTF-49								X
MKTF-50								X

TABLE 5-3. 2020 GROUNDWATER MONITORING SCHEDULE
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP F	BTEX (8260B) + MTBE (8260B)	Cations (200.7) + Anions (300)	General Organics (8015D)	Total Metals (200.7) + Cyanide (E335.4)	Dissovled Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)	Pesticides (8011)	Misc Tests
EP-2	BTEX, MTBE	F, Cl, Br, NO-2, NO-3, SO4	NA	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Ag, Hg, Se, U, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Acetone, Bromomethane, 2-Butanone, Carbon Disulfide, Chloroform, Chloromethane, Isopropylbenzene, 4-Isopropyltoluene, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, 4-Methylene-2-pentanone, Methylene Chloride	Aniline, Benzoic Acid, Benzyl alcohol, BEHP, Carbazole, Chrysene, Di-n-octylphthalate, Dimethylphthalate, 2.4-Dimethylphenol, Fluoranthene, Fluorene, 1-MN, 2-MN, 2-Methylphenol, 3,4-Methylphenol, Naphthalene, 2-Nitrophenol, Phenanthrene, Phenol, Pyrene, Pyridine, Benzo(a)pyrene, Benzo(b) fluoranthene, Benzo(g,h,i) perylene, Indeno(1,2,3-cd) pyrene, Diethylphthalate, 4-Nitrophenol	NA	**EP-3, EP-12A, EP-12B only:** 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Aldrin, alpha-BHC, beta-BHC, Chlordane, delta-BHC, Dieldrin, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin aldehyde, gamma-BHC, Heptachlor, Heptaclor expoxide, Methyoxychlor, Toxaphene	BOD (M5210B), COD (H8000), E. Coli (3014), Total Coliform (9223B)
EP-3										
EP-4										
EP-5										
EP-6										
EP-7										
EP-8										
EP-9										
EP-11										
EP-12A										
EP-12B										
STP-1 to EP-2	BTEX, MTBE	TDS (2540C), TSS (2540D)	DRO, GRO, MRO	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, U, Zn	As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, U, Zn	1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Acetone, Bromomethane, 2-Butanone, Carbon Disulfide, Methylene Chloride	NA	NA	NA	BOD, COD
Boiler Water Inlet to EP-9	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Notes:
[1] Not sampled; has required supplied air due to elevated H2S levels.
[2] Not sampled for VOC/SVOC

1,1-DCA - 1,1-Dichloroethane
1,1-DCE - 1,1-Dichloroethene
1-MN - 1-Methyl Naphthalene
2-MN - 2-Methyl Naphthalene
Ag - Silver
As - Arsenic
Ba - Barium
BAP - Benzo(a)Pyrene
BEHP - Bis(2-ethylhexyl) Phthalate
BOD - Biological Oxygen Demand
Br - Bromide
BTEX - Benzene, Ethyl Benzene, Toluene, Total Xylenes
Ca - Calcium
Cd - Cadmium
cis-1,2-DCE - cis-1,2-Dichloroethene
Cl - Chloride
CN- - Cyanide
COD - Chemical Oxygen Demand
Cr - Chromium
Cu - Copper
DRO - Diesel Range Organics
EDB - 1,2-Dibromomethane
EDC - 1,2-Dichloroethane
F - Fluoride
Fe - Iron
GRO - Gasoline Range Organics
Hg - Mercury
K - Potassium
Mg - Magnesium
Mn - Manganese
MRO - Motor Oil Range Organics
MTBE - Methyl tert-Butyl Ether
NA - Not analyzed
Na - Sodium
Ni - Nickel
NO-2 - Nitrite
NO-2 + NO-3, as N - Nitrite + Nitrate as Nitrogen
NO-3 - Nitrate
NS - Not sampled
P - Phosphorus
Pb - Lead
PCE - Tetrachloroethene
Se - Selenium
SO4 - Sulfate
SVOC - Semivolatile Organic Compound
TCE - Trichloroethene
TDS - Total Dissolved Solids
TSS - Total Suspended Solids
U - Uranium
VOC - Volatile Organic Compound
Zn - Zinc

TABLE 5-4. PROPOSED MODIFICATIONS TO THE ANALYTE LIST
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2020 Analytes	2021 Modifications and Justification
GROUP A		
BW-1A BW-1B BW-1C BW-2A BW-2B BW-2C BW-3B BW-3C BW-4A BW-4B BW-5A BW-5B BW-5C	BTEX + MTBE	Remove BEX. Not detected in last 3 consecutive years sampled.
	Gen Inorganic: F, Cl, Br, NO2, NO3, P, SO4	No change
	General Organic: DRO, GRO, MRO	Remove DRO, MRO. Not detected in last 3 consecutive years sampled. Note some DLs greater than standard.
	Total Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, U, Zn	Remove Cd. Not detected in last 3 consecutive years sampled. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, U, Zn	Remove Cd. Not detected in last 3 consecutive years sampled. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: Acetone, EDC, 1,1-DCA, EDB, Carbon disulfide	No change
	SVOC: Benzoic Acid, BEHP, Di-n-octyl phthalate	No change
	1,4-dioxane (BW-5C)	No change
MW-1 MW-2 MW-4 MW-5	BTEX + MTBE	Remove all. Not detected in last 3 consecutive years sampled.
	Gen Inorganic: F, Cl, Br, NO-2, NO-3, P, SO4	Remove Br, P, NO-2. Not detected in last 3 consecutive years sampled. Note some DLs greater than standard.
	General Organic: DRO, GRO, MRO	Remove all. Not detected in last 3 consecutive years sampled. Note some DLs greater than standard.
	Total Metals: As, Ba, Cr, Fe, Pb, Mn, Se, CN-, Hg, U, Zn	Remove Se. Not detected in last 3 consecutive years sampled. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, U, Zn	Remove Cd, Cu, Fe, Se. Not detected in last 3 consecutive years sampled. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: Acetone, Methylene Chloride	No change
	SVOC: Benzoic Acid, BEHP, Di-n-octyl phthalate, Diethyl phthalate, Dimethyl phthalate, Pyrene	Remove di-n-octyl phthalate, diethyl phthalate, dimethyl phthalate, pyrene. Not detected in last 3 consecutive years sampled. **Add 1,4-dioxane to MW-1 per NMED Disapproval Facility Wide GW Monitoring Plan - Updates for 2019 Comment 22 (7/12/19).**
SMW-2 SWM-4	BTEX + MTBE	Remove TEX. Not detected in last 3 consecutive years sampled.
	Gen Inorganic: F, Cl, NO-2, NO-3, SO4	No change
	General Organic: DRO, GRO, MRO	Remove MRO. Not detected in last 3 consecutive years sampled. Note some DLs greater than standard.
	Total Metals: As, Ba, Cd, Cr, Co, Cu, Fe, Pb, Mn, Ni, Se, CN-, Hg, U, V, Zn	Remove Cd, Cu, Se. Not detected in last 3 consecutive years sampled. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, U, Zn	Remove Cd, Ni, Se. Not detected in last 3 consecutive years sampled. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: Acetone	No change
	SVOC: Benzoic Acid, BEHP, Di-n-octyl phthalate, Diethyl phthalate, Dimethyl phthalate, Phenol, Pyrene	Remove di-n-octyl phthalate, diethyl phthalate, dimethyl phthalate, pyrene, BEHP, phenol. Not detected in last 3 consecutive years sampled. Note some DLs greater than standard. **Add 1,4-dioxane SWM-4 per NMED Disappproval Annual GW Report - 2019 Comment 52 (11/23/20).**

TABLE 5-4. PROPOSED MODIFICATIONS TO THE ANALYTE LIST
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2020 Analytes	2021 Modifications and Justification
GROUP B		
GWM-1 GWM-2 GWM-3	BTEX + MTBE	No change
	Gen Inorganic: F, Cl, Br, NO-2, NO-3	No change
	General Organic: DRO, GRO, MRO	Remove MRO. Not detected in last 3 consecutive years sampled. Note some DLs greater than standard.
	Total Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, U, Zn	Remove Cd, Cr, and Hg. Not detected in last 3 consecutive years sampled. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Ca, Cd, Cr, Cu, Fe, Pb, Mg, Mn, K, Na, Se, U, Zn	Remove Cd, Cr, and Cu. Not detected in last 3 consecutive years sampled. Remove K, Na, Mg, Ca. Anion analyses are done as totals; therefore, the cations should be done as totals for comparison. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: Acetone, EDC, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Isopropylbenzene, n-Butylbenzene, n-Propylbenzene	Remove n-butyl benzene. Not detected in last 3 consecutive years sampled.
	SVOC: Benz(a)anthracene, BAP, Benzo(g,h,i)perylene, Chrysene, 2,4-Dimethylphenol, Fluorene, 1-MN, 2-MN, Naphthalene, Phenanthrene, Pyrene	**Add 1,4-dioxane to Well GMW-1 per NMED Disapproval Facility Wide GW Monitoring Plan - Updates for 2019 Comment 22 (7/12/19).**
NAPIS-1 NAPIS-2 NAPIS-3 KA-3	BTEX + MTBE	No change
	Gen Inorganic: F, Cl, NO-2, NO-3, P, SO4	No change
	General Organic: DRO, GRO, MRO	Remove MRO. Not detected in last 3 consecutive years sampled. Note some DLs greater than standard.
	Total Metals: As, Ba, Cr, Cu, Fe, Pb, Mn, Se, Hg, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Cr, Cu, Fe, Pb, Mn, K, NA, Se, U, Zn	Remove K, Na. Anion analyses are done as totals; therefore, the cations should be done as totals for comparison. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: Acetone, EDC, EDB, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Bromodichloromethane, cis-1,2-DCE, 4-Chlorotoluene, 1,1-DCA, 1,1-DCE, Isopropylbenzene, 4-Isopropyltoluene, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, tert-Butylbenzene	Remove cis-1,2-DCE, 1,1-dichloroethene. Not detected in last 3 consecutive years sampled.. Note some DLs greater than standard. Remove naphthalene, 1-methyl naphthalene, 2-methyl naphthalene. Analyzed on the SVOC list.
	SVOC: Acenaphthene, Aniline, Anthracene, Benz(a)anthracene, Benzoic Acid, BEHP, Fluorene, 1-MN, 2-MN, 2-Methylphenol, 3,4-Methylphenol, Naphthalene, Phenanthrene, Phenol	Remove aniline, benz(a)anthracene, 2-methylphenol, 3+4-methylphenol. Not detected in last 3 consecutive years sampled. Note some DLs greater than standard.
	1,4-dioxane (NAPIS-2, NAPIS-3, KA-3)	No change
OAPIS-1	BTEX + MTBE	No change
	Gen Inorganic: F, Cl, NO-2, NO-3, SO4	Remove NO-2. Not detected in last 3 consecutive years sampled. Note some DLs greater than standard.
	General Organic: DRO, GRO, MRO	Remove MRO. Not detected in last 3 consecutive years sampled. Note some DLs greater than standard.
	Total Metals: As, Ba, Cr, Cu, Fe, Pb, Mn, Se, Hg, U, Zn, CN-	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr. Cu, Fe, Pb, Mn, Se, Ag, U, Zn	Remove Cd, Cr. Not detected in last 3 consecutive years sampled. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: Acetone, EDC, EDB, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, 2-Butanone, 1,1-DCA, Isopropylbenzene, 4-Isopropyltoluene, 4-Methyl-2-Chloride, Methylene Chloride, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene	Remove 1,3,5-trimethyl benzene, EDB. Not detected in last 3 consecutive years sampled. Note some DLs greater than standard. Remove naphthalene, 1-methyl naphthalene, 2-methyl naphthalene. Analyzed on the SVOC list.
	SVOC: Acenaphthene, Anthracene, Benzoic Acid, BEHP, Di-n-octylphthalate, Dimethylphthalate, 2,4-Dimethylphenol, Fluorene, 1-MN, Naphthalene, Phenanthrene, Phenol	Remove di-n-octyl phthalte, dimethyl phthalate. Not detected in last 3 consecutive years sampled.
	1,4-dioxane	No change

TABLE 5-4. PROPOSED MODIFICATIONS TO THE ANALYTE LIST
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2020 Analytes	2021 Modifications and Justification
STP1-NW STP1-SW OW-59 OW-60 OW-62	BTEX + MTBE	No change
	Gen Inorganic: F, Cl, NO-2, NO-3, SO4	No change
	General Organic: DRO, GRO, MRO	Remove MRO. Not detected in last 3 consecutive years sampled. Note some DLs greater than standard.
	Total Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, Hg, U, Zn	Remove Cd. Not detected in last 3 consecutive years sampled. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	Remove Cd. Not detected in last 3 consecutive years sampled. Note some DLs greater than standard. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: Acetone, Isopropyl-benzene, n-Butylbenzene, n-Propyl-benzene, Sec-butylbenzene, 1,2,4-Trimethyl-benzene, 1,3,5-Trimethyl-benzene	No change
	SVOC: Benzoic Acid, BEHP, Naphthalene, 1-MN, 2-MN, Phenol	No change
East LDU West LDU Oil Sump LDU	BTEX, MTBE	No change
	General Organic: DRO, GRO, MRO	Remove MRO. Not detected in last 3 consecutive years sampled. Note some DLs greater than standard.
	Total Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, Hg, U, Zn	Remove Cd, Ag. Not detected in last 3 consecutive years sampled. Note some DLs greater than standard. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	Remove Cd, Cu, Pb. Not detected in last 3 consecutive years sampled. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: Acetone, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, 2-Butanone, Carbon Disulfide, Isopropylbenzene, 4-Isopropyltoluene, 4-Methyl-2-Chloride, Methylene Chloride, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, Tert-Butylbenzene, TCE	Remove naphthalene, 1-methyl naphthalene, 2-methyl naphthalene. Analyze under SVOCs
	SVOC: None	**Add naphthalene, 1-methyl naphthalene, 2-methyl naphthalene. Analyze under SVOCs to be consistent with other well groups.** **Add 1,4-dioxane to West LDU per NMED Disapproval Facility Wide GW Monitoring Plan - Updates for 2019 Comment 22 (7/12/2019).**

TABLE 5-4. PROPOSED MODIFICATIONS TO THE ANALYTE LIST
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2020 Analytes	2021 Modifications and Justification
GROUP C		
OW-13 OW-14 OW-29 OW-30	BTEX + MTBE Gen Inorganic: F, Cl, Br, NO-2 + NO-3 as N, SO4 General Organic: DRO, GRO, MRO Total Metals Total Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, Ag, U, Zn Dissolved Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn VOC: Acetone, EDC, EDB, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-Butanone, Chloroethane, 1,1-DCA, Isopropylbenzene, Methylene Chloride, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene SVOC: None	Removed from well network because these are SPH recovery wells.
OW-50 OW-52 OW-53 OW-54 OW-55 OW-56 OW-57 OW-58 OW-58A OW-61 OW-63 OW-64 OW-65	BTEX + MTBE	No change
	Gen Inorganic: F, Cl, NO-2, NO-3, SO4	No change
	General Organic: DRO, GRO, MRO	Remove MRO. Not detected in last 3 consecutive years sampled. Note some DLs greater than standard.
	Total Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, Ag, U, Zn	Remove Cd. Not detected in last 3 consecutive years sampled. Note some DLs greater than standards. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	Remove Cd and Cr. Not detected in last 3 consecutive years sampled. Note some DLs greater than standards. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC:1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, EDC, EDB, Naphthalene, 1-MN, 2-MN, Acetone, 2-Butanone, Chloroethane, 1,1-Dichloroethane, Isopropyl benzene, 4-Isopropyltoluene, Methylene Chloride, n-Butyl benzene, n-Propyl benzene, sec-butylbenzene, tert-butylbenzene	Remove EDB and chloroethane. Not detected in last 3 consecutive years sampled. Note some DLs greater than standard. Remove naphthalene, 1-methyl naphthalene, 2-methyl naphthalene. Analyzed under SVOCs.
	SVOC: Acenaphthene, Benzoic Acid, BEHP, Carbazole, Di-n-octylphalate, dimethylphthalate, 2-4-Dimethylphenol, Flourene, Flouranthene, 1-MN, 2-MN, 2-Methylphenol, 3+4-Methyphenol, Naphthalene, Phenanthrene, Phenol, Pyrene, Dibenzofuran	Remove 1,4-dioxane from OW-54, OW-55, OW-56 per NMED Disapproval Facility Wide GW Monitoring Plan - Updates for 2019 Comment 22. (7/12/19). **Add PFAS to OW-63 per NMED Disapproval Annual GW Report - 2019 Comment 30 (11/23/20).**
	1,4-dioxane (OW-54, OW-55, OW-56)	**Add 1,4-dioxane to OW-50 and OW-52 per NMED Disappproval Annual GW Report - 2019 Comment 13 (11/23/20).**
RW-1 RW-2 RW-5 RW-6	BTEX + MTBE Gen Inorganic: F, Cl, Br, NO-2, NO-3, P, SO4 General Organic: DRO, GRO, MRO Total Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, Hg, U, Zn Dissolved Metals: As, Ba, Cd, Ca, Cr, Cu, Fe, Pb, Mg, Mn, K, Na, Se, Ag, U, Zn 8260: 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Acetone, 2-Butanone, Chloroethane, Isopropylbenzene, 4-Isopropyltoluene, n-Butylbenzene, n-Propylbenzene, sec-butylbenzene, Styrene, tert-butylbenzene 8270: Aniline, Benzoic Acid, Benzyl Alcohol, 2,4-Dimethyl phenol, 1-MN, 2-MN, 2-Methylphenol, 3,4-Methylphenol, Naphthalene, Phenanthrene, Phenol, Pyridine	Removed from well network because these are SPH recovery wells.

TABLE 5-4. PROPOSED MODIFICATIONS TO THE ANALYTE LIST
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2020 Analytes	2021 Modifications and Justification
GROUP D		
PW-2 PW-3 PW-4	BTEX + MTBE	Remove toluene, ethylbenzene, MTBE. Not detected in last 3 consecutive years sampled.
	Gen Inorganic: NO-2	Remove NO-2. Not detected in last 3 consecutive years sampled.
	General Organic: DRO, GRO, MRO	No change
	Total Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, U, Zn, CN-	Remove Cd, Cr, CN-. Not detected in last 3 consecutive years sampled. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, U, Zn	Remove Cd, Cr, Cu, Pb. Not detected in last 3 consecutive years sampled. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Acetone, n-Propyl benzene, PCE	Remove PCE. Not detected in last 3 consecutive years sampled.
	SVOC: Benzoic acid, BEHP, Di-n-octylphthalate, Diethyl phthalate, Dimethyl phthalate, 2,4-Dimethyl phenol, 2-Methylphenol, 3,4-Methylphenol, Phenanthrene, Phenol, Naphthalene, 1-MN, 2-MN	Remove di-n-octyl phthalate, diethyl phthalte, dimethyl phthalate, 2,4-dimethyl phenol, 2-methyl phenol, 3+4-methyl phenol, phenanthrene, phenol, 2-methyl naphthalene. Not detected in last 3 consecutive years sampled. Note some DLs greater than standard.
	1,4-dioxane (NA)	**Add 1,4-dioxane to PW-2 per NMED Disapproval Facility Wide GW Monitoring Plan - Updates for 2019 Comment 22 (7/12/19).**
OW-1 OW-10	BTEX + MTBE	Remove toluene, total xylenes. Not detected in last 3 consecutive years sampled.
	Gen Inorganic: F, Cl, NO-2, NO-3, SO-4	No change
	General Organic: DRO, GRO, MRO	Remove DRO, MRO. Not detected in last 3 consecutive years sampled. Note some DLs greater than standard.
	Total Metals: As, Ba, Cd, Cr, Fe, Pb, Mn, Se, Hg, Ag, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	Remove Cd. Not detected in last 3 consecutive years sampled. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: 1,2,4-Trimethylbenzene, EDC, EDB, Acetone, cis-1,2-DCE, 1,1-Dichloroethane, 1,1-Dichloroethene, Methylene Chloride	Remove EDB, 1,2,4-trimethylbenzene. Not detected in last 3 consecutive years sampled.
	SVOC: Benzoic acid	No change
	1,4-dioxane (NA)	**Add 1,4-dioxane to OW-1, OW-10 per NMED Disapproval Facility Wide GW Monitoring Plan - Updates for 2019 Comment 22 (7/12/19).**
OW-11 OW-12	BTEX + MTBE	No change
	Gen Inorganic: F, Cl, Br, NO-2, NO-3, P, SO4	Remove P. Not detected in last 3 consecutive years sampled.
	General Organic: DRO, GRO, MRO	Remove DRO, GRO, MRO. Not detected in last 3 consecutive years sampled. Note some DLs greater than standard.
	Total Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, U, Zn	Remove Cd, Cu. Not detected in last 3 consecutive years sampled. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cu, Fe, Pb, Mn, Se, U, Zn	Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: Acetone, 1,2,4-Trimethylbenzene, EDC	No change
	SVOC: BEHP	Remove BEHP. Not detected in last 3 consecutive years sampled.
	1,4-dioxane (NA)	**Add 1,4-dioxane and EDB to OW-11 per NMED Disapproval Annual GW Report - 2019 Comment 22 (11/23/20).**

TABLE 5-4. PROPOSED MODIFICATIONS TO THE ANALYTE LIST
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2020 Analytes	2021 Modifications and Justification
GROUP E		
MKTF-1 through MKTF-50	BTEX + MTBE	No change
	Gen Inorganic: F, Cl, NO-2, NO-3, SO4	**Add sulfide to MKTF-1, MKTF-2, MKTF-23, MKTF-24, MKTF-33 per NMED Disapproval Annual GW Report - 2019 Comment 3a (11/23/20)**
	General Organic: DRO, GRO, MRO	No change
	Total Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, Ag, U, Zn	Remove Cd. Not detected in last 3 consecutive years sampled. Note some DLs greater than standards. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	Remove Cd. Not detected in last 3 consecutive years sampled. Note some DLs greater than standards. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: Acetone, EDC, EDB, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Bromomethane, 2-Butanone, Chlorobenzene, Chloroethane, Chloroform, Chloromethane, cis-1,2-DCE, 4-Chlorotoluene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 1,1-DCA, 1,1-DCE, 1,2-Dichloropropane, 2-Hexanon, Isopropylbenzene, 4-Isopropyltoluene, 4-Methyl-2-pentanone, Methylene Chloride, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, Styrene, tert-Butylbenzene, PCE, TCE, 1,2,4-Trichlorobenzene, 1,1,1-Trichloroethane, 1,1,2-Trichloro ethane, Vinyl Chloride	Remove bromomethane, chloromethane, 1,2-dichloropropane, 2-hexanone. Not detected in last 3 consecutive years sampled. Note some DLs greater than standards. Remove naphthalene, 1-methyl naphthalene, 2-methyl naphthalene. Analyzed under SVOCs.
	SVOC: Acenaphthene, Aniline, Anthracene, Benz(a)anthracene, Benzoic Acid, Benzyl Alcohol, BEHP, Butylbenzylphthalate, Carbazole, Chryzene, Di-n-octylphthalate, Dibenzofuran, 1,4-Dichloro benzene, Diethyl phthalate, Dimethylphthalate, 2,4-Dimethyl phenol, Fluorene, 1-MN, 2-MN, 2-Methylphenol, 3,4-Methylphenol, Naphthalene, Pentachlorophenol, Phenanthrene, Phenol, Pyrene, Pyridine, 1,4,6-Trichlorophenol	Remove pentachlorophenol, pyridine. Not detected in last 3 consecutive years sampled.
	1,4-dioxane (MKTF-02, MKTF-04, MKTF-09, MKTF-11, MKTF-13, MKTF-16 through MKTF-22, MKTF-24, MKTF-25, MKTF-27 through MKTF-35, MKTF-38 through MKTF-44, MKTF-46 through MKTF-50)	**Add 1,4-dioxane to MKTF-01, MKTF-03, MKTF-05 through MKTF-08, MKTF-12 through MKTF-17, MKTF-19 through MKTF-23, MKTF-26, MKTF-33, MKTF-36, MKTF-37, MKTF-45 per NMED Disapproval Facility Wide GW Monitoring Plan - Updates for 2019 Comment 22 (7/12/19).**

TABLE 5-4. PROPOSED MODIFICATIONS TO THE ANALYTE LIST
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2020 Analytes	2021 Modifications and Justification
GROUP F		
EP-2 EP-3 EP-4 EP-5 EP-6 EP-7 EP-8 EP-9 EP-11 EP12A EP12B	BTEX + MTBE	Remove MTBE. Not detected in last 3 consecutive years sampled. Note some DLs are greater than standards.
	Gen Inorganic: F, Cl, NO-2, NO-3, SO4	No change
	Total Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, Hg, U, Zn	Remove Cd. Not detected in last 3 consecutive years sampled. Note some DLs greater than standards. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Ag, U, Zn	Remove Cd. Not detected in last 3 consecutive years sampled. Note some DLs greater than standards. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	BOD, COD, E-coli, Total Coliform	No change
	VOC: 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Acetone, Bromomethane, 2-Butanone, Carbon Disulfide, Chloroform, Chloromethane, Isopropylbenzene, 4-Isopropyltoluene, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, 4-Methylene-2-pentanone, Methylene Chloride	Remove Chloroform. Not detected in last 3 consecutive years sampled. Remove naphthalene, 1-methyl naphthalene, 2-methyl naphthalene. Analyzed uder SVOCs.
	SVOC: Aniline, Benzoic Acid, Benzyl alcohol, BEHP, Carbazole, Chrysene, Di-n-octylphthalate, Dimethylphthalate, 2.4-Dimethylphenol, Fluoranthene, Fluorene, 1-MN, 2-MN, 2-Methylphenol, 3,4-Methylphenol, Naphthalene, 2-Nitrophenol, Phenanthrene, Phenol, Pyrene, Pyridine, Benzo(a)pyrene, Benzo(b) fluoranthene, Benzo(g,h,i) perylene, Indeno(1,2,3-cd) pyrene, Diethylphthalate, 4-Nitrophenol	Remove benzyl alcohol; carbazole; di-n-octyl phthalate; dimethyl phthalate; fluoranthene, fluorene, phenanthrene, pyrene, pyridine, benzo(a)pyrene; benzo(b)fluoranthene; benzo(g,h,i)perylene; indeno(1,2,3-cd)pyrene. Not detected in last 3 consecutive years sampled. Note some DLs greater than standards.
	Pesticides **EP-3, EP-12A, EP-12B only**: 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Aldrin, alpha-BHC, beta-BHC, Chlordane, delta-BHC, Dieldrin, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin aldehyde, gamma-BHC, Heptachlor, Heptaclor expoxide, Methyoxychlor, Toxaphene	Remove pesticides from EP-3, EP-12A, and EP-12B per NMED Disapproval Annual GW Report - 2019 Comment 26 (11/23/20). **Add pesticides to EP-2 per NMED Disapproval Annual GW Report - 2019 Comment 25 (11/23/20).**

TABLE 5-4. PROPOSED MODIFICATIONS TO THE ANALYTE LIST
GALLUP REFINERY, GALLUP, NEW MEXICO

Wells	2020 Analytes	2021 Modifications and Justification
STP-1 to EP-2	BTEX + MTBE	Remove MTBE. Not detected in last 3 consecutive years sampled. Note some DLs are greater than standards.
	Gen Inorganic: TDS, TSS	No change
	General Organic: DRO, GRO, MRO	No change
	BOD, COD	No change
	Total Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, Hg, U, Zn	Remove Cd. Not detected in last 3 consecutive years sampled. Note some DLs are greater than standards. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	Dissolved Metals: As, Ba, Cd, Cr, Cu, Fe, Pb, Mn, Se, U, Zn	Remove Cd, Pb. Not detected in last 3 consecutive years sampled. Remove U per NMED Disapproval Annual GW Report - 2019 Comment 21 (11/23/20).
	VOC: 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Acetone, Bromomethane, 2-Butanone, Carbon Disulfide, Methylene Chloride	Remove methylene chloride. Not detected in last 3 consecutive years sampled. Note some DLs greater than standards.
Boiler Water Inlet to EP-9	NA	NA

Notes:

1,1-DCA - 1,1-Dichloroethane
1,1-DCE - 1,1-Dichloroethene
1-MN - 1-Methyl Naphthalene
2-MN - 2-Methyl Naphthalene
Ag - Silver
As - Arsenic
Ba - Barium
BAP - Benzo(a)Pyrene
BEHP - Bis(2-ethylhexyl) Phthalate
BOD - Biological Oxygen Demand
Br - Bromide
BTEX - Benzene, Ethyl Benzene, Toluene, Total Xylenes
Ca - Calcium
Cd - Cadmium
cis-1,2-DCE - cis-1,2-Dichloroethene
Cl - Chloride
CN- - Cyanide
COD - Chemical Oxygen Demand
Cr - Chromium
Cu - Copper
DRO - Diesel Range Organics
EDB - 1,2-Dibromomethane
EDC - 1,2-Dichloroethane
F - Fluoride
Fe - Iron
GRO - Gasoline Range Organics
Hg - Mercury
K - Potassium
Mg - Magnesium
Mn - Manganese
MRO - Motor Oil Range Organics
MTBE - Methyl tert-Butyl Ether
NA - Not analyzed
Na - Sodium
Ni - Nickel
NO-2 - Nitrite
NO-2 + NO-3, as N - Nitrite + Nitrate as Nitrogen
NO-3 - Nitrate
NS - Not sampled
P - Phosphorus
Pb - Lead
PCE - Tetrachloroethene
Se - Selenium
SO4 - Sulfate
SVOC - Semivolatile Organic Compound
TCE - Trichloroethene
TDS - Total Dissolved Solids
TSS - Total Suspended Solids
U - Uranium
VOC - Volatile Organic Compound
Zn - Zinc

