GW - 032

Other RCRA Correspondence

2021

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

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

Michelle Lujan Grisham
Governor

Howie C. Morales
Lt. Governor

James C. Kenney
Cabinet Secretary

Jennifer J. Pruett
Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

March 15, 2021

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

RE: APPROVAL WITH MODIFICATIONS
RESPONSE TO DISAPPROVAL INVESTIGATION WORK PLAN SOLID WASTE MANAGEMENT UNIT (SWMU) NO. 1 AERATION BASIN AND SWMU NO. 14 OLD API SEPARATOR
WESTERN REFINING SOUTHWEST INC., GALLUP REFINERY
EPA ID # NMD000333211
HWB-WRG-14-005

Dear Mr. Moore:

The New Mexico Environment Department (NMED) has reviewed the *Response to Disapproval Investigation Work Plan Solid Waste Management Unit (SWMU) No. 1 Aeration Basin and SWMU 14 Old API Separator* (Response), dated November 28, 2018, submitted on behalf of Marathon Petroleum Company dba Western Refining Southwest Inc., Gallup Refinery (the Permittee). NMED hereby issues this Approval with Modifications with the following comments.

Comment 1
The response to NMED's *Disapproval* Comment 1, item a states, "[t]he proposed boring/temporary well north of SMWU 1-6 and 1-28 will be completed to define the lateral

extent of impacts observed in the groundwater sample collected at SWMU 1-6." According to Figure 6, *Proposed Sample Location,* the referenced soil boring is proposed to be installed at the northern perimeter of Pond EP-1. NMED's *Approval with Modifications Solid Waste Management Unit 1 Revised Investigation Report,* dated January 26, 2021, approved a removal of the Aeration Lagoons and Evaporation Pond 1 altogether and required the Permittee to submit a work plan that describes all activities related to the removal no later than **April 30, 2021**. The proposed boring is no longer relevant because of the upcoming excavation of the Aeration Lagoons and Evaporation Pond 1.

Whether or not the proposed boring shown on Figure 6 will be located inside the excavation, the removal likely eliminates the source of the contamination from SWMU 1. Accordingly, the proposed soil boring is not necessary.

Comment 2

The response to NMED's *Disapproval* Comment 1, item b states, "[a] new proposed soil boring/temporary well is now located up-gradient, to the southeast of the Old API Separator (see Figure 7 and new Figure 8). This is a very active operations area around the flare, so access is limited, but we believe we can locate a well on the east side of the overhead pipe rack." The current refinery shutdown may have improved accessibility in the vicinity of the Old API Separator. Explain whether the structures associated with the Old API Separator and flare stack can be removed under the current refinery shutdown. If so, propose to remove them before the investigation of SWMU 14 takes place.

Regardless, the investigations associated with the Old API Separator must be deferred until the removal of the Aeration Lagoons and Evaporation Pond 1 is completed. The Old API Separator is located close to the Aeration Lagoons and the removal potentially affects current scope of the investigation. In a response letter, propose to submit an investigation work plan that solely focuses on the investigation of SWMU 14 after the removal of the Aeration Lagoons and Evaporation Pond 1 is completed.

In addition, the Permittee's *Flare KOD Pump Sodium Hydroxide Release Soil Sampling Investigation Work Plan*, dated November 30, 2020, proposes soil sampling in the vicinity of the Old API Separator. Since the area of the investigations overlaps one another, these investigations may concurrently be conducted and the results may be combined, as appropriate. However, the investigation reports must be submitted separately for tracking purposes. As a reminder, the NMED's *Approval with Modifications Flare KOD Pump Sodium Hydroxide Release Investigation Work Plan,* dated December 21, 2020, requires a submittal of a response letter no later than **April 30, 2021**. The investigation activities proposed in the *Flare KOD Pump Sodium Hydroxide Release Soil Sampling Investigation Work Plan* may also be deferred until the removal of the Aeration Lagoons and Evaporation Pond 1 is completed, as appropriate.

Comment 3
The response to NMED's *Disapproval* Comment 1, item c states, "[d]ue to aboveground tanks and overhead pipe racks, it is not possible to get access with a drilling rig any closer than was achieved during the previous field effort. Based on the limited area of concern, the fact that no concentrations exceed the non-residential soil screening levels and the physical access limitations, we recommend no further assessment specifically for 1,2-dibromoethane." The current refinery shutdown may have improved accessibility in the vicinity of the Old API Separator. The extent of contamination associated with 1,2-dibromoethane must further be investigated and the provision must be included in the work plan required by Comment 2 above.

Comment 4
The response to NMED's *Disapproval* Comment 1, item c states, "[s]ome of this [north side of the Old API Separator] area is routinely stands surface water [sic], but an effort will be made to install borings in such a manner as to prevent cross-contamination." The issue associated with surface water may be resolved after the Aeration Lagoons are removed. The investigations associated with the Old API Separator must be deferred until the removal of the Aeration Lagoons and Evaporation Pond 1 is completed (see Comment 2 above).

Comment 5
The response to NMED's *Disapproval* Comment 3 states, "[w]e propose one boring on the south, two along the west, one to the north and two along the east side of the Aeration Basin to the north of the New API Separator, with final locations to be determined based on rig access." The confirmatory soil sampling from the excavation floor and sidewall may substitute for the proposed investigation associated with SWMU 1. Accordingly, the investigation associated with SWMU 1 may no longer be necessary (see Comment 1 above).

The Permittee must address the comments in this letter and submit a response letter no later than **June 11, 2021**. The investigation work plan required by Comment 2 must be submitted no later than **December 31, 2022**.

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

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

Sincerely,

Dave Cobrain
Program Manager
Hazardous Waste Bureau

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

File: Reading File and WRG 2021 File

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

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

Michelle Lujan Grisham
Governor

Howie C. Morales
Lt. Governor

James C. Kenney
Cabinet Secretary

Jennifer J. Pruett
Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

March 15, 2021

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

RE: APPROVAL
[REVISED] INVESTIGATION WORK PLAN SWMU NO. 9 – DRAINAGE DITCH AND INACTIVE LANDFARM
WESTERN REFINING SOUTHWEST INC., GALLUP REFINERY
EPA ID # NMD000333211
HWB-WRG-18-016

Dear Mr. Moore:

The New Mexico Environment Department (NMED) has reviewed the [Revised] Investigation Work Plan SWMU No. 9 – Drainage Ditch and Inactive Landfarm (Work Plan), dated August 2019, submitted on behalf of Marathon Petroleum Company dba Western Refining Southwest Inc., Gallup Refinery (the Permittee). The Permittee adequately addressed the comments provided by the NMED's April 5, 2019 *Disapproval* in the Work Plan. Accordingly, NMED hereby issues this Approval.

The Permittee must conduct field investigations for SWMU 9 in accordance with the approved Work Plan. The investigation report that summarizes the results of the investigation must be submitted to NMED no later than **December 31, 2022**.

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

If you have questions regarding this letter, please contact Michiya Suzuki of my staff at 505-690-6930.

Sincerely,

Dave Cobrain
Program Manager
Hazardous Waste Bureau

cc: M. Suzuki, NMED HWB
C. Chavez, OCD
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 29, 2021

Mr. Kevin Pierard, Chief
New Mexico Environment Department
2905 Rodeo Park Drive East, Bldg. 1
Santa Fe, NM 875O5-6303

RE: Response to Approval with Modifications
Revised Investigation Work Plan North Drainage Ditch Area
Marathon Petroleum Company LP, Gallup Refinery
(dba Western Refining Southwest LLC)
EPA ID# NMD000333211
HWB-WRG-19-009

Dear Mr. Kieling:

Marathon Petroleum Company LP (dba Western Refining Southwest LLC) Gallup Refinery is submitting the enclosed responses to your comments dated March 4, 2021 on the referenced Work Plan. The Work Plan has been revised per your comments and enclosed for your review is a revised copy of Figure 2. If there are any questions, please call John Moore at 505-879-7643.

Certification

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

Sincerely,
Marathon Petroleum Company LP, Gallup Refinery

Robert S. Hanks
Refinery General Manager

Enclosure

cc D. Cobrain, NMED HWB
M. Suzuki, NMED HWB
C. Chavez NMOCD
G. McCartney, Marathon Petroleum Company
K. Luka, Marathon Petroleum Company
J. Moore, Marathon Gallup Refinery
H. Jones, Trihydro Corporation
S. Crouch, DiSorbo Consulting, LLC

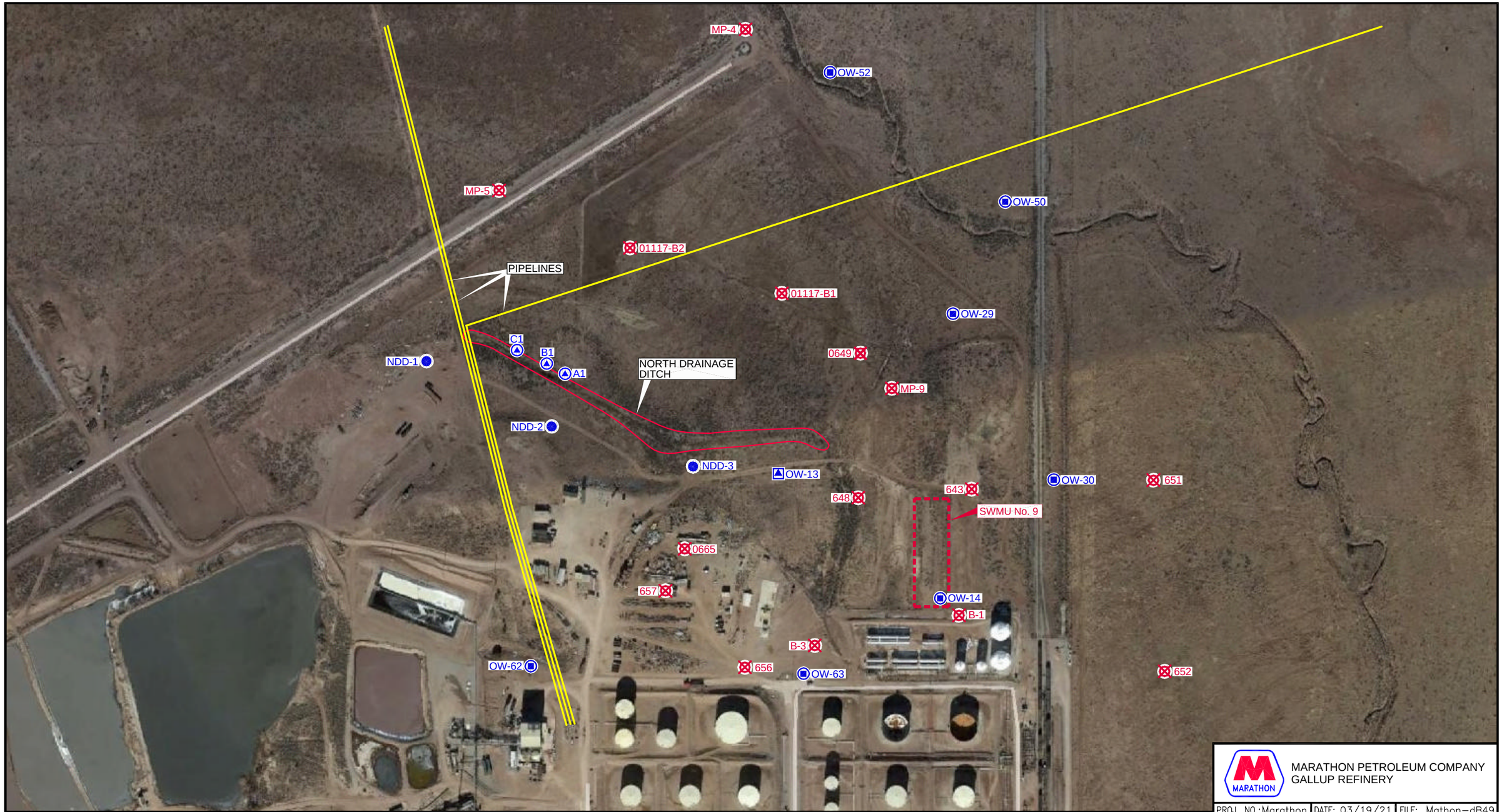
RESPONSE TO COMMENTS
March 4, 2021 Approval with Modifications –
Revised Investigation Work Plan North Drainage Ditch Area
(September 2019)

NMED Comment 1:
The response to NMED's Disapproval Comment 2 states, "[t]he missing historic borings [01117-B1, 0117-B2, 648, 643, 649, 651, 652, 665, 656, 657, MP-4, MP-5, MP-9, B-1, and B-3] are included in Appendix B…" The boring logs are appropriately included in Appendix B; however, the Work Plan does not include a figure that identifies the location of the borings. Provide a figure that identifies the location of the historic borings.