TABLE 5-5. 2021 ANALYTE LIST
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP A	BTEX + MTBE (8260B)	Cations (200.7) + Anions (300.00)	Gen Organics (8015D)	Tot Metals (200.7) + Cyanide (335.4)	Dis Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)
BW-1A	Toluene, MTBE	F, Cl, Br, NO-2, NO-3, P, SO4	GRO	As, Ba, Cr, Cu, Fe, Pb, Mn, Hg, Se, Zn	As, Ba, Cr, Cu, Fe, Pb, Mn, Se, Zn	Acetone, 1,2-DCA, 1,1-DCE, EDB, Carbon Disulfide	Benzoic Acid, BEHP, Di-n-octyl Phthalate	NA
BW-1B								
BW-1C								
BW-2A								
BW-2B								
BW-2C								
BW-3A								
BW-3B								
BW-3C								
BW-4A								
BW-4B								
BW-5A								
BW-5B								
BW-5C								X
MW-1	NA	F, Cl, NO-3, SO4	NA	As, Ba, Cr, Fe, Pb, Mn, Hg, Zn	As, Ba, Cr, Pb, Mn, Zn	Acetone, Methylene Chloride	Benzoic Acid, BEHP	X
MW-2								NA
MW-4								
MW-5								
SMW-2	Benzene, MTBE	F, Cl, Br, NO-2, NO-3 SO4	DRO, GRO	As, Ba, Cr, Co, Fe, Hg, Pb, Mn, Ni, V, Zn, CN-	As, Ba, Cr, Cu, Fe, Pb, Mn, Zn	Acetone	Benzoic Acid	NA
SMW-4								X

TABLE 5-5. 2021 ANALYTE LIST
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP B	BTEX + MTBE (8260B)	Cations (200.7) + Anions (300.00)	Gen Organics (8015D)	Tot Metals (200.7) + Cyanide (335.4)	Dis Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)
GWM-1	BTEX, MTBE	F, Cl, Br, NO-2, NO-3	DRO, GRO	As, Ba, Cu, Fe, Pb, Mn, Se, Zn	As, Ba, Fe, Pb, Mn, Se, Zn	Acetone, EDC, 1,2,4-Trimethyl Benzene, 1,3,5-Trimethyl Benzene, Isopropyl Benzene, n-Propyl Benzene	Benz(a)anthracene, BAP, Benzo(g,h,i)perylene, Chrysene, 2,4-Dimethylphenol, Fluorene, 1-MN, 2-MN, Naphthalene, Phenanthrene, Pyrene	X
GWM-2								NA
GWM-3								
NAPIS-1	BTEX, MTBE	Fl, Cl, NO-2, NO-3, P, SO4	DRO, GRO	As, Ba, Cr, Cu, Fe, Pb, Mn, Hg, Se, Zn	As, Cr, Cu, Fe, Pb, Mn, Se, Zn	Acetone, EDC, EDB, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Bromodichloromethane, 4-Chlorotoluene, 1,1-DCA, Isopropylbenzene, 4-Isopropyltoluene, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, tert-Butylbenzene	Acenaphthene, Anthracene, Benzoic Acid, BEHP, Fluorene, 1-MN, 2-MN, Naphthalene, Phenanthrene, Phenol	NA
NAPIS-2								X
NAPIS-3								X
KA-3								X
OAPIS-1	BTEX, MTBE	Fl, Cl, NO-3, SO4	DRO, GRO	As, Ba, CN-, Cr, Cu, Fe, Pb, Mn, Hg, Se, Zn	As, Ba, Cu, Fe, Pb, Mn, Se, Ag, Zn	Acetone, EDC, 1,2,4-Trimethylbenzene, 2-Butanone, 1,1-DCA, Isopropylbenzene, 4-Isopropyltoluene, 4-Methyl-2-Chloride, Methylene Chloride, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene	Acenaphthene, Anthracene, Benzoic Acid, BEHP, 2,4-Dimethylphenol, Fluorene, 1-Methylnaphthalene, Naphthalene, Phenanthrene, Phenol	X

TABLE 5-5. 2021 ANALYTE LIST
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP B	BTEX + MTBE (8260B)	Cations (200.7) + Anions (300.00)	Gen Organics (8015D)	Tot Metals (200.7) + Cyanide (335.4)	Dis Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)
STP1-NW	BTEX, MTBE	Fl, Cl, NO-2, NO-3, SO4	DRO, GRO	As, Ba, Cr, Cu, Fe, Pb, Mn, Hg, Se, Ag, Zn	As, Ba, Cr, Cu, Fe, Pb, Mn, Se, Ag, Zn	Acetone, Isopropyl-benzene, n-Butylbenzene, n-Propyl-benzene, Sec-butylbenzene, 1,2,4-Trimethyl-benzene, 1,3,5-Trimethyl-benzene	Benzoic Acid, BEHP, Naphthalene, 1-MN, 2-MN, Phenol	NA
STP1-SW								
OW-59								
OW-60								
OW-62								
East LDU	BTEX, MTBE	NA	DRO, GRO	As, Ba, Cr, Cu, Fe, Pb, Mn, Se, Hg, Zn	As, Ba, Cr, Fe, Mn, Se, Ag, Zn	Acetone, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, 2-Butanone, Carbon Disulfide, Isopropylbenzene, 4-Isopropyltoluene, 4-Methyl-2-Chloride, Methylene Chloride, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, Tert-Butylbenzene, TCE	Naphthalene, 1-MN, 2-MN	NA
West LDU								X
Oil Sump LDU								NA

TABLE 5-5. 2021 ANALYTE LIST
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP C	BTEX + MTBE (8260B)	Cations (200.7) + Anions (300.00)	Gen Organics (8015D)	Tot Metals (200.7) + Cyanide (335.4)	Dis Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)	PFAS (537.1)
OW-50	BTEX, MTBE	F, Cl, NO-2, NO-3, SO4	DRO, GRO	As, Ba, Cr, Cu, Fe, Pb, Mn, Se, Ag, Hg, Zn	As, Ba, Cu, Fe, Pb, Mn, Se, Ag, Zn	1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, 1,2-EDC, Acetone, 2-Butanone, 1,1-Dichloroethane, Isopropyl benzene, 4-Isopropyl toluene, Methylene Chloride, n-Butyl benzene, n-Propyl benzene, sec-butyl benzene, tert-butyl benzene	Acenaphthene, Benzoic Acid, BEHP, Carbazole, Di-n-octylphalate, dimethylphthalate, 2-4-Dimethylphenol, Fluorene, Fluoranthene, 1-MN, 2-MN, 2-Methylphenol, 3+4-Methyphenol, Naphthalene, Phenanthrene, Phenol, Pyrene, Dibenzofuran	X	NA
OW-52								X	
OW-53								NA	
OW-54									
OW-55									
OW-56									
OW-57									
OW-58									
OW-58A									
OW-61									
OW-63									X
OW-64									NA
OW-65									

GROUP D	BTEX + MTBE (8260B)	Cations (200.7) + Anions (300.00)	Gen Organics (8015D)	Tot Metals (200.7) + Cyanide (335.4)	Dis Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)
PW-2	Benzene, Xylene	NA	DRO, GRO, MRO	As, Ba, Cu, Fe, Pb, Mn, Se, Hg, Zn	As, Ba, Fe, Mn, Se, Zn	1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Acetone, n-Propyl benzene	Benzoic acid, BEHP, 1-MN Naphthalene	X
PW-3								NA
PW-4								
OW-1	MTBE, Benzene, Ethylbenzene	F, Cl, NO-2, NO-3, SO4	GRO	As, Ba, Cd, Cr, Fe, Pb, Mn, Se, Hg, Ag, Zn	As, Ba, Cr, Cu, Fe, Pb, Mn, Se, Ag, Zn	Acetone, cis-1,2-DCE, 1,1-DCA, EDC, 1,1-DCE, Methylene Chloride	Benzoic acid	X
OW-10								X
OW-11	BTEX, MTBE	F, Cl, Br, NO-2, NO-3, SO4	NA	As, Ba, Cr, Fe, Pb, Mn, Se, Hg, Zn	As, Ba, Cu, Fe, Pb, Mn, Se, Zn	Acetone, EDC, EDB 1,2,4-Trimethylbenzene	NA	X
OW-12								X

TABLE 5-5. 2021 ANALYTE LIST
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP E	BTEX + MTBE (8260B)	Cations (200.7) + Anions (300.00)	Gen Organics (8015D)	Tot Metals (200.7) + Cyanide (335.4)	Dis Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)	Sulfide (9030B)
MKTF-01	BTEX, MTBE	F, Cl, NO-2, NO-3, SO4	DRO, GRO, MRO	As, Ba, Cr, Cu, Fe, Pb, Mn, Se, Hg, Ag, Zn	As, Ba, Cr, Cu, Fe, Pb, Mn, Se, Hg, Ag, Zn	Acetone, EDC, EDB, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, 2-Butanone, Chlorobenzene, Chloroethane, Chloroform, cis-1,2-DCE, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 1,1-DCA, 1,1-DCE, Isopropylbenzene, 4-Isopropyltoluene, 4-Methyl-2-pentanone, Methylene Chloride, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, Styrene, tert-Butylbenzene, PCE, TCE, 1,2,4-Trichlorobenzene, 1,1,1-Trichloroethane, 1,1,2-Trichloro ethane, Vinyl Chloride	Acenaphthene, Aniline, Anthracene, Benz(a)anthracene, Benzoic Acid, Benzyl Alcohol, BEHP, Butylbenzylphthalate, Carbazole, Chryzene, Di-n-octylphthalate, Dibenzofuran, 1,4-Dichlorobenzene, Diethylphthalate, Dimethylphthalate, 2,4-Dimethyl phenol, Fluorene, 2-Methylphenol, 3,4-Methylphenol, Naphthalene, Phenanthrene, Phenol, Pyrene, 2,4,6-Trichlorophenol, 1-MN, 2-MN	X	X
MKTF-02								X	X
MKTF-03								X	NA
MKTF-04								X	NA
MKTF-05								X	NA
MKTF-06								X	NA
MKTF-07								X	NA
MKTF-08								X	NA
MKTF-09								X	NA
MKTF-10								NA	NA
MKTF-11								X	NA
MKTF-12								X	NA
MKTF-13								X	NA
MKTF-14								X	NA
MKTF-15								X	NA
MKTF-16								X	NA
MKTF-17								X	NA
MKTF-18								X	NA
MKTF-19								X	NA
MKTF-20								X	NA
MKTF-21								X	NA
MKTF-22								X	NA
MKTF-23								X	X
MKTF-24								X	X
MKTF-25								X	NA
MKTF-26								X	NA
MKTF-27								X	NA
MKTF-28								X	NA
MKTF-29								X	NA
MKTF-30								X	NA
MKTF-31								X	NA
MKTF-32								X	NA
MKTF-33								X	X
MKTF-34								X	NA
MKTF-35								X	NA
MKTF-36								X	NA
MKTF-37								X	NA
MKTF-38								X	NA
MKTF-39								X	NA
MKTF-40								X	NA
MKTF-41								X	NA
MKTF-42								X	NA
MKTF-43								X	NA
MKTF-44								X	NA
MKTF-45								X	NA
MKTF-46								X	NA
MKTF-47								X	NA
MKTF-48								X	NA
MKTF-49								X	NA
MKTF-50								X	NA

TABLE 5-5. 2021 ANALYTE LIST
GALLUP REFINERY, GALLUP NEW MEXICO

GROUP F	BTEX + MTBE (8260B)	Cations (200.7) + Anions (300.00)	Gen Organics (8015D)	Tot Metals (200.7) + Cyanide (335.4)	Dis Metals (200.7)	VOC (8260B, 8011 for EDB)	SVOC (8270C)	1,4-Dioxane (8270 SIM)	Pesticides (8011)	Misc Tests
EP-2	BTEX	F, Cl, Br, NO-2, NO-3, SO4	NA	As, Ba, Cr, Cu, Fe, Pb, Mn, Ag, Hg, Se, Zn	As, Ba, Cr, Cu, Fe, Pb, Mn, Se, Ag, Zn	1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Acetone, Bromomethane, 2-Butanone, Carbon Disulfide, Chloromethane, Isopropylbenzene, 4-Isopropyltoluene, n-Butylbenzene, n-Propylbenzene, sec-Butylbenzene, 4-Methyl-2-pentanone, Methylene Chloride	Aniline, Benzoic Acid, BEHP, Chrysene, 2,4-Dimethylphenol, 1-MN, 2-MN, 2-Methylphenol, 3+4-Methylphenol, Naphthalene, 2-Nitrophenol, Phenol, Diethylphthalate, 4-Nitrophenol	NA	**EP-2 only:** 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Aldrin, alpha-BHC, beta-BHC, Chlordane, delta-BHC, Dieldrin, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin aldehyde, gamma-BHC, Heptachlor, Heptaclor expoxide, Methyoxychlor, Toxaphene	BOD (M5210B), COD (H8000), E. Coli (3014), Total Coliform (9223B)
EP-3										
EP-4										
EP-5										
EP-6										
EP-7										
EP-8										
EP-9										
EP-11										
EP-12A										
EP-12B										
STP-1 to EP-2	BTEX	TDS (2540C), TSS (2540D)	DRO, GRO, MRO	As, Ba, Cr, Cu, Fe, Pb, Mn, Se, Hg, Zn	As, Ba, Cr, Cu, Fe, Mn, Se, Zn	1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Naphthalene, 1-MN, 2-MN, Acetone, Bromomethane, 2-Butanone, Carbon Disulfide	NA	NA	NA	BOD, COD

Notes:

1,1-DCA - 1,1-Dichloroethane
1,1-DCE - 1,1-Dichloroethene
1-MN - 1-Methyl Naphthalene
2-MN - 2-Methyl Naphthalene
Ag - Silver
As - Arsenic
Ba - Barium
BAP - Benzo(a)Pyrene
BEHP - Bis(2-ethylhexyl) Phthalate
BOD - Biological Oxygen Demand
Br - Bromide
BTEX - Benzene, Ethyl Benzene, Toluene, Total Xylenes
Ca - Calcium
Cd - Cadmium
cis-1,2-DCE - cis-1,2-Dichloroethene
Cl - Chloride
CN- - Cyanide
COD - Chemical Oxygen Demand
Cr - Chromium
Cu - Copper
DRO - Diesel Range Organics
EDB - 1,2-Dibromomethane
EDC - 1,2-Dichloroethane
F - Fluoride
Fe - Iron
GRO - Gasoline Range Organics
Hg - Mercury
K - Potassium
Mg - Magnesium
Mn - Manganese
MRO - Motor Oil Range Organics
MTBE - Methyl tert-Butyl Ether
NA - Not analyzed
Na - Sodium
Ni - Nickel
NO-2 - Nitrite
NO-2 + NO-3, as N - Nitrite + Nitrate as Nitrogen
NO-3 - Nitrate as Nitrogen
NS - Not sampled
P - Phosphorus
Pb - Lead
PCE - Tetrachloroethene
Se - Selenium
SO4 - Sulfate
SVOC - Semivolatile Organic Compound
TCE - Trichloroethene
TDS - Total Dissolved Solids
TSS - Total Suspended Solids
U - Uranium
VOC - Volatile Organic Compound
Zn - Zinc

FIGURES

NOTE:
REGIONAL MAP SHOWING THE LOCATION OF THE GALLUP REFINERY (RED STAR ALONG INTERSTATE-40, 20 MILES EAST OF THE CITY OF GALLUP).

N

0 14 MI

Trihydro CORPORATION
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Laramie, Wyoming 82070
www.trihydro.com
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FIGURE 1-1

REGIONAL MAP

MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO

Drawn By: REP	Checked By: MS	Scale: 1" = 14 MI	Date: 1/8/21	File: 697-GW-REGIONMAP-2020

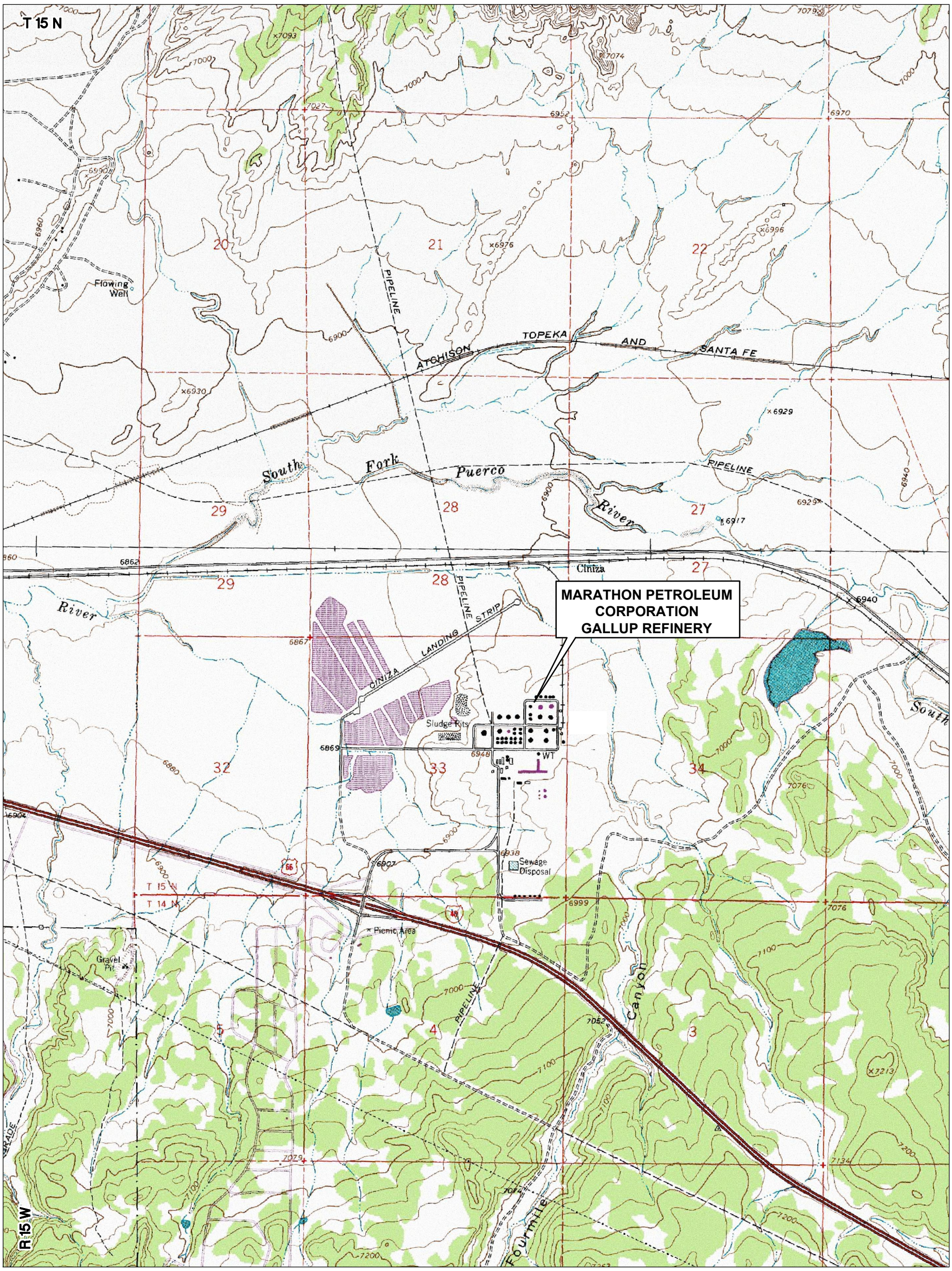

Image Cite: U.S. Geological Survey, 1:24,000–Scale 7.5 Minute Digital Raster Graphic Quadrangle, McKinley County, Publication: 2004

NOTE:

SITE LEGAL DESCRIPTION - TOWNSHIP 15 NORTH, RANGE 15 WEST, SECTION 33, LOWER QUARTER SECTION 28, AND NORTHEAST QUARTER SECTION 4.

QUADRANGLE LOCATION

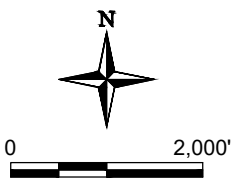

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FIGURE 1-2

TOPOGRAPHIC MAP

MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO

Drawn By: REP	Checked By: MS	Scale: 1" = 2,000'	Date: 1/8/21	File: 697-GW-TOPOMAP-2020

M:\TION\MARATHON\CADD\GALLUP_REPORTS\GW\WORKPLANS\2021_GW-WORKLAN\697-GW-TOPOMAP-2020

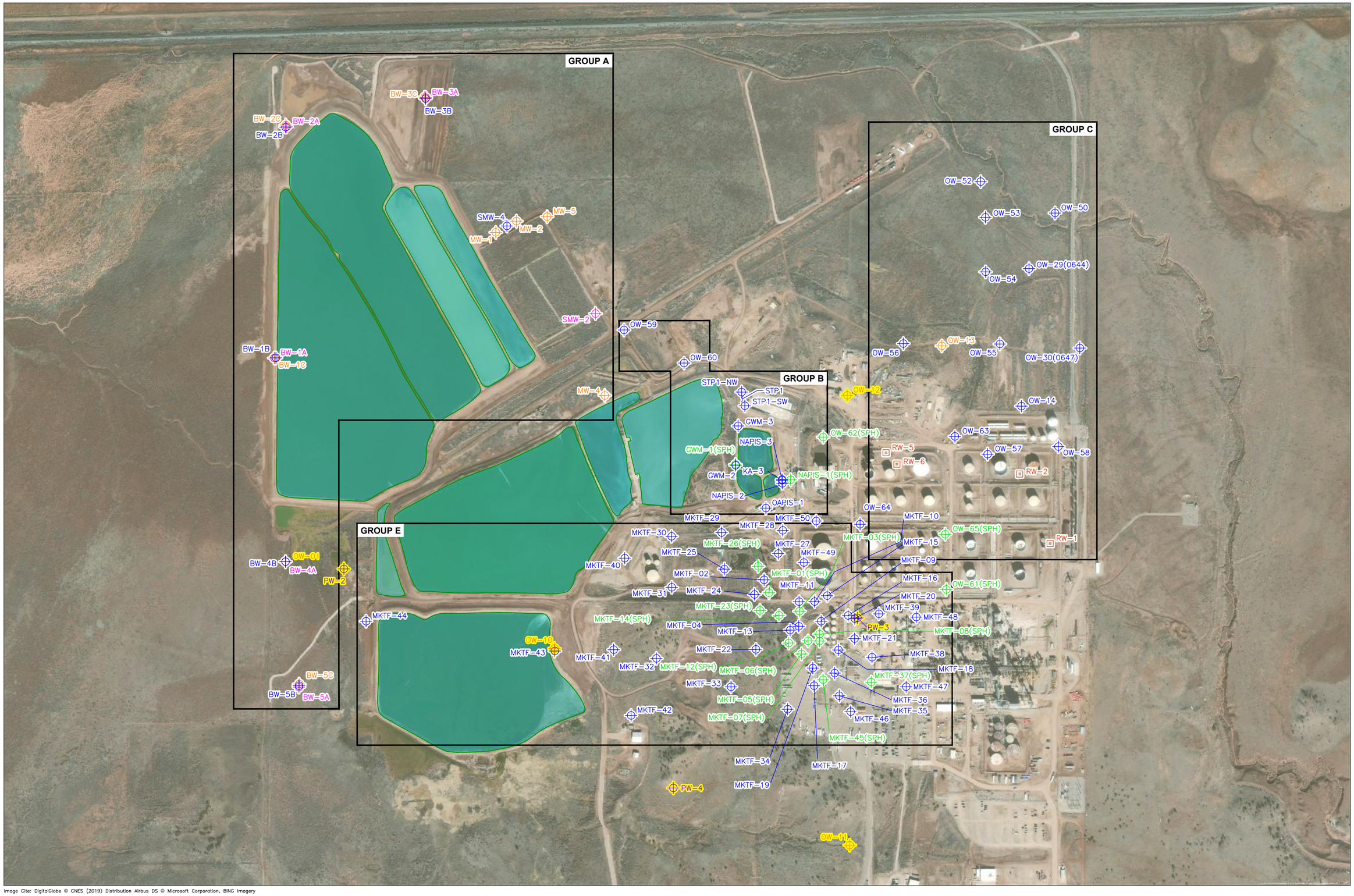

Image Cite: DigitalGlobe © CNES (2019) Distribution Airbus DS © Microsoft Corporation, BING Imagery

EXPLANATION

OW-10	SONSELA WELL AND DESIGNATION	RW-6	RECOVERY WELL AND DESIGNATION
OW-11	CHINLE/ALLUVIUM INTERFACE WELL AND DESIGNATION		GROUP F SURFACE WATER
SMW-2	UPPER SAND WELL AND DESIGNATION	SPH	SINGLE-PHASE HYDROCARBON
MKTF-45	SPH MONITORING WELL AND DESIGNATION	STP	SANITARY TREATMENT POND
PW-4	RAW WATER PRODUCTION WELL AND DESIGNATION		

NOTE:
GROUP D WELLS PW-2, PW-3, PW-4, OW-1, OW-10, OW-11, AND OW-12 ARE SHOWN IN YELLOW HALO.

N

0 400' 800'

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FIGURE 2-1

FACILITIES AND WELL GROUPS 2021

**MARATHON PETROLEUM CORP.
GALLUP REFINERY
GALLUP, NEW MEXICO**

Drawn By:	Checked By:	Scale:	Date:	File:
KEP	MS	1" = 400'	9/2/20	697-GW-FACWELLGROUPS-2020

M:\LTON\MARATHON\CAD\GALLUP_REPORTS\GW\WORKPLANS\2021_GW-WORKLAN\697-GW-FACWELLGROUPS-2020

POND 11
POND 12A
POND 12B
RCRA LTA
OCD NON-HAZARDOUS LTA
POND 7
POND 10
POND 8
POND 2
POND 3
POND 4
POND 5
POND 1
NEW API SEPARATOR
POND 6
EARTHEN BERM
SEWAGE LAGOON
POND 9
PROCESS AREA

EXPLANATION

- NEW FACILITY BOUNDARY
- EARTHEN BERM
- CONTAINED/BERMED AREA, NO STORMWATER RUN OFF DISCHARGED TO ANOTHER POINT
- AREA CONTRIBUTING FLOW TO OUTFALL 2
- DRAINS TO GRASSY AREA, DOES NOT LEAVE SITE
- NEW STORMWATER COLLECTION BASIN
- AREA CONTRIBUTING FLOW TO OUTFALL 1
- PROCESS AREA, STORMWATER DRAINS TO POND 1
- IMPERVIOUS SURFACE

NOTE:

IMPERVIOUS AREAS ARE IDENTIFIED FOR DISCHARGING AREAS ONLY. IMPERVIOUS SURFACES WITHIN AREAS WHERE STORMWATER DOES NOT DISCHARGE HAVE NOT BEEN IDENTIFIED, CONSIDERING THESE AREAS DO NOT PRODUCE REGULATED STORMWATER DISCHARGES.

N

0 600'

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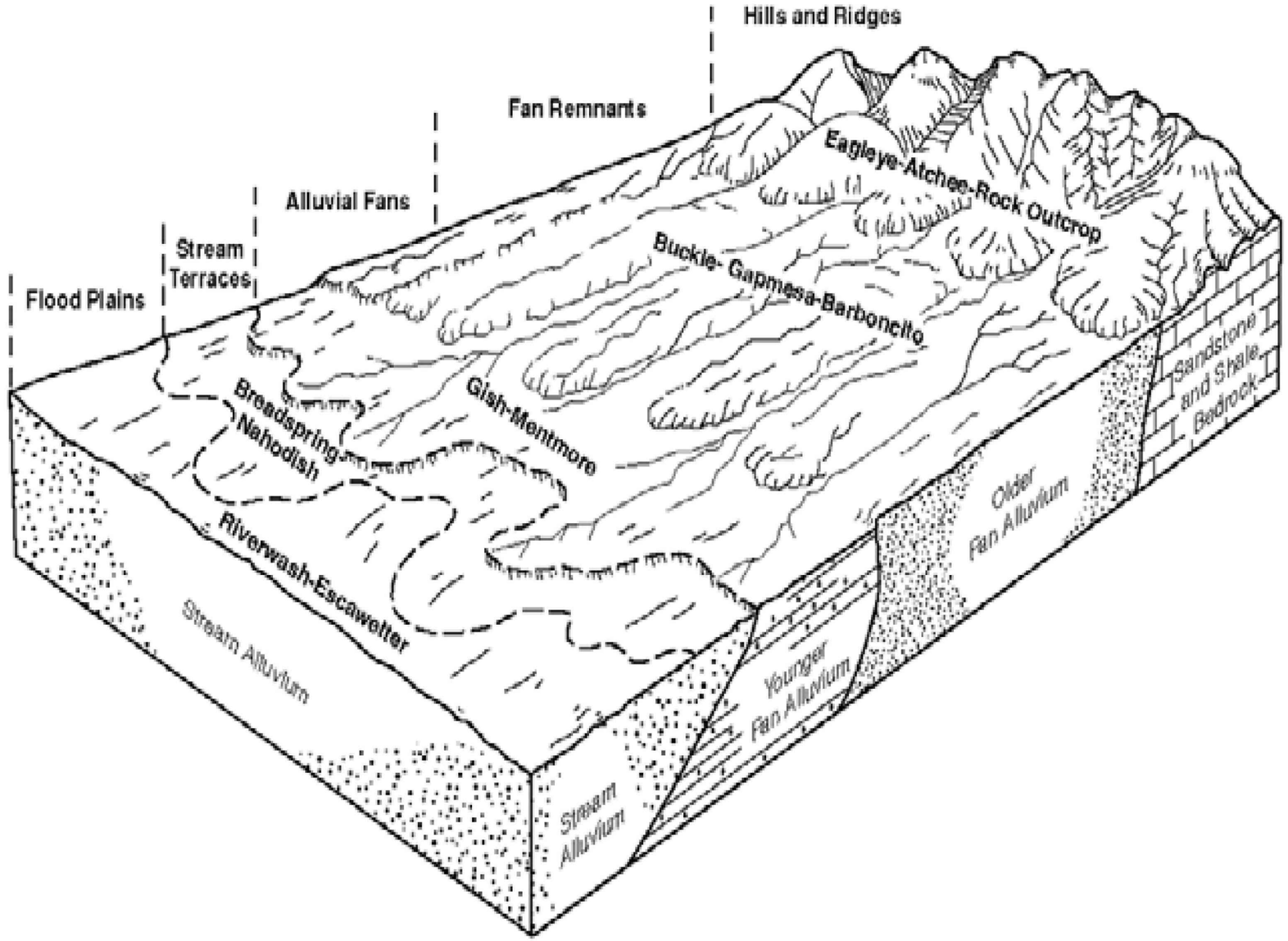
FIGURE 3-1

STORMWATER CATCH BASINS 2020

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

Drawn By: REP	Checked By: MS	Scale: 1" = 600'	Date: 1/12/21	File: 697-GW-STRMCTCHBASIN-2020



NOTE:
GENERALI□ED RELATIONSHIP OF SOILS IN THE GALLUP REFINERY AREA: FROM NRCS/USDA SOIL SURVEY OF MCKINLEY COUNTY.