MPC Response 1:
Figure 2 in the Work Plan has been revised to include the location of the historic borings. Attached to this correspondence is a copy of Figure 2.

NMED Comment 2:
The response to NMED's Disapproval Comment 12 states, "we acknowledge the comment and will take this into consideration during report preparation as to which constituents are included in the data summary tables." Note that NMED's Disapproval Comment 12 does not allow the Permittee to selectively report detected constituents. All constituents detected above their corresponding detection limits must be identified in the data summary tables of the investigation report.

MPC Response 2:
The comment is acknowledged and Marathon will identify all constituents detected above their corresponding detection limits in the data summary tables of the investigation report.



Aerial Map Source: Google Map, 02/19/2014.

N

0 300
SCALE IN FEET

LEGEND

A1	SURFACE WATER SAMPLE LOCATION AND IDENTIFICATION NUMBER	OW-14	ALLUVIUM/CHINLE GP MONITORING WELL LOCATION AND IDENTIFICATION NUMBER
NDD-1	TEMPORARY MONITORING WELL LOCATION AND IDENTIFICATION NUMBER	MP-5	HISTORIC SOIL BORING LOCATION AND IDENTIFICATION NUMBER
OW-13	SONSELA MONITORING WELL LOCATION AND IDENTIFICATION NUMBER		

GALLUP SITE LOCATION

MARATHON PETROLEUM COMPANY
GALLUP REFINERY

PROJ. NO.:Marathon | DATE: 03/19/21 | FILE: Mathon-dB49

FIGURE 2
INVESTIGATION AREA

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

Western Refining Southwest LLC
A subsidiary of Marathon Petroleum Corporation
I-40 Exit 39
Jamestown, NM 87347

April 30, 2021

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

RE: Response to Comments Approval with Modifications
Flare KOD Pump Sodium Hydroxide Release Investigation Work Plan
Marathon Petroleum Company LP, Gallup Refinery
(dba Western Refining Southwest LLC)
EPA ID# NMD000333211
HWB-WRG-20-020

Dear Mr. Pierard:

Marathon Petroleum Company LP (dba Western Refining Southwest, LLC) Gallup Refinery is submitting this *Response to Comments Approval with Modifications Flare KOD Pump Sodium Hydroxide Re lease Investigation Work Plan,* dated December 21, 2020. If there are any questions, please call 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 or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,
Marathon Petroleum Company LP, Gallup Refinery

Robert S. Hanks
Refinery General Manager

Enclosure

cc: D. Cobrain, NMED HWB
M. Suzuki, NMED HWB
C. Chavez, NMOCD
T. McDill, NMOCD
L. King, EPA Region 6
G. McCartney, Marathon Petroleum Corporation
K. Luka, Marathon Petroleum Corporation
J. Moore, Marathon Gallup Refinery
H. Jones, Trihydro Corporation

Attachment A: Response to Comment

New Mexico Environment Department to Marathon Petroleum Company Comment Letter "Response to Approval with Modifications Flare KOD Pump Sodium Hydroxide Release Investigation Work Plan" (December 21, 2020)

New Mexico Environment Department (NMED) Comment	Marathon Petroleum Company (MPC) Response
Comment 1:	**Response 1:**
In the *Scope of Activities Section, Field Screening*, page 6 of 10, the Permittee states, "the sample will also be wetted, and a field pH will be taken." Appendix A*, Standard Operating Procedure - Soil Sampling*, indicates that a soil pH meter will be used for field screening and calibrated according to manufacturer's recommendations. Provide a more detailed description of the pH screening procedures in a response letter. In addition, the soil pH meter used for this investigation must be capable of reading pH values above 12.5. One of the calibration points must include pH greater than 12.5 and the linearity of the calibration curve must be demonstrated for the instrument. Otherwise, EPA Method 9045B must be used for soil pH measurement. In this case, a low-sodium—error electrode must be used to compensate for inaccurate readings associated with very high pH that may be present in the areas where sodium hydroxide was released. Include the provision in the revised Work Plan and provide replacement pages, as appropriate.	Prior to the soil sample being placed in a Ziploc® bag, the sample will be wetted with deionized water at the depth of interest for in situ soil pH measurement. The pH meter probe will be placed on the wetted area and allowed to equilibrate (stabilize). The pH and temperature will be recorded as well as the date, time, sample location, and depth. Once the pH and temperature have been recorded the soils will be allowed to warm to approximately 70 degrees Fahrenheit (F) and be transferred to a Ziploc® bag. The head space will then be measured for petroleum hydrocarbons with a photo-ionization detector (PID). The soil pH meter to be used for this project is an ExStick pH Meter, Model PH100 or equivalent. This pH meter is cable of reading soil pH measurements between 0.00 and 14. A CAL alert feature ensures consistently accurate readings by alerting users when to recalibrate. Using a 1-, 2-, or 3-point calibration, the unit automatically recognizes buffer solutions. The unit will be calibrated at least once daily using buffer solutions with pH of 7, 10, and 13. The calibration results will be recorded in a field notebook. The calibration results will be graphed to confirm linearity or error of the calibration. If the unit cannot show linearity of the calibration curve, the sample(s) will be analyzed by EPA Method 9045B with a low sodium-error electrode. This provision will be included in the revised Work Plan and the revised pages are also included with this letter as Attachment A.

New Mexico Environment Department to Marathon Petroleum Company Comment Letter "Response to Approval with Modifications Flare KOD Pump Sodium Hydroxide Release Investigation Work Plan" (December 21, 2020)

New Mexico Environment Department (NMED) Comment	Marathon Petroleum Company (MPC) Response
Comment 2:	**Response 2:**
In the *Investigation Method Section, Sample Collection Procedures*, page 7 of 10, the Permittee states, "[s]amples will be collected in accordance with the soil sampling Standard Operating Procedure (SOP) (Appendix B) and screened in accordance with the soil screening SOP (Appendix B)." Appendix B is not included in the Work Plan. Resolve the discrepancy and provide replacement pages.	Appendix B will be included in the revised Work Plan and the revised pages are also included with this letter as Attachment A.
Comment 3:	**Response 3:**
The *Data Quality and Validation* Section, page 9 of 10, provides a detailed description of quality assurance and quality control criteria. However, the criteria are presumed to be only described for total petroleum hydrocarbons analyses. Quality assurance and quality control related to pH measurements are equally important for this investigation. Accordingly, include a description of such criteria for pH measurement in the revised Work Plan and provide replacement pages.	For the field screening, a pH field duplicate will be measured and recorded at least once per day or for every 10 samples. The field duplicate will be measured by placing the pH sensor upon a wetted area immediately adjacent to the original sample location and recording the measurement. In addition, an equipment blank will be used to measure pH by rinsing the cleaned trowel or hand auger with distilled water and collecting the water in a clean glass jar. The rinsate will then be measured for pH and recorded in the field notebook. Equipment blanks will be collected at least once per day or every 10 samples. A description of the quality assurance and quality control criteria will be included in the revised Work Plan and the revised pages are also included with this letter.

Attachment B: Revised Pages

MARATHON PETROLEUM CORPORATION

GALLUP REFINING DIVISION

FLARE KOD PUMP CAUSTIC RELEASE

SOIL SAMPLING INVESTIGATION WORK PLAN

NOVEMBER 30, 2020

REVISED APRIL 30, 2021

The purpose of this Investigation Work Plan is to collect soil samples to delineate the horizontal and vertical extent of any contamination and determine if further investigation or remediation is necessary.

Site Conditions

Surface Conditions

Local site topographic features include high ground in the southeast gradually decreasing to a lowland fluvial plain to the northwest. Elevations on the refinery property range from 6,860 feet (ft) above mean sea level (amsl) to 7,040 ft amsl. The area near the flare KOD pump caustic release area is approximately 6,920 ft amsl.

Subsurface Conditions

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

Scope of Activities

The investigative activities of the flare KOD pump caustic release area will be completed in order to delineate horizontal and vertical caustic and hydrocarbon impacts and collect soil samples. Pending New Mexico Environment Department (NMED) approval, MPC anticipates investigation work to be completed by the second quarter of 2021.

Field Screening

Soil samples will be collected using a hand trowel or a hand auger. Samples will be collected at 1 ft bgs and wetted with deionized water for in situ soil pH measurement. The area of soil needing wetting will be approximately a 2-inch (in) by 2-in area. The pH meter probe will be placed on the wetted area and allowed to equilibrate (stabilize). The pH and temperature will be recorded as well as the date, time, sample location, and depth. Once the pH and temperature have been recorded the soils will be allowed to warm to approximately 70 degrees Fahrenheit (F) and be transferred to a Ziploc® bag. The head space will then be measured for petroleum hydrocarbons with a photo-ionization detector (PID). The total organic vapor (TOV) and measured pH will be recorded on the field log. Lastly, a field paint filter test will be collected for saturated samples to

determine the percentage of free liquids in the waste and to establish whether the waste is hazardous based on the corrosivity (20% free liquids or more).

The soil pH meter to be used for this project is an ExStick pH Meter, Model PH100 or equivalent. This pH meter is cable of reading soil pH measurements between 0.00 and 14. A CAL alert feature ensures consistently accurate readings by alerting users when to recalibrate. Using a 1-, 2-, or 3-point calibration, the unit automatically recognizes buffer solutions. The unit will be calibrated at least once daily using buffer solutions with pH of 7, 10, and 13. The calibration results will be recorded in a field notebook. The calibration results will be graphed to confirm linearity or error of the calibration. If the unit cannot show linearity of the calibration curve, the sample(s) will be analyzed by EPA Method 9045B with a low sodium-error electrode.

If the soil pH field screening is greater than or equal to 12.5 at the proposed sampling locations soil samples will be collected at two and a half ft intervals and screened for pH until the pH no longer exceeds 12.5. Once the sampling location's pH no longer exceeds 12.5, a soil sample will be collected for laboratory hydrocarbon analysis.

Laboratory Analysis

Soil samples will be collected at the shallowest depth with a pH of less than 12.5. These samples will be packaged and shipped to a laboratory to be analyzed for hydrocarbon impacts via Method 8015M/D (total petroleum hydrocarbons-diesel range organics [TPH-DRO] and TPH-oil range organics [TPH-ORO]), Method 8015D (TPH-gasoline range organics [TPH-GRO]).