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FIGURE 3-2

GENERALIZED RELATIONSHIP OF SOILS

MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO

Drawn By: REP	Checked By: MS	Scale: NONE	Date: 1/8/21	File: 697-GW-RELATIONSOILS-2020

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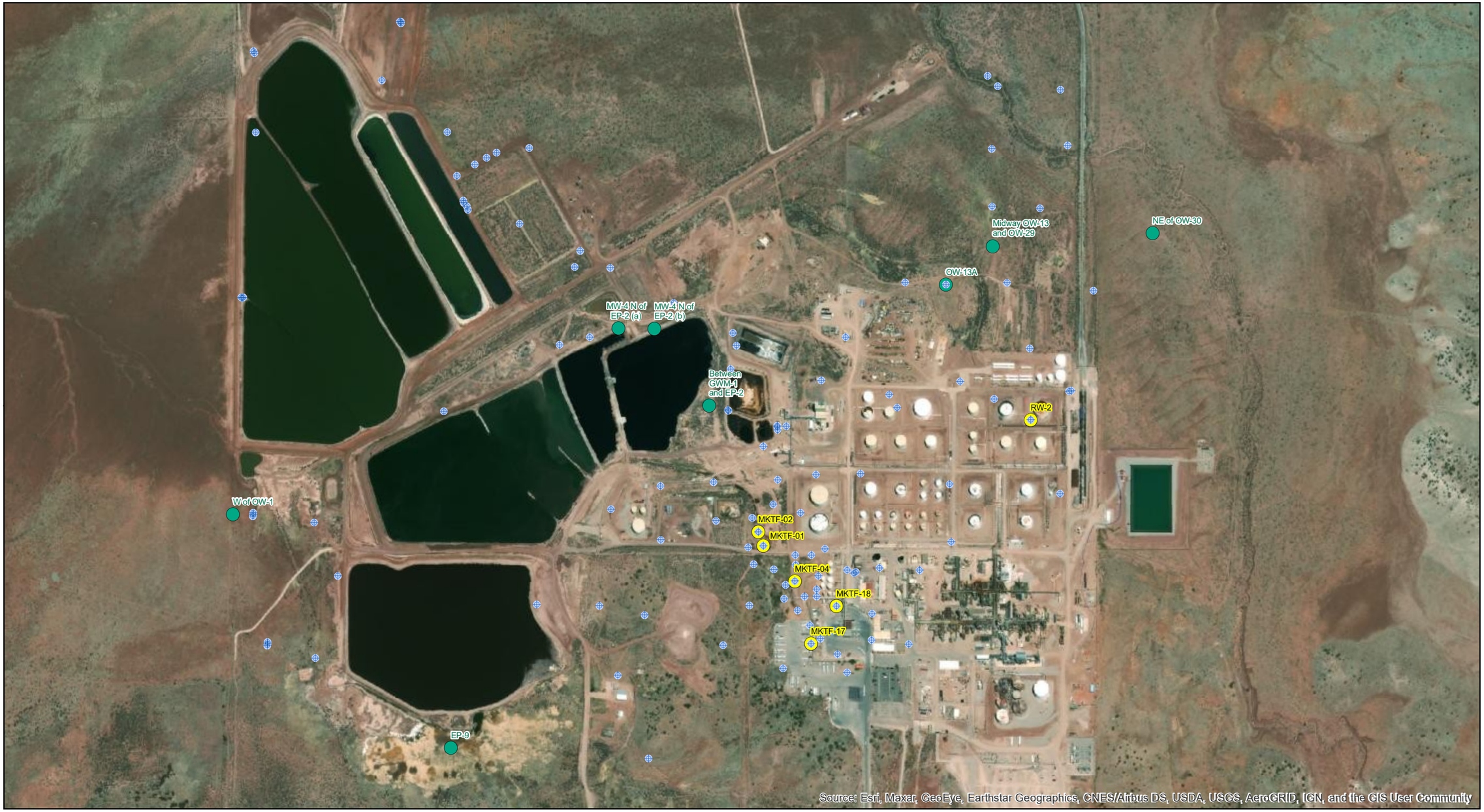

EXPLANATION

- EXISTING MONITORING WELL LOCATION
- PROPOSED REPLACEMENT OF EXISTING MONITORING WELL LOCATION
- PROPOSED NEW MONITORING WELL

N

0 600'

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FIGURE 5-1

PROPOSED WELL LOCATIONS

MARATHON PETROLEUM COMPANY
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO

Drawn By: KEJ	Checked By: CF	Scale: 1 " = 600 '	Date: 3/16/21	File: 6-1_Addnl_Well_Install2021_Fig6-1.mxd

M:\TON\MARATHON\GIS\PROJECTS\GALLUP\REFINERY\GROUNDWATER\REPORTING\WORKPLANS\GW_WORKPLAN_2021\6-1_ADDNL_WELL_INSTALL2021_FIG6-1.MXD

APPENDIX A

Appendix A
Investigation Methods

Groundwater Sampling Methodology

All monitoring wells scheduled for sampling during a groundwater sampling event will be sampled within 15 working days of the start of the monitoring and sampling event, weather permitting. Attachment A, *Gallup Refinery Field Sampling Collection and Handling Standard Procedures*, provides the basis for the investigation methods.

Well Gauging

At the beginning of each quarterly, semi-annual, or annual sampling event, monitoring and recovery wells listed in Section 5.1 of the annual "Facility Wide Groundwater Monitoring Work Plan" will be gauged to record the depth to separate phase hydrocarbon (SPH), if present, the depth to water, and the depth to bottom of the well. The gauging will be performed using an oil/water interface probe attached to a measuring tape capable of recording measurements to the nearest 0.01 foot (ft). Each well is field verified with the well number on the well casing or adjacent to the well to ensure that samples are collected at the correct well location. Wells have a permanent marked reference point on the well casing from which groundwater levels and well depths are measured.

Gauging measurements will be recorded on a field gauging form. Data obtained from the gauging will be reported in the annual groundwater monitoring report. The data will be used to develop groundwater contour maps and SPH thickness isopleths which will be included in the annual report.

Figure 1 depicts the potentiometric surface for the Sonsela aquifer and Figure 2 shows the potentiometric surface for the Alluvium/Chinle Group Interface zone. Attachment B-1 is a summary of the fluid level data collected in 2020 for the non-Marketing Tank Farm (MKTF) wells. Attachment B-2 is a summary of the fluid level data collected in 2020 for the MKTF wells. Attachments B-3 and B-4 include well information for the non-MKTF wells and MKTF wells, respectively. The well information consists of the survey data, screened intervals, and stratigraphic unit in which the wells are screened. Attachment B-5 includes well information for artesian wells also known as Process or Production wells. Information provided for the artesian wells was gathered from well boring logs. These wells are encased; therefore, measurement for depth to bottom was not field verified.

Well Purging

Each well will be purged by removing groundwater prior to sampling to ensure that formation water is being sampled. Generally, at least three well volumes (or a minimum of two if the well has low recharge rate) will be purged from each well prior to sampling. Field water quality parameters measured during purging are pH, electrical conductivity, temperature, dissolved oxygen (DO), and oxidation-reduction potential (ORP). One or more parameters must stabilize to within 10 percent (%) for a minimum of three consecutive measurements before collecting groundwater samples using low-flow sampling techniques. When purging wells using a bailer, bailing will be considered complete when three well volumes have been removed from the wells. Field parameters will be measured and recorded while bailing, with the understanding that the process of hand-bailing may prevent stabilization of field parameters. Once purging requirements are met, the well is ready for sample collection. The volume of groundwater purged, the instruments used, and the readings obtained at each interval will be recorded on the field-monitoring log. Well purging and sampling will be performed using 1.5-inch (in) x 3 ft and/or 3-in x 3-ft disposable polyethylene bailers for groundwater sampling and/or appropriately decontaminated portable sampling pumps.

If a well is pumped or bailed dry before two or three well volumes can be evacuated, samples will be collected after sufficient time has elapsed for an adequate volume of water to accumulate for the sampling event. The first sample will be tested for pH, temperature, specific conductivity, DO, and ORP. The well will be retested for pH, temperature, specific conductivity, DO, and ORP after sampling as a measure of purging efficiency and as a check on the stability of the water samples over time. All well evacuation information will be recorded in a logbook.

All wells are purged and sampled with dedicated or disposable equipment. Wells MW-1, MW-2, MW-4, MW-5, BW-1C, BW-2A, BW-2B, BW-3B, BW-4B, BW-5B, BW-5C, SMW-4, OW-1, OW-10, OW-13, OW-14, OW-29, and OW-30 are each equipped with a dedicated electrical pump. Wells SMW-2, OW-11, OW-12, OW-50, and OW-52 are purged and sampled using a portable Grundfos pump with dedicated tubing. The remaining wells are hand-bailed if the presence of water is detected. If SPH is detected in any of these wells, no samples will be collected. Purged well water is collected in 55-gallon drums, buckets, or totes and drained to the process sewer upstream of the New American Petroleum Institute Separator for treatment in the wastewater treatment plant.

Groundwater Sample Collection

Groundwater samples will be obtained from each well within 24 hours of the completion of well purging or as soon as the well sufficiently recharges. 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.

Groundwater samples are collected and analyzed for both total and dissolved metals. Groundwater samples obtained for dissolved metals analysis will be filtered through disposable filters with a 0.45-micrometer mesh size.

Sample Handling

All sample containers are supplied by the contracted analytical laboratory and shipped to the Refinery in sealed coolers. Chemical preservation is also provided by the laboratory through pre-preserved bottle ware. Collection of groundwater samples are in the order of most volatile to least volatile, such as: volatile organic compounds (VOCs), semivolatile organic compounds, metals, phenols, cyanide, sulfate, chloride, nitrate, and nitrite. At a minimum, the following procedures will be used when collecting samples:

- Neoprene, nitrile, or other protective gloves will be worn when collecting samples for safety and sampling purity. New disposable gloves will be used to collect each sample.
- All samples collected for chemical analysis will be transferred into clean sample containers supplied by the analytical laboratory. The sample containers will be clearly marked. Sample container volumes and preservation methods will be in accordance with the most recent standard United States Environmental Protection Agency (USEPA) and industry accepted practices for use by accredited analytical laboratories. Sufficient sample volume will be obtained for the laboratory to complete the method-specific quality control (QC) analyses on a laboratory-batch basis.
- Sample labels and documentation will be completed for each sample.

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 in "Sample Custody" section of this Appendix, will be followed for all samples collected. All samples will be submitted to the laboratory to conduct the analyses within the method holding times.

General Well Sampling Procedures

Sample bottles and labels will be separated into plastic bags for each well to be sampled. The plastic bags, with the sample bottles, will be placed in an ice chest to take into the field. A field notebook and sample log will be used to document weather conditions and sample date and time. The label will be complete with location, date, time, analysis, preservative, and the name of the sampler. For low-flow sampling, converter speed will be adjusted prior to filling bottles. Sample labels will be affixed, and bottles will be filled according to lab instructions. Bottles with septa lids will be used for samples intended for VOC analysis. VOC bottles will be filled to minimize headspace.

Any reusable equipment that is not dedicated to a specific well will be decontaminated. Completed samples will be refrigerated until they are shipped to the laboratory. Appropriate shipping methods will be arranged to accommodate holding times. Sampling equipment and supplies will be checked, and proper inventory verified prior to sampling. Before departing, quality assurance (QA)/QC requirements will be checked to ensure there are additional equipment and supplies to meet additional requirements.

Surface Water Sample Collection

At the evaporation ponds, samples will be collected as a grab sample at the pond edge near the inlets. This location will be noted in the field notebooks. The sampler will avoid disturbing sediment and gently allow the sample container to fill making sure that undue disturbance does not allow volatile constituents to be lost. The sample bottle will be used for the sample collection in a shallow location near the bank. If a separate bottle and/or bailer are used to refill the sample container, this will be noted in the field log books. The decision to use a separate bottle/bailer will be made, if at all, by the sampler and the reasons will be noted in the field log books.

Decontamination Procedures

The objective of the decontamination procedures is to minimize the potential for cross-contamination. Most field equipment used for groundwater sampling will be disposable and, therefore, not require decontamination. To prevent cross-contamination, field equipment that comes into contact with water

or soil will be decontaminated between each sampling location. The decontamination procedure will consist of washing the equipment with a non-phosphate detergent solution (e.g., Fantastik™, Liqui-Nox®), followed by two rinses of distilled water, and air dried.

Decontamination water and rinsate will be contained and disposed of the same way as purge water, as described in the "Well Purging" section of this Appendix. Decontamination procedures and the cleaning agents used will be documented in the daily field log.

Documentation of Field Activities

Daily field activities, including observations and field procedures, will be recorded using indelible ink on field sampling forms. The original field forms will be maintained at the Refinery. Completed forms will be maintained in a bound and sequentially numbered field file for reference during field activities. The daily record of field activities will include the following information:

- Well identification
- Date
- Start and finish sampling time
- Field team members, including visitors
- Weather conditions
- Daily activities and times conducted
- Observations
- Record of samples collected with sample designations
- Photo log (if needed)
- Field monitoring data, including health and safety monitoring (if needed)
- Equipment used and calibration records, if appropriate
- List of additional data sheets and maps completed
- An inventory of the waste generated and the method of storage or disposal
- Signature of personnel completing the field record

Sample Custody

All samples collected for analysis will be recorded in the field report or data sheets. Chain-of-custody forms will be completed at the end of each sampling day, prior to the transfer of samples off site and will

accompany the samples during shipment to the laboratory. A signed and dated custody seal will be affixed to the lid of the shipping container. Upon receipt of the samples at the laboratory, the custody seals will be broken, the chain-of-custody (COC) form will be signed as received by the laboratory, and the conditions of the samples will be recorded on the form. The original COC form will remain with the laboratory; copies will be sent to the Refinery. The Refinery will maintain copies of all COC forms generated as part of sampling activities. Copies of the COC records will be included with all draft and final laboratory reports submitted to the New Mexico Environment Department (NMED) and Oil Conservation Division.

Shipping Procedures

The following shipping procedures will be performed during each sampling event:

- Individual sample containers will be packed to prevent breakage and transported in a sealed cooler with ice or other suitable coolant or other USEPA 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.
- Each cooler or other container will be delivered directly to the analytical laboratory.
- Glass bottles will be separated in the shipping container by cushioning material to prevent breakage.
- Plastic containers will be protected from possible puncture during shipping using cushioning material.
- The COC form and sample request form will be shipped inside the sealed storage container to be delivered to the laboratory.
- Signed and dated COC seals will be applied to each cooler prior to transport of samples from the site.

Analytical Methods

Groundwater and surface water samples collected during the monitoring events will be analyzed using the specified analytical methods and for the constituents discussed in Section 5.3 of the annual "Facility Wide Groundwater Monitoring Work Plan."

Quality Assurance Procedures

Contract analytical laboratories will maintain internal QA programs in accordance with USEPA and industry accepted practices and procedures. At a minimum, the laboratories will use a combination of standards, blanks, surrogates, duplicates, matrix spike/matrix spike duplicates (MS/MSD), blank spike/blank spike duplicates (BS/BSD), and laboratory control samples to demonstrate analytical QA/QC. The laboratories will establish control limits for individual chemicals or groups of chemicals based on the long-term performance of the test methods. In addition, the laboratories will establish internal QA/QC that meets USEPA's laboratory certification requirements. The specific procedures to be completed are identified in the following sections.

Equipment Calibration Procedures and Frequency

The laboratory's equipment calibration procedures, calibration frequency, and calibration standards will be in accordance with the USEPA test methodology requirements and documented in the laboratory's QA and Standard Operating Procedures manuals. All instruments and equipment used by the laboratory will be operated, calibrated, and maintained according to the manufacturers' guidelines and recommendations. Operation, calibration, and maintenance will be performed by personnel who have been properly trained in these procedures. A routine schedule and record of instrument calibration and maintenance will be kept on file at the laboratory.

Field QA/QC Samples

Field duplicates, field blanks, equipment rinsate blanks (if required), reagent blanks, and trip blanks may be obtained for QA during sampling activities. The samples will be handled as described in the "Laboratory QA/QC Samples" section of this Appendix.

Field duplicates will consist of two samples either split from the same sample device or collected sequentially. Field duplicate groundwater samples will be collected at a frequency of one per ten regular samples and will be analyzed for the full set of analyses used for the regular sample collected. At a minimum, one duplicate sample per sampling day will be obtained.

Field blanks shall be obtained at a frequency of no less than one per day per site or unit. Field blanks shall be generated by filling sample containers in the field with deionized water and submitting the samples,

along with the groundwater or surface water samples, to the analytical laboratory for the appropriate analyses.

Currently, all samples are collected using dedicated or disposable equipment; therefore, equipment blanks will not be collected. However, if non-dedicated or non-disposable equipment are used, equipment blanks shall be obtained for chemical analysis at the rate of 5% but no fewer than one rinsate blank per sampling day. Rinsate samples shall be generated by rinsing deionized water through decontaminated sampling equipment. The rinsate sample then shall be placed in the appropriate sample container and submitted with the groundwater or surface water samples to the analytical laboratory for the appropriate analyses.

Reagent blanks shall be obtained at a frequency of 10% but no fewer than one per day per unit if chemical analyses requiring the use of chemical reagents are conducted in the field during water sampling activities.

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 placed in an appropriate sample container. Trip blanks will be analyzed at a frequency of one for each shipping container of samples.

Laboratory QA/QC Samples

Analytical procedures will be evaluated by analyzing reagent or method blanks, surrogates, MS/MSDs, BS/BSDs and/or laboratory duplicates, as appropriate for each method. The laboratory QA/QC samples and frequency of analysis to be completed will be documented in the cited USEPA or other test methodologies. At a minimum, the laboratory will analyze laboratory blanks, MS/MSDs, BS/BSDs, and laboratory duplicates at a frequency of one in twenty for all batch runs requiring USEPA test methods and a frequency of one in ten for non-USEPA test methods. Laboratory batch QA/QC samples will be project specific.

Laboratory Deliverables

The analytical data package will be prepared in accordance with USEPA-established Level II analytical support protocol which will include:

- Transmittal letter, including information about the receipt of samples, the testing methodology performed, any deviations from the required procedures, any problems encountered in the analysis of the samples, any data quality exceptions, and any corrective actions taken by the laboratory relative to the quality of the data contained in the report;
- Sample analytical results, including sampling date; date of sample extraction or preparation; date of sample analysis; dilution factors and test method identification; water sample results in consistent units (milligrams per liter or micrograms per liter); and detection limits for undetected analytes. Results will be reported for all field samples, including field duplicates and blanks, submitted for analysis
- Method blank results, including reporting limits for undetected analytes
- Surrogate recovery results and corresponding control limits for samples and method blanks (organic analyses only)
- Laboratory duplicate results for inorganic analyses, including relative percent differences and corresponding control limits
- Sample COC documentation
- Holding times and conditions
- Conformance with required analytical protocol(s)
- Instrument calibration
- Blanks
- Detection/quantitative limits
- Recoveries of surrogates and/or MS/MSDs
- Variability for duplicate analyses
- Completeness
- Data report formats

Data deliverables provided by the laboratory that include analysis of organic compounds will also include the following:

- A cover letter referencing the procedure used and discussing any analytical problems, deviations, and modifications, including signature from authority representative certifying to the quality and authenticity of data as reported
- A report of sample collection, extraction, and analysis dates, including sample holding conditions

- Tabulated results for samples in units as specified, including data qualification in conformance with USEPA protocol, and definition of data descriptor codes
- Final extract volumes (and dilutions required), sample size, wet-to-dry weight ratios, and instrument practical detection/quantitative limit for each analyte
- Analyte concentrations with reporting units identified, including data qualification and a description of the qualifiers
- Quantification of analytes in all blank analyses, as well as identification of method blank associated with each sample
- Recovery assessments and a replicate sample summary, including all surrogate spike recovery data with spike levels/concentrations for each sample and all MS/MSD results (recoveries and spike amounts)

Review of Field and Laboratory QA/QC Data

The sample data, field, and laboratory QA/QC results will be evaluated for acceptability with respect to the data quality objectives (DQOs). Each group of samples will be compared with the DQOs and evaluated using data validation guidelines contained in USEPA guidance documents: "Guidance Document for the Assessment of RCRA Environmental Data Quality, National Functional Guidelines for Organic Data Review," "Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses," and the most recent version of SW-846, and industry-accepted QA/QC methods and procedures.

The laboratory will notify the Refinery Project Manager of data quality exceptions within one business day of identifying the data quality exception to allow for sample re-analysis, if possible. The Refinery Project Manager will contact NMED within one business day of receipt of laboratory notification of data quality exceptions to discuss the implementations and determine whether the data will still be considered acceptable, or if sample re-analysis or re-sampling is necessary.

Blanks, Field Duplicates, Reporting Limits and Holding Times

Blanks

The analytical results of field blanks and field rinsate blanks will be reviewed to evaluate the adequacy of the equipment decontamination procedures and the possibility of cross-contamination caused by decontamination of sampling equipment. The analytical results of trip blanks will be reviewed to evaluate the possibility for contamination resulting from the laboratory-prepared sample containers or the sample

transport containers. The analytical results of laboratory blanks will be reviewed to evaluate the possibility of contamination caused by the analytical procedures. If constituents are detected in field or laboratory blanks, the sample data will be qualified or rejected, as appropriate. Methods and reasoning for the decision to qualify or reject sample data will be discussed in the annual groundwater report. Furthermore, any impact to data quality and/or need to adjust methods will be addressed in the report.

Field Duplicates

Field duplicates will consist of two samples either split from the same sample device or collected sequentially. The analytical data quality objectives for precision shall be used for water duplicates.

Method Reporting Limits

Method reporting limits for sample analyses will be established at the lowest level practicable for the method and analyte concentrations and will not exceed groundwater or surface water cleanup standards and screening levels. Detection limits that exceed established standards or screening levels and are reported as "not detected" will be considered data quality exceptions and an explanation for its acceptability for use will be provided.

Holding Times

Per USEPA protocol the sampling, extraction, and analysis dates will be reviewed to confirm that extraction and analyses were completed within the recommended holding times. Appropriate data qualifiers will be noted if holding times are exceeded.

Representativeness and Comparability

Representativeness

Representativeness is a qualitative parameter related to the degree to which the sample data represent the relevant specific characteristics of the media sampled. Procedures will be implemented to assure representative samples are collected and analyzed, such as repeated measurements of the same parameter at the same location over several distinct sampling events. Any procedures or variations that may affect the collection or analysis of representative samples will be noted and the data will be qualified.

Comparability

Comparability is a qualitative parameter related to whether similar sample data can be compared. To assure comparability, analytical results will be reported in appropriate units for comparison with other data (past studies, comparable sites, screening levels, and cleanup standards), and standard collection and analytical procedures will be implemented. Any procedure or variation that may affect comparability will be noted and the data will be qualified.

Laboratory Reporting, Documentation, Data Reduction, and Corrective Action

Upon receipt of each laboratory data package, data will be evaluated against the criteria outlined in the previous sections. Any deviation from the established criteria will be noted and the data will be qualified. A full review and discussion of analytical data QA/QC and all data qualifiers will be submitted as appendices or attachments to the groundwater monitoring reports. Data validation procedures for all samples will include checking the following, when appropriate:

- Holding times
- Detection limits
- Field equipment rinsate blanks
- Field blanks
- Field duplicates
- Trip blanks
- Reagent blanks
- Laboratory duplicates
- Laboratory blanks
- Laboratory MS/MSD
- Laboratory BS/BSD
- Surrogate recoveries

If significant quality assurance problems are encountered, appropriate corrective action will be implemented. All corrective action will be reported, and the corrected data will be qualified.

FIGURES

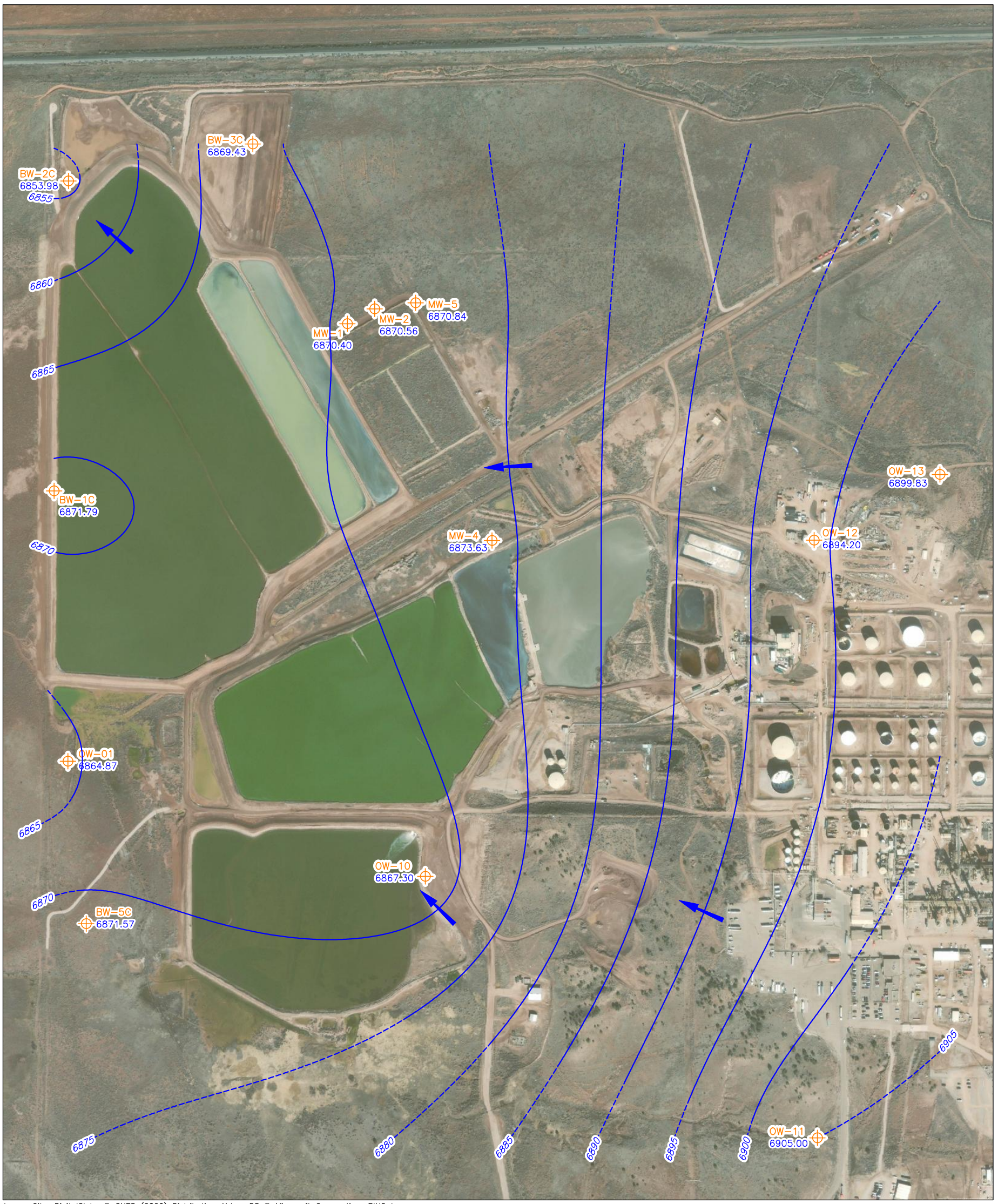

Image Cite: DigitalGlobe © CNES (2020) Distribution Airbus DS © Microsoft Corporation, BING Imagery

EXPLANATION

OW-10 6867.30 — SONSELA WELL AND DESIGNATION (SHOWING GROUNDWATER ELEVATION IN FT AMSL, SEPTEMBER AND DECEMBER 2020)

6880 — LINE OF EQUAL ELEVATION OF POTENTIOMETRIC SURFACE (FT AMSL, DASHED WHERE INFERRED)

ESTIMATED GROUNDWATER FLOW DIRECTION

FT AMSL — FEET ABOVE MEAN SEA LEVEL

N

0 500'

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FIGURE 1

SONSELA WATER ELEVATION MAP 2020

MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO

Drawn By: REP	Checked By: MS	Scale: 1" = 500'	Date: 1/8/21	File: 697-GW-S-WTRELEVMAP-2020

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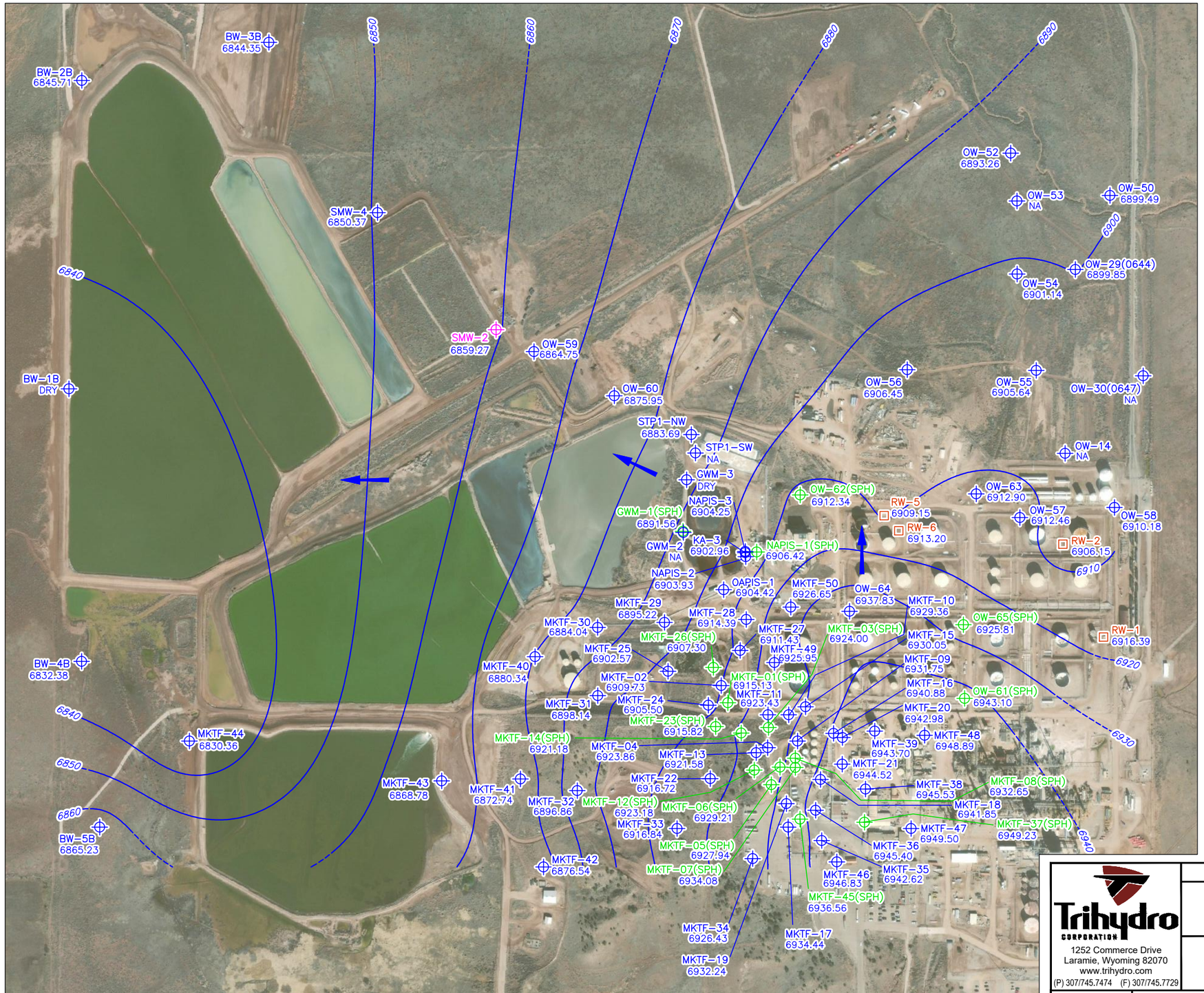

EXPLANATION

OW-52 6893.26	CHINLE/ALLUVIUM INTERFACE WELL AND DESIGNATION (SHOWING GROUNDWATER ELEVATION IN FT AMSL, DECEMBER 2020)
SMW-2 6859.27	UPPER SAND WELL AND DESIGNATION (SHOWING GROUNDWATER ELEVATION IN FT AMSL, DECEMBER 2020)
OW-62(SPH) 6912.34	SPH MONITORING WELL AND DESIGNATION (SHOWING GROUNDWATER ELEVATION IN FT AMSL,DECEMBER 2020)
RW-5 6909.15	RECOVERY WELL AND DESIGNATION (SHOWING GROUNDWATER ELEVATION IN FT AMSL, DECEMBER 2020)
6900	LINE OF EQUAL ELEVATION OF POTENTIOMETRIC SURFACE (FT AMSL, DASHED WHERE INFERRED)
	ESTIMATED GROUNDWATER FLOW DIRECTION
FT AMSL	FEET ABOVE MEAN SEA LEVEL
SPH	SINGLE-PHASE HYDROCARBON

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FIGURE 2

ALLUVIUM / CHINLE GROUP INTERFACE WATER ELEVATION MAP 2020

MARATHON PETROLEUM CORP.
GALLUP REFINING DIVISION
GALLUP, NEW MEXICO

Drawn By: REP	Checked By: MS	Scale: 1" = 500'	Date: 1/8/21	File: 697-GW-AC-WTRELEVMAP-2020

ATTACHMENTS

Attachment A
Gallup Refinery Field Sampling Collection and Handling Standard Procedures

Field Data Collection: Elevation and Purging

All facility monitoring and recovery wells are gauged as required throughout the year. The Gallup Refinery (Refinery) does not have any recovery well pumps that need to be shut off and removed prior to water elevation measurements. There are groundwater recovery pumps installed in wells RW-1, RW-2, RW-5, RW-6, OW-14, OW-58, OW-30, and OW-55, but they are inactive at this time. If Marathon Petroleum Company resumes recovery operations with these pumps, they must halt the pumping operation at least 48 hours prior to conducting depth measurements in these wells.

Each well is field verified with the well number on the well casing or adjacent to the well to ensure that samples are collected from the correct well location. Wells also have a permanent marked reference point on the well casing from which ground water levels and well depths are measured. The portable pump intake is lowered to the midpoint of the listed screened interval for each specific well using the markings identified on the pump hose, which are set at 1-foot (ft) intervals. In wells with dedicated pumps, the pumps have been installed at the midpoint of the screened interval.

All water/product levels are measured to an accuracy of the nearest 0.01 ft using an oil/water interface meter. Water levels and well depths in the deeper wells are gauged with an electric water depth meter. After determining water levels, well volumes are calculated using the appropriate conversion factors for a given well based on its internal diameter. Volume is equal to the height of the liquid column times the internal cross-sectional area of the well.

Generally, at least three well volumes (or a minimum of two if the well has low recharge) are purged from each well prior to sampling. Field water quality parameters measured during purging are pH, electrical conductivity, temperature, dissolved oxygen (DO), and oxidation-reduction potential (ORP). One or more parameters must stabilize to within 10% for a minimum of three consecutive measurements before collection of ground water samples utilizing low-flow sampling techniques. When purging wells using a bailer, bailing will be considered complete when 3 well volumes have been removed from the wells. Field

parameters will be measured and recorded while bailing, with the understanding that the process of hand-bailing may prevent stabilization of field parameters.

Before sample collection can begin, the water collected from each well must be fresh aquifer water. Well evacuation replaces stagnant well water with fresh aquifer water. The water level in the well, total depth of well and thickness of floating product (if any) will be measured using an oil/water interface meter. If any product is present, regardless of thickness, a groundwater sample will not be obtained.

If a well is pumped or bailed dry before two or three well volumes can be evacuated, it requires only that sufficient time elapse for an adequate volume of water to accumulate for the sampling event. The first sample will be tested for pH, temperature, specific conductivity and DO. The well will be retested for pH, temperature, specific conductivity and DO after sampling as a measure of purging efficiency and as a check on the stability of the water samples over time. All well evacuation information will be recorded in a log-book.

Wells MW-1, MW-2, MW-4, MW-5, BW-1C, BW-2A, BW-2B, BW-3B, BW-4B, BW-5B, BW-5C, SMW-4, OW-1, OW-10, OW-13, OW-14, OW-29, and OW-30 are each equipped with a dedicated electrical pump. Wells SMW-2, OW-11, OW-12, OW-50, and OW-52 are purged and sampled using a portable Grundfos pump. The remaining wells are hand-bailed if the presence of water is detected. If SPH is detected in any of these wells, no samples will be collected.

Purged well water from wells is collected in 55-gallon drums, buckets, or totes and drained to the process sewer upstream of the NAPIS. The water is treated in the refinery's wastewater treatment system.

Sampling Equipment at Refinery

The following sampling equipment is maintained at the Refinery and used by the sampling personnel:

- Heron Instruments 100 ft. DipperT electric water depth tape complying with US GGG-T-106E, EEC Class II.
- Pall Corporation Acro 50A 0.45-micron disposable filter used with 60 ml disposable syringes for filtering water in the field.

- YSI pH/Conductivity meter Model 63, calibrated with a one-point, two-point, or three-point calibration procedure using pH standards of 7, 4 and 10 (measures pH, temperature, conductivity, TDS, salinity, DO, and ORP)
- IQ Scientific Instruments (measures pH, temperature, conductivity, TDS, salinity, DO, and ORP), Model IQ1806LP.
- Grundfos 2-in pumps with Grundfos 115-volt AC–to-DC converter.
- WaterMark Oil Water Interface Meter (100 ft), Model 101L/SMOIL, S/N 01-5509.

Calibration and maintenance procedures will be performed according to the manufacturer's specifications. In the event an instrument becomes inoperable, a similar instrument will be used.

Order of Collection

Samples will be collected in the order listed below:

Parameter	**Bottle Type**
VOC	40 milliliter (mL) VOA vials (HCl)
TPH	40 mL VOA vials (HCl)
TPH	250 mL glass amber bottles
EDB AND EDC	40 mL VOA vials ($Na_2S_2O_3$)
SVOC	1 liter glass amber bottle
Total Metals	250 mL plastic bottle (HNO_3)
Dissolved Metals	125 mL plastic bottle (HNO_3)
Major Cations/Anions	125 mL plastic bottle (HNO_3)
Major Cations/Anions	125 mL plastic bottle (HNO_3)
Major Cations/Anions	125 mL plastic bottle (HNO_3)
BOD	1 liter plastic bottle
TDS	500 mL plastic bottle
COD	500 mL plastic bottle (H_2SO_4)
Cyanide	500 mL plastic bottle (NaOH)
Pesticides	1 liter glass amber bottle
E-Coli	100 mL plastic bottle

*Pre-filtration bottle for dissolved metals which is subsequently filtered in the field and transferred to a pint plastic bottle with nitric acid (HNO_3) preservative.

Filtration

Ground water samples are filtered prior to dissolve metals analysis. For dissolved metals, sample water is poured into a jar and then extracted with a syringe. The syringe is then used to force the sample water through a 0.45-micron pore filter into the proper sample bottle to collect dissolved metals samples. Filtration must be performed within 2 hours of sample collection. Pour the filtrate into a sample bottle containing HNO_3 preservative.

For samples destined for total metals analysis, do not filter the sample, and preserve with HNO_3 to pH <2 in the field.

Sampling personnel will carry a cell phone when gathering ground water and other water samples. While sampling procedures are generally well known and the appropriate sample bottles are ordered to match each sampling event, occasional questions do arise from unforeseen circumstances which may develop during sampling. At such times, sampling personnel contact Hall Environmental Analytical Laboratory to verify that sampling is correctly performed. Examples would be if a well were to run dry short of filling the last sample bottle or to determine if there is enough water for sample analysis.

Sample Handling Procedures

At a minimum, the following procedures will be used when collecting samples:

- Neoprene, nitrile, or other protective gloves will be worn when collecting samples. New disposable gloves will be used to collect each sample.
- All samples collected for chemical analysis will be transferred into clean sample containers supplied by the analytical laboratory. The sample container will be clearly marked. 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.
- Sample labels and documentation will be completed for each sample.

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 in Section 4.2.1 of this Plan, will be followed for all samples collected. All samples

will be submitted to the laboratory to allow the laboratory to conduct the analyses within the method holding times.

General Well Sampling Procedures

For safety, protection, and sampling purity, rubber gloves or disposable nitrile gloves will be worn and changed between each activity.

Sample bottles and labels will be separated into plastic bags for each well to be sampled. The plastic bags holding the sample bottles, will be placed in an ice chest to take into the field. A field notebook and sample log will be used to document weather conditions and sample date and time. The label will be completed with location, date, time, analysis, preservative, and the name of the sampler. For low-flow sampling, converter speed will be adjusted prior to filling bottles. Sample labels will be affixed and bottles will be filled according to lab instructions. Bottles with septa lids will be used for samples intended for VOC analysis. VOC bottles will be filled to the neck and a final amount of water will be added using the cap to form meniscus before screwing the lid onto the sample bottle. To ensure a proper sample has been collected, the bottles will be turned upside down and examined for bubbles, if bubbles are detected in the vial, the collection procedure will be repeated. If no bubbles are present, the lid will be secured, and the bottles will be packed in bubble wrap and placed in the cooler until sampling is completed.

Any reusable equipment that is not dedicated to a specific well will be decontaminated. Completed samples will be refrigerated until they are shipped to the laboratory. Appropriate shipping methods will be arranged to accommodate holding times. Sampling equipment and supplies will be checked, and proper inventory verified prior to sampling. Before departing, QA/QC requirements will be checked to ensure that there are equipment and supplies to fulfil the additional requirements.

Surface Water Sample Collection

At the evaporation ponds, samples will be collected as a grab sample at the pond edge near the inlets. This location will be noted in the field notebooks. The sampler will avoid disturbing sediment and gently allow the sample container to fill, making sure that undue disturbance does not allow volatile contaminants to be lost. The sample bottle will be used for the sample collection in a shallow location near the bank. If a separate bottle and/or bailer are used to refill the sample container, this will be noted

in the field log books. The decision to use a separate bottle/bailer will be made, if at all, by the sampler and the reasons for doing so will be noted in the field log book.

Upon arrival at the field site, the sampler will set out safety equipment such as traffic cones and signs (if required). The vehicle will be parked at a sufficient distance away so as to prevent sample contamination from emissions. Appropriate sample containers and gloves must be used for the type of analyses to be performed.

Decontamination Procedures

The objective of the decontamination procedures is to minimize the potential for cross-contamination. Most field equipment used for ground water sampling will be disposable and, therefore, not require decontamination. To prevent cross-contamination, field equipment that comes into contact with water or soil will be decontaminated between each sampling location. The decontamination procedure will consist of washing the equipment with a non-phosphate detergent solution (e.g., Fantastik™, Liqui-Nox®), followed by two rinses of distilled water, and air dried.

Decontamination water and rinsate will be contained and disposed of the same way as purge water, as described in Section 4.2. Decontamination procedures and the cleaning agents used will be documented in the daily field log.

Field Equipment Calibration Procedures

Field equipment requiring calibration will be calibrated to known standards, in accordance with the manufacturers' recommended schedules and procedures. Calibration checks will be conducted daily, 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. A properly calibrated replacement instrument will be used in the interim. Instrumentation used during sampling events will be recorded in the daily field logs.

Collection and Management of Investigation Derived Waste

Investigation derived waste generated during each groundwater sampling event may include purge water, decontamination water, excess sample material, and disposable sampling equipment. All water

from all wells generated during sampling and decontamination activities will be temporarily stored in labeled 55-gallon drums until placed in the refinery wastewater treatment system upstream of the API separator. All other solid waste generated during sampling activities (sampling gloves, tubing, etc.) will be disposed of with the refinery's general municipal waste.

Documentation of Field Activities

Daily field activities, including observations and field procedures, will be recorded using indelible ink on field sampling forms. The original field forms will be maintained at the Refinery. Completed forms will be maintained in a bound and sequentially numbered field file for reference during field activities. The daily record of field activities will include the following information:

- Well ID/evaporation pond location/outfall
- Date
- Start and finish sampling time
- Field team members, including visitors
- Weather conditions
- Daily activities and times conducted
- Observations
- Record of samples collected with sample designations
- Photo log (if needed)
- Field monitoring data, including health and safety monitoring (if needed)
- Equipment used and calibration records, if appropriate
- List of additional data sheets and maps completed
- An inventory of the waste generated and the method of storage or disposal
- Signature of personnel completing the field record

Sample Custody

All samples collected for analysis will be recorded in the field report or data sheets. Chain-of-custody forms will be completed at the end of each sampling day, prior to the transfer of samples off site, and will accompany the samples during shipment to the laboratory. A signed and dated custody seal will be affixed to the lid of the shipping container. 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 a copy sent to the refinery. The Refinery will maintain copies of all chain-of-custody forms generated as part of sampling activities. Copies of the chain-of-custody records will be included with all draft and final laboratory reports submitted to NMED and OCD.

ATTACHMENT B-1. 2020 FLUID LEVEL DATA FOR NON-MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Location	Date Measured	Measuring Point Elevation	Elevation Product Surface	Elevation Water Surface	Depth To Water	Depth To Product
BW-1A	9/14/2020	6885.12	NA	Dry	Dry	ND
BW-1B	9/14/2020	6885.78	NA	Dry	Dry	ND
BW-1C	9/14/2020	6885.68	NA	6871.79	13.89	ND
BW-2A	9/14/2020	6874.69	NA	6841.76	32.93	ND
BW-2B	9/14/2020	6874.5	NA	6845.71	28.79	ND
BW-2C	9/14/2020	6875.3	NA	6853.98	21.32	ND
BW-3A	9/14/2020	6878.39	NA	Dry	Dry	ND
BW-3B	9/14/2020	6878.59	NA	6844.35	34.24	ND
BW-3C	9/14/2020	6877.95	NA	6869.43	8.52	ND
BW-4A	3/9/2020	6873.18	NA	6834.84	38.34	ND
BW-4A	6/30/2020	6873.18	NA	Dry	Dry	ND
BW-4A	9/14/2020	6873.18	NA	Dry	Dry	ND
BW-4A	12/7/2020	6873.18	NA	Dry	Dry	ND
BW-4B	3/9/2020	6873.23	NA	6832.88	40.35	ND
BW-4B	6/26/2020	6873.23	NA	NA	NA	NA
BW-4B	6/30/2020	6873.23	NA	6828.48	44.75	ND
BW-4B	9/14/2020	6873.23	6833.38	6833.37	39.86	39.85
BW-4B	12/7/2020	6873.23	NA	6837.37	35.86	ND
BW-5A	3/5/2020	6877.00	NA	Dry	Dry	ND
BW-5A	6/26/2020	6877.00	NA	6853.79	23.21	ND
BW-5A	9/14/2020	6877.00	NA	Dry	Dry	ND
BW-5A	12/7/2020	6877.00	NA	6853.73	23.27	ND
BW-5B	3/5/2020	6876.82	NA	6866.88	9.94	ND
BW-5B	6/26/2020	6876.82	NA	6866.61	10.21	ND
BW-5B	9/14/2020	6876.82	NA	6866.21	10.61	ND
BW-5B	12/7/2020	6876.82	NA	6866.29	10.53	ND
BW-5C	3/5/2020	6876.85	NA	6874.05	2.8	ND
BW-5C	6/26/2020	6876.85	NA	6873.47	3.38	ND
BW-5C	9/14/2020	6876.85	NA	6872.49	4.36	ND
BW-5C	12/7/2020	6876.85	NA	6872.58	4.27	ND
GWM-1	3/3/2020	6912.61	6891.21	6891.13	21.48	21.4
GWM-1	7/1/2020	6912.61	6891.79	6892.24	20.37	20.82
GWM-1	9/15/2020	6912.61	6891.88	6891.21	21.4	20.73
GWM-1	11/9/2020	6912.61	6891.73	6890.89	21.72	20.88
GWM-1	12/7/2020	6912.61	6891.7	6890.76	21.85	20.91
GWM-2	3/3/2020	6913.09	NA	Dry	Dry	ND
GWM-2	7/1/2020	6913.09	NA	Dry	Dry	ND
GWM-2	9/15/2020	6913.09	NA	Dry	Dry	ND
GWM-2	11/10/2020	6913.09	NA	Dry	Dry	ND
GWM-2	12/7/2020	6913.09	NA	Dry	Dry	ND
GWM-3	3/3/2020	6910.25	NA	Dry	Dry	ND
GWM-3	7/1/2020	6910.25	NA	Dry	Dry	ND
GWM-3	9/15/2020	6910.25	NA	Dry	Dry	ND
GWM-3	10/11/2020	6910.25	NA	Dry	Dry	ND
GWM-3	12/7/2020	6910.25	NA	Dry	Dry	ND
KA-3	3/3/2020	6912.52	NA	6903.22	9.3	ND

ATTACHMENT B-1. 2020 FLUID LEVEL DATA FOR NON-MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Location	Date Measured	Measuring Point Elevation	Elevation Product Surface	Elevation Water Surface	Depth To Water	Depth To Product
KA-3	7/1/2020	6912.52	NA	6903.77	8.75	ND
KA-3	12/7/2020	6912.52	NA	6902.96	9.56	ND
MW-1	6/30/2020	6878.12	NA	6870.87	7.25	ND
MW-1	9/14/2020	6878.12	NA	6870.4	7.72	ND
MW-2	6/30/2020	6880.30	NA	6871.01	9.29	ND
MW-2	9/14/2020	6880.30	NA	6870.56	9.74	ND
MW-4	6/30/2020	6881.63	NA	6874.13	7.5	ND
MW-4	9/14/2020	6881.63	NA	6873.63	8	ND
MW-5	6/30/2020	6882.83	NA	6871.37	11.46	ND
MW-5	9/14/2020	6882.83	NA	6870.84	11.99	ND
NAPIS-1	3/4/2020	6913.86	6906.17	6906.12	7.74	7.69
NAPIS-1	7/1/2020	6913.86	6906.48	6906.44	7.42	7.38
NAPIS-1	9/15/2020	6913.86	6907.16	6907.15	6.71	6.7
NAPIS-1	11/10/2020	6913.86	6906.67	6906.66	7.2	7.19
NAPIS-1	12/7/2020	6913.86	NA	6906.42	7.44	ND
NAPIS-2	3/3/2020	6912.65	NA	6903.19	9.46	ND
NAPIS-2	7/1/2020	6912.65	NA	6903.53	9.12	ND
NAPIS-2	9/15/2020	6912.65	NA	6904.53	8.12	ND
NAPIS-2	11/10/2020	6912.65	NA	6904.14	8.51	ND
NAPIS-2	12/7/2020	6912.65	NA	6903.93	8.72	ND
NAPIS-3	7/1/2020	6912.76	NA	6902.66	10.1	ND
NAPIS-3	9/15/2020	6912.76	NA	6903.51	9.25	ND
NAPIS-3	11/10/2020	6912.76	NA	6903.29	9.47	ND
NAPIS-3	12/7/2020	6912.76	NA	6904.25	8.51	ND
OAPIS-1	3/3/2020	6916.73	NA	6904.27	12.46	ND
OAPIS-1	7/1/2020	6916.73	NA	6904.13	12.6	ND
OAPIS-1	9/15/2020	6916.73	NA	6904.83	11.9	ND
OAPIS-1	11/10/2020	6916.73	NA	6904.71	12.02	ND
OAPIS-1	12/7/2020	6916.73	NA	6904.42	12.31	ND
OW-01	3/9/2020	6866.62	NA	6864.92	1.7	ND
OW-01	6/30/2020	6866.62	NA	6865.02	1.6	ND
OW-01	9/15/2020	6866.62	NA	6865.17	1.45	ND
OW-01	12/7/2020	6866.62	NA	6864.87	1.75	ND
OW-10	3/4/2020	6874.91	NA	6869.48	5.43	ND
OW-10	6/30/2020	6874.91	NA	6868.16	6.75	ND
OW-10	9/20/2020	6874.91	NA	6867.21	7.7	ND
OW-10	10/9/2020	6874.91	NA	6867.21	7.7	ND
OW-10	12/7/2020	6874.91	NA	6867.3	7.61	ND
OW-11	9/15/2020	6923.51	NA	6905	18.51	ND
OW-12	6/30/2020	6940.69	NA	Dry	Dry	ND
OW-12	9/14/2020	6940.69	NA	6894.24	46.45	ND
OW-12	11/9/2020	6940.69	NA	6894.2	46.49	ND
OW-13	3/2/2020	6920.07	NA	6900.16	19.91	ND
OW-13	6/30/2020	6920.07	NA	6897.91	22.16	ND
OW-13	9/14/2020	6920.07	NA	6899.08	20.99	ND
OW-13	11/9/2020	6920.07	NA	6899.69	20.38	ND

ATTACHMENT B-1. 2020 FLUID LEVEL DATA FOR NON-MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Location	Date Measured	Measuring Point Elevation	Elevation Product Surface	Elevation Water Surface	Depth To Water	Depth To Product
OW-13	12/7/2020	6920.07	NA	6899.83	20.24	ND
OW-14	3/2/2020	6926.65	NA	NA	NA	NA
OW-14	6/30/2020	6926.65	NA	6903.9	22.75	ND
OW-14	9/14/2020	6926.65	NA	NA	NA	NA
OW-14	12/7/2020	6926.65	NA	6902.25	24.4	NA
OW-29	2/24/2020	6917.00	NA	6900.52	16.48	ND
OW-29	6/30/2020	6917.00	NA	6899.58	17.42	ND
OW-29	9/14/2020	6917.00	NA	6902.43	14.57	ND
OW-29	11/9/2020	6917.00	NA	6899.77	17.23	ND
OW-29	12/7/2020	6917.00	NA	6899.85	17.15	ND
OW-30	3/2/2020	6924.69	NA	NA	NA	NA
OW-30	6/30/2020	6924.69	NA	6902.36	22.33	ND
OW-30	9/15/2020	6924.69	NA	NA	NA	ND
OW-30	12/7/2020	6924.69	NA	6902.47	22.22	ND
OW-50	3/2/2020	6914.21	NA	6900.16	14.05	ND
OW-50	6/30/2020	6914.21	NA	6899.6	14.61	ND
OW-50	9/14/2020	6914.21	NA	6899.1	15.11	ND
OW-50	11/9/2020	6914.21	NA	6899.34	14.87	ND
OW-50	12/7/2020	6914.21	NA	6899.49	14.72	ND
OW-52	3/2/2020	6907.68	NA	6893.97	13.71	ND
OW-52	6/30/2020	6907.68	NA	6893.48	14.2	ND
OW-52	9/14/2020	6907.68	NA	6893.12	14.56	ND
OW-52	10/9/2020	6907.68	NA	6893.16	14.52	ND
OW-52	12/7/2020	6907.68	NA	6893.26	14.42	ND
OW-53	3/2/2020	6914.38	NA	Dry	Dry	ND
OW-53	6/30/2020	6914.38	NA	Dry	Dry	ND
OW-53	9/14/2020	6914.38	NA	Dry	Dry	ND
OW-53	11/9/2020	6914.38	NA	Dry	Dry	ND
OW-53	12/7/2020	6914.38	NA	Dry	Dry	ND
OW-54	3/2/2020	6918.92	NA	6901.74	17.18	ND
OW-54	6/30/2020	6918.92	NA	6901.17	17.75	ND
OW-54	9/14/2020	6918.92	NA	6900.75	18.17	ND
OW-54	10/9/2020	6918.92	NA	6901	17.92	ND
OW-54	12/7/2020	6918.92	NA	6901.14	17.78	ND
OW-55	3/2/2020	6923.25	NA	6906.29	16.96	ND
OW-55	6/30/2020	6923.25	NA	6905.83	17.42	ND
OW-55	9/14/2020	6923.25	NA	6905.29	17.96	ND
OW-55	10/9/2020	6923.25	NA	6905.55	17.7	ND
OW-55	12/7/2020	6923.25	NA	6905.64	17.61	ND
OW-56	3/2/2020	6920.18	NA	6907.16	13.02	ND
OW-56	6/30/2020	6920.18	NA	6905.85	14.33	ND
OW-56	9/14/2020	6920.18	NA	6905.82	14.36	ND
OW-56	11/9/2020	6920.18	NA	6905.97	14.21	ND
OW-56	12/7/2020	6920.18	NA	6906.45	13.73	ND
OW-57	3/4/2020	6933.10	NA	6913.13	19.97	ND
OW-57	6/30/2020	6933.10	NA	6912.88	20.22	ND