Investigation Methods

The proposed field screening and soil sampling locations are shown on Figure 2. The proposed locations include 10 primary screening and 10 secondary soil screening sample locations around the old API separator and the KOD area. The secondary samples are to verify that the release extent did not extend past the anticipated area and will only be collected if the primary soil screening sample pH field results at 1-ft depth are greater than or equal to 12.5.

Soils obtained will be visually inspected and classified in general accordance with American Society for Testing and Materials (ASTM) D2487 (Unified Soil Classification System) and D2488 (Description and Identification of Soils). Detailed sample logs will be completed in the field by qualified field staff. Samples will be field

equipment blanks, trip blanks, and other quality control samples will be included at the rate of one quality control sample per 10 soil samples. Before shipment, each cooler will be packed with ice and one temperature blank. A chain of custody (CoC) form will accompany each sample shipment. Coolers will be sealed and shipped overnight to Eurofins Environment Testing in Pensacola, Florida.

Laboratory Sample Frequency

Laboratory samples will be collected at the shallowest depth at which the field pH is less than 12.5. This equates to one laboratory sample per location.

Data Quality and Validation

Quality assurance/quality control (QA/QC) samples will be collected during sampling to monitor the validity of the sample collection procedures. Field duplicates will be collected at a rate of 10 percent (%) of all samples collected. Equipment blanks will be collected from re-usable equipment at a rate of 10%; if disposable sampling equipment is used, the blanks shall be collected at a frequency of one per day. Field blank samples will also be collected once a day. The field duplicate and blank samples will be submitted to the laboratory along with the soil samples.

For the field screening, a pH field duplicate will be measured and recorded at least once per day or for every 10 samples. The field duplicate will be measured by placing the pH sensor upon a wetted area immediately adjacent to the original sample location and recording the measurement. In addition, an equipment blank will be used to measure pH by rinsing the cleaned trowel or hand auger with distilled water and collecting the water in a clean glass jar. The rinsate will then be measured for pH and recorded in the field notebook. Equipment blanks will be collected at least once per day or every 10 samples.

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

Data Evaluation

The soil confirmation sampling results will be compared to NMED Industrial SSLs to help delineate the extent of contamination from the KOD release and determine if excavation is necessary. Soil recovered during sampling will be placed in roll-off boxes or drums, labeled, and stored within the area of the flare KOD and characterized prior to disposal within 90 days.

Attachment C: Appendix B Soil Screening SOP

memorandum

To:	Trihydro Employees
From:	Project Manager – Heidi Jones
Date:	March 26, 2013
Re:	Standard Operating Procedure – Field Screening of Soil Samples

1.0 INTRODUCTION

The purpose of this Standard Operating Procedure (SOP) is to establish procedures for conducting field screening of soil samples. Field screening of soil samples involves the qualitative and quantitative field assessment of various indicators of potential contamination. Field-screening procedures employed will include scanning the soil core and measurement of sample headspace for total organic vapors (TOV) using a photoionization detector (PID) and observing visual/olfactory indicators.

Other soil field-screening methods—such as the use of pH meters, chemical-specific detector tubes (Draeger tubes), soil-gas test kits, fiber optic chemical sensors, colormetric test kits, immunoassay test kits, portable infrared detectors (IR), and gas chromatography/mass spectrometry (GC/MS)--are also available. However, Trihydro Corporation does not routinely use these methods for field screening. If specific Work Plans require their use, procedures will be specified in the project Work Plans.

The PID uses an ultraviolet light source to ionize components of an incoming source. The ionization potential of the light source relative to the target compound governs the instrument sensitivity. Select a bulb having an ionization potential (commonly 8.4, 9.5, 10.2, and 11.7 electron volts [eV]) that is approximately equal to or greater than the target compounds. The PID will commonly detect compounds having ionization potentials up to 0.3 eV greater than the bulb value.

Use a PID when the presence of carbon-based volatile organic compounds is suspected to be present. Target compounds include hydrocarbons (e.g., benzene, toluene, etc.), halocarbons (e.g., carbon tetrachloride, vinyl chloride, Freon, etc.), solvents (e.g., tetrachloroethylene, trichloroethylene, etc.), and oxygenates (e.g., acetone, MTBE, etc.) that volatilize in air. PID readings are not recommended for saturated soils because groundwater constituents can cause anomalously high TOV readings if groundwater is impacted, and the presence of liquid could affect the soil-to-gaseous phase volatilization rate.

2.0 PROCEDURES

Soil field-screening procedures are listed below:

Step 1: Immediately after exposing the soil core, collect approximately 100 grams of soil from each sampling interval using a clean, decontaminated stainless-steel safety knife or spatula. **Do not use a fixed open-bladed knife for this task of the other field-screening tasks described in the steps below. Only**

safety knives can be used for Trihydro work. Use the proper hand protection for this task and the other field-screening tasks described in the steps below.

Step 2: Place the soil sample in a resealable plastic bag (e.g., one quart) and seal the bag. Place the sealed container in a covered area (not in direct sunlight) for 15 minutes to allow organic constituents to volatilize to the headspace.

Step 3: Insert the PID probe tip into the resealable plastic bag. Avoid contacting the soil or any fluids that may have collected in the sample container with the probe tip.

Step 4: Allow the instrument to stabilize, usually within 5 seconds of exposure to the headspace gas, and note the highest measured instrument reading. Record the reading in field notes.

If there are erratic readings (e.g., due to high TOV or moisture), obtain additional readings to obtain a representative headspace measurement.

Step 5: Allow the instrument to "zero out" before taking a measurement for subsequent samples or re-measuring a sample.

Step 6: Note the presence of any visual indicators of contamination (e.g., staining, discoloration, and/or sheen). Note the presence of any phase-separated liquids. Document the observations in field notes.

Step 7: Note and characterize the presence of any unusual odors in the working space over the sample. Describe odors in generic terms such as "gasoline-like," "musty," "sweet," "pungent," etc.

QAQ-CSO-P00

Western Refining Southwest LLC
A subsidiary of Marathon Petroleum Corporation

I-40 Exit 39
Jamestown, NM 87347

April 30, 2021

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

RE: Request for Extension of Time, Disapproval Annual Groundwater Monitoring Report Gallup Refinery – 2019, Comment 46
Marathon Petroleum Company LP, Gallup Refinery
(dba Western Refining Southwest LLC)
EPA ID# NMD000333211
HWB-WRG-16-001

Dear Mr. Pierard:

Marathon Petroleum Company LP (dba Western Refining Southwest LLC) Gallup Refinery (MPC) is requesting an extension for the *Disapproval, Annual Groundwater Monitoring Report – 2019, Comment 46* dated November 23, 2020.

New Mexico Environment Department (NMED) requested a letter work plan to investigate the integrity of the process sewer lines in the vicinity of the Heat Exchanger Bundle Cleaning Pad no later than April 30, 2021. Activities requested by NMED have been started by conducting a focused assessment using dye tests related to the drainage collection features of the cleaning pad (sump and liquid collection trench). The lack of dye observations within well MKTF-16 during the tests indicates that the cleaning pad sump and collection trench are most likely not the source of benzene observed in well MKTF-16. In addition, previous surveys of the sewer lines performed by MPC in the vicinity of the pad did not reveal any integrity issues.

Given the assessment findings, MPC has initiated preparation of the requested work plan that includes additional assessment activities adjacent to the bundle cleaning pad to evaluate potential sources of benzene to well MKTF-16. Therefore, MPC respectively requests an extension to the submittal date for the requested work plan to allow for incorporating the findings presented herein.

Western Refining Southwest LLC
A subsidiary of Marathon Petroleum Corporation

I-40 Exit 39
Jamestown, NM 87347

If there are any questions, please call 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 or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,
Marathon Petroleum Company LP, Gallup Refinery

Robert S. Hanks
Refinery General Manager

697-082-001

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

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

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

Michelle Lujan Grisham
Governor

Howie C. Morales
Lt. Governor

James C. Kenney
Cabinet Secretary

Jennifer J. Pruett
Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

May 7, 2021

Kawika Tupou
Environmental Manager
HollyFrontier Navajo Refining LLC
P.O. Box 159
Artesia, New Mexico 88211-0159

RE: DISAPPROVAL
EVALUATION OF METHYL TERT-BUTYL ETHER (MTBE) IN GROUNDWATER
HOLLYFRONTIER NAVAJO REFINING LLC – ARTESIA REFINERY
EPA ID NO. NMD048918817
HWB-NRC-19-004

Dear Mr. Tupou:

The New Mexico Environment Department (NMED) has completed its review of HollyFrontier Navajo Refining LLC, Artesia Refinery's (the Permittee) *Evaluation of Methyl Tert-Butyl Ether (MTBE) in Groundwater* (Report), dated September 2019. NMED hereby provides this Disapproval with the following comments.

The Permittee must submit a revised Report that addresses all of the comments contained in this Disapproval. Two hard copies and an electronic version of the revised Report must be submitted to NMED. The Permittee must also include a red-line strikeout version in electronic format showing where all revisions to the Report have been made. The revised Report must be accompanied with a response letter that details where all revisions have been made, cross-referencing NMED's numbered comments. The revised Report must be submitted to NMED no

later than **August 31, 2021**. In addition, the work plans required by Comments 4, 13, 14, 15, 23, and 24 must be submitted to NMED no later than **December 31, 2021**.

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

Sincerely,

Kevin M. Pierard, Chief
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB
L. Tsinnajinnie, NMED HWB
M. Suzuki, NMED HWB
T. McDill, NMED EMNRD
J. Leiks, HFNR LLC, Artesia Refinery
M. Holder, HFNR LLC, Artesia Refinery
L. King, EPA Region 6 (6LCRRC)

File: Reading File and NRC 2021, HWB-NRC-19-004

Attachment

Comment 1

In Section 2.1 (History of MTBE Usage), page 3, paragraph 2, the Permittee states, "[d]uring the 1980s, MTBE was brought into the Refinery by railcar and unloaded at the railcar loading rack located northwest of the north plant (AOC 30 – CBO Loading), east of US 285 and south of West Champ Clark Avenue (Figure 4). MTBE was piped to Tank 113, located in the Southwest Tank Farm (AOC 4), and was blended into gasoline at the Gasoline Loading Rack (AOC 21) located along Moseley Avenue, northeast of Tank 113. From 1990 to 1991, MTBE was also stored in Tanks 108 and 109, located near the southeastern corner of the Southeast Tank Farm (AOC 3)." Figure 4 (Historical MTBE Storage Tanks and Piping) depicts the MTBE product pipeline from the railcar loading rack to the gasoline loading rack; however, the pipeline was not connected to Tanks 108 and 109. It is not clear how MTBE was transported to Tanks 108 and 109. Provide the description in the revised Report.

Comment 2

Section 2.2 (Other Potential Sources of MTBE in the Vicinity of the Refinery), pages 3 to 4, identifies multiple potential sources of MTBE; however, the locations of these potential sources are not clear without a figure. Include a figure that depicts the locations of all potential MTBE sources in the revised Report.