ATTACHMENT B-1. 2020 FLUID LEVEL DATA FOR NON-MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Location	Date Measured	Measuring Point Elevation	Elevation Product Surface	Elevation Water Surface	Depth To Water	Depth To Product
OW-57	9/14/2020	6933.10	NA	6912.6	20.5	ND
OW-57	11/9/2020	6933.10	NA	6912.57	20.53	ND
OW-57	12/7/2020	6933.10	NA	6912.46	20.64	ND
OW-58	6/30/2020	6934.50	NA	6910.38	24.12	ND
OW-58	9/14/2020	6934.50	NA	6910.95	23.55	ND
OW-58	11/9/2020	6934.50	NA	6911.19	23.31	ND
OW-58	12/8/2020	6934.50	NA	6910.18	24.32	ND
OW-58A	3/5/2020	6935.88	NA	6909.75	26.13	ND
OW-58A	6/30/2020	6935.88	NA	6909.38	26.5	ND
OW-58A	9/15/2020	6935.88	NA	6909.01	26.87	ND
OW-58A	11/9/2020	6935.88	NA	6911.57	24.31	ND
OW-58A	12/8/2020	6935.88	NA	6909.17	26.71	ND
OW-59	6/30/2020	6889.73	NA	6866.06	23.67	ND
OW-59	9/14/2020	6889.73	NA	6865.67	24.06	ND
OW-59	12/7/2020	6889.73	NA	6865.82	23.91	ND
OW-60	3/3/2020	6893.51	NA	6877.37	16.14	ND
OW-60	6/30/2020	6893.51	NA	6877.01	16.5	ND
OW-60	9/14/2020	6893.51	NA	6876.94	16.57	ND
OW-60	11/9/2020	6893.51	NA	6877.16	16.35	ND
OW-60	12/7/2020	6893.51	NA	6876.96	16.55	ND
OW-61	3/4/2020	6963.57	6945.29	6942.48	21.09	18.28
OW-61	6/29/2020	6963.57	6946.4	6945.53	18.04	17.17
OW-61	9/15/2020	6963.57	6946.69	6944.17	19.4	16.88
OW-61	11/9/2020	6963.57	6945.35	6943.99	19.58	18.22
OW-61	12/8/2020	6963.57	6945.17	6943.27	20.3	18.4
OW-62	3/10/2020	6937.36	6913.78	6913.2	24.16	23.58
OW-62	6/30/2020	6937.36	6913.74	6913.45	23.91	23.62
OW-62	9/15/2020	6937.36	6913.74	6913.49	23.87	23.62
OW-62	11/9/2020	6937.36	6913.66	6913.36	24	23.7
OW-62	12/8/2020	6937.36	6913.67	6913.38	23.98	23.69
OW-63	3/4/2020	6935.06	NA	6914.65	20.41	ND
OW-63	6/29/2020	6935.06	NA	6914.6	20.46	ND
OW-63	9/14/2020	6935.06	NA	6914.33	20.73	ND
OW-63	11/9/2020	6935.06	NA	6914.21	20.85	ND
OW-63	12/8/2020	6935.06	NA	6914.09	20.97	ND
OW-64	3/4/2020	6947.40	NA	6939.9	7.5	ND
OW-64	6/30/2020	6947.40	NA	6939.05	8.35	ND
OW-64	9/14/2020	6947.40	NA	6939.45	7.95	ND
OW-64	11/9/2020	6947.40	NA	6939.22	8.18	ND
OW-64	12/7/2020	6947.40	NA	6939.14	8.26	ND
OW-65	3/4/2020	6954.05	6930.22	6923.97	30.08	23.83
OW-65	6/29/2020	6954.05	6929.97	6922.64	31.41	24.08
OW-65	9/14/2020	6954.05	6929.35	6923.29	30.76	24.7
OW-65	11/9/2020	6954.05	6929	6921.7	32.35	25.05
OW-65	12/8/2020	6954.05	6928.26	6922.1	31.95	25.79
RW-1	3/4/2020	6946.06	NA	NA	NA	NA

ATTACHMENT B-1. 2020 FLUID LEVEL DATA FOR NON-MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Location	Date Measured	Measuring Point Elevation	Elevation Product Surface	Elevation Water Surface	Depth To Water	Depth To Product
RW-1	6/30/2020	6946.06	6917.81	6916.56	29.5	28.25
RW-1	9/19/2020	6946.06	6917.99	6915.86	30.2	28.07
RW-1	11/10/2020	6946.06	6916.56	6915.73	30.33	29.5
RW-1	12/8/2020	6946.06	6916.56	6915.73	30.33	29.5
RW-2	3/4/2020	6928.53	NA	NA	NA	NA
RW-2	6/30/2020	6928.53	6907.87	6907.53	21	20.66
RW-2	9/19/2020	6928.53	6906.43	6906.3	22.23	22.1
RW-2	11/9/2020	6928.53	6906.44	6906.25	22.28	22.09
RW-2	12/8/2020	6928.53	6906.33	6906.15	22.38	22.2
RW-5	3/4/2020	6943.57	NA	NA	NA	NA
RW-5	6/30/2020	6943.57	6914.92	6911.52	32.05	28.65
RW-5	9/19/2020	6943.57	6913.98	6910.76	32.81	29.59
RW-5	11/9/2020	6943.57	6913.71	6910.54	33.03	29.86
RW-5	12/8/2020	6943.57	6910.42	6904.06	39.51	33.15
RW-6	3/4/2020	6944.01	NA	NA	NA	NA
RW-6	6/30/2020	6944.01	6915.14	6913.51	30.5	28.87
RW-6	9/19/2020	6944.01	6914.29	6911.37	32.64	29.72
RW-6	11/9/2020	6944.01	6914.03	6910.96	33.05	29.98
RW-6	12/8/2020	6944.01	6913.83	6910.7	33.31	30.18
SMW-2	6/30/2020	6883.97	NA	6859.72	24.25	ND
SMW-2	9/14/2020	6883.97	NA	6859.27	24.7	ND
SMW-4	6/30/2020	6879.52	NA	6850.35	29.17	ND
SMW-4	9/14/2020	6879.52	NA	6850.37	29.15	ND
STP1-NW	3/3/2020	6904.47	NA	6884.2	20.27	ND
STP1-NW	6/30/2020	6904.47	NA	6883.8	20.67	ND
STP1-NW	12/8/2020	6904.47	NA	6883.69	20.78	ND
STP1-SW	3/3/2020	6912.38	NA	NA	NA	NA
STP1-SW	12/8/2020	6912.38	NA	6883.15	29.23	NA

Definitions:
DRY = no water detected
NA = no data
ND = not detected
Monitoring wells were not monitored during the second quarter due to the COVID-19 pandemic and state shutdowns.

ATTACHMENT B-2. 2020 FLUID LEVEL DATA FOR MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Location	Date Measured	Measuring Point Elevation	Product Surface Elevation	Water Surface Elevation	Depth To Water	Depth To Product
MKTF-01	2/24/2020	6920.67	6915.80	6915.51	5.16	4.87
MKTF-01	6/26/2020	6920.67	6915.17	6914.96	5.71	5.50
MKTF-01	9/15/2020	6920.67	6915.06	6915.05	5.62	5.61
MKTF-01	11/10/2020	6920.67	6915.06	6914.78	5.89	5.61
MKTF-01	12/3/2020	6920.67	6914.93	6914.65	6.02	5.74
MKTF-02	2/24/2020	6917.45	NA	6910.93	6.52	ND
MKTF-02	6/26/2020	6917.45	NA	6909.75	7.70	ND
MKTF-02	9/15/2020	6917.45	NA	6909.57	7.88	ND
MKTF-02	11/10/2020	6917.45	NA	6910.02	7.43	ND
MKTF-02	12/3/2020	6917.45	NA	6909.73	7.72	ND
MKTF-03	3/5/2020	6931.69	6925.22	6923.85	7.84	6.47
MKTF-03	6/26/2020	6931.69	6924.33	6923.06	8.63	7.36
MKTF-03	9/15/2020	6931.69	6924.61	6924.60	7.09	7.08
MKTF-03	11/10/2020	6931.69	6924.56	6923.26	8.43	7.13
MKTF-03	12/3/2020	6931.69	6924.23	6923.07	8.62	7.46
MKTF-04	3/2/2020	6933.57	NA	6925.10	8.47	ND
MKTF-04	6/26/2020	6933.57	NA	6923.82	9.75	ND
MKTF-04	9/15/2020	6933.57	6924.18	6924.17	9.40	9.39
MKTF-04	11/10/2020	6933.57	NA	6924.37	9.20	ND
MKTF-04	12/3/2020	6933.57	6923.87	6923.86	9.71	9.70
MKTF-05	3/5/2020	6942.22	6928.64	6928.50	13.72	13.58
MKTF-05	6/25/2020	6942.22	6928.16	6927.42	14.80	14.06
MKTF-05	9/15/2020	6942.22	6928.57	6927.54	14.68	13.65
MKTF-05	11/10/2020	6942.22	6928.20	6927.32	14.90	14.02
MKTF-05	12/3/2020	6942.22	6928.10	6927.29	14.93	14.12
MKTF-06	3/5/2020	6946.81	6929.92	6928.21	18.60	16.89
MKTF-06	6/25/2020	6946.81	6932.76	6927.91	18.90	14.05
MKTF-06	9/15/2020	6946.81	6930.03	6928.10	18.71	16.78
MKTF-06	11/10/2020	6946.81	6929.61	6928.22	18.59	17.20
MKTF-06	12/3/2020	6946.81	6929.43	6928.32	18.49	17.38
MKTF-07	3/5/2020	6947.18	6934.68	6933.46	13.72	12.50
MKTF-07	6/25/2020	6947.18	6934.95	6933.42	13.76	12.23
MKTF-07	9/18/2020	6947.18	6935.76	6933.41	13.77	11.42
MKTF-07	11/10/2020	6947.18	6934.62	6933.42	13.76	12.56
MKTF-07	12/3/2020	6947.18	6934.25	6933.38	13.80	12.93
MKTF-08	3/5/2020	6947.09	6933.06	6932.72	14.37	14.03

ATTACHMENT B-2. 2020 FLUID LEVEL DATA FOR MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Location	Date Measured	Measuring Point Elevation	Product Surface Elevation	Water Surface Elevation	Depth To Water	Depth To Product
MKTF-08	6/25/2020	6947.09	6933.09	6932.69	14.40	14.00
MKTF-08	9/18/2020	6947.09	6933.33	6932.94	14.15	13.76
MKTF-08	11/10/2020	6947.09	6932.86	6932.40	14.69	14.23
MKTF-08	12/3/2020	6947.09	6932.73	6932.33	14.76	14.36
MKTF-09	3/2/2020	6946.50	NA	6932.27	14.23	ND
MKTF-09	6/25/2020	6946.50	NA	6931.95	14.55	ND
MKTF-09	9/18/2020	6946.50	6932.31	6932.30	14.20	14.19
MKTF-09	11/10/2020	6946.50	6931.89	6931.88	14.62	14.61
MKTF-09	12/3/2020	6946.50	6931.75	6931.74	14.76	14.75
MKTF-10	3/2/2020	6937.16	NA	6929.49	7.67	ND
MKTF-10	6/25/2020	6937.16	NA	6930.09	7.07	ND
MKTF-10	9/18/2020	6937.16	6929.64	6929.63	7.53	7.52
MKTF-10	11/10/2020	6937.16	NA	6929.37	7.79	ND
MKTF-10	12/3/2020	6937.16	NA	6929.36	7.80	ND
MKTF-11	3/2/2020	6931.34	NA	6923.45	7.89	ND
MKTF-11	6/26/2020	6931.34	6923.67	6923.66	7.68	7.67
MKTF-11	9/18/2020	6931.34	6923.75	6923.74	7.60	7.59
MKTF-11	11/10/2020	6931.34	NA	6923.73	7.61	ND
MKTF-11	12/3/2020	6931.34	6923.45	6923.43	7.91	7.89
MKTF-12	2/27/2020	6942.11	6924.27	6924.19	17.92	17.84
MKTF-12	6/29/2020	6942.11	6922.98	6922.86	19.25	19.13
MKTF-12	9/18/2020	6942.11	6923.47	6923.46	18.65	18.64
MKTF-12	11/10/2020	6942.11	6924.14	6924.11	18.00	17.97
MKTF-12	12/3/2020	6942.11	6923.21	6923.05	19.06	18.90
MKTF-13	2/27/2020	6935.18	6924.05	6917.87	17.31	11.13
MKTF-13	6/29/2020	6935.18	6922.51	6916.97	18.21	12.67
MKTF-13	9/18/2020	6935.18	6922.63	6918.26	16.92	12.55
MKTF-13	11/10/2020	6935.18	6923.20	6918.82	16.36	11.98
MKTF-13	12/3/2020	6935.18	6922.34	6918.53	16.65	12.84
MKTF-14	2/27/2020	6928.02	6922.67	6922.37	5.65	5.35
MKTF-14	6/29/2020	6928.02	6921.64	6919.44	8.58	6.38
MKTF-14	9/18/2020	6928.02	6921.84	6919.86	8.16	6.18
MKTF-14	11/10/2020	6928.02	6922.04	6921.74	6.28	5.98
MKTF-14	12/3/2020	6928.02	6921.23	6920.96	7.06	6.79
MKTF-15	2/3/2020	6943.48	6930.46	6930.37	13.11	13.02
MKTF-15	6/26/2020	6943.48	6930.37	6930.31	13.17	13.11

ATTACHMENT B-2. 2020 FLUID LEVEL DATA FOR MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Location	Date Measured	Measuring Point Elevation	Product Surface Elevation	Water Surface Elevation	Depth To Water	Depth To Product
MKTF-15	9/18/2020	6943.48	6930.48	6930.45	13.03	13.00
MKTF-15	11/10/2020	6943.48	6930.09	6929.88	13.60	13.39
MKTF-16	2/5/2020	6950.58	NA	6940.90	9.68	ND
MKTF-16	6/26/2020	6950.58	NA	6941.04	9.54	ND
MKTF-16	9/18/2020	6950.58	6941.40	6941.39	9.19	9.18
MKTF-16	11/10/2020	6950.58	NA	6943.38	7.20	ND
MKTF-16	12/8/2020	6950.58	NA	6940.88	9.70	ND
MKTF-17	2/3/2020	6945.76	6934.32	6928.91	16.85	11.44
MKTF-17	6/29/2020	6945.76	6935.57	6930.26	15.50	10.19
MKTF-17	9/14/2020	6945.76	6935.76	6930.39	15.37	10
MKTF-17	11/10/2020	6945.76	6934.37	6934.17	11.59	11.39
MKTF-17	12/4/2020	6945.76	6934.48	6934.29	11.47	11.28
MKTF-18	2/5/2020	6950.65	NA	6941.55	9.10	ND
MKTF-18	6/30/2020	6950.65	NA	6941.67	8.98	ND
MKTF-18	9/18/2020	6950.65	6942.16	6942.15	8.50	8.49
MKTF-18	11/10/2020	6950.65	NA	6941.91	8.74	ND
MKTF-18	12/4/2020	6950.65	NA	6941.85	8.80	ND
MKTF-19	2/3/2020	6944.67	6933.32	6932.27	12.40	11.35
MKTF-19	6/29/2020	6944.67	6932.59	6931.38	13.29	12.08
MKTF-19	9/14/2020	6944.67	6932.72	6932.70	11.97	11.95
MKTF-19	11/10/2020	6944.67	6932.45	6931.12	13.55	12.22
MKTF-19	12/4/2020	6944.67	6932.49	6931.25	13.42	12.18
MKTF-20	2/5/2020	6951.78	NA	6942.76	9.02	ND
MKTF-20	6/26/2020	6951.78	NA	6943.11	8.67	ND
MKTF-20	9/15/2020	6951.78	6943.24	6942.43	9.35	8.54
MKTF-20	11/10/2020	6951.78	6943.68	6942.88	8.90	8.10
MKTF-20	12/8/2020	6951.78	6943.02	6942.83	8.95	8.76
MKTF-21	2/5/2020	6952.57	NA	6944.32	8.25	ND
MKTF-21	6/26/2020	6952.57	6944.40	6944.37	8.20	8.17
MKTF-21	9/15/2020	6952.57	6945.49	6945.48	7.09	7.08
MKTF-21	11/10/2020	6952.57	NA	6946.16	6.41	ND
MKTF-21	12/4/2020	6952.57	6944.53	6944.52	8.05	8.04
MKTF-22	2/27/2020	6942.31	6917.83	6916.78	25.53	24.48
MKTF-22	6/29/2020	6942.31	6917.74	6914.60	27.71	24.57
MKTF-22	9/14/2020	6942.31	6917.33	6914.63	27.68	24.98
MKTF-22	11/10/2020	6942.31	6917.37	6915.02	27.29	24.94

ATTACHMENT B-2. 2020 FLUID LEVEL DATA FOR MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Location	Date Measured	Measuring Point Elevation	Product Surface Elevation	Water Surface Elevation	Depth To Water	Depth To Product
MKTF-22	12/4/2020	6942.31	6917.21	6914.76	27.55	25.10
MKTF-23	2/27/2020	6929.98	NA	6916.56	13.42	ND
MKTF-23	6/29/2020	6929.98	NA	6916.73	13.25	ND
MKTF-23	9/19/2020	6929.98	6914.56	6914.54	15.44	15.42
MKTF-23	11/10/2020	6929.98	NA	6915.75	14.23	ND
MKTF-23	12/4/2020	6929.98	6915.83	6915.82	14.16	14.15
MKTF-24	2/24/2020	6928.72	NA	6906.55	22.17	ND
MKTF-24	6/26/2020	6928.72	NA	6905.92	22.80	ND
MKTF-24	9/15/2020	6928.72	NA	6905.37	23.35	ND
MKTF-24	11/10/2020	6928.72	NA	6905.40	23.32	ND
MKTF-24	12/4/2020	6928.72	NA	6905.50	23.22	ND
MKTF-25	2/26/2020	6916.19	NA	6903.25	12.94	ND
MKTF-25	6/26/2020	6916.19	NA	6902.86	13.33	ND
MKTF-25	9/15/2020	6916.19	NA	6902.29	13.90	ND
MKTF-25	11/10/2020	6916.19	NA	6902.44	13.75	ND
MKTF-25	12/4/2020	6916.19	NA	6902.57	13.62	ND
MKTF-26	2/26/2020	6915.31	6906.96	6906.20	9.11	8.35
MKTF-26	6/26/2020	6915.31	6906.70	6905.81	9.50	8.61
MKTF-26	9/15/2020	6915.31	6906.50	6905.75	9.56	8.81
MKTF-26	11/10/2020	6915.31	6906.66	6905.95	9.36	8.65
MKTF-26	12/4/2020	6915.31	6907.64	6905.92	9.39	7.67
MKTF-27	2/24/2020	6917.90	NA	6914.29	3.61	ND
MKTF-27	6/30/2020	6917.90	NA	6911.20	6.70	ND
MKTF-27	9/15/2020	6917.90	NA	6911.69	6.21	ND
MKTF-27	11/10/2020	6917.90	NA	6911.18	6.72	ND
MKTF-27	12/4/2020	6917.90	NA	6911.43	6.47	ND
MKTF-28	2/24/2020	6921.52	NA	6916.99	4.53	ND
MKTF-28	6/30/2020	6921.52	NA	6916.68	4.84	ND
MKTF-28	9/15/2020	6921.52	NA	6916.93	4.59	ND
MKTF-28	11/10/2020	6921.52	NA	6912.71	8.81	ND
MKTF-28	12/4/2020	6921.52	NA	6914.39	7.13	ND
MKTF-29	2/24/2020	6901.62	NA	6897.13	4.49	ND
MKTF-29	6/26/2020	6901.62	NA	6895.20	6.42	ND
MKTF-29	9/15/2020	6901.62	NA	6893.61	8.01	ND
MKTF-29	11/10/2020	6901.62	NA	6894.64	6.98	ND
MKTF-29	12/4/2020	6901.62	NA	6895.22	6.40	ND

ATTACHMENT B-2. 2020 FLUID LEVEL DATA FOR MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Location	Date Measured	Measuring Point Elevation	Product Surface Elevation	Water Surface Elevation	Depth To Water	Depth To Product
MKTF-30	2/26/2020	6900.80	NA	6885.49	15.31	ND
MKTF-30	6/26/2020	6900.80	NA	6884.61	16.19	ND
MKTF-30	9/15/2020	6900.80	NA	6884.14	16.66	ND
MKTF-30	11/10/2020	6900.80	NA	6883.93	16.87	ND
MKTF-30	12/4/2020	6900.80	NA	6884.04	16.76	ND
MKTF-31	2/24/2020	6906.87	NA	6898.77	8.10	ND
MKTF-31	6/26/2020	6906.87	NA	6898.62	8.25	ND
MKTF-31	9/15/2020	6906.87	NA	6898.12	8.75	ND
MKTF-31	11/10/2020	6906.87	NA	6898.08	8.79	ND
MKTF-31	12/4/2020	6906.87	NA	6898.14	8.73	ND
MKTF-32	2/26/2020	6911.11	NA	6897.33	13.78	ND
MKTF-32	6/29/2020	6911.11	NA	6896.86	14.25	ND
MKTF-32	9/14/2020	6911.11	NA	6896.53	14.58	ND
MKTF-32	11/10/2020	6911.11	NA	6896.80	14.31	ND
MKTF-32	12/4/2020	6911.11	NA	6896.86	14.25	ND
MKTF-33	2/27/2020	6939.75	NA	6917.04	22.71	ND
MKTF-33	6/29/2020	6939.75	NA	6918.58	21.17	ND
MKTF-33	9/14/2020	6939.75	6918.14	6911.73	28.02	21.61
MKTF-33	11/10/2020	6939.75	6918.10	6911.94	27.81	21.65
MKTF-33	12/4/2020	6939.75	6918.06	6911.98	27.77	21.69
MKTF-34	2/5/2020	6945.35	NA	6927.57	17.78	ND
MKTF-34	6/29/2020	6945.35	6926.31	6926.29	19.06	19.04
MKTF-34	9/14/2020	6945.35	NA	6926.26	19.09	ND
MKTF-34	11/10/2020	6945.35	NA	6926.27	19.08	ND
MKTF-34	12/4/2020	6945.35	6926.44	6926.43	18.92	18.91
MKTF-35	2/5/2020	6951.65	NA	6942.37	9.28	ND
MKTF-35	6/30/2020	6951.65	NA	6942.40	9.25	ND
MKTF-35	9/14/2020	6951.65	NA	6943.06	8.59	ND
MKTF-35	11/10/2020	6951.65	NA	6942.79	8.86	ND
MKTF-35	12/4/2020	6951.65	6942.63	6942.62	9.03	9.02
MKTF-36	2/3/2020	6950.12	6942.23	6941.68	8.44	7.89
MKTF-36	6/30/2020	6950.12	6942.08	6941.87	8.25	8.04
MKTF-36	9/14/2020	6950.12	NA	6942.25	7.87	ND
MKTF-36	11/10/2020	6950.12	6942.14	6942.09	8.03	7.98
MKTF-36	12/4/2020	6950.12	6942.02	6941.95	8.17	8.1
MKTF-37	2/3/2020	6958.87	6949.10	6948.98	9.89	9.77

ATTACHMENT B-2. 2020 FLUID LEVEL DATA FOR MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Location	Date Measured	Measuring Point Elevation	Product Surface Elevation	Water Surface Elevation	Depth To Water	Depth To Product
MKTF-37	6/30/2020	6958.87	6949.26	6949.24	9.63	9.61
MKTF-37	9/14/2020	6958.87	NA	6950.11	8.76	ND
MKTF-37	11/10/2020	6958.87	6949.51	6949.50	9.37	9.36
MKTF-37	12/4/2020	6958.87	6949.23	6949.22	9.65	9.64
MKTF-38	3/4/2020	6954.89	NA	6945.28	9.61	ND
MKTF-38	6/26/2020	6954.89	NA	6945.51	9.38	ND
MKTF-38	9/14/2020	6954.89	NA	6946.34	8.55	ND
MKTF-38	11/10/2020	6954.89	NA	6945.77	9.12	ND
MKTF-38	12/4/2020	6954.89	6945.54	6945.53	9.36	9.35
MKTF-39	2/3/2020	6953.75	NA	6943.65	10.10	ND
MKTF-39	6/26/2020	6953.75	NA	6944.12	9.63	ND
MKTF-39	9/15/2020	6953.75	NA	6944.17	9.58	ND
MKTF-39	11/10/2020	6953.75	NA	6943.70	10.05	ND
MKTF-39	12/4/2020	6953.75	NA	6943.60	10.15	ND
MKTF-40	2/27/2020	6894.33	NA	6881.10	13.23	ND
MKTF-40	6/26/2020	6894.33	NA	6881.58	12.75	ND
MKTF-40	9/15/2020	6894.33	NA	6880.94	13.39	ND
MKTF-40	11/10/2020	6894.33	NA	6880.62	13.71	ND
MKTF-40	12/4/2020	6894.33	NA	6880.34	13.99	ND
MKTF-41	2/26/2020	6893.64	NA	6873.49	20.15	ND
MKTF-41	6/29/2020	6893.64	NA	6873.87	19.77	ND
MKTF-41	9/14/2020	6893.64	NA	6872.92	20.72	ND
MKTF-41	11/10/2020	6893.64	NA	6872.63	21.01	ND
MKTF-41	12/4/2020	6893.64	NA	6872.74	20.90	ND
MKTF-42	2/26/2020	6892.95	NA	6876.16	16.79	ND
MKTF-42	6/30/2020	6892.95	NA	6876.70	16.25	ND
MKTF-42	9/14/2020	6892.95	NA	6876.60	16.35	ND
MKTF-42	11/10/2020	6892.95	NA	6877.65	15.30	ND
MKTF-42	12/4/2020	6892.95	NA	6876.54	16.41	ND
MKTF-43	2/26/2020	6876.90	NA	6870.57	6.33	ND
MKTF-43	6/30/2020	6876.90	NA	6871.40	5.50	ND
MKTF-43	9/14/2020	6876.90	NA	6870.45	6.45	ND
MKTF-43	11/10/2020	6876.90	NA	6869.42	7.48	ND
MKTF-43	12/4/2020	6876.90	NA	6868.78	8.12	ND
MKTF-44	3/4/2020	6869.95	NA	6839.61	30.34	ND
MKTF-44	6/26/2020	6869.95	NA	6836.87	33.08	ND

ATTACHMENT B-2. 2020 FLUID LEVEL DATA FOR MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Location	Date Measured	Measuring Point Elevation	Product Surface Elevation	Water Surface Elevation	Depth To Water	Depth To Product
MKTF-44	9/14/2020	6869.95	NA	6841.95	28.00	ND
MKTF-44	12/4/2020	6869.95	NA	6830.36	39.59	ND
MKTF-45	2/3/2020	6949.59	6939.99	6930.97	18.62	9.60
MKTF-45	6/30/2020	6949.59	6938.51	6930.51	19.08	11.08
MKTF-45	9/14/2020	6949.59	6936.45	6931.16	18.43	13.14
MKTF-45	11/10/2020	6949.59	6936.65	6934.83	14.76	12.94
MKTF-45	12/4/2020	6949.59	6936.93	6935.08	14.51	12.66
MKTF-46	3/5/2020	6957.60	NA	6946.67	10.93	ND
MKTF-46	6/30/2020	6957.60	NA	6946.52	11.08	ND
MKTF-46	9/14/2020	6957.60	NA	6947.42	10.18	ND
MKTF-46	11/10/2020	6957.60	NA	6947.03	10.57	ND
MKTF-46	12/4/2020	6957.60	NA	6946.83	10.77	ND
MKTF-47	3/5/2020	6959.09	NA	6949.20	9.89	ND
MKTF-47	6/29/2020	6959.09	NA	6949.59	9.50	ND
MKTF-47	9/15/2020	6959.09	6950.56	6950.55	8.54	8.53
MKTF-47	11/10/2020	6959.09	NA	6949.76	9.33	ND
MKTF-47	12/4/2020	6959.09	6949.51	6949.50	9.59	9.58
MKTF-48	3/3/2020	6961.73	6949.07	6948.91	12.82	12.66
MKTF-48	6/29/2020	6961.73	NA	6950.15	11.58	ND
MKTF-48	9/15/2020	6961.73	6949.88	6949.87	11.86	11.85
MKTF-48	11/10/2020	6961.73	6949.33	6949.22	12.51	12.40
MKTF-48	12/4/2020	6961.73	6948.96	6948.63	13.10	12.77
MKTF-49	3/4/2020	6946.76	NA	6926.49	20.27	ND
MKTF-49	6/30/2020	6946.76	NA	6926.11	20.65	ND
MKTF-49	9/15/2020	6946.76	NA	6926.43	20.33	ND
MKTF-49	11/10/2020	6946.76	NA	6926.01	20.75	ND
MKTF-49	12/4/2020	6946.76	NA	6925.95	20.81	ND
MKTF-50	3/4/2020	6942.82	NA	6926.95	15.87	ND
MKTF-50	6/30/2020	6942.82	NA	6926.82	16.00	ND
MKTF-50	9/15/2020	6942.82	6927.46	6927.45	15.37	15.36
MKTF-50	11/10/2020	6942.82	NA	6926.79	16.03	ND
MKTF-50	12/4/2020	6942.82	NA	6926.65	16.17	ND

Definitions:
NA = no data
ND = Not measured
Monitoring wells were not monitored during the second quarter due to the COVID-19 pandemic and state shutdowns.