Comment 3

In Section 3.2.3.4 (Comparison of Potentiometric Surface between Groundwater Zones), page 9, paragraph 5, the Permittee states, "[t]he cross-sectional view is provided in Appendix A and depicts that it is highly unlikely that groundwater from the shallow water bearing zone or the Valley Fill zone migrates from the western portion of the Refinery to the depth of the Artesian Aquifer east of the Refinery." In Appendix A (Cross-Section Depicting Average Groundwater Flow), the maximum depth where MTBE can be detected in the vicinity of well KWB-11B is indicated as approximately 90 feet below ground surface (bgs). However, MTBE has already been detected from the groundwater samples collected from well RA-4798 that was advanced to a depth exceeding 800 feet bgs. This information appears to contradict the Permittee's statement. Provide additional explanation with examples to verify the statement or remove the statement from the revised Report.

Comment 4

In Section 3.2.3.4 (Comparison of Potentiometric Surface between Groundwater Zones), page 9, paragraph 5, the Permittee states, "[t]he cross-sectional view is provided in Appendix A and depicts that it is highly unlikely that groundwater from the shallow water bearing zone or the Valley Fill zone migrates from the western portion of the Refinery to the depth of the Artesian Aquifer east of the Refinery. Thus, it is also highly unlikely that dissolved phase constituents would migrate from the western portion of the Refinery into the Artesian Aquifer east of the Refinery." The dissolved phase constituent concentrations are elevated and phase separated hydrocarbons (PSH) are present in the Shallow Water Bearing Unit east of the Refinery; therefore, these contaminants have likely migrated from the southeastern portion of the

Refinery. However, there are not enough groundwater monitoring wells that are screened to the Valley Fill and Artesian Aquifers to evaluate the extent of contamination. Submit a work plan to investigate the extent of MTBE in the Valley Fill and Artesian Aquifers no later than **December 31, 2021**.

Comment 5

In Section 3.3 (Previous Investigations), page 10, paragraph 4, the Permittee states, "MTBE has also been identified as a COC in soil in limited areas within the Refinery. MTBE has not been identified as a COC within the soil or groundwater in the former evaporation ponds east of the Refinery. Thus, this evaluation does not address the former evaporation ponds." Low concentrations of MTBE has been detected in groundwater samples collected during the April 2015 through October 2018 monitoring events from the following wells located in the vicinity of the former Evaporation Ponds: MW-4A, MW-5A, MW-5B, MW-5C, MW-7A, MW-10, MW-15, MW-18A, MW-22A, MW-22B, MW-73, MW-74, MW-75, MW-76, MW-77, MW-78, MW-84, MW-87, MW-123, OCD-7AR, OCD-8A, and OCD-8B. For example, the MTBE concentrations in groundwater samples collected from Pond 1 and south of Pond 1 (wells MW-4A and MW-84) range from 0.000444 J mg/L to 0.00128 mg/L between April 2017 to October 2018. The MTBE concentration in the groundwater sample collected from a well located west of Pond 1 (well MW-15) is reported as 0.000836 J mg/L in April 2018. The MTBE concentrations in groundwater samples collected from Pond 2 and south of Pond 2 (wells MW-5A, MW-5B, MW-5C, MW-74, MW-75, MW-76, MW-77, and MW-78) range from 0.000369 mg/L to 0.0119 mg/L between April 2015 through October 2018. The MTBE concentrations in groundwater samples collected from Pond 3 and south/southeast of Pond 3 (wells MW-73, MW-7A, OCD-7AR, OCD-8A, and OCD-8B) range from 0.000919 J mg/L to 0.00463 mg/L between April 2017 and October 2018. The MTBE concentrations in groundwater sample collected from wells south of the Ponds (MW-10, MW-18A, MW-22A, MW-22B, MW-87, and MW-123) range from 0.000566 J mg/L to 0.00564 mg/L between April through October 2018. Explain why the wells at the former Evaporation Ponds where MTBE was detected were excluded from the evaluation in the response letter or include the evaluation of the MTBE detections for the former Evaporation Ponds in the revised Report. In addition, explain and clarify the process for determining the monitoring well data qualified for evaluating the MTBE concentrations in the revised Report.

Comment 6

Section 4.2 (MTBE in Soil), pages 12 to 13, summarizes the results from the previous soil investigations at the Refinery. According to the Permittee, "Figure 5 shows the locations of the soil borings described [in Section 4.2] and the associated MTBE concentrations at locations where at least one sample from the boring contained detectable MTBE concentrations." It appears that the MTBE concentrations in the soil and groundwater samples do not correlate in Figure 5 (MTBE Detections in Soil Samples from Corrective Action Investigations). For example, the MTBE concentrations in groundwater samples collected from well MW-96 consistently exceed 20 mg/L from April 2016 to October 2018 while the MTBE concentrations in soil samples collected from the borings installed at the comparable depths of the water table (from

approximately eight feet below ground surface (bgs) to 16 feet bgs) in the vicinity of well MW-96 (SWMU17-BH03, SWMU17-BH04, SWMU17-BH05, and AOC01-SB06) reported relatively low concentrations < 0.05 mg/kg (12 - 15 feet bgs) , 0.49 mg/kg (10 -12 feet bgs), < 0.05 mg/kg (15 - 17 feet bgs), and < 0.0332 mg/kg (12 – 13 feet bgs) respectively, during the 2007 and 2011 investigations. Explain why MTBE concentrations in soil and groundwater do not correlate in the revised Report.

Comment 7

In Section 4.3 (MTBE in Shallow Water Bearing Zone), page 13, paragraph 5, the Permittee states, "[t]he data in Table 3 for wells completed within the shallow water bearing zone were used to develop isopleth maps showing the interpreted ex[t]ent of the dissolved phase MTBE plumes above the WQS for domestic water supply of 0.1 mg/L for each semiannual sampling event from 2009 through 2018, which are shown in Figures 6 through 26." There appears to be a typographical error in reporting the correct figure numbers. The data is presented in Figures 6 through 25, rather than Figure 26. In addition, the word "extent" is misspelled. Correct the typographical errors in the revised Report.

Comment 8

In Section 4.3 (MTBE in Shallow Water Bearing Zone), page 13, paragraph 8, the Permittee states, "Figure 23 (sic) provides a depiction of the current extent of the MTBE plumes along with a graphic symbol at each well location outside the plumes that indicate [that] [w]ells with a stable or decreasing trend in MTBE concentrations (green triangle pointing downward)." Address the following comments:

a. There appears to be a typographical error in referencing the correct figure in the statement. Figure 23 depicts the isopleths of MTBE concentrations in the Shallow Water Bearing Unit. Figure 26 (Trends and Extent of MTBE Concentrations in Shallow Water Bearing Unit, 2009 to 2018) appears to be the correct reference. Revise the reference in the appropriate section of the revised Report.

b. The Permittee categorizes the graphic symbols on Figure 26 as "not detected", "stable to declining" and "increasing" MTBE concentrations trends. However, it does not make sense to categorize the "stable to declining trends" together. The "stable to declining" trend must be distinguished separately as "stable" and "declining" trends. Appendix B (MTBE Concentration Trend Plots) provides figures to exhibit changes in MTBE concentrations over time in each well. It is not clear how each figure demonstrates either a "stable" or "declining" trend. MTBE concentrations in many wells appear to exhibit stable rather than declining trends. Revise the figure to accurately depict trends. Utilizing linear regression may also provide a clearer determination about the trends. Use linear regression to demonstrate the different categories, as appropriate.

Comment 9

In Section 4.3 (MTBE in Shallow Water Bearing Zone), page 14, paragraph 2, the Permittee states, "[t]here are four distinct plumes of MTBE present in the shallow water bearing zone." These four distinct plumes are identified as the Northwestern Refinery Plume, Wastewater Treatment Plant (WWTP) and Tetra-Ethyl Lead (TEL) Impoundment Area Plume, Southeastern Refinery Plume, and Northeastern Plume. Address the following:

a. There appears to be only two distinct plumes, the Northwestern Refinery Plume and the Southeastern Refinery Plume, present at the Refinery. For example, there is no verifiable data to distinguish the Southeastern Refinery Plume from the Northeastern Plume. There is no groundwater monitoring well located in the area between wells MW-133 where PSH is present and NP-1 where an MTBE is detected. Therefore, the plumes are likely contiguous and the Northeastern and Southeastern Plumes are likely a part of the same plume.

b. MTBE has been detected in groundwater samples collected from wells MW-23, MW-62, and MW-93 which are located between the areas identified as the Northwestern Refinery Plume and the WWTP and TEL Impoundment Area Plume. There are no groundwater monitoring wells located in the area between wells MW-67 and MW-43 where MTBE is detected. These identified plumes may likely be contiguous. Therefore, the WWTP and TEL Impoundment Area Plume and the Northeastern Plume are likely a part of the same plume.

Revise all pertinent sections of the Report accordingly or provide more supporting data to demonstrate that there are four distinct plumes. In addition, provide a figure that clearly depicts the boundaries of the plumes identified in Section 4.3. It would also be helpful to reviewers to include these boundaries on all of the figures to clearly define the plume boundaries and the wells within them.

Comment 10

In Section 4.3 (MTBE in Shallow Water Bearing Zone), page 14, bullet 5, under the Northwestern Refinery Plume section, the Permittee states, "RW-7 is used to recover PSH and shallow groundwater and provides a boundary for this plume." Although MTBE has not been detected in well MW-108, it has been detected in wells NCL-32, NCL-33, NCL-34A, and NCL-44. These wells are located north of recovery well RW-7. Therefore, recovery well RW-7 does not contain the MTBE plume at this site. Furthermore, MTBE concentrations detected northeast from the center of the identified plume at wells RW-17A, MW-55, ME-56 supports the assertation that the MTBE plume is not contained by recovery well RW-7. Explain and demonstrate how recovery well RW-7 contains the Northwestern Refinery Plume and acts as a boundary for the identified plume or revise the statement in the revised Report.

Comment 11
In Section 4.3 (MTBE in Shallow Water Bearing Zone), page 14, bullet 6, under the Northwestern Refinery Plume section, the Permittee states, "RW-8 is located along the eastern side of North Freeman Avenue, oriented in a north-south direction along the downgradient edge of this plume." As observed in Comment 10, MTBE has been detected in wells located downgradient from recovery well RW-8 (e.g., MW-43, MW-138); therefore, the plume boundary is not contained by recovery well RW-8. Provide additional support for the statement or remove it from the revised Report.

Comment 12
In Section 4.3 (MTBE in Shallow Water Bearing Zone), page 14, bullet 8, under the WWTP and TEL Impoundment Area Plume section, the Permittee states, "[t]he most likely sources of the MTBE in this plume are historical, unknown releases from the WWTP, downgradient migration of MTBE from the Northwestern Refinery Plume." It appears that MTBE concentrations in the referenced plume may also originate from the Northwestern Refinery Plume; therefore, these plumes are likely contiguous. Provide additional information to support the statement or revise the statement in the revised Report.

Comment 13
In Section 4.3 (MTBE in Shallow Water Bearing Zone), page 15, bullet 6, under the Southern Refinery Plume section, the Permittee states that "[c]oncentrations of MTBE in samples collected from downgradient wells KWB-7, KWB-11A, MW-113, MW-135, RW-13R, and RW-12R are below the WQS and appear to be stable or decreasing." Two additional monitoring wells, MW-147 and MW-148, were installed in September 2020. These monitoring wells must be included in evaluating the extent of the MTBE plume downgradient of MW-135. Additional monitoring wells between wells MW-135 and KWB-P4 and south of the Lovington Highway are also needed to delineate the MTBE plume. The Permittee must submit a work plan to investigate the extent of the MTBE plume downgradient of well MW-135 no later than **December 31, 2021**.

Comment 14
In Section 4.3 (MTBE in Shallow Water Bearing Zone), page 15, bullet 2, under the Northeastern Plume section, the Permittee states that "[t]he plume is bounded upgradient to the west, [cross gradient] to the northwest, and downgradient to the east by wells MW-134, MW-20, and MW-71, respectively, which have been sampled and analyzed for MTBE but have had no detectable concentrations" and have also concluded that the source for this plume is unknown. Although it appears that the northern, western, and eastern extents of the plume have been delineated, there is no groundwater monitoring well south of well NP-1 that could support this observation. Therefore, the southern to southwestern extent of the Northeastern plume surrounding well NP-1 is not fully delineated. Since PSH is present in well MW-133, MTBE may have migrated from the vicinity of well MW-133; the plume may be contiguous from well MW-133. Comment 24 of the NMED's *Disapproval Desktop Groundwater Receptor Survey and Vapor Intrusion*

Evaluation of Off-Site Receptors also directed the Permittee to install an additional monitoring well between well MW-133 and well NP-1. Submit a work plan to propose the installation of an additional well between wells MW-133 and NP-1 to delineate the southern/southwestern extent of the Northeastern plume no later than **December 31, 2021**.

Comment 15

In Section 4.4 (MTBE in Valley Fill and Artesian Water Bearing Zones), page 15, paragraph 2, the Permittee states, "[f]ive monitoring wells are completed in the Valley Fill zone within the Refinery and the fields east and south of the Refinery. These wells are sampled at different frequencies, but the samples from each of the wells are analyzed for MTBE. Trend plots for the monitoring wells completed in the Valley Fill zone are provided in Appendix B." Appendix B (MTBE Concentration Trend Plots) includes only one plot for KWB-11B that was completed in the Valley Fill Aquifer because MTBE was not detected at the other four wells (MW-54B, MW-126B, KWB-1C, and KWB-12B). These four wells were installed outside the boundary of the plumes present in the Shallow Water Bearing Unit. Therefore, data collected from these wells will not be useful evaluating the potential vertical extent of MTBE. Submit a work plan to propose installing additional Valley Fill Aquifer wells to investigate the vertical extent of MTBE no later than **December 31, 2021**.

Comment 16

In Section 4.4 (MTBE in Valley Fill and Artesian Water Bearing Zones), page 16, bullet 1, the Permittee states, "MW-54B is located north of the NCL in the northwestern portion of the Refinery. MW-54B was sampled during the first semiannual events of 2010, 2011, 2013, 2015, and 2017. No detectable MTBE has been reported in these samples." MTBE was also not detected in well MW-54A, a well located next to MW-54B and completed in the Shallow Water Bearing Unit. These wells are located outside of the MTBE plume boundary; therefore, the data collected from well MW-54B does not support the assertion that MTBE has not migrated vertically from the Shallow Water Bearing Unit to the Valley Fill Aquifer. Address this comment in the work plan required by Comment 15.

Comment 17

In Section 4.4 (MTBE in Valley Fill and Artesian Water Bearing Zones), page 16, bullet 2, the Permittee states, "MW-126B is located at the eastern side of the Refinery and has been sampled semiannually since it was installed in April 2014. No detectable MTBE has been reported in these samples." MTBE was also not detected in well MW-126A, a well located next to well MW-126B and completed in the Shallow Water Bearing Unit. These wells are located outside of the MTBE plume boundary; therefore, the data collected from well MW-126B does not support the assertion that MTBE has not migrated vertically from the Shallow Water Bearing Unit to the Valley Fill Aquifer. Address this comment in the work plan required by Comment 15.

Comment 18
In Section 4.4 (MTBE in Valley Fill and Artesian Water Bearing Zones), page 16, bullet 3, the Permittee states, "KWB-1C is located in the field east of the Refinery, west of Bolton Road, and was sampled during the first semiannual events of 2011, 2013, 2015, and 2017. No detectable MTBE has been reported in these samples." MTBE was also not detected in well KWB-1A, a well located next to well KWB-1C and completed in the Shallow Water Bearing Unit. These wells are located outside of the MTBE plume boundary; therefore, the data collected from well KWB-1C does not support the assertion that MTBE has not migrated vertically from the Shallow Water Bearing Unit to the Valley Fill Aquifer. Address this comment in the work plan required by Comment 15.

Comment 19
In Section 4.4 (MTBE in Valley Fill and Artesian Water Bearing Zones), page 16, bullet 4, the Permittee states, "MTBE [in well KWB-11B] was reported above the detection limit in the samples collected during April 2015, October 2017, April 2018, and October 2018." MTBE was also detected in well KWB-11A, a well located next to well KWB-11B and completed in the Shallow Water Bearing Unit. The detection in KWB-11B potentially indicates that MTBE migrated vertically from the Shallow Water Bearing Unit to the Valley Fill Aquifer due to the detections of MTBE in wells KWB-11A and KWB-11B. Address this comment in the work plan required by Comment 15.

Comment 20
In Section 4.4 (MTBE in Valley Fill and Artesian Water Bearing Zones), page 16, bullet 5, the Permittee states, "KWB-12B is located on South Bolton Road south of US 82 and has been sampled semiannually since October 2010. No detectable MTBE has been reported in these samples." MTBE was also not detected in well KWB-12A, a well located next to well KWB-12B and completed in the Shallow Water Bearing Unit. These wells are located outside of the MTBE plume boundary; therefore, the data collected from well KWB-12B does not support the assertion that MTBE has not migrated vertically from the Shallow Water Bearing Unit to the Valley Fill Aquifer. Address this comment in the work plan required by Comment 15.

Comment 21
In Section 4.4 (MTBE in Valley Fill and Artesian Water Bearing Zones), page 16, paragraph 2, the Permittee states, "Figures 27 to 46 depict the semiannual monitoring MTBE results for wells completed in either the Valley Fill or Artesian aquifers." It is unclear why Figures 27 through 46 are included in the Report as there are not enough data points to generate isopleths. Instead, the figures depict the locations of wells in the Valley Fill and Artesian Aquifers with MTBE concentrations from the corresponding event. Remove these figures from the revised Report.

Comment 22
In Section 4.4 (MTBE in Valley Fill and Artesian Water Bearing Zones), page 16, bullet 9, the Permittee states, "MTBE concentrations [in irrigation well RA-4798] fluctuate but appear to be

declining with the highest reported concentration reported in the sample collected during the second semiannual event of 2009 and an order of magnitude below the WQS." According to Appendix B (MTBE Concentration Trend Plots, Artesian Aquifer Trend Plots), MTBE concentrations in irrigation well RA-4798 do not appear to be declining. It appears that the MTBE concentrations at irrigation well RA-4798 are stabilizing rather than declining based on the fluctuating data results from the recent years. It would be helpful to include a linear regression and adjust the range for MTBE concentrations on the trend plots to have a clearer depiction of what is occurring with the analytical data (see Comment 8b). Revise the statement for accuracy and the trend plots in Appendix B in the revised Report.

Comment 23

In Section 4.4 (MTBE in Valley Fill and Artesian Water Bearing Zones), page 16, paragraph 5, the Permittee states, "[t]he presence of MTBE in the Valley Fill zone is intermittent, with reported concentrations two orders of magnitude below the WQS, and concentrations appear to be stable." All groundwater monitoring wells screened to the Valley Fill Aquifer were completed outside the MTBE plumes that are present in the Shallow Water Bearing Unit. Therefore, the presence or absence of the underlying MTBE plume in the Valley Fill Aquifer has not been evaluated. Submit a work plan that proposes to investigate whether the MTBE plume is present in the Valley Fill Aquifer no later than **December 31, 2021**.

Comment 24

In Section 4.4 (MTBE in Valley Fill and Artesian Water Bearing Zones), page 16, paragraph 6, the Permittee states, "[t]he presence of MTBE in the Artesian aquifer is limited to the two irrigation wells located east of Bolton Road." Although the presence of MTBE in the Artesian Aquifer is limited to the two irrigation wells, the full presence of the Artesian Aquifer is still unknown and must be investigated. Additionally, all wells screened to the Artesian Aquifer were completed outside the MTBE plumes that are present at the Shallow Water Bearing Unit. Therefore, the extent of MTBE in the Artesian Aquifer has not been delineated. Revise the statement to accurately state that the presence and extent of the Artesian Aquifer is currently unknown because of the limited number of wells installed at that depth. In addition, submit a work plan to investigate how MTBE plume migrated to the Artesian Aquifer no later than **December 31, 2021**.

Comment 25

In Section 4.5.2 (Volatile Organic Compound Comparison), page 18, Bullet 1, under the RA-4798 section, the Permittee states, "1,2-Dichloroethane and MTBE are the only VOCs detected in samples collected from this irrigation well [RA-4798]." Chlorinated solvents have been detected in some groundwater samples collected during several monitoring events at the Facility. The New Mexico Water Quality Control Commission (WQCC) adopted revised regulations that listed 1,4-dioxane as a toxic pollutant on December 21, 2018. The Permittee must analyze groundwater samples collected from all monitoring wells where chlorinated solvents have been detected in the past ten years for 1,4-dioxane using EPA Method 8270 Selective Ion Monitoring

(SIM). Propose to analyze 1,4-dioxane for two consecutive events in the upcoming revision of the Facility-Wide Groundwater Monitoring Work Plan. In addition, since 1,2-dichloroethane (EDC) was detected in the groundwater samples collected from the well, the Permittee must include analysis for 1,2-dibromoethane (EDB), as well. The analytical method must be capable of detecting EDB at concentrations less than 0.004 micrograms per liter (e.g., EPA Method 8011). Propose to analyze EDB for two consecutive events in the upcoming revision of the Facility-Wide Groundwater Monitoring Work Plan for all wells where EDC was detected in groundwater samples in the past ten years. Include a discussion of the analytical data in the corresponding annual groundwater monitoring report. NMED will review the analytical data and determine if EDB analysis will be required in additional sampling events.

Comment 26

In Section 4.5.2 (Volatile Organic Compound Comparison), page 18, bullet 2, under the RA-4798 section, the Permittee states, "[n]otably, 1,2-Dichloroethane was not detected in samples collected from MW-58 and MW-99 and was detected in only one sample collected from KWB-11A." Well MW-58 is located more than 2,000 feet upgradient and well MW-99 is located more than 3,000 feet upgradient of well RA-4798. There are several wells (MW-132, MW-133, KWB-8, RW-13R, RW-14R, and RW-22) screened within the Shallow Water Bearing Unit with phase-separated hydrocarbons (PSH) in the vicinity of well RA-4798. PSH or dissolved volatile organic compounds (VOCs) in the Shallow Water Bearing Unit may be the source of VOCs detected in the groundwater samples collected from RA-4798. In the revised Report, propose to collect the samples of PSH and groundwater beneath PSH, if present, from the wells (MW-132, MW-133, KWB-8, RW-13R, RW-14R, and RW-22) and analyze volatile and semi-volatile organic constituents, in order to determine the source of VOCs detected in the groundwater samples collected from RA-4798.

Comment 27

In Section 4.5.2 (Volatile Organic Compound Comparison), page 18, bullet 3, under the RA-4798 section, the Permittee states, "[t]he concentration of MTBE at [RA-4798] shows an overall decreasing trend." As stated in Comment 22, according to Appendix B (MTBE Concentration Trend Plots), MTBE concentrations in irrigation well RA-4798 do not appear to be declining. It appears that the MTBE concentrations at irrigation well RA-4798 are relatively stable rather than declining based on the fluctuating data results from the recent years. Revise the statement for accuracy.