ATTACHMENT B-3. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
NON-MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Well ID	Sample Date	Installation Date	Casing Diameter (in)	Surface Elevation (ft)	Well Casing Rim Elevation (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Thickness (ft)	DTW (ft)	GW Elevation (ft)	Corrected Water Table [1] Elevation (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
BW-1A	09/14/20	11/10/03	2	6,883.17	6,885.12	1.95	6,847.50	43.70	ND	NA	DRY	DRY	NA	30 - 35	Upper Sand
BW-1B	09/14/20	10/28/03	2	6,883.17	6,885.78	2.61	6,818.33	73.38	ND	NA	DRY	DRY	NA	54.6 - 64.6	Chinle/Alluvial Interface
BW-1C	09/14/20	11/10/03	2	6,883.17	6,885.68	2.51	6,749.29	145.29	ND	NA	13.89	6,871.79	NA	125 -135	Sonsela Sandstone
BW-2A	09/14/20	11/10/03	2	6,871.88	6,874.69	2.81	6,807.12	67.21	ND	NA	32.93	6,841.76	NA	55 - 65	Upper Sand
BW-2B	09/14/20	10/28/03	2	6,871.66	6,874.50	2.84	6,782.24	92.26	ND	NA	28.79	6,845.71	NA	80 - 90	Chinle/Alluvial Interface
BW-2C	09/14/20	10/28/03	2	6,872.90	6,875.30	2.40	6,722.46	149.10	ND	NA	21.32	6,853.98	NA	139.5 - 149.5	Sonsela Sandstone
BW-3A	09/14/20	06/15/04	2	6,875.94	6,878.39	2.45	6,826.04	53.30	ND	NA	DRY	DRY	NA	39.5 - 49.5	Upper Sand
BW-3B	09/14/20	10/15/03	2	6,876.16	6,878.59	2.43	6,809.19	69.54	ND	NA	34.24	6,844.35	NA	63 - 73	Chinle/Alluvial Interface
BW-3C	09/14/20	07/20/04	2	6,875.72	6,877.95	2.23	6,723.40	150.20	ND	NA	8.52	6,869.43	NA	144.5 - 154.5	Sonsela Sandstone
BW-4A	09/14/20	06/29/17	2	6,869.28	6,872.20	2.92	6,908.18	38.90	ND	NA	DRY	DRY	NA	21 - 36	Upper Sand
BW-4A	12/07/20	06/29/17	2	6,869.28	6,872.20	2.92	6,908.18	38.90	ND	NA	DRY	DRY	NA	21 - 36	Upper Sand
BW-4B	09/14/20	06/29/17	2	6,869.45	6,872.24	2.79	6,932.95	63.50	39.85	0.01	39.86	6,832.38	NA	41 - 61	Chinle/Alluvial Interface
BW-4B	12/07/20	06/29/17	2	6,869.45	6,872.24	2.79	6,932.95	63.50	ND	NA	35.86	6,832.38	NA	41 - 61	Chinle/Alluvial Interface
BW-5A	09/14/20	06/29/17	2	6,873.18	6,876.06	2.88	6,896.58	23.40	ND	NA	DRY	DRY	NA	10 - 20	Upper Sand
BW-5A	12/07/20	06/29/17	2	6,873.18	6,876.06	2.88	6,896.58	23.40	ND	NA	23.27	DRY	NA	10 - 20	Upper Sand
BW-5B	09/14/20	06/29/17	2	6,873.30	6,875.84	2.54	6,934.75	61.45	ND	NA	10.61	6,865.23	NA	48 - 58	Chinle/Alluvial Interface
BW-5B	12/07/20	06/29/17	2	6,873.30	6,875.84	2.54	6,934.75	61.45	ND	NA	10.53	6,865.23	NA	48 - 58	Chinle/Alluvial Interface
BW-5C	09/14/20	06/29/17	2	6,872.92	6,875.93	3.01	6,949.27	76.35	ND	NA	4.36	6,871.57	NA	64.3-74.30	Sonsela Sandstone
BW-5C	12/07/20	06/29/17	2	6,872.92	6,875.93	3.01	6,949.27	76.35	ND	NA	4.27	6,871.57	NA	64.3-74.30	Sonsela Sandstone
GWM-1	09/15/20	07/08/04	2	6,910.22	6,912.61	2.39	6,886.41	26.65	20.73	0.67	21.40	6,891.21	6891.75	17.5 - 23.5	Chinle/Alluvial Interface
GWM-1	11/09/20	07/08/04	2	6,910.22	6,912.61	2.39	6,886.41	26.65	20.88	0.84	21.72	6,890.89	6891.56	17.5 - 23.5	Chinle/Alluvial Interface
GWM-1	12/07/20	07/08/04	2	6,910.22	6,912.61	2.39	6,886.41	26.45	20.91	0.94	21.85	6,890.89	6891.56	17.5 - 23.5	Chinle/Alluvial Interface
GWM-2	09/15/20	09/25/05	2	6,910.32	6,913.09	2.77	6,894.28	18.08	ND	NA	DRY	NA	NA	3.2 - 16.2	Chinle/Alluvial Interface
GWM-2	11/10/20	09/25/05	2	6,910.32	6,913.09	2.77	6,894.28	18.08	ND	NA	DRY	NA	NA	3.2 - 16.2	Chinle/Alluvial Interface
GWM-2	12/07/20	09/25/05	2	6,910.32	6,913.09	2.77	6,894.28	18.08	ND	NA	DRY	NA	NA	3.2 - 16.2	Chinle/Alluvial Interface
GWM-3	09/15/20	09/25/05	2	6,907.35	6,910.25	2.90	6,892.45	19.15	ND	NA	DRY	DRY	NA	3 - 15	Chinle/Alluvial Interface
GWM-3	10/11/20	09/25/05	2	6,907.35	6,910.25	2.90	6,892.45	19.15	ND	NA	DRY	DRY	NA	3 - 15	Chinle/Alluvial Interface
GWM-3	12/07/20	09/25/05	2	6,907.35	6,910.25	2.90	6,892.45	19.15	ND	NA	DRY	DRY	NA	3 - 15	Chinle/Alluvial Interface
KA-3	12/07/20	06/11/07	2	6,913.29	6,912.52	-0.77	6,889.32	23.20	ND	NA	9.56	6,902.96	NA	15 - 25	Chinle/Alluvial Interface
MW-1	09/14/20	10/14/81	5	6,876.63	6,878.12	1.49	6,747.29	135.30	ND	NA	7.72	6,870.40	NA	117.72 - 127.72	Sonsela Sandstone
MW-2	09/14/20	10/15/81	5	6,878.39	6,880.30	1.91	6,742.82	138.20	ND	NA	9.74	6,870.56	NA	112 - 122	Sonsela Sandstone
MW-4	09/14/20	10/16/81	5	6,879.89	6,881.63	1.74	6,759.91	125.90	ND	NA	8.00	6,873.63	NA	101 - 121	Sonsela Sandstone
MW-5	09/14/20	07/21/86	4	6,880.20	6,882.83	2.63	6,752.00	133.00	ND	NA	11.99	6,870.84	NA	115 - 125	Sonsela Sandstone
NAPIS-1	09/15/20	03/14/08	2	6,913.62	6,913.86	0.24	6,900.33	13.58	6.70	0.01	6.71	6,907.15	6907.158	3.7 - 13.7	Chinle/Alluvial Interface
NAPIS-1	11/10/20	03/14/08	2	6,913.62	6,913.86	0.24	6,900.33	13.58	7.19	0.01	7.20	6,906.66	6906.668	3.7 - 13.7	Chinle/Alluvial Interface
NAPIS-1	12/07/20	03/14/08	2	6,913.62	6,913.86	0.24	6,900.33	13.76	ND	NA	7.44	6,906.42	NA	3.7 - 13.7	Chinle/Alluvial Interface

ATTACHMENT B-3. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
NON-MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Well ID	Sample Date	Installation Date	Casing Diameter (in)	Surface Elevation (ft)	Well Casing Rim Elevation (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Thickness (ft)	DTW (ft)	GW Elevation (ft)	Corrected Water Table [1] Elevation (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
NAPIS-2	09/15/20	03/14/08	2	6,913.40	6,912.65	-0.75	6,899.04	14.60	ND	NA	8.12	6,904.53	NA	4.2 - 14.2	Chinle/Alluvial Interface
NAPIS-2	11/10/20	03/14/08	2	6,913.40	6,912.65	-0.75	6,899.04	14.60	ND	NA	8.51	6,904.14	NA	4.2 - 14.2	Chinle/Alluvial Interface
NAPIS-2	12/07/20	03/14/08	2	6,913.40	6,912.65	-0.75	6,899.04	14.61	ND	NA	8.72	6,903.93	NA	4.2 - 14.2	Chinle/Alluvial Interface
NAPIS-3	09/15/20	03/14/08	2	6,913.38	6,912.76	-0.62	6,882.34	31.50	ND	NA	9.25	6,903.51	NA	25.4 - 30-4	Chinle/Alluvial Interface
NAPIS-3	11/10/20	03/14/08	2	6,913.38	6,912.76	-0.62	6,882.34	31.50	ND	NA	9.47	6,903.29	NA	25.4 - 30-4	Chinle/Alluvial Interface
NAPIS-3	12/07/20	03/14/08	2	6,913.38	6,912.76	-0.62	6,882.34	31.50	ND	NA	8.51	6,904.25	NA	25.4 - 30-4	Chinle/Alluvial Interface
OAPIS-1	09/15/20	07/17/12	2	6,914.37	6,916.73	2.36	6,888.37	28.00	ND	NA	11.90	6,904.83	NA	16 - 26	Chinle/Alluvial Interface
OAPIS-1	11/10/20	07/17/12	2	6,914.37	6,916.73	2.36	6,888.37	28.00	ND	NA	12.02	6,904.71	NA	16 - 26	Chinle/Alluvial Interface
OAPIS-1	12/07/20	07/17/12	2	6,914.37	6,916.73	2.36	6,888.37	28.00	ND	NA	12.31	6,904.42	NA	16 - 26	Chinle/Alluvial Interface
OW-1	09/15/20	01/05/81	4	6,866.32	6,866.62	0.30	6,772.07	99.39	ND	NA	1.45	6,865.17	NA	89.3 - 99.3	Sonsela Sandstone
OW-1	12/07/20	01/05/81	4	6,866.32	6,866.62	0.30	6,772.07	99.39	ND	NA	1.75	6,864.87	NA	89.3 - 99.3	Sonsela Sandstone
OW-10	10/09/20	11/25/80	4	6,873.67	6,874.91	1.24	6,814.58	66.30	ND	NA	7.70	6,867.21	NA	40 - 60	Sonsela Sandstone
OW-10	12/07/20	11/25/80	4	6,873.67	6,874.91	1.24	6,814.58	66.30	ND	NA	7.61	6,867.30	NA	40 - 60	Sonsela Sandstone
OW-11	09/15/20	09/25/81	4	6,922.05	6,923.51	1.46	6,857.72	65.83	ND	NA	18.51	6,905.00	NA	43 - 65	Sonsela Sandstone
OW-12	11/09/20	12/15/80	4	6,939.57	6,940.69	1.12	6,811.84	131.20	ND	NA	46.49	6,894.20	NA	117.8 - 137.8	Sonsela Sandstone
OW-13	09/14/20	12/10/80	4	6,918.95	6,920.07	1.12	6,820.92	91.65	ND	NA	20.99	6,899.08	NA	78.2 - 98.2	Sonsela Sandstone
OW-13	11/09/20	12/10/80	4	6,918.95	6,920.07	1.12	6,820.92	91.65	ND	NA	20.38	6,899.69	NA	78.2 - 98.2	Sonsela Sandstone
OW-13	12/07/20	12/10/80	4	6,918.95	6,920.07	1.12	6,820.92	91.65	ND	NA	20.24	6,899.83	NA	78.2 - 98.2	Sonsela Sandstone
OW-14	09/14/20	12/17/80	4	6,924.55	6,926.65	2.10	6,880.13	46.52	NM	NA	NM	NA	NA	35 - 45	Chinle/Alluvial Interface
OW-14	12/07/20	12/17/80	4	6,924.55	6,926.65	2.10	6,880.13	46.52	NM	NA	24.40	NA	NA	35 - 45	Chinle/Alluvial Interface
OW-29	09/14/20	08/23/96	4	6,913.89	6,917.00	3.11	6,865.92	51.05	ND	NA	14.57	6,902.43	NA	37.5 - 47.5	Chinle/Alluvial Interface
OW-29	11/09/20	08/23/96	4	6,913.89	6,917.00	3.11	6,865.92	51.05	ND	NA	17.23	6,899.77	NA	37.5 - 47.5	Chinle/Alluvial Interface
OW-29	12/07/20	08/23/96	4	6,913.89	6,917.00	3.11	6,865.92	51.05	ND	NA	17.15	6,899.85	NA	37.5 - 47.5	Chinle/Alluvial Interface
OW-30	09/15/20	08/28/96	4	6,921.81	6,924.69	2.88	6,874.79	49.90	ND	NA	NM	NA	NA	37.9 - 47.9	Chinle/Alluvial Interface
OW-30	12/07/20	08/28/96	4	6,921.81	6,924.69	2.88	6,874.79	49.90	ND	NA	22.22	NA	NA	37.9 - 47.9	Chinle/Alluvial Interface
OW-50	09/14/20	10/05/09	2	6,912.63	6,914.21	1.58	6,850.21	39.02	ND	NA	15.11	6,899.10	NA	48 - 63	Chinle/Alluvial Interface
OW-50	11/09/20	10/05/09	2	6,912.63	6,914.21	1.58	6,850.21	39.02	ND	NA	14.87	6,899.34	NA	48 - 63	Chinle/Alluvial Interface
OW-50	12/07/20	10/05/09	2	6,912.63	6,914.21	1.58	6,850.21	39.02	ND	NA	14.72	6,899.49	NA	48 - 63	Chinle/Alluvial Interface
OW-52	09/14/20	10/06/09	2	6,906.53	6,907.68	1.15	6,829.94	40.43	ND	NA	14.56	6,893.12	NA	64 - 79	Chinle/Alluvial Interface
OW-52	10/09/20	10/06/09	2	6,906.53	6,907.68	1.15	6,829.94	40.43	ND	NA	14.52	6,893.16	NA	64 - 79	Chinle/Alluvial Interface
OW-52	12/07/20	10/06/09	2	6,906.53	6,907.68	1.15	6,829.94	40.43	ND	NA	14.42	6,893.26	NA	64 - 79	Chinle/Alluvial Interface
OW-53	09/14/20	05/31/16	2	6,911.71	6,914.38	2.67	6,945.62	33.91	ND	NA	DRY	NA	NA	16 - 31	Chinle/Alluvial Interface
OW-53	11/09/20	05/31/16	2	6,911.71	6,914.38	2.67	6,945.62	33.91	ND	NA	DRY	NA	NA	16 - 31	Chinle/Alluvial Interface
OW-53	12/07/20	05/31/16	2	6,911.71	6,914.38	2.67	6,945.62	33.91	ND	NA	DRY	NA	NA	16 - 31	Chinle/Alluvial Interface
OW-54	09/14/20	06/01/16	2	6,916.27	6,918.92	2.65	6,940.85	24.58	ND	NA	18.17	6,900.75	NA	13 - 28	Chinle/Alluvial Interface
OW-54	10/09/20	06/01/16	2	6,916.27	6,918.92	2.65	6,940.85	24.58	ND	NA	17.92	6,901.00	NA	13 - 28	Chinle/Alluvial Interface

ATTACHMENT B-3. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
NON-MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Well ID	Sample Date	Installation Date	Casing Diameter (in)	Surface Elevation (ft)	Well Casing Rim Elevation (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Thickness (ft)	DTW (ft)	GW Elevation (ft)	Corrected Water Table [1] Elevation (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
OW-54	12/07/20	06/01/16	2	6,916.27	6,918.92	2.65	6,940.85	24.58	ND	NA	17.78	6,901.14	NA	13 - 28	Chinle/Alluvial Interface
OW-55	09/14/20	06/01/16	2	6,921.02	6,923.25	2.23	6,945.50	24.48	ND	NA	17.96	6,905.29	NA	13 - 28	Chinle/Alluvial Interface
OW-55	10/09/20	06/01/16	2	6,921.02	6,923.25	2.23	6,945.50	24.48	ND	NA	17.70	6,905.55	NA	13 - 28	Chinle/Alluvial Interface
OW-55	12/07/20	06/01/16	2	6,921.02	6,923.25	2.23	6,945.50	24.48	ND	NA	17.61	6,905.64	NA	13 - 28	Chinle/Alluvial Interface
OW-56	09/14/20	06/01/16	2	6,917.61	6,920.18	2.57	6,936.19	18.58	ND	NA	14.36	6,905.82	NA	6 - 16	Chinle/Alluvial Interface
OW-56	11/09/20	06/01/16	2	6,917.61	6,920.18	2.57	6,936.19	18.58	ND	NA	14.21	6,905.97	NA	6 - 16	Chinle/Alluvial Interface
OW-56	12/07/20	06/01/16	2	6,917.61	6,920.18	2.57	6,936.19	18.58	ND	NA	13.73	6,906.45	NA	6 - 16	Chinle/Alluvial Interface
OW-57	09/14/20	10/05/16	2	6,930.64	6,933.10	2.46	6,958.73	28.09	ND	NA	20.50	6,912.60	NA	15 - 25	Chinle/Alluvial Interface
OW-57	11/09/20	10/05/16	2	6,930.64	6,933.10	2.46	6,958.73	28.09	ND	NA	20.53	6,912.57	NA	15 - 25	Chinle/Alluvial Interface
OW-57	12/07/20	10/05/16	2	6,930.64	6,933.10	2.46	6,959.03	28.39	ND	NA	20.64	6,912.46	NA	15 - 25	Chinle/Alluvial Interface
OW-58	09/14/20	10/03/16	2	6,934.71	6,934.50	-0.21	6,982.71	48.00	ND	NA	23.55	6,910.95	NA	38 - 48	Chinle/Alluvial Interface
OW-58	11/09/20	10/03/16	2	6,934.71	6,934.50	-0.21	6,982.71	48.00	ND	NA	23.31	6,911.19	NA	38 - 48	Chinle/Alluvial Interface
OW-58	12/08/20	10/03/16	2	6,934.71	6,934.50	-0.21	6,982.66	47.95	ND	NA	24.32	6,910.18	NA	38 - 48	Chinle/Alluvial Interface
OW-58A	09/15/20	10/17/19	4	6,933.39	6,936.29	2.90	6,969.39	36.00	ND	NA	26.87	6,909.42	NA	25 - 33	Chinle/Alluvial Interface
OW-58A	11/09/20	10/17/19	4	6,933.39	6,936.29	2.90	6,970.30	36.91	ND	NA	24.31	6,911.98	NA	25 - 33	Chinle/Alluvial Interface
OW-58A	12/08/20	10/17/19	4	6,933.39	6,936.29	2.90	6,969.77	36.38	ND	NA	26.71	6,909.58	NA	25 - 33	Chinle/Alluvial Interface
OW-59	09/14/20	06/29/17	2	6,886.40	6,888.66	2.26	6,924.92	38.52	ND	NA	24.06	6,864.60	NA	20 - 35	Chinle/Alluvial Interface
OW-59	12/07/20	06/29/17	2	6,886.40	6,888.66	2.26	6,924.95	38.55	ND	NA	23.91	6,864.75	NA	20 - 35	Chinle/Alluvial Interface
OW-60	9/14/2020	06/29/17	2	6,889.93	6,892.50	2.57	6,935.63	45.70	ND	NA	16.57	6,875.93	NA	25 - 45	Chinle/Alluvial Interface
OW-60	11/9/2020	06/29/17	2	6,889.93	6,892.50	2.57	6,935.63	45.70	ND	NA	16.35	6,876.15	NA	25 - 45	Chinle/Alluvial Interface
OW-60	12/7/2020	06/29/17	2	6,889.93	6,892.50	2.57	6,935.63	45.70	ND	NA	16.55	6,875.95	NA	25 - 45	Chinle/Alluvial Interface
OW-61	9/15/2020	03/14/18	4	6,959.29	6,961.88	2.59	6,991.14	31.85	16.88	2.52	19.40	6,942.48	6944.496	8 - 28	Chinle/Alluvial Interface
OW-61	11/9/2020	03/14/18	4	6,959.29	6,961.88	2.59	6,991.14	31.85	18.22	1.36	19.58	6,942.30	6943.388	8 - 28	Chinle/Alluvial Interface
OW-61	12/8/2020	03/14/18	4	6,959.29	6,961.88	2.59	6,990.62	31.33	18.40	1.90	20.30	6,941.58	6943.1	8 - 28	Chinle/Alluvial Interface
OW-62	9/15/2020	03/15/18	4	6,933.21	6,936.09	2.88	6,965.26	32.05	23.62	0.25	23.87	6,912.22	6912.42	8 - 28	Chinle/Alluvial Interface
OW-62	11/9/2020	03/15/18	4	6,933.21	6,936.09	2.88	6,965.26	32.05	23.70	0.30	24.00	6,912.09	6912.33	8 - 28	Chinle/Alluvial Interface
OW-62	12/8/2020	03/15/18	4	6,933.21	6,936.09	2.88	6,964.87	31.66	23.69	0.29	23.98	6,912.11	6912.34	8 - 28	Chinle/Alluvial Interface
OW-63	09/14/20	03/14/18	4	6,930.87	6,933.87	3.00	6,962.92	32.05	ND	NA	20.73	6,913.14	NA	9 - 29	Chinle/Alluvial Interface
OW-63	11/09/20	03/14/18	4	6,930.87	6,933.87	3.00	6,962.92	32.05	ND	NA	20.85	6,913.02	NA	9 - 29	Chinle/Alluvial Interface
OW-63	12/08/20	03/14/18	4	6,930.87	6,933.87	3.00	6,963.09	32.22	ND	NA	20.97	6,912.90	NA	9 - 29	Chinle/Alluvial Interface
OW-64	9/14/2020	03/16/18	4	6,943.32	6,946.09	2.77	6,970.67	27.35	ND	NA	7.95	6,938.14	NA	4 - 24	Chinle/Alluvial Interface
OW-64	11/9/2020	03/16/18	4	6,943.32	6,946.09	2.77	6,970.67	27.35	ND	NA	8.18	6,937.91	NA	4 - 24	Chinle/Alluvial Interface
OW-64	12/7/2020	03/16/18	4	6,943.32	6,946.09	2.77	6,970.67	27.35	ND	NA	8.26	6,937.83	NA	4 - 24	Chinle/Alluvial Interface
OW-65	9/14/2020	03/12/18	4	6,949.95	6,952.83	2.88	6,992.75	42.80	24.70	6.06	30.76	6,922.07	6926.918	17 - 37	Chinle/Alluvial Interface
OW-65	11/9/2020	03/12/18	4	6,949.95	6,952.83	2.88	6,992.75	42.80	25.05	7.30	32.35	6,920.48	6926.32	17 - 37	Chinle/Alluvial Interface
OW-65	12/8/2020	03/12/18	4	6,949.95	6,952.83	2.88	6,992.45	42.50	25.79	6.16	31.95	6,920.88	6925.808	17 - 37	Chinle/Alluvial Interface

ATTACHMENT B-3. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
NON-MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Well ID	Sample Date	Installation Date	Casing Diameter (in)	Surface Elevation (ft)	Well Casing Rim Elevation (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Thickness (ft)	DTW (ft)	GW Elevation (ft)	Corrected Water Table [1] Elevation (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
RW-1	9/19/2020	03/28/95	4	6,942.86	6,946.06	3.20	6,903.02	43.45	28.07	2.13	30.20	6,915.86	6,917.56	25 - 40	Chinle/Alluvial Interface
RW-1	11/10/2020	03/28/95	4	6,942.86	6,946.06	3.20	6,903.02	43.45	29.50	0.83	30.33	6,915.73	6,916.39	25 - 40	Chinle/Alluvial Interface
RW-1	12/8/2020	03/28/95	4	6,942.86	6,946.06	3.20	6,903.02	43.45	29.50	0.83	30.33	6,915.73	6,916.39	25 - 40	Chinle/Alluvial Interface
RW-2	9/19/2020	03/29/95	4	6,926.40	6,928.53	2.13	6,888.73	40.00	22.10	0.13	22.23	6,906.30	NA	26.1 - 36.1	Chinle/Alluvial Interface
RW-2	11/9/2020	03/29/95	4	6,926.40	6,928.53	2.13	6,888.73	40.00	22.09	0.19	22.28	6,906.25	NA	26.1 - 36.1	Chinle/Alluvial Interface
RW-2	12/8/2020	03/29/95	4	6,926.40	6,928.53	2.13	6,888.73	40.00	22.20	0.18	22.38	6,906.15	NA	26.1 - 36.1	Chinle/Alluvial Interface
RW-5	9/19/2020	08/27/97	4	6,941.53	6,943.57	2.04	6,903.98	39.51	29.59	3.22	32.81	6,910.76	6,913.34	29.5 - 39.5	Chinle/Alluvial Interface
RW-5	11/9/2020	08/27/97	4	6,941.53	6,943.57	2.04	6,903.98	39.51	29.86	3.17	33.03	6,910.54	6,913.08	29.5 - 39.5	Chinle/Alluvial Interface
RW-5	12/8/2020	08/27/97	4	6,941.53	6,943.57	2.04	6,903.98	39.51	33.15	6.36	39.51	6,904.06	6,909.15	29.5 - 39.5	Chinle/Alluvial Interface
RW-6	9/19/2020	08/27/97	4	6,941.96	6,944.01	2.05	6,903.11	40.85	29.72	2.92	32.64	6,911.37	6,913.71	28.5 - 38.5	Chinle/Alluvial Interface
RW-6	11/9/2020	08/27/97	4	6,941.96	6,944.01	2.05	6,903.11	40.85	29.98	3.07	33.05	6,910.96	6,913.42	28.5 - 38.5	Chinle/Alluvial Interface
RW-6	12/8/2020	08/27/97	4	6,941.96	6,944.01	2.05	6,903.11	40.85	30.18	3.13	33.31	6,910.70	6,913.20	28.5 - 38.5	Chinle/Alluvial Interface
SMW-2	9/14/2020	09/26/85	2	6,881.63	6,883.97	2.34	6,831.17	53.11	ND	NA	24.70	6,859.27	NA	34.31 - 54.31	Chinle/Alluvial Interface and Upper Sand Well
SMW-4	9/14/2020	09/25/85	2	6,877.63	6,879.52	1.89	6,809.84	62.90	ND	NA	29.15	6,850.37	NA	51.7 - 71.7	Chinle/Alluvial Interface
STP1-NW	12/8/2020	05/06/14	2	6,904.50	6,904.47	-0.03	6,854.47	50.28	ND	NA	20.78	6,883.69	NA	20 - 50	Chinle/Alluvial Interface
STP1-SW	12/8/2020	05/06/14	2	6,912.40	6,912.38	-0.02	6,854.47	29.25	NM	NA	29.23	NA	NA	15 - 30	Chinle/Alluvial Interface

Definitions:

DRY = no water detected
DTW = depth to water
ft = feet
GW = groundwater
ID = identification
in = inch
NA = not applicable
NS = not surveyed
SPH = separate phase hydrocarbons
* Checked for Artesian flow conditions.
Negative number in Stick up Length column indicates well is flushmount and located at or below ground level.
Depth to Water Column - if 0.00 is indicated - means water is at top of casing (full) under artesian flow conditions.