Comment 28

In Section 5.1 (Conclusions), page 19, bullet 1, the Permittee states, "[d]ownward migration from the shallow water bearing zone and Valley Fill zone into the Artesian Aquifer is unlikely." This statement is not appropriate as the Permittee did not provide enough information to support this claim as there are not enough groundwater monitoring wells screened in the Valley Fill and Artesian Aquifers to demonstrate the conclusion. Remove the statement from the

revised Report. In addition, submit a work plan to install additional wells to evaluate vertical MTBE migration (see also Comment 4).

Comment 29

In Section 5.1 (Conclusions), page 19, bullet 1, under the Shallow Water Bearing Zone, the Permittee states, "MTBE is present in the shallow water bearing unit at concentrations above the WQS in four separate plumes in and around the Refinery." As stated above, NMED does not agree that the Permittee has demonstrated that there are four separate plumes. Additional information is required to support this claim (see Comments 9 and 12).

Comment 30

In Section 5.1 (Conclusions), page 19, bullet 3, under the Shallow Water Bearing Zone, the Permittee states, "[a]dditional potential historical sources of MTBE in the shallow water bearing zone exist immediately upgradient of the Refinery." The MTBE concentrations in groundwater samples collected from all upgradient wells have been below the detection limit. Even if there are potential historical sources of MTBE immediately upgradient of the Refinery, these potential sources would not have been significant enough to affect MTBE detections within the Refinery. Remove the statement from the revised Report.

Comment 31

In Section 5.1 (Conclusions), page 19, bullet 4, under the Shallow Water Bearing Zone, the Permittee states, "[g]roundwater recovery activities provide downgradient control of the Northwestern and Southeastern plumes." Although groundwater recovery activities generally provide some control for migration of the plumes, PSH and dissolved phase contaminants continue to be detected downgradient of the recovery wells. The on-going groundwater recovery activities do not provide sufficient containment of these contaminants. In addition, MTBE is highly soluble in groundwater and could essentially move past any recovery efforts currently in place. Include a discussion regarding the issues associated with MTBE's high solubility and mobility in groundwater in the revised Report. Since the facility-wide groundwater injection/recovery system is proposed to be implemented in a separate submittal, evaluation of the effectiveness of the current groundwater system may be deferred. However, the Permittee's statement is misleading; therefore, it must be revised or removed from the revised Report.

Comment 32

In Section 5.1 (Conclusions), page 19, paragraph 3, the Permittee states, "[a]n evaluation of average groundwater flow over a 10 year period indicated that it is highly unlikely that groundwater from the shallow water bearing zone or the Valley Fill zone migrates from the western portion of the Refinery to the depth of the Artesian Aquifer east of the Refinery. Thus, it is also highly unlikely that dissolved phase constituents would migrate from the western portion of the Refinery into the Artesian Aquifer east of the Refinery." The current groundwater conditions east of the Refinery boundary contradict the Permittee's statement based on the

observation that PSH in the vicinity of RA-4196 and RA-4798 is present in the Shallow Water Bearing Unit. PSH has migrated from the Refinery. MTBE detected in the Artesian wells likely migrated from the Refinery as there are no other significant sources other than the Refinery. Submit a work plan to install additional wells in the Valley Fill to investigate the extent of MTBE contamination and to investigate how MTBE plume migrated to the Artesian Aquifer (see also Comments 4, 15, 23, 24, and 28).

Comment 33

In Section 5.2 (Recommendations), page 19, paragraph 4, the Permittee states, "[h]owever, based on the overall declining concentrations of MTBE in the groundwater and the lack of a clear pathway (natural groundwater flow or migration through a faulty well casing) for MTBE from former Refinery operations to migrate to the irrigation wells, no additional action is warranted or recommended to address MTBE detections in irrigation wells located east of the Refinery." NMED does not agree with this statement. Section 5.1 (Conclusions) states, "[b]ased on the data presented herein, the detections of MTBE in wells RA-4196 and RA-4798 are not a result of impacts in the shallow water-bearing unit migrating vertically due to faulty well seals." The source of MTBE detection in wells RA-4196 and RA-4798 has not been identified. Therefore, additional investigation is required to determine the source of MTBE in the irrigation wells. Submit a work plan to determine if the irrigation wells have been damaged or otherwise compromised.

Comment 34

Table 3 (Summary of Groundwater MTBE Data 2009-2018) does not include data for recovery well RW-18E. Since the trend of MTBE concentrations for recovery well RW-18E is presented in Figure 26 (Trends and Extent of MTBE Concentrations in Shallow Water Bearing Units 2009 to 2018), Table 3 must be revised to include the data for recovery well RW-18E.

Comment 35

Table 3 (Summary of Groundwater MTBE Data 2009-2018) includes many blank cells that are not defined in the Notes and Abbreviations section in Page 10 of 10. Explain why these cells were left blank (e.g., PSH, dry) in the revised Report and include an explanation for the blank cells in a revised Table 3.

Comment 36

Table 3 (Summary of Groundwater MTBE Data 2009-2018) greyed out all of the UG wells, MW-57, MW-59, MW-60, MW-61, MW-98, MW-115, MW-116, MW-117, MW-118 and MW-119 indicating that these wells have not been included in the MTBE evaluation because the wells are located outside the study area; however, the trend data of the MTBE concentrations in these wells have been included as part of the evaluation of Figure 26 (trends and Extent of MTBE Concentrations in Shallow Water Bearing Unit, 2009 to 2018). The Permittee has not clearly defined the study area in the Report. Describe the study area and define it in the text,

the appropriate tables, and figures in the revised Report. Additionally, if the MTBE concentration data for any of the wells greyed out in Table 3 is reported in any of the figures, the data is considered as part of the evaluation and Table 3 must be revised. The appropriate sections of the Report must also be revised to include the evaluation of these data in the revised Report.

Comment 37

In Figure 3 (Well Locations and Tank Information within Refinery), it appears that there are some locations of groundwater monitoring wells that do not match with those in the figures from the annual groundwater monitoring reports. For example, abandoned well MW-100 is depicted approximately 100 feet north of monitoring well MW-28. The location of abandoned well MW-100 has been incorrectly placed at the actual location of active monitoring well MW-99 which is correctly depicted in the figures included in the 2018 annual groundwater monitoring report. In addition, it also appears that the location for active monitoring well MW-99, located approximately 500 feet south of well MW-28, has been incorrectly depicted in a location where there has never been a well. Review all of the figures provided in this Report and compare them to past annual groundwater monitoring report figures to ensure that the locations of the monitoring wells are correct. Correct all discrepancies in the revised Report.

Comment 38

Figure 4 (Historical MTBE Storage Tanks and Piping) appears twice in the Figures section. The first Figure 4 has comments on the figure and the second Figure 4 does not. Remove one of the figures in the revised Report, as appropriate.

Comment 39

In Figure 5 (MTBE Detections in Soil Samples from Corrective Action Investigations), the MTBE concentrations in soil samples collected from various depths from multiple borings are depicted. According to Figure 5, the higher MTBE concentrations were generally detected from soil samples below the depths of the water table (e.g., 26 to 28 feet bgs at boring location SWMU17-BH04). MTBE has not been used at the Facility since 1991; therefore, it may be concluded that MTBE concentrations in soils above the water table appears to have migrated or attenuated. Attenuation of MTBE occurs when the vapor pressure of MTBE exceeds 200 mmHg at 20 degrees Celsius which causes MTBE to partition into the atmosphere. When MTBE reaches this point, MTBE is unlikely to be further leaching into the groundwater from the soils. However, MTBE that has already partitioned into groundwater persistently remains in the aquifers and appears to be migrating downgradient laterally and vertically. As part of the investigations described in previous comments, submit a work plan to investigate the extent and source of MTBE.

Comment 40

There are multiple discrepancies in Figure 26 (Trends and Extent of MTBE Concentrations in Shallow Water Bearing Units, 2009 to 2018). Address the following:

a) The locations of wells MW-137 and MW-138 are not consistent with those depicted in Figure 3 (Well Locations and Tank Information within Refinery) and previous figures from the annual groundwater monitoring reports. The locations of MW-137 and MW-138 appear to be reversed. Review all of the figures with well locations and compare them to figures from the annual groundwater monitoring reports to ensure the well locations are correct and revise the figure(s) for accuracy.

b) The trend of MTBE concentrations in well MW-49 is depicted as stable to declining. However, MTBE concentrations for well MW-49 has steadily increased from 0.0535 mg/L to 0.124 mg/L between April 2016 and October 2018. Therefore, MTBE concentrations in well MW-49 appears to be increasing rather than decreasing in recent years. Revise the figure to correct the symbol and also revise the appropriate sections of the revised Report.

c) The trends of MTBE concentrations in wells RW-5R, RW-6, RW-8, RW-22, RW-13R, MW-92, MW-94, MW-97, MW-112 and MW-129 are depicted as stable to declining. However, PSH was sporadically present in these wells and MTBE data were not collected when PSH was present; therefore, it is not appropriate to present the trends for these wells as stable to declining. Remove the trend symbols from the figure.

d) The trend of MTBE concentrations in well KWB-5 is depicted as increasing. However, MTBE concentration measured in 2013 was recorded as 10 mg/L while MTBE concentrations measured in 2018 were recorded as 10.3 and 10.8 mg/L. The trend of MTBE concentrations in well KWB-5 appears to be relatively stable rather than increasing in recent years. Revise the appropriate sections of the revised Report.

e) The trend of MTBE concentrations in well KWB-2R is depicted as stable to declining. However, the MTBE concentration has increased one to two orders of magnitude during the last measurement of October 2017 in comparison to the previous MTBE levels. The trend of MTBE concentrations in well KWB-2R appears to be increasing in recent years. Revise the appropriate sections of the revised Report.

f) MTBE was not detected in well KWB-12A during the April 2015 to October 2018 sampling events. The well is depicted outside the study area in Table 3 (Summary of Groundwater MTBE Data 2009 – 2018); however, well KWB-12A must be included in the MTBE evaluation because it is potentially located downgradient of the MTBE plume.

g) The MTBE concentration in well MW-107 was reported as 3.02 mg/L in April 2018; however, the well is depicted outside of the 0.10 mg/L isopleth. Therefore, the size of the MTBE plume is underestimated by the exclusion of well MW-107. The well must be depicted inside the 1 – 5 mg/L isopleth. Revise the figure to include well MW-107 within the MTBE plume.

h) The trend of MTBE concentrations in well MW-106 is depicted as increasing. However, the MTBE level measured in October 2018 was recorded as non-detect in Table 3 (<0.184 mg/L). Verify the data presented in Table 3 for MW-106 to confirm that the MTBE concentrations are increasing. Furthermore, the value is one to three orders of magnitude greater than most reporting limits. Also, include an explanation for the higher reporting limit for this sample result.

i) The trend of MTBE concentrations in well MW-45 is depicted as stable to declining. However, MTBE concentrations at this well has steadily increased from 0.00152 mg/L to 0.00766 mg/L between April 2016 and October 2018. The trend of MTBE level in well MW-45 appears to be increasing rather than declining in recent years. Revise the appropriate sections of the revised Report.

j) The trend of MTBE concentrations in wells RW-16B and RW-16E is depicted as increasing. However, the analytical data for these wells was not included in the Report. Include the analytical data for these two wells in the revised Report.

k) The trend of MTBE concentrations in well RW-17A is depicted as increasing. However, MTBE concentrations have decreased from 0.189 mg/L to 0.107 mg/L between 2017 and 2018. The trend of MTBE concentration in well RW-17A appears to be decreasing rather than increasing in recent years. Revise the appropriate sections of the revised Report.

l) The trend of MTBE concentrations in wells MW-56 and MW-67 is depicted as increasing. However, MTBE concentrations appear to be fluctuating during the 2016 and 2018 sampling events but staying relatively stable. Revise the appropriate sections of the revised Report.

m) The trend of MTBE concentrations in well MW-29 is depicted as stable to declining. However, MTBE concentration has increased from 0.000482 mg/L to 0.00403 mg/L between April and October 2018. The MTBE concentration recorded in October 2018 is at the highest level since 2009. The trend of MTBE concentrations in well MW-29 appears to be increasing rather than declining in recent years. Revise the appropriate sections of the revised Report.

Comment 41

Appendix B (MTBE Concentration Trend Plots) includes multiple MTBE trend plots for wells completed in the Shallow Water Bearing Unit. The data presented in the section titled MTBE Concentrations Less Than 0.10 mg/L presents the MTBE Concentration range from 0 to 0.15 mg/L. Revise the data range on the y-axis to report the MTBE Concentration range from 0 to 0.10 mg/L. In addition, include a linear regression to better distinguish what is happening with the trend data. Provide the revisions in the revised Report (see also Comment 8b).

Comment 42

A pilot test to remediate hydrocarbons at the Facility was proposed under a separate submittal. and is currently in the implementation phase of the work plan. The proposed remedy focuses on biodegradation of hydrocarbon constituents under sulfate reducing conditions. MTBE appears to biodegrade under sulfate reducing condition to tert-butyl alcohol. (TBA). Therefore, TBA may accumulate under the current site conditions. Propose to analyze groundwater for TBA in the upcoming revision of the Facility-Wide Groundwater Monitoring Work Plan and discuss the analytical results in the annual report. The Permittee must analyze groundwater for TBA for four consecutive sampling events and NMED will re-evaluate the results to determine if additional sampling is warranted.

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

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

Michelle Lujan Grisham
Governor

Howie C. Morales
Lt. Governor

James C. Kenney
Cabinet Secretary

Jennifer J. Pruett
Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

June 2, 2021

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

RE: DISAPPROVAL
MARKETING TANK FARM LASER-INDUCED FLUORESCENCE/HYDRAULIC PROFILING INVESTIGATION REPORT
WESTERN REFINING SOUTHWEST INC., GALLUP REFINERY
EPA ID # NMD000333211
HWB-WRG-21-007

Dear Mr. Moore:

The New Mexico Environment Department (NMED) has reviewed the *Marketing Tank Farm Laser-induced Fluorescence/Hydraulic Profiling Investigation Report* (Report), 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
The cover letter states, "[t]he LIF/HP lithologic boring logs will be submitted to the New Mexico Environment Department under separate cover letter by April 30, 2021." Appendix C, *LIF/HP logs,* that presents the LIF/HP lithologic boring logs is included in the Report. Clarify whether the referenced logs are already included in the Report or if there are additional logs. If not, the

referenced logs have not been received by NMED as of May 27, 2021. In this case, submit the referenced document to NMED upon receipt of this letter.

Comment 2
In the Executive Summary, page 3, and Section 4.0, *Conclusion,* page 16, the Permittee states, "[t]he gasoline occurrence splits into two lobes at the west side of the parking lot (Figure 3-2)." The gasoline lobes are designated as northern and southern lobes and the diesel lobes are designated as the east and west lobes. Figure 3-2, *Approximate Locations of SPH Occurrence Marketing Tank Farm/Loading Rack,* does not identify the boundary of each lobe. Provide a figure that identifies the boundaries in the revised Report.

Comment 3
In the Executive Summary, page 3, and Section 4.0, *Conclusion,* page 16, the Permittee states, "[t]he leading edge of the north gasoline occurrence appears to be in the area of the borrow pit hydrocarbon seep (between MKTF-LIF-73 and MKTF-LIF-74)." Gasoline is detected at multiple borings (e.g., MKTF-LIF-60) located north of borings MKTF-LIF-73 and MKTF-LIF-74 according to Figure 3-2. Provide explanation to support the assertion or revise the statement for accuracy in the revised Report.

Comment 4
In the Executive Summary, page 3, and Section 4.0, *Conclusion,* page 16, the Permittee states, "SPH is in the near surface (less than 6 feet below ground surface) east of the borrow pit hydrocarbon seep near MKTF-LIF-74." According to the MKTF-LIF-74 log included in Appendix C, an elevated % RE signal is observed at a depth of approximately three feet below ground surface (bgs) and diminished at a depth of approximately six feet bgs. The depth of the water table at boring MKTF-LIF-74 is presumably below six feet bgs based on the gauging data collected from adjacent MKTF wells. Since the location of boring MKTF-LIF-74 is approximately 800 feet west of the source location, groundwater would be the only transport mechanism for SPH detected at the location. Therefore, it is not clear how SPH has migrated approximately 800 feet downgradient from the source location and been detected at a depth where groundwater is absent. Provide explanation in the revised Report.

Comment 5
In the Executive Summary, page 3, and Section 4.0, *Conclusion,* page 16, the Permittee states, "southern [gasoline] lobe is migrating to the southwest towards the 90-day pad but has not reached the water seep located just to the east of the pad (west of MKTF-LIF-90)." According to Figure 3-2, no boring was advanced west of MKTF-LIF-90; therefore, the leading edge of the gasoline plume is not delineated. Well MKTF-42 is suitable as a sentinel well for the detection of SPH migrating west of MKTF-LIF-90. However, the water seep location must also be visually monitored on a monthly basis for potential breakthrough. Propose to monitor the seep and report the monitoring results in the future quarterly hydrocarbon seep interim measures status reports.

Comment 6
In the Executive Summary, page 3, and Section 4.0, *Conclusion*, page 16, the Permittee states, "[a] north diesel occurrence emanating from the Marketing Tank Farm appears to be moving through a paleochannel to the north towards the hydrocarbon seep located near monitoring well MKTF-01." Note that the location of the referenced paleochannel may coincide with that of the sewer line to the Sanitary Lagoon. Therefore, the diesel migration may follow the sewer line. The Permittee's *Sanitary Lagoon Investigation Phase II Work Plan*, dated March 31, 2021, proposes to install trenches along the sewer line. The investigation may help identify the diesel migration path toward the hydrocarbon seep area. Incorporate the findings from this LIF/HP investigation in the Sanitary Lagoon investigation report, as appropriate.

Comment 7
In the Executive Summary, page 3, and Section 4.0, *Conclusion*, page 16, the Permittee states, "[t]he west [diesel] lobe of the occurrence appears to be comingling in the south with the MKTF gasoline occurrence and in the north with the naphtha occurrence, migrating beneath the road from the east." The statement is not clear because the references to the statement are not provided (see also Comment 2). Revise the statement for clarity.

Comment 8
In the Executive Summary, page 3, and Section 4.0, *Conclusion*, page 16, the Permittee states, "[t]he east lobe of the occurrence is migrating to the west towards the crude tanks from the process area and is nearing the Marketing Tank Farm complex (MKTF-LIF-66). The waveforms from this occurrence are similar to the waveforms observed in PA-LIF-4." According to Appendix C, the % RE signals of boring MKTF-LIF-66 (max % RE = 708.9% at 8.57 feet bgs) are much greater than those of boring PA-LIF-4 at any depth (max % RE = 196.1% at 10.48 feet bgs). If diesel were migrating from the process area to the crude tanks and marketing tank farm, the % RE responses of boring PA-LIF-4 would likely be greater since it is located closer to the source area (Process Area); however, the data indicates otherwise. Provide explanation for why diesel may be originating from the process area rather than other potential source areas such as SWMU 6 – Tank Farm in the revised Report.

Comment 9
In the Executive Summary, page 4, the Permittee states, "[the recommendations include] [i]nvestigating the Process Area diesel occurrence to evaluate the eastern extent prior to recommending any remediation activities." NMED concurs that the Process Area needs further investigation. Submit a work plan proposing to investigate the Process Area no later than **November 30, 2021**.

Comment 10
In Section 3.0, *Investigation Results*, page 11, the Permittee states, "[t]he air knife excavations were backfilled with dry cuttings prior to installing the LIF/HP boreholes. Therefore, the LIF/HP interval of 0-5 ft was not representative of undisturbed subsurface conditions." According to

the MKTF-LIF-74 log included in Appendix C, an elevated % RE signal is observed at a depth of approximately three feet below ground surface (bgs) and diminished at a depth of approximately six feet bgs. Provide a clarification whether the interval of boring MKTF-LIF-74 represents backfill material. If it represents backfill material, the data collected from MKTF-LIF-74 is not representative. If it does not represent backfill material, provide a table that indicates which borings used the air knife excavation/backfill procedures in the revised Report.

Comment 11

Section 3.1, *Laser-Induced Fluorescence Results*, pages 11 through 13, discusses the LIF results for borings designated as MKTF-LIF and PA-LIF. Figure 3-2 also presents borings designated as EB-LIF that were advanced in the vicinity of Tank 572. Elevated % RE signals were observed from these borings according to Appendix C. However, the Report does not discuss the results collected from the borings designated as EB-LIF. Revise the Report to include the discussion for the data collected from the borings designated as EB-LIF.

Comment 12

In Section 3.1, *Laser-Induced Fluorescence Results*, page 12, the Permittee states, "[a] classic gasoline waveform appears in MKTF-LIF-37 below approximately 6 ft bgs." According to the MKTF-LIF-37 log included in Appendix C, elevated % RE signals are observed at the depth intervals of approximately 5 - 17 feet bgs and 22 - 29.5 feet bgs. Although elevated % RE signals were detected at a termination depth of 29.5 feet, boring MKTF-LIF-37 was not advanced to a deeper interval. Therefore, the vertical extent of the SPH distribution at boring MKTF-LIF-37 was not determined. The boring should have been advanced to the depth where % RE signals diminish. Include this provision in future LIF investigations. No response required.

Comment 13

In Section 3.1, *Laser-Induced Fluorescence Results*, page 12, the Permittee states, "[i]n MKTF-LIF-42, the SPH is following lower permeability zones at 11.0 to 11.5 ft bgs, 15.5 to 16.0 ft bgs, and at the alluvium/Chinle Group interface at 20.0 ft bgs. The predominant SPH pathway appears to be from 15.5 to 18.5 ft bgs where % RE responses of up to 367 % were recorded." The statement does not appear to be accurate. Elevated % RE signals are observed at depths of approximately 11.5 to 28 feet bgs according to the MKTF-LIF-42 log included in Appendix C. Note that the % RE signal exceeding 350% appears at a depth of approximately 27.5 feet bgs rather than 15.5 to 18.5 ft bgs. Correct the statement in the revised Report.

Comment 14

In Section 3.1, *Laser-Induced Fluorescence Results*, page 12, the Permittee states, "[m]oving west to MKTF-LIF-42 and MKTF-LIF-43, the MKTF gasoline occurrence appears to bifurcate along western and southwestern paths (Figure 3-2)." It is not clear what data suggests that the MKTF gasoline occurrence bifurcates west of boring MKTF-LIF-42 and MKTF-LIF-43. Provide additional data and discussion to support the assertion in the revised Report.