Note:
1. Corrected Water Table Elevation applies only if SPH thickness column measurement exists. (0.8 X SPH thickness + Groundwater Elevation)

ATTACHMENT B-4. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

	Well ID	Sample Date	Date of Installation	Casing Diameter (in)	Surface Elevation (ft)	Well Casing Rim Elevation (ft)	Ground Elevation Inside Steel Sleeve (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Column Thickness (ft)	DTW (ft)	GW Elevation (ft)	Corrected Water Table[1] Elevation (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
	MKTF-01	02/24/20	11/14/13	4	6,918.28	6,920.67	6,920.67	2.39	6,903.25	17.42	4.87	0.29	5.16	6,915.51	6915.74	5 - 15	Chinle/Alluvium Interface
	MKTF-01	06/26/20	11/14/13	4	6,918.28	6,920.67	6,920.67	2.39	6,903.25	17.42	5.50	0.21	5.71	6,914.96	6915.13	5 - 15	Chinle/Alluvium Interface
1	MKTF-01	09/15/20	11/14/13	4	6,918.28	6,920.67	6,920.67	2.39	6,903.19	17.48	5.61	0.01	5.62	6,914.96	6915.13	5 - 15	Chinle/Alluvium Interface
	MKTF-01	11/10/20	11/14/13	4	6,918.28	6,920.67	6,920.67	2.39	6,903.25	17.48	5.61	0.28	5.89	6,914.96	6915.13	5 - 15	Chinle/Alluvium Interface
	MKTF-01	12/03/20	11/14/13	4	6,918.28	6,920.67	6,920.67	2.39	6,903.25	17.43	5.74	0.28	6.02	6,914.96	6915.13	5 - 15	Chinle/Alluvium Interface
	MKTF-02	02/24/20	11/14/13	4	6,915.00	6,917.45	6,917.18	2.45	6,896.97	20.48	ND	0.00	6.52	6,910.93	NA	7 - 17	Chinle/Alluvium Interface
	MKTF-02	06/26/20	11/14/13	4	6,915.00	6,917.45	6,917.18	2.45	6,896.97	20.48	ND	0.00	7.70	6,909.75	NA	7 - 17	Chinle/Alluvium Interface
*	MKTF-02	09/15/20	11/14/13	4	6,915.00	6,917.45	6,917.18	2.45	6,896.91	20.54	ND	0.00	7.88	6,909.57	NA	7 - 17	Chinle/Alluvium Interface
*	MKTF-02	11/10/20	11/14/13	4	6,915.00	6,917.45	6,917.18	2.45	6,896.97	20.54	ND	0.00	7.43	6,910.02	NA	7 - 17	Chinle/Alluvium Interface
	MKTF-02	12/03/20	11/14/13	4	6,915.00	6,917.45	6,917.18	2.45	6,896.97	20.54	ND	0.00	7.72	6,909.73	NA	7 - 17	Chinle/Alluvium Interface
	MKTF-03	03/05/20	11/07/13	4	6,931.73	6,931.69	6,930.85	-0.04	6,913.24	18.45	6.47	1.37	7.84	6,923.85	6924.95	3 - 18	Chinle/Alluvium Interface
	MKTF-03	06/26/20	11/07/13	4	6,931.73	6,931.69	6,930.85	-0.04	6,913.24	18.45	7.36	1.27	8.63	6,923.06	6924.08	3 - 18	Chinle/Alluvium Interface
*	MKTF-03	09/15/20	11/07/13	4	6,931.73	6,931.69	6,930.85	-0.04	6,913.10	18.59	7.08	0.01	7.09	6,924.60	6924.61	3 - 18	Chinle/Alluvium Interface
*	MKTF-03	11/10/20	11/07/13	4	6,931.73	6,931.69	6,930.85	-0.04	6,913.10	18.59	7.13	1.30	8.43	6,923.26	6924.30	3 - 18	Chinle/Alluvium Interface
*	MKTF-03	12/03/20	11/07/13	4	6,931.73	6,931.69	6,930.85	-0.04	6,913.11	18.58	7.46	1.16	8.62	6,923.07	6924.00	3 - 18	Chinle/Alluvium Interface
	MKTF-04	03/02/20	11/12/13	4	6,933.90	6,933.57	6,933.24	-0.33	6,911.36	22.21	ND	0.00	8.47	6,925.10	NA	10 - 22	Chinle/Alluvium Interface
	MKTF-04	06/26/20	11/12/13	4	6,933.90	6,933.57	6,933.24	-0.33	6,911.42	22.15	ND	0.00	9.75	6,923.82	NA	10 - 22	Chinle/Alluvium Interface
*	MKTF-04	09/15/20	11/12/13	4	6,933.90	6,933.57	6,933.24	-0.33	6,910.85	22.72	9.39	0.01	9.40	6,924.17	NA	10 - 22	Chinle/Alluvium Interface
*	MKTF-04	11/10/20	11/12/13	4	6,933.90	6,933.57	6,933.24	-0.33	6,910.85	22.72	ND	0.00	9.20	6,924.37	NA	10 - 22	Chinle/Alluvium Interface
*	MKTF-04	12/03/20	11/12/13	4	6,933.90	6,933.57	6,933.24	-0.33	6,910.85	22.72	9.70	0.01	9.71	6,923.86	NA	10 - 22	Chinle/Alluvium Interface
	MKTF-05	03/05/20	11/20/13	4	6,939.49	6,942.22	6,941.95	2.73	6,924.47	17.75	13.58	0.14	13.72	6,928.50	6928.61	4 - 14	Chinle/Alluvium Interface
	MKTF-05	06/25/20	11/20/13	4	6,939.49	6,942.22	6,941.95	2.73	6,924.47	17.75	14.06	0.75	14.80	6,927.42	6928.02	4 - 14	Chinle/Alluvium Interface
*	MKTF-05	09/15/20	11/20/13	4	6,939.49	6,942.22	6,941.95	2.73	6,924.39	17.83	13.65	1.03	14.68	6,927.54	6928.36	4 - 14	Chinle/Alluvium Interface
*	MKTF-05	11/10/20	11/20/13	4	6,939.49	6,942.22	6,941.95	2.73	6,924.39	17.83	14.02	0.88	14.90	6,927.32	6928.02	4 - 14	Chinle/Alluvium Interface
*	MKTF-05	12/03/20	11/20/13	4	6,939.49	6,942.22	6,941.95	2.73	6,924.42	17.80	14.12	0.81	14.93	6,927.29	6927.94	4 - 14	Chinle/Alluvium Interface
	MKTF-06	03/05/20	11/11/13	4	6,944.24	6,946.81	6,946.63	2.57	6,923.04	23.77	16.89	1.71	18.60	6,928.21	6929.58	8 - 20	Chinle/Alluvium Interface
	MKTF-06	06/25/20	11/11/13	4	6,944.24	6,946.81	6,946.63	2.57	6,923.04	23.77	14.05	4.86	18.90	6,927.91	6931.79	8 - 20	Chinle/Alluvium Interface
*	MKTF-06	09/15/20	11/11/13	4	6,944.24	6,946.81	6,946.63	2.57	6,923.02	23.79	16.78	1.93	18.71	6,928.10	6929.64	8 - 20	Chinle/Alluvium Interface
*	MKTF-06	11/10/20	11/11/13	4	6,944.24	6,946.81	6,946.63	2.57	6,923.02	23.79	17.20	1.39	18.59	6,928.22	6929.33	8 - 20	Chinle/Alluvium Interface
*	MKTF-06	12/03/20	11/11/13	4	6,944.24	6,946.81	6,946.63	2.57	6,923.02	23.79	17.38	1.11	18.49	6,928.32	6929.21	8 - 20	Chinle/Alluvium Interface
	MKTF-07	03/05/20	11/11/13	4	6,944.40	6,947.18	6,947.06	2.78	6,929.56	17.62	12.50	1.22	13.72	6,933.46	6934.44	4 - 14	Chinle/Alluvium Interface
	MKTF-07	06/25/20	11/11/13	4	6,944.40	6,947.18	6,947.06	2.78	6,929.56	17.62	12.23	1.53	13.76	6,933.42	6934.64	4 - 14	Chinle/Alluvium Interface
*	MKTF-07	09/18/20	11/11/13	4	6,944.40	6,947.18	6,947.06	2.78	6,929.75	17.43	11.42	2.35	13.77	6,933.41	6935.29	4 - 14	Chinle/Alluvium Interface

ATTACHMENT B-4. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

	Well ID	Sample Date	Date of Installation	Casing Diameter (in)	Surface Elevation (ft)	Well Casing Rim Elevation (ft)	Ground Elevation Inside Steel Sleeve (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Column Thickness (ft)	DTW (ft)	GW Elevation (ft)	Corrected Water Table[1] Elevation (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
*	MKTF-07	11/10/20	11/11/13	4	6,944.40	6,947.18	6,947.06	2.78	6,929.75	17.43	12.56	1.20	13.76	6,933.42	6934.38	4 - 14	Chinle/Alluvium Interface
*	MKTF-07	12/03/20	11/11/13	4	6,944.40	6,947.18	6,947.06	2.78	6,929.52	17.66	12.93	0.87	13.80	6,933.38	6934.08	4 - 14	Chinle/Alluvium Interface
	MKTF-08	03/05/20	11/11/13	4	6,944.02	6,947.09	6,942.67	3.07	6,925.11	21.98	14.03	0.34	14.37	6,932.72	6932.99	8 - 18	Chinle/Alluvium Interface
	MKTF-08	06/25/20	11/11/13	4	6,944.02	6,947.09	6,942.67	3.07	6,925.11	21.98	14.00	0.40	14.40	6,932.69	6933.01	8 - 18	Chinle/Alluvium Interface
*	MKTF-08	09/18/20	11/11/13	4	6,944.02	6,947.09	6,942.67	3.07	6,925.09	22.00	13.76	0.39	14.15	6,932.94	6933.25	8 - 18	Chinle/Alluvium Interface
*	MKTF-08	11/10/20	11/11/13	4	6,944.02	6,947.09	6,942.67	3.07	6,925.09	22.00	14.23	0.46	14.69	6,932.40	6932.77	8 - 18	Chinle/Alluvium Interface
*	MKTF-08	12/03/20	11/11/13	4	6,944.02	6,947.09	6,942.67	3.07	6,925.08	22.01	14.36	0.40	14.76	6,932.33	6932.65	8 - 18	Chinle/Alluvium Interface
	MKTF-09	03/02/20	11/11/13	4	6,943.57	6,946.50	6,945.90	2.93	6,923.74	22.76	ND	0.00	14.23	6,932.27	NA	7 - 19	Chinle/Alluvium Interface
	MKTF-09	06/25/20	11/11/13	4	6,943.57	6,946.50	6,945.90	2.93	6,923.73	22.77	ND	0.00	14.55	6,931.95	NA	7 - 19	Chinle/Alluvium Interface
*	MKTF-09	09/18/20	11/11/13	4	6,943.57	6,946.50	6,945.90	2.93	6,924.09	22.41	14.19	0.01	14.20	6,932.30	6932.31	7 - 19	Chinle/Alluvium Interface
*	MKTF-09	11/10/20	11/11/13	4	6,943.57	6,946.50	6,945.90	2.93	6,924.09	22.41	14.61	0.01	14.62	6,931.88	6931.89	7 - 19	Chinle/Alluvium Interface
*	MKTF-09	12/03/20	11/11/13	4	6,943.57	6,946.50	6,945.90	2.93	6,923.72	22.78	14.75	0.01	14.76	6,931.74	6931.75	7 - 19	Chinle/Alluvium Interface
	MKTF-10	03/02/20	10/31/13	4	6,937.51	6,937.16	6,936.63	-0.35	6,921.17	15.99	ND	0.00	7.67	6,929.49	NA	7 - 17	Chinle/Alluvium Interface
	MKTF-10	06/25/20	10/31/13	4	6,937.51	6,937.16	6,936.63	-0.35	6,921.17	15.99	ND	0.00	7.07	6,930.09	NA	7 - 17	Chinle/Alluvium Interface
*	MKTF-10	09/18/20	10/31/13	4	6,937.51	6,937.16	6,936.63	-0.35	6,920.75	16.41	7.52	0.01	7.53	6,929.63	6929.64	7 - 17	Chinle/Alluvium Interface
*	MKTF-10	11/10/20	10/31/13	4	6,937.51	6,937.16	6,936.63	-0.35	6,920.75	16.41	ND	0.00	7.79	6,929.37	NA	7 - 17	Chinle/Alluvium Interface
*	MKTF-10	12/03/20	10/31/13	4	6,937.51	6,937.16	6,936.63	-0.35	6,920.66	16.50	ND	0.00	7.80	6,929.36	NA	7 - 17	Chinle/Alluvium Interface
	MKTF-11	03/02/20	10/31/13	4	6,931.61	6,931.34	6,930.86	-0.27	6,913.20	18.14	ND	0.00	7.89	6,923.45	NA	8 - 18	Chinle/Alluvium Interface
	MKTF-11	06/26/20	10/31/13	4	6,931.61	6,931.34	6,930.86	-0.27	6,913.20	18.14	7.67	0.01	7.68	6,923.66	6923.67	8 - 18	Chinle/Alluvium Interface
*	MKTF-11	09/18/20	10/31/13	4	6,931.61	6,931.34	6,930.86	-0.27	6,912.89	18.45	7.59	0.01	7.60	6,923.74	6923.75	8 - 18	Chinle/Alluvium Interface
*	MKTF-11	11/10/20	10/31/13	4	6,931.61	6,931.34	6,930.86	-0.27	6,912.89	18.45	ND	0.00	7.61	6,923.73	NA	8 - 18	Chinle/Alluvium Interface
*	MKTF-11	12/03/20	10/31/13	4	6,931.61	6,931.34	6,930.86	-0.27	6,912.89	18.45	7.89	0.02	7.91	6,923.43	NA	8 - 18	Chinle/Alluvium Interface
	MKTF-12	02/27/20	11/07/13	4	6,939.70	6,942.11	6,941.88	2.41	6,916.51	25.60	17.84	0.08	17.92	6,924.19	6924.25	12 - 22	Chinle/Alluvium Interface
	MKTF-12	06/29/20	11/07/13	4	6,939.70	6,942.11	6,941.88	2.41	6,916.51	25.60	19.13	0.12	19.25	6,922.86	6922.96	12 - 22	Chinle/Alluvium Interface
*	MKTF-12	09/18/20	11/07/13	4	6,939.70	6,942.11	6,941.88	2.41	6,916.29	25.82	18.64	0.01	18.65	6,923.46	6923.47	12 - 22	Chinle/Alluvium Interface
*	MKTF-12	11/10/20	11/07/13	4	6,939.70	6,942.11	6,941.88	2.41	6,916.29	25.82	17.97	0.03	18.00	6,924.11	6924.13	12 - 22	Chinle/Alluvium Interface
*	MKTF-12	12/03/20	11/07/13	4	6,939.70	6,942.11	6,941.88	2.41	6,916.22	25.89	18.90	0.16	19.06	6,923.05	6923.18	12 - 22	Chinle/Alluvium Interface
	MKTF-13	02/27/20	11/12/13	4	6,933.67	6,935.18	6,934.83	1.51	6,913.93	21.25	11.13	6.18	17.31	6,917.87	6922.81	8 - 18	Chinle/Alluvium Interface
	MKTF-13	06/29/20	11/12/13	4	6,933.67	6,935.18	6,934.83	1.51	6,913.93	21.25	12.67	5.54	18.21	6,916.97	6921.40	8 - 18	Chinle/Alluvium Interface
*	MKTF-13	09/18/20	11/12/13	4	6,933.67	6,935.18	6,934.83	1.51	6,913.05	22.13	12.55	4.37	16.92	6,918.26	6921.76	8 - 18	Chinle/Alluvium Interface
*	MKTF-13	11/10/20	11/12/13	4	6,933.67	6,935.18	6,934.83	1.51	6,913.05	22.13	11.98	4.38	16.36	6,918.82	6922.32	8 - 18	Chinle/Alluvium Interface
*	MKTF-13	12/03/20	11/12/13	4	6,933.67	6,935.18	6,934.83	1.51	6,913.26	21.92	12.84	3.81	16.65	6,918.53	6921.58	8 - 18	Chinle/Alluvium Interface
	MKTF-14	02/27/20	11/12/13	4	6,925.65	6,928.02	6,927.80	2.37	6,910.56	17.46	5.35	0.30	5.65	6,922.37	6922.61	4 - 14	Chinle/Alluvium Interface

ATTACHMENT B-4. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

	Well ID	Sample Date	Date of Installation	Casing Diameter (in)	Surface Elevation (ft)	Well Casing Rim Elevation (ft)	Ground Elevation Inside Steel Sleeve (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Column Thickness (ft)	DTW (ft)	GW Elevation (ft)	Corrected Water Table[1] Elevation (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
	MKTF-14	06/29/20	11/12/13	4	6,925.65	6,928.02	6,927.80	2.37	6,910.56	17.46	6.38	2.20	8.58	6,919.44	6921.20	4 - 14	Chinle/Alluvium Interface
*	MKTF-14	09/18/20	11/12/13	4	6,925.65	6,928.02	6,927.80	2.37	6,910.70	17.32	6.18	1.98	8.16	6,919.86	6921.44	4 - 14	Chinle/Alluvium Interface
*	MKTF-14	11/10/20	11/12/13	4	6,925.65	6,928.02	6,927.80	2.37	6,910.70	17.32	5.98	0.30	6.28	6,921.74	6921.98	4 - 14	Chinle/Alluvium Interface
*	MKTF-14	12/03/20	11/12/13	4	6,925.65	6,928.02	6,927.80	2.37	6,910.47	17.55	6.79	0.27	7.06	6,920.96	6921.18	4 - 14	Chinle/Alluvium Interface
	MKTF-15	02/03/20	10/29/13	2	6,943.74	6,943.48	6,943.19	-0.26	6,924.00	19.48	13.02	0.09	13.11	6,930.37	6,930.44	9 - 19	Chinle/Alluvium Interface
	MKTF-15	06/26/20	10/29/13	2	6,943.74	6,943.48	6,943.19	-0.26	6,924.00	19.48	13.11	0.06	13.17	6,930.31	6,930.36	9 - 19	Chinle/Alluvium Interface
*	MKTF-15	09/18/20	10/29/13	2	6,943.74	6,943.48	6,943.19	-0.26	6,924.30	19.18	13.00	0.03	13.03	6,930.45	6,930.47	9 - 19	Chinle/Alluvium Interface
*	MKTF-15	11/10/20	10/29/13	2	6,943.74	6,943.48	6,943.19	-0.26	6,924.30	19.18	13.25	0.25	13.50	6,929.98	6,930.18	9 - 19	Chinle/Alluvium Interface
*	MKTF-15	11/10/20	10/29/13	2	6,943.74	6,943.48	6,943.19	-0.26	6,923.96	19.52	13.39	0.21	13.60	6,929.88	6,930.05	9 - 19	Chinle/Alluvium Interface
	MKTF-16	02/05/20	11/07/13	2	6,951.00	6,950.58	6,950.58	-0.42	6,936.48	14.10	ND	0.00	9.68	6,940.90	NA	4 - 14	Chinle/Alluvium Interface
	MKTF-16	06/26/20	11/07/13	2	6,951.00	6,950.58	6,950.58	-0.42	6,936.48	14.10	ND	0.00	9.54	6,941.04	NA	4 - 14	Chinle/Alluvium Interface
*	MKTF-16	09/18/20	11/07/13	2	6,951.00	6,950.58	6,950.58	-0.42	6,939.66	10.92	9.18	0.01	9.19	6,941.39	6,941.40	4 - 14	Chinle/Alluvium Interface
*	MKTF-16	11/10/20	11/07/13	2	6,951.00	6,950.58	6,950.58	-0.42	6,939.66	10.92	ND	0.00	7.20	6,943.38	NA	4 - 14	Chinle/Alluvium Interface
*	MKTF-16	12/08/20	11/07/13	2	6,951.00	6,950.58	6,950.58	-0.42	6,939.63	10.95	ND	0.00	9.70	6,940.88	NA	4 - 14	Chinle/Alluvium Interface
	MKTF-17	02/03/20	11/14/13	2	6,945.79	6,945.76	6,945.64	-0.03	6,921.65	24.11	11.44	5.41	16.85	6,928.91	6,933.24	14 - 24	Chinle/Alluvium Interface
	MKTF-17	06/29/20	11/14/13	2	6,945.79	6,945.76	6,945.64	-0.03	6,921.65	24.11	10.19	5.31	15.50	6,930.26	6,934.51	14 - 24	Chinle/Alluvium Interface
*	MKTF-17	09/14/20	11/14/13	2	6,945.79	6,945.76	6,945.64	-0.03	6,921.09	24.67	10.00	5.37	15.37	6,930.39	6,934.69	14 - 24	Chinle/Alluvium Interface
*	MKTF-17	11/10/20	11/14/13	2	6,945.79	6,945.76	6,945.64	-0.03	6,921.09	24.67	11.39	0.20	11.59	6,934.17	6,934.33	14 - 24	Chinle/Alluvium Interface
*	MKTF-17	12/04/20	11/14/13	2	6,945.79	6,945.76	6,945.64	-0.03	6,921.10	24.66	11.28	0.19	11.47	6,934.29	6,934.44	14 - 24	Chinle/Alluvium Interface
	MKTF-18	02/05/20	11/15/13	2	6,950.97	6,950.65	6,950.17	-0.32	6,925.27	25.38	ND	0.00	9.10	6,941.55	NA	17 - 27	Chinle/Alluvium Interface
	MKTF-18	06/30/20	11/15/13	2	6,950.97	6,950.65	6,950.17	-0.32	6,925.27	25.38	ND	0.00	8.98	6,941.67	NA	17 - 27	Chinle/Alluvium Interface
*	MKTF-18	09/18/20	11/15/13	2	6,950.97	6,950.65	6,950.17	-0.32	6,928.92	21.73	8.49	0.01	8.50	6,942.15	6,942.16	17 - 27	Chinle/Alluvium Interface
*	MKTF-18	11/10/20	11/15/13	2	6,950.97	6,950.65	6,950.17	-0.32	6,928.92	21.73	ND	0.00	8.74	6,941.91	NA	17 - 27	Chinle/Alluvium Interface
*	MKTF-18	12/04/20	11/15/13	2	6,950.97	6,950.65	6,950.17	-0.32	6,925.15	25.50	ND	0.00	8.80	6,941.85	NA	17 - 27	Chinle/Alluvium Interface
	MKTF-19	02/03/20	11/05/13	2	6,944.89	6,944.67	6,944.34	-0.22	6,927.20	17.47	11.35	1.05	12.40	6,932.27	6,933.11	10 - 20	Chinle/Alluvium Interface
	MKTF-19	06/29/20	11/05/13	2	6,944.89	6,944.67	6,944.34	-0.22	6,927.20	17.47	12.08	1.21	13.29	6,931.38	6,932.35	10 - 20	Chinle/Alluvium Interface
*	MKTF-19	09/14/20	11/05/13	2	6,944.89	6,944.67	6,944.34	-0.22	6,925.43	19.24	11.95	0.02	11.97	6,932.70	6,932.72	10 - 20	Chinle/Alluvium Interface
*	MKTF-19	11/10/20	11/05/13	2	6,944.89	6,944.67	6,944.34	-0.22	6,925.43	19.24	12.22	1.33	13.55	6,931.12	6,932.18	10 - 20	Chinle/Alluvium Interface
*	MKTF-19	12/04/20	11/05/13	2	6,944.89	6,944.67	6,944.34	-0.22	6,925.29	19.38	12.18	1.24	13.42	6,931.25	6,932.24	10 - 20	Chinle/Alluvium Interface
	MKTF-20	02/05/20	02/10/14	4	6,951.89	6,951.78	6,951.17	-0.11	6,942.95	8.83	ND	0.00	9.02	6,942.76	NA	2 - 10	Chinle/Alluvium Interface
	MKTF-20	06/26/20	02/10/14	4	6,951.89	6,951.78	6,951.17	-0.11	6,942.95	8.83	ND	0.00	8.67	6,943.11	NA	2 - 10	Chinle/Alluvium Interface
*	MKTF-20	09/15/20	02/10/14	4	6,951.89	6,951.78	6,951.17	-0.11	6,942.16	9.62	8.54	0.81	9.35	6,942.43	6,943.08	2 - 10	Chinle/Alluvium Interface
*	MKTF-20	11/10/20	02/10/14	4	6,951.89	6,951.78	6,951.17	-0.11	6,942.16	9.62	8.10	0.80	8.90	6,942.88	6,943.52	2 - 10	Chinle/Alluvium Interface

ATTACHMENT B-4. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

	Well ID	Sample Date	Date of Installation	Casing Diameter (in)	Surface Elevation (ft)	Well Casing Rim Elevation (ft)	Ground Elevation Inside Steel Sleeve (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Column Thickness (ft)	DTW (ft)	GW Elevation (ft)	Corrected Water Table[1] Elevation (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
*	MKTF-20	12/08/20	02/10/14	4	6,951.89	6,951.78	6,951.17	-0.11	6,942.18	9.60	8.76	0.19	8.95	6,942.83	6,942.98	2 - 10	Chinle/Alluvium Interface
	MKTF-21	02/05/20	02/10/14	4	6,952.68	6,952.57	6,952.00	-0.11	6,943.74	8.83	ND	0.00	8.25	6,944.32	NA	2 - 10	Chinle/Alluvium Interface
	MKTF-21	06/26/20	02/10/14	4	6,952.68	6,952.57	6,952.00	-0.11	6,943.74	8.83	8.17	0.03	8.20	6,944.37	6944.39	2 - 10	Chinle/Alluvium Interface
*	MKTF-21	09/15/20	02/10/14	4	6,952.68	6,952.57	6,952.00	-0.11	6,943.73	8.84	7.08	0.01	7.09	6,945.48	6945.49	2 - 10	Chinle/Alluvium Interface
*	MKTF-21	11/10/20	02/10/14	4	6,952.68	6,952.57	6,952.00	-0.11	6,943.73	8.84	ND	0.00	6.41	6,946.16	NA	2 - 10	Chinle/Alluvium Interface
*	MKTF-21	12/04/20	02/10/14	4	6,952.68	6,952.57	6,952.00	-0.11	6,943.77	8.80	8.04	0.01	8.05	6,944.52	NA	2 - 10	Chinle/Alluvium Interface
	MKTF-22	02/27/20	11/08/13	2	6,939.76	6,942.31	6,938.57	2.55	6,907.06	35.25	24.48	1.05	25.53	6,916.78	6917.62	22 - 32	Chinle/Alluvium Interface
	MKTF-22	06/29/20	11/08/13	2	6,939.76	6,942.31	6,938.57	2.55	6,907.06	35.25	24.57	3.14	27.71	6,914.60	6917.11	22 - 32	Chinle/Alluvium Interface
*	MKTF-22	09/14/20	11/08/13	2	6,939.76	6,942.31	6,938.57	2.55	6,907.22	35.09	24.98	2.70	27.68	6,914.63	6916.79	22 - 32	Chinle/Alluvium Interface
*	MKTF-22	11/10/20	11/08/13	2	6,939.76	6,942.31	6,938.57	2.55	6,907.22	35.09	24.94	2.35	27.29	6,915.02	6916.90	22 - 32	Chinle/Alluvium Interface
*	MKTF-22	12/04/20	11/08/13	2	6,939.76	6,942.31	6,938.57	2.55	6,907.22	35.09	25.10	2.45	27.55	6,914.76	6916.72	22 - 32	Chinle/Alluvium Interface
	MKTF-23	02/27/20	11/04/13	2	6,927.23	6,929.98	6,925.79	2.75	6,909.62	20.36	ND	0.00	13.42	6,916.56	NA	7 - 17	Chinle/Alluvium Interface
	MKTF-23	06/29/20	11/04/13	2	6,927.23	6,929.98	6,925.79	2.75	6,909.62	20.36	ND	0.00	13.25	6,916.73	NA	7 - 17	Chinle/Alluvium Interface
*	MKTF-23	09/19/20	11/04/13	2	6,927.23	6,929.98	6,925.79	2.75	6,909.96	20.02	15.42	0.02	15.44	6,914.54	6,914.56	7 - 17	Chinle/Alluvium Interface
*	MKTF-23	11/10/20	11/04/13	2	6,927.23	6,929.98	6,925.79	2.75	6,909.96	20.02	ND	0.00	14.23	6,915.75	NA	7 - 17	Chinle/Alluvium Interface
*	MKTF-23	12/04/20	11/04/13	2	6,927.23	6,929.98	6,925.79	2.75	6,909.59	20.39	14.15	0.01	14.16	6,915.82	NA	7 - 17	Chinle/Alluvium Interface
	MKTF-24	02/24/20	10/29/13	2	6,926.07	6,928.72	6,924.62	2.65	6,898.25	30.47	ND	0.00	22.17	6,906.55	NA	18 - 28	Chinle/Alluvium Interface
	MKTF-24	06/26/20	10/29/13	2	6,926.07	6,928.72	6,924.62	2.65	6,898.25	30.47	ND	0.00	22.80	6,905.92	NA	18 - 28	Chinle/Alluvium Interface
*	MKTF-24	09/15/20	10/29/13	2	6,926.07	6,928.72	6,924.62	2.65	6,897.59	31.13	ND	0.00	23.35	6,905.37	NA	18 - 28	Chinle/Alluvium Interface
*	MKTF-24	11/10/20	10/29/13	2	6,926.07	6,928.72	6,924.62	2.65	6,897.59	31.13	ND	0.00	23.32	6,905.40	NA	18 - 28	Chinle/Alluvium Interface
*	MKTF-24	12/04/20	10/29/13	2	6,926.07	6,928.72	6,924.62	2.65	6,897.54	31.18	ND	0.00	23.22	6,905.50	NA	18 - 28	Chinle/Alluvium Interface
	MKTF-25	02/26/20	10/30/13	2	6,913.35	6,916.19	6,911.79	2.84	6,896.76	19.43	ND	0.00	12.94	6,903.25	NA	6 - 16	Chinle/Alluvium Interface
	MKTF-25	06/26/20	10/30/13	2	6,913.35	6,916.19	6,911.79	2.84	6,896.76	19.43	ND	0.00	13.33	6,902.86	NA	6 - 16	Chinle/Alluvium Interface
*	MKTF-25	09/15/20	10/30/13	2	6,913.35	6,916.19	6,911.79	2.84	6,896.10	20.09	ND	0.00	13.90	6,902.29	NA	6 - 16	Chinle/Alluvium Interface
*	MKTF-25	11/10/20	10/30/13	2	6,913.35	6,916.19	6,911.79	2.84	6,896.10	20.09	ND	0.00	13.75	6,902.44	NA	6 - 16	Chinle/Alluvium Interface
*	MKTF-25	12/04/20	10/30/13	2	6,913.35	6,916.19	6,911.79	2.84	6,895.81	20.38	ND	0.00	13.62	6,902.57	NA	6 - 16	Chinle/Alluvium Interface
	MKTF-26	02/26/20	10/30/13	2	6,912.55	6,915.31	6,911.35	2.76	6,898.16	17.15	8.35	0.76	9.11	6,906.20	6906.81	4 - 14	Chinle/Alluvium Interface
	MKTF-26	06/26/20	10/30/13	2	6,912.55	6,915.31	6,911.35	2.76	6,898.16	17.15	8.61	0.89	9.50	6,905.81	6906.52	4 - 14	Chinle/Alluvium Interface
*	MKTF-26	09/15/20	10/30/13	2	6,912.55	6,915.31	6,911.35	2.76	6,898.16	16.85	8.81	0.75	9.56	6,905.75	6906.35	4 - 14	Chinle/Alluvium Interface
*	MKTF-26	11/10/20	10/30/13	2	6,912.55	6,915.31	6,911.35	2.76	6,898.16	16.85	8.65	0.71	9.36	6,905.95	6906.52	4 - 14	Chinle/Alluvium Interface
*	MKTF-26	12/04/20	10/30/13	2	6,912.55	6,915.31	6,911.35	2.76	6,898.16	17.16	7.67	1.72	9.39	6,905.92	6907.30	4 - 14	Chinle/Alluvium Interface
	MKTF-27	02/24/20	10/30/13	2	6,915.36	6,917.90	6,914.18	2.54	6,903.18	14.72	ND	0.00	3.61	6,914.29	NA	1 - 12	Chinle/Alluvium Interface
	MKTF-27	06/30/20	10/30/13	2	6,915.36	6,917.90	6,914.18	2.54	6,903.18	14.72	ND	0.00	6.70	6,911.20	NA	1 - 12	Chinle/Alluvium Interface

ATTACHMENT B-4. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

	Well ID	Sample Date	Date of Installation	Casing Diameter (in)	Surface Elevation (ft)	Well Casing Rim Elevation (ft)	Ground Elevation Inside Steel Sleeve (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Column Thickness (ft)	DTW (ft)	GW Elevation (ft)	Corrected Water Table[1] Elevation (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
*	MKTF-27	09/15/20	10/30/13	2	6,915.36	6,917.90	6,914.18	2.54	6,903.18	14.72	ND	0.00	6.21	6,911.69	NA	1 - 12	Chinle/Alluvium Interface
*	MKTF-27	11/10/20	10/30/13	2	6,915.36	6,917.90	6,914.18	2.54	6,903.18	14.72	ND	0.00	6.72	6,911.18	NA	1 - 12	Chinle/Alluvium Interface
*	MKTF-27	12/04/20	10/30/13	2	6,915.36	6,917.90	6,914.18	2.54	6,903.16	14.74	ND	0.00	6.47	6,911.43	NA	1 - 12	Chinle/Alluvium Interface
	MKTF-28	02/24/20	04/02/14	2	6,918.67	6,921.52	6,917.51	2.85	6,905.36	16.16	ND	0.00	4.53	6,916.99	NA	3 - 13	Chinle/Alluvium Interface
	MKTF-28	06/30/20	04/02/14	2	6,918.67	6,921.52	6,917.51	2.85	6,905.36	16.16	ND	0.00	4.84	6,916.68	NA	3 - 13	Chinle/Alluvium Interface
*	MKTF-28	09/15/20	04/02/14	2	6,918.67	6,921.52	6,917.51	2.85	6,905.36	16.17	ND	0.00	4.59	6,916.93	NA	3 - 13	Chinle/Alluvium Interface
*	MKTF-28	11/10/20	04/02/14	2	6,918.67	6,921.52	6,917.51	2.85	6,905.36	16.17	ND	0.00	8.81	6,912.71	NA	3 - 13	Chinle/Alluvium Interface
*	MKTF-28	12/04/20	04/02/14	2	6,918.67	6,921.52	6,917.51	2.85	6,905.36	16.16	ND	0.00	7.13	6,914.39	NA	3 - 13	Chinle/Alluvium Interface
	MKTF-29	02/24/20	04/02/14	2	6,898.83	6,901.62	6,897.67	2.79	6,878.78	22.84	ND	0.00	4.49	6,897.13	NA	10 - 20	Chinle/Alluvium Interface
	MKTF-29	06/26/20	04/02/14	2	6,898.83	6,901.62	6,897.67	2.79	6,878.78	22.84	ND	0.00	6.42	6,895.20	NA	10 - 20	Chinle/Alluvium Interface
*	MKTF-29	09/15/20	04/02/14	2	6,898.83	6,901.62	6,897.67	2.79	6,878.84	22.78	ND	0.00	8.01	6,893.61	NA	10 - 20	Chinle/Alluvium Interface
*	MKTF-29	11/10/20	04/02/14	2	6,898.83	6,901.62	6,897.67	2.79	6,878.84	22.78	ND	0.00	6.98	6,894.64	NA	10 - 20	Chinle/Alluvium Interface
*	MKTF-29	12/04/20	04/02/14	2	6,898.83	6,901.62	6,897.67	2.79	6,878.77	22.85	ND	0.00	6.40	6,895.22	NA	10 - 20	Chinle/Alluvium Interface
	MKTF-30	02/26/20	04/01/14	2	6,898.10	6,900.80	6,896.68	2.70	6,877.60	23.20	ND	0.00	15.31	6,885.49	NA	10 - 20	Chinle/Alluvium Interface
	MKTF-30	06/26/20	04/01/14	2	6,898.10	6,900.80	6,896.68	2.70	6,877.60	23.20	ND	0.00	16.19	6,884.61	NA	10 - 20	Chinle/Alluvium Interface
*	MKTF-30	09/15/20	04/01/14	2	6,898.10	6,900.80	6,896.68	2.70	6,877.58	23.22	ND	0.00	16.66	6,884.14	NA	10 - 20	Chinle/Alluvium Interface
*	MKTF-30	11/10/20	04/01/14	2	6,898.10	6,900.80	6,896.68	2.70	6,877.58	23.22	ND	0.00	16.87	6,883.93	NA	10 - 20	Chinle/Alluvium Interface
*	MKTF-30	12/04/20	04/01/14	2	6,898.10	6,900.80	6,896.68	2.70	6,877.58	23.22	ND	0.00	16.76	6,884.04	NA	10 - 20	Chinle/Alluvium Interface
	MKTF-31	02/24/20	04/01/14	2	6,904.26	6,906.87	6,903.11	2.61	6,884.06	22.81	ND	0.00	8.10	6,898.77	NA	6 - 21	Chinle/Alluvium Interface
	MKTF-31	06/26/20	04/01/14	2	6,904.26	6,906.87	6,903.11	2.61	6,884.06	22.81	ND	0.00	8.25	6,898.62	NA	6 - 21	Chinle/Alluvium Interface
*	MKTF-31	09/15/20	04/01/14	2	6,904.26	6,906.87	6,903.11	2.61	6,887.53	19.34	ND	0.00	8.75	6,898.12	NA	6 - 21	Chinle/Alluvium Interface
*	MKTF-31	11/10/20	04/01/14	2	6,904.26	6,906.87	6,903.11	2.61	6,887.53	19.34	ND	0.00	8.79	6,898.08	NA	6 - 21	Chinle/Alluvium Interface
*	MKTF-31	12/04/20	04/01/14	2	6,904.26	6,906.87	6,903.11	2.61	6,887.50	19.37	ND	0.00	8.73	6,898.14	NA	6 - 21	Chinle/Alluvium Interface
	MKTF-32	02/26/20	03/31/14	2	6,908.44	6,911.11	6,907.16	2.67	6,883.36	27.75	ND	0.00	13.78	6,897.33	NA	9- 25	Chinle/Alluvium Interface
	MKTF-32	06/29/20	03/31/14	2	6,908.44	6,911.11	6,907.16	2.67	6,883.36	27.75	ND	0.00	14.25	6,896.86	NA	10 - 24	Chinle/Alluvium Interface
*	MKTF-32	09/14/20	03/31/14	2	6,908.44	6,911.11	6,907.16	2.67	6,883.65	27.46	ND	0.00	14.58	6,896.53	NA	9- 26	Chinle/Alluvium Interface
*	MKTF-32	11/10/20	03/31/14	2	6,908.44	6,911.11	6,907.16	2.67	6,883.65	27.46	ND	0.00	14.31	6,896.80	NA	9- 26	Chinle/Alluvium Interface
*	MKTF-32	12/04/20	03/31/14	2	6,908.44	6,911.11	6,907.16	2.67	6,883.29	27.82	ND	0.00	14.25	6,896.86	NA	9- 26	Chinle/Alluvium Interface
	MKTF-33	02/27/20	04/03/14	2	6,936.59	6,939.75	6,936.59	3.16	6,906.55	33.20	ND	0.00	22.71	6,917.04	NA	20 - 30	Chinle/Alluvium Interface
	MKTF-33	06/29/20	04/03/14	2	6,936.59	6,939.75	6,936.59	3.16	6,906.55	33.20	ND	0.00	21.17	6,918.58	NA	20 - 30	Chinle/Alluvium Interface
	MKTF-33	09/14/20	04/03/14	2	6,936.59	6,939.75	6,936.59	3.16	6,906.60	33.15	21.61	6.41	28.02	6,911.73	6916.86	20 - 30	Chinle/Alluvium Interface
	MKTF-33	11/10/20	04/03/14	2	6,936.59	6,939.75	6,936.59	3.16	6,906.60	33.15	21.65	6.16	27.81	6,911.94	6916.87	20 - 30	Chinle/Alluvium Interface
	MKTF-33	12/04/20	04/03/14	2	6,936.59	6,939.75	6,936.59	3.16	6,906.18	33.57	21.69	6.08	27.77	6,911.98	6916.84	20 - 30	Chinle/Alluvium Interface

ATTACHMENT B-4. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

	Well ID	Sample Date	Date of Installation	Casing Diameter (in)	Surface Elevation (ft)	Well Casing Rim Elevation (ft)	Ground Elevation Inside Steel Sleeve (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Column Thickness (ft)	DTW (ft)	GW Elevation (ft)	Corrected Water Table[1] Elevation (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
	MKTF-34	02/05/20	03/31/14	2	6,942.42	6,945.35	3,943.52	2.93	6,917.65	27.70	ND	0.00	17.78	6,927.57	NA	9 - 24	Chinle/Alluvium Interface
	MKTF-34	06/29/20	03/31/14	2	6,942.42	6,945.35	3,943.52	2.93	6,917.65	27.70	19.04	0.02	19.06	6,926.29	6926.31	9 - 24	Chinle/Alluvium Interface
*	MKTF-34	09/14/20	03/31/14	2	6,942.42	6,945.35	3,943.52	2.93	6,917.59	27.76	ND	0.00	19.09	6,926.26	NA	9 - 24	Chinle/Alluvium Interface
*	MKTF-34	11/10/20	03/31/14	2	6,942.42	6,945.35	3,943.52	2.93	6,917.59	27.76	ND	0.00	19.08	6,926.27	NA	9 - 24	Chinle/Alluvium Interface
*	MKTF-34	12/04/20	03/31/14	2	6,942.42	6,945.35	3,943.52	2.93	6,917.57	27.78	18.91	0.01	18.92	6,926.43	NA	9 - 24	Chinle/Alluvium Interface
	MKTF-35	02/05/20	11/19/14	2	6,951.90	6,951.65	6,951.25	-0.25	6,935.20	16.45	ND	0.00	9.28	6,942.37	NA	6 - 16	Chinle/Alluvium Interface
	MKTF-35	06/30/20	11/19/14	2	6,951.90	6,951.65	6,951.25	-0.25	6,935.20	16.45	ND	0.00	9.25	6,942.40	NA	6 - 16	Chinle/Alluvium Interface
*	MKTF-35	09/14/20	11/19/14	2	6,951.90	6,951.65	6,951.25	-0.25	6,935.42	16.23	ND	0.00	8.59	6,943.06	NA	6 - 16	Chinle/Alluvium Interface
*	MKTF-35	11/10/20	11/19/14	2	6,951.90	6,951.65	6,951.25	-0.25	6,935.42	16.23	ND	0.00	8.86	6,942.79	NA	6 - 16	Chinle/Alluvium Interface
*	MKTF-35	12/04/20	11/19/14	2	6,951.90	6,951.65	6,951.25	-0.25	6,935.26	16.39	9.02	0.01	9.03	6,942.62	NA	6 - 16	Chinle/Alluvium Interface
	MKTF-36	02/03/20	11/19/14	2	6,953.90	6,953.51	6,949.87	-0.39	6,937.90	15.61	7.89	0.55	8.44	6,945.07	6945.51	5 - 15	Chinle/Alluvium Interface
	MKTF-36	06/30/20	11/19/14	2	6,953.90	6,953.51	6,949.87	-0.39	6,937.90	15.61	8.04	0.21	8.25	6,945.26	6945.43	5 - 15	Chinle/Alluvium Interface
*	MKTF-36	09/14/20	11/19/14	2	6,953.90	6,953.51	6,949.87	-0.39	6,937.93	15.58	ND	0.00	7.87	6,945.64	NA	5 - 15	Chinle/Alluvium Interface
*	MKTF-36	11/10/20	11/19/14	2	6,953.90	6,953.51	6,949.87	-0.39	6,937.93	15.58	7.98	0.05	8.03	6,945.48	6945.52	5 - 15	Chinle/Alluvium Interface
*	MKTF-36	12/04/20	11/19/14	2	6,953.90	6,953.51	6,949.87	-0.39	6,937.93	15.58	8.10	0.07	8.17	6,945.34	6945.40	5 - 15	Chinle/Alluvium Interface
	MKTF-37	02/03/20	11/18/14	2	6,959.07	6,958.87	6,958.62	-0.20	6,934.27	24.60	9.77	0.12	9.89	6,948.98	6949.08	4 - 24	Chinle/Alluvium Interface
	MKTF-37	06/30/20	11/18/14	2	6,959.07	6,958.87	6,958.62	-0.20	6,934.27	24.60	9.61	0.02	9.63	6,949.24	6949.26	4 - 24	Chinle/Alluvium Interface
*	MKTF-37	09/14/20	11/18/14	2	6,959.07	6,958.87	6,958.62	-0.20	6,934.33	24.54	ND	0.00	8.76	6,950.11	NA	4 - 24	Chinle/Alluvium Interface
*	MKTF-37	11/10/20	11/18/14	2	6,959.07	6,958.87	6,958.62	-0.20	6,934.33	24.54	9.36	0.01	9.37	6,949.50	6949.51	4 - 24	Chinle/Alluvium Interface
*	MKTF-37	12/04/20	11/18/14	2	6,959.07	6,958.87	6,958.62	-0.20	6,934.26	24.61	9.64	0.01	9.65	6,949.22	6949.23	4 - 24	Chinle/Alluvium Interface
	MKTF-38	03/04/20	11/20/14	2	6,955.17	6,954.89	6,954.54	-0.28	6,934.58	20.31	ND	0.00	9.61	6,945.28	NA	5 - 20	Chinle/Alluvium Interface
	MKTF-38	06/26/20	11/20/14	2	6,955.17	6,954.89	6,954.54	-0.28	6,934.56	20.33	ND	0.00	9.38	6,945.51	NA	5 - 20	Chinle/Alluvium Interface
*	MKTF-38	09/14/20	11/20/14	2	6,955.17	6,954.89	6,954.54	-0.28	6,934.71	20.18	ND	0.00	8.55	6,946.34	NA	5 - 20	Chinle/Alluvium Interface
*	MKTF-38	11/10/20	11/20/14	2	6,955.17	6,954.89	6,954.54	-0.28	6,934.71	20.18	ND	0.00	9.12	6,945.77	NA	5 - 20	Chinle/Alluvium Interface
*	MKTF-38	12/04/20	11/20/14	2	6,955.17	6,954.89	6,954.54	-0.28	6,933.59	21.30	9.35	0.01	9.36	6,945.53	NA	5 - 20	Chinle/Alluvium Interface
	MKTF-39	02/03/20	11/14/14	2	6,953.97	6,953.75	6,953.12	-0.22	6,938.55	15.20	ND	0.00	10.10	6,943.65	NA	5 - 15	Chinle/Alluvium Interface
	MKTF-39	06/26/20	11/14/14	2	6,953.97	6,953.75	6,953.12	-0.22	6,938.75	15.00	ND	0.00	9.63	6,944.12	NA	5 - 15	Chinle/Alluvium Interface
*	MKTF-39	09/15/20	11/14/14	2	6,953.97	6,953.75	6,953.12	-0.22	6,939.56	14.19	ND	0.00	9.58	6,944.17	NA	5 - 15	Chinle/Alluvium Interface
*	MKTF-39	11/10/20	11/14/14	2	6,953.97	6,953.75	6,953.12	-0.22	6,939.56	14.19	ND	0.00	10.05	6,943.70	NA	5 - 15	Chinle/Alluvium Interface
*	MKTF-39	12/04/20	11/14/14	2	6,953.97	6,953.75	6,953.12	-0.22	6,939.56	15.19	ND	0.00	10.15	6,943.70	NA	5 - 15	Chinle/Alluvium Interface
	MKTF-40	02/27/20	11/13/14	2	6,891.35	6,894.33	6,890.48	2.98	6,870.69	23.64	ND	0.00	13.23	6,881.10	NA	5 - 20	Chinle/Alluvium Interface
	MKTF-40	06/26/20	11/13/14	2	6,891.35	6,894.33	6,890.48	2.98	6,870.69	23.64	ND	0.00	12.75	6,881.58	NA	5 - 20	Chinle/Alluvium Interface
*	MKTF-40	09/15/20	11/13/14	2	6,891.35	6,894.33	6,890.48	2.98	6,870.67	23.66	ND	0.00	13.39	6,880.94	NA	5 - 20	Chinle/Alluvium Interface

ATTACHMENT B-4. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

	Well ID	Sample Date	Date of Installation	Casing Diameter (in)	Surface Elevation (ft)	Well Casing Rim Elevation (ft)	Ground Elevation Inside Steel Sleeve (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Column Thickness (ft)	DTW (ft)	GW Elevation (ft)	Corrected Water Table[1] Elevation (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
*	MKTF-40	11/10/20	11/13/14	2	6,891.35	6,894.33	6,890.48	2.98	6,870.67	23.66	ND	0.00	13.71	6,880.62	NA	5 - 20	Chinle/Alluvium Interface
*	MKTF-40	12/04/20	11/13/14	2	6,891.35	6,894.33	6,890.48	2.98	6,870.66	23.67	ND	0.00	13.99	6,880.34	NA	5 - 20	Chinle/Alluvium Interface
	MKTF-41	02/26/20	11/14/14	2	6,891.11	6,893.64	6,889.80	2.53	6,853.54	40.10	ND	0.00	20.15	6,873.49	NA	22 - 37	Chinle/Alluvium Interface
	MKTF-41	06/29/20	11/14/14	2	6,891.11	6,893.64	6,889.80	2.53	6,853.54	40.10	ND	0.00	19.77	6,873.87	NA	22 - 37	Chinle/Alluvium Interface
*	MKTF-41	09/14/20	11/14/14	2	6,891.11	6,893.64	6,889.80	2.53	6,853.98	39.66	ND	0.00	20.72	6,872.92	NA	22 - 37	Chinle/Alluvium Interface
*	MKTF-41	11/10/20	11/14/14	2	6,891.11	6,893.64	6,889.80	2.53	6,853.98	39.66	ND	0.00	21.01	6,872.63	NA	22 - 37	Chinle/Alluvium Interface
*	MKTF-41	12/04/20	11/14/14	2	6,891.11	6,893.64	6,889.80	2.53	6,853.84	39.80	ND	0.00	20.90	6,872.74	NA	22 - 37	Chinle/Alluvium Interface
	MKTF-42	02/26/20	11/12/14	2	6,890.42	6,892.95	6,888.75	2.53	6,859.80	33.15	ND	0.00	16.79	6,876.16	NA	10 - 30	Chinle/Alluvium Interface
	MKTF-42	06/30/20	11/12/14	2	6,890.42	6,892.95	6,888.75	2.53	6,859.80	33.15	ND	0.00	16.25	6,876.70	NA	10 - 30	Chinle/Alluvium Interface
*	MKTF-42	09/14/20	11/12/14	2	6,890.42	6,892.95	6,888.75	2.53	6,859.85	33.10	ND	0.00	16.35	6,876.60	NA	10 - 30	Chinle/Alluvium Interface
*	MKTF-42	11/10/20	11/12/14	2	6,890.42	6,892.95	6,888.75	2.53	6,859.85	33.10	ND	0.00	15.30	6,877.65	NA	10 - 30	Chinle/Alluvium Interface
*	MKTF-42	12/04/20	11/12/14	2	6,890.42	6,892.95	6,888.75	2.53	6,860.00	32.95	ND	0.00	16.41	6,876.54	NA	10 - 30	Chinle/Alluvium Interface
	MKTF-43	02/26/20	11/11/14	2	6,874.12	6,876.90	6,873.22	2.78	6,861.47	15.43	ND	0.00	6.33	6,870.57	NA	2 - 12	Chinle/Alluvium Interface
	MKTF-43	06/30/20	11/11/14	2	6,874.12	6,876.90	6,873.22	2.78	6,861.47	15.43	ND	0.00	5.50	6,871.40	NA	2 - 12	Chinle/Alluvium Interface
*	MKTF-43	09/14/20	11/11/14	2	6,874.12	6,876.90	6,873.22	2.78	6,860.68	16.22	ND	0.00	6.45	6,870.45	NA	2 - 12	Chinle/Alluvium Interface
*	MKTF-43	11/10/20	11/11/14	2	6,874.12	6,876.90	6,873.22	2.78	6,860.68	16.22	ND	0.00	7.48	6,869.42	NA	2 - 12	Chinle/Alluvium Interface
*	MKTF-43	12/04/20	11/11/14	2	6,874.12	6,876.90	6,873.22	2.78	6,859.98	16.92	ND	0.00	8.12	6,868.78	NA	2 - 12	Chinle/Alluvium Interface
	MKTF-44	03/04/20	11/11/14	2	6,867.41	6,869.95	6,866.06	2.54	6,818.80	51.15	ND	0.00	30.34	6,839.61	NA	38 - 48	Chinle/Alluvium Interface
	MKTF-44	06/26/20	11/11/14	2	6,867.41	6,869.95	6,866.06	2.54	6,818.80	51.15	ND	0.00	33.08	6,836.87	NA	38 - 48	Chinle/Alluvium Interface
*	MKTF-44	09/14/20	11/11/14	2	6,867.41	6,869.95	6,866.06	2.54	6,818.00	51.95	ND	0.00	28.00	6,841.95	NA	38 - 48	Chinle/Alluvium Interface
*	MKTF-44	12/04/20	11/11/14	2	6,867.41	6,869.95	6,866.06	2.54	6,818.56	51.39	ND	0.00	39.59	6,830.36	NA	38 - 48	Chinle/Alluvium Interface
	MKTF-45	02/03/20	Pre-existing	4	6,948.63	6,949.59	6,948.27	0.96	6,919.35	30.24	9.60	9.02	18.62	6,930.97	6938.19	Unknown	Chinle/Alluvium Interface
	MKTF-45	06/30/20	Pre-existing	4	6,948.63	6,949.59	6,948.27	0.96	6,919.35	30.24	11.08	8.00	19.08	6,930.51	6936.91	Unknown	Chinle/Alluvium Interface
*	MKTF-45	09/14/20	Pre-existing	4	6,948.63	6,949.59	6,948.27	0.96	6,912.14	37.45	13.14	5.29	18.43	6,931.16	6935.39	Unknown	Chinle/Alluvium Interface
*	MKTF-45	11/10/20	Pre-existing	4	6,948.63	6,949.59	6,948.27	0.96	6,912.14	37.45	12.94	1.82	14.76	6,934.83	6936.29	Unknown	Chinle/Alluvium Interface
*	MKTF-45	12/04/20	Pre-existing	4	6,948.63	6,949.59	6,948.27	0.96	6,919.14	30.45	12.66	1.85	14.51	6,935.08	6936.56	Unknown	Chinle/Alluvium Interface
	MKTF-46	03/05/20	10/12/19	2	6,954.73	6,957.60	6,866.06	2.87	6,939.60	18.00	ND	0.00	10.93	6,946.67	NA	3 - 18	Chinle/Alluvium Interface
	MKTF-46	06/30/20	10/12/19	2	6,954.73	6,957.60	6,866.06	2.87	6,939.60	18.00	ND	0.00	11.08	6,946.52	NA	3 - 18	Chinle/Alluvium Interface
*	MKTF-46	09/14/20	10/12/19	2	6,954.73	6,957.60	6,866.06	2.87	6,932.31	25.29	ND	0.00	10.18	6,947.42	NA	3 - 18	Chinle/Alluvium Interface
*	MKTF-46	11/10/20	10/12/19	2	6,954.73	6,957.60	6,866.06	2.87	6,932.31	25.29	ND	0.00	10.57	6,947.03	NA	3 - 18	Chinle/Alluvium Interface
*	MKTF-46	12/04/20	10/12/19	2	6,954.73	6,957.60	6,866.06	2.87	6,936.30	21.30	ND	0.00	10.77	6,946.83	NA	3 - 18	Chinle/Alluvium Interface
	MKTF-47	03/05/20	10/14/19	2	6,959.51	6,959.09	6,866.06	-0.42	6,944.79	14.00	ND	0.00	9.89	6,949.20	NA	4 - 14	Chinle/Alluvium Interface
	MKTF-47	06/29/20	10/14/19	2	6,959.51	6,959.09	6,866.06	-0.42	6,944.79	14.00	ND	0.00	9.50	6,949.59	NA	4 - 14	Chinle/Alluvium Interface

ATTACHMENT B-4. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
MKTF WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

	Well ID	Sample Date	Date of Installation	Casing Diameter (in)	Surface Elevation (ft)	Well Casing Rim Elevation (ft)	Ground Elevation Inside Steel Sleeve (ft)	Stick-up length (ft)	Well Casing Bottom Elevation (ft)	Total Well Depth (ft)	Depth to SPH (ft)	SPH Column Thickness (ft)	DTW (ft)	GW Elevation (ft)	Corrected Water Table[1] Elevation (ft)	Screened Interval Depth Top to Bottom (ft)	Stratigraphic unit in which screen exists
*	MKTF-47	09/15/20	10/14/19	2	6,959.51	6,959.09	6,866.06	-0.42	6,944.79	14.31	8.53	0.01	8.54	6,950.55	6950.56	4 - 14	Chinle/Alluvium Interface
*	MKTF-47	11/10/20	10/14/19	2	6,959.51	6,959.09	6,866.06	-0.42	6,944.79	14.31	ND	0.00	9.33	6,949.76	NA	4 - 14	Chinle/Alluvium Interface
*	MKTF-47	12/04/20	10/14/19	2	6,959.51	6,959.09	6,866.06	-0.42	6,944.79	14.31	9.58	0.01	9.59	6,949.50	NA	4 - 14	Chinle/Alluvium Interface
	MKTF-48	03/03/20	10/14/19	2	6,959.24	6,961.73	6,866.06	2.49	6,940.81	18.00	12.66	0.16	12.82	6,948.91	6949.04	2 - 17	Chinle/Alluvium Interface
	MKTF-48	06/29/20	10/14/19	2	6,959.24	6,961.73	6,866.06	2.49	6,940.81	18.00	ND	0.00	11.58	6,950.15	NA	2 - 17	Chinle/Alluvium Interface
*	MKTF-48	09/15/20	10/14/19	2	6,959.24	6,961.73	6,866.06	2.49	6,940.81	19.91	11.85	0.01	11.86	6,949.87	6949.88	2 - 17	Chinle/Alluvium Interface
*	MKTF-48	11/10/20	10/14/19	2	6,959.24	6,961.73	6,866.06	2.49	6,940.81	19.91	12.40	0.11	12.51	6,949.22	6949.31	2 - 17	Chinle/Alluvium Interface
*	MKTF-48	12/04/20	10/14/19	2	6,959.24	6,961.73	6,866.06	2.49	6,940.81	20.94	12.77	0.33	13.10	6,948.63	6948.89	2 - 17	Chinle/Alluvium Interface
	MKTF-49	03/04/20	10/15/19	2	6,944.00	6,946.76	6,866.06	2.76	6,921.86	28.00	ND	0.00	20.27	6,926.49	NA	5 - 25	Chinle/Alluvium Interface
	MKTF-49	06/30/20	10/15/19	2	6,944.00	6,946.76	6,866.06	2.76	6,921.86	28.00	ND	0.00	20.65	6,926.11	NA	5 - 25	Chinle/Alluvium Interface
*	MKTF-49	09/15/20	10/15/19	2	6,944.00	6,946.76	6,866.06	2.76	6,921.86	24.96	ND	0.00	20.33	6,926.43	NA	5 - 25	Chinle/Alluvium Interface
*	MKTF-49	11/10/20	10/15/19	2	6,944.00	6,946.76	6,866.06	2.76	6,921.86	24.96	ND	0.00	20.75	6,926.01	NA	5 - 25	Chinle/Alluvium Interface
*	MKTF-49	12/04/20	10/15/19	2	6,944.00	6,946.76	6,866.06	2.76	6,921.86	24.97	ND	0.00	20.81	6,925.95	NA	5 - 25	Chinle/Alluvium Interface
	MKTF-50	03/04/20	10/16/19	2	6,939.68	6,942.82	6,948.27	3.14	6,921.17	26.00	ND	0.00	15.87	6,926.95	NA	3 - 18	Chinle/Alluvium Interface
	MKTF-50	06/30/20	10/16/19	2	6,939.68	6,942.82	6,948.27	3.14	6,921.17	26.00	ND	0.00	16.00	6,926.82	NA	3 - 18	Chinle/Alluvium Interface
*	MKTF-50	09/15/20	10/16/19	2	6,939.68	6,942.82	6,948.27	3.14	6,921.17	22.64	15.36	0.01	15.37	6,927.45	6927.46	3 - 18	Chinle/Alluvium Interface
*	MKTF-50	11/10/20	10/16/19	2	6,939.68	6,942.82	6,948.27	3.14	6,921.17	22.64	ND	0.00	16.03	6,926.79	NA	3 - 18	Chinle/Alluvium Interface
*	MKTF-50	12/04/20	10/16/19	2	6,939.68	6,942.82	6,948.27	3.14	6,921.17	21.63	ND	0.00	16.17	6,926.65	NA	3 - 18	Chinle/Alluvium Interface

Definitions:
NA = not applicable
DTW = depth to water
SPH = separate phase hydrocarbons
NS = Not Surveyed
NM = Not Measured
DRY = no water detected
in = inch
ft = feet

Notes:
1. Corrected Water Table Elevation applies only if SPH thickness column measurement exists. (0.8 X SPH thickness + Groundwater Elevation)
Negative number in Stick up Length column indicates well is flushmount and located at or below ground level.
Depth to Water Column - if 0.00 is indicated - means water is at top of casing (full) under artesian flow conditions.

ATTACHMENT B-5. WELL INFORMATION - SURVEY DATA, SCREENED INTERVAL, STRATIGRAPHIC UNIT
ARTESIAN WATER WELLS
GALLUP REFINERY, GALLUP, NEW MEXICO

Well ID	Date of Installation	Submersible pump depth (ft)	Casing Diameter (in)	Well Head Elevation Mark* (North) (ft)	Well Head Elevation Mark* (West) (ft)	Well Head Elevation Mark* (Z) (ft)	Measuring Point Discription	Total Well Depth (ft)
PW-2	9/24/1956	800	16.0	3300.40	4694.28	162.78	1st Discharge tee or elbow	1075.00
PW-3	4/1979	900	14.0	2932.83	1387.79	248.00	1st Discharge tee or elbow	1030.00
PW-4	11/12/1999	750	12.0	1895.73	2979.78	178.51	1st Discharge tee or elbow	1020.00

Well ID	Well Casing Bottom Elevation (ft)	Stratigraphic unit	Aquifer
PW-2	2225.40	Chinle	San Andreas/Yeso Aquifer
PW-3	1902.83	Chinle	San Andreas/Yeso Aquifer
PW-4	819.73	Chinle	San Andreas/Yeso Aquifer

Notes

ft = feet
ID = identification
in = inch
MSL = mean sea level
* Basis of survey Refinery Control Point at 1000W, 2575N, plant elevation = 254.87 ft and MSL elevation = 6959.41 ft

1) Well casing bottom elevation using Well Head Elevation Mark (North) as a reference point.
2) Actual well casing diameter is 12 inches. The 176 ft of 24 in steel casing is the actual cemented support for development of the well.
3) The actual total well depth is 1020 ft with additonal 56 ft x 7-7/8 in diameter open exploratory hole which was accounted for as total well depth of 1076 ft.