Comment 15
In Section 3.1, *Laser-Induced Fluorescence Results*, page 12, the Permittee states, "MKTF-LIF-61 marks the northern edge of the north gasoline occurrence with a peak response at 23.73 ft bgs, similar to the depths at MKTF-LIF-62 and MKTF-LIF-54 to the south." The statement is contradictory to the previous statement in the Executive Summary and in Section 4.0 stating, "[t]he leading edge of the north gasoline occurrence appears to be in the area of the borrow pit hydrocarbon seep (between MKTF-LIF-73 and MKTF-LIF-74)" (see also Comment 3). Resolve the discrepancy in the revised Report.

Comment 16
In Section 3.1, *Laser-Induced Fluorescence Results*, page 12, the Permittee states, "[t]he south gasoline occurrence forms a path between MKTF-LIF-43 and MKTF-LIF-90 (Figure 3-2). This portion occurs as a very thin interval where potential product was identified in the LIF pushes. The maximum response signal is 56.4% RE at 19.91 ft bgs and is centered on a less permeable zone between 18.5 and 20.0 ft bgs." According to the MKTF-LIF-43 and MKTF-LIF-90 logs included in Appendix C, neither log appears to represent the described observation in the statement. The maximum response signals are recorded as 287.0% at 14.61 feet bgs in boring MKTF-LIF-43 and 83.2% at 16.68 feet bgs in boring MKTF-LIF-43. Correct the statement in the revised Report.

Comment 17
In Section 3.1, *Laser-Induced Fluorescence Results*, page 12, the Permittee states, "MKTF-LIF-77 has a strong response of 321% RE at 18.03 ft bgs with the SPH filling a less permeable zone between 17.0 and 19.0 ft bgs. This permeable zone appears to resemble the permeable zone in MKTF-LIF-67." The former and latter sentences appear to be contradictory regarding the description of permeable zone. According to the MKTF-LIF-77 log included in Appendix C, the conductivity readings at a depth of approximately 17 and 19 feet bgs range 40 to 70 mS/m, which is notably lower than those at other depth intervals. Therefore, the soils at a depth of approximately 17 and 19 feet bgs would rather be relatively more permeable. Correct the statement in the revised Report.

Comment 18
In Section 3.1, *Laser-Induced Fluorescence Results*, page 12, the Permittee states, "[b]oring locations in the MKTF, north, and south gasoline occurrences with greater than 100% RE include MKTF-LIF-46 (409%), MKTF-LIF-45 (329%), MKTF-LIF-44 (315%), MKTF-LIF-37 (339%), MKTF-LIF-42 (367%), MKTF-LIF-43 (287%), MKTF-LIF-77 (321%), MKTF-LIF-62 (361%), MKTF-LIF-61 (105%), MKTF-LIF-72 (305%), and MKTF-LIF-74 (538%). The LIF response at these locations indicate the presence of gasoline and diesel product within the soil and formation pore space." According to Figure 3-2, boring locations MKTF-LIF-46, MKTF-LIF-45, and MKTF-LIF-44 indicate the presence of both gasoline and diesel while boring locations MKTF-LIF-37, MKTF-LIF-42, MKTF-LIF-43, MKTF-LIF-77, MKTF-LIF-62, MKTF-LIF-61, MKTF-LIF-72, and MKTF-LIF-74 indicate the presence of only gasoline. Revise the statement for accuracy in the revised Report.

Furthermore, other MKTF borings with greater than 100% RE are present according to Appendix C. For example, boring MKTF-LIF-36, located north of boring location MKTF-LIF-37, indicates the presence of both gasoline and diesel with the % RE signals exceeding 100%. Boring MKTF-LIF-36 is not included in the discussion. Revise the statement or explain the criteria for selecting the boring locations discussed in the statement.

Comment 19

In Section 3.1, *Laser-Induced Fluorescence Results*, page 13, the Permittee states, "[a]s observed in MKTF-LIF-36, the waveform indicates the presence of gasoline (blue and green waveforms) mixed with a small amount of diesel (orange and red peaks that are higher than what would be expected in a gasoline)." The statement indicates that gasoline is dominant rather than diesel at boring location MKTF-LIF-36. According to the MKTF-LIF-36 log included in Appendix C, diesel rather appears to be dominant with orange peaks. Correct the statement or explain the interpretation in the revised Report.

Comment 20

In Section 3.1, *Laser-Induced Fluorescence Results*, page 13, the Permittee states, "[t]he north diesel occurrence appears to have headed further to the northwest and is evident in MKTF-LIF-56 where it appears to have mixed with the naphtha occurrence moving in from the east." According to Figure 3-2, only diesel was detected at boring location MKTF-LIF-56. Resolve the discrepancy in the revised Report.

In addition, the western extent of diesel contamination detected boring MKTF-LIF-56 was not delineated. Explain why the western extent of diesel was not investigated or propose to submit a work plan to investigate the extent in the revised Report.

Furthermore, the Permittee explained that blue and green peaks represent gasoline and orange and red peaks represent diesel. However, it is not clear how naphtha peaks are differentiated from gasoline and diesel peaks. Naphtha may range from a gas condensate to a kerosene-like product. First, define the naphtha (e.g., composition); then, explain how the naphtha peaks are differentiated from gasoline and diesel peaks in the revised Report.

Comment 21

In Section 3.1, *Laser-Induced Fluorescence Results*, page 13, the Permittee states, "[t]he north diesel occurrence is present in MKTF-LIF-87 and may also be present in MKTF-LIF-86 (the orange coloration at 9 to 10 ft bgs)." According to Figure 3-2, both diesel and naphtha were detected at borings MKTF-LIF-86 and MKTF-LIF-87. Correct the statement in the revised Report.

In addition, the northern extent of diesel and naphtha was not delineated. Explain why the northern extent of diesel and naphtha was not investigated or propose to submit a work plan to investigate the extent in the revised Report.

Comment 22
In Section 3.1, *Laser-Induced Fluorescence Results*, page 13, the Permittee states, "[t]he SPH in MKTF-LIF-85 is an unidentified petroleum product that may possibly be from the sour naphtha release on March 26, 2017. The waveform in the LIF response is representative of naphtha, and the boring is located within the naphtha release area." According to Figure 3-2, naphtha was detected at boring MKTF-LIF-85. It appears that there is sufficient evidence to state that the SPH detected in MKTF-LIF-85 is naphtha; however, the Permittee labels it as an unidentified petroleum product. Revise the statement for clarity.

Comment 23
In Section 3.1, *Laser-Induced Fluorescence Results*, page 13, the Permittee states, "[a]s further evidence of a diesel fuel composition, recently found SPH in MKTF-39 (between MKTF-LIF-66 and PA-LIF-04) has an initial boiling point of 333°F, which is within the range (310-691°F) in Section 9 of the MPC #2 Ultra Low Sulfur Diesel Safety Data Sheet. This diesel waveform is also found in MKTF-LIF-84, which is northwest of MKTF-LIF-66." According to Figure 3-2, only naphtha was detected at boring MKTF-LIF-84 and the detection of diesel is not indicated. Resolve the discrepancy in the revised Report.

In addition, boring MKTF-LIF-66, where diesel was detected, was advanced adjacent to well MKTF-16, where elevated benzene concentrations in groundwater samples have persisted in recent years. Diesel detected in boring MKTF-LIF-66 is unlikely the source of benzene detected in well MKTF-16. The LIF instrument is not capable of detecting dissolved phase constituents and the source of benzene in well MKTF-16 remains unknown. Discuss the potential source of benzene in well MKTF-16 and propose to investigate the source of benzene in well MKTF-16 in the revised Report.

Comment 24
In Section 3.2, *Hydraulic Profiling Results*, page 13, the Permittee states, "[t]his low K prevented the dissipation test from being conducted during the first mobilization in November 2019 due to the extremely long dissipation time (hours). Dissipation tests were conducted at four locations during the second mobilization in February 2021. These locations were PA-LIF-02, PA-LIF-06, MKTF-LIF-83, and MKTF-LIF-84." Clarify if the purpose of the dissipation tests is to determine depth of the water table.

In addition, it is not clear why the dissipation tests were conducted in February 2021 but not in November 2019 and why the tests were conducted at only four locations in February 2021. It is useful to compare depths of the water table relative to the depths where SPH is distributed. If existing hydraulic profiling data allow calculation of the water table depth, revise the LIF/HP logs in Appendix C to include the estimated depths of the water table.

Comment 25
In Section 3.2, *Hydraulic Profiling Results*, page 14, the Permittee states, "[l]ow K values (high P Dwn) on the HP logs roughly correlate with the alluvium/Chinle Group contact as shown on the Figure 3-4 cross section." In Figure 3-4, *Cross Sections with Maximum Separate Phase Hydrocarbons,* the only borings advanced to the alluvium/Chinle interface are historical borings LR-1 and LR-2, which are not relevant to the hydraulic profiling investigation. Provide explanation for clarity or revise the statement for accuracy in the revised Report.

Comment 26
In Section 3.2, *Hydraulic Profiling Results*, pages 13 and 14, the Permittee states, "Figure 3-3 presents the cross-section location map; Figure 3-4 presents the cross-sections with maximum historical SPH thickness." Figure 3-4 depicts the surface elevations of borings MKTF-LIF-42, MKTF-LIF-73, MKT-LIF-74, MKTF-LIF-81, and MKTF-LIF-89; however, the LIF/HP logs included in Appendix C indicate that the elevations are unavailable. If the elevation data are available, include the data in the LIF/HP logs; otherwise, explain how the surface elevations were determined in the revised Report.

Comment 27
In Section 3.2, *Hydraulic Profiling Results*, page 14, the Permittee states, "[f]ractures and/or bedding planes are possible pathways for SPH migration below the alluvium/Chinle Group contact and are indicated by a slight decrease in P Dwn on the HP logs." According to Figure 3-4, no LIF/HP borings or groundwater monitoring wells were advanced to the depth of the alluvium/Chinle interface. It is not clear which data suggests such observations. Provide an explanation for clarity.

Comment 28
In Section 3.2, *Hydraulic Profiling Results*, page 14, the Permittee states, "[e]xamples of P Dwn indicating a fracture and/or bedding planes can be seen recurring in MKTF-LIF-45 at 25 ft bgs (Appendix C). This example represents micro or thin fractures that likely contribute to most of the permeability, resulting in a bulk average permeability similar to a clayey silt rather than intact bedrock." Boring MKTF-LIF-45 was advanced along the A – A' cross section according to Figure 3-3, *Cross-section Location Map*; however, it is not included in Figure 3-4 that presents the cross sections. Revise Figure 3-4 to include boring MKTF-LIF-45.

Comment 29
In Section 3.3, *Electrical Conductivity Results*, page 14, the Permittee states, "[e]xamples of conductivity indicating a fracture and/or bedding planes can be seen in MKTF-LIF-77 at 18.0 ft bgs and 19.73 ft bgs on MKTF-LIF-79A (Appendix C)." The lower electrical conductivity readings observed in the LIF/HP logs represent a presence of coarser sediments; however, they do not

necessarily represent a presence of fractures. Revise the statement for accuracy or provide explanation to support the assertion in the revised Report.

Comment 30

In Section 3.4, *Soil Sampling Results*, page 15, the Permittee states, "[t]he samples [that were analyzed for TPH] were labeled as MKTF-LIF-44 (6 to 7 ft, 8 to 10 ft, and 18 to 19 ft), MKTF-LIF-53 (7 to 8 ft and 8 to 9 ft), MKTF-LIF-74 (2 to 3 ft, 4 to 5 ft, and 5 to 6 ft), MKTF-LIF-85 (7 to 9 ft), and PA-LIF-07 (11 to 13 ft and 13 to 14 ft)." According to Appendix C, higher % RE signals are recorded from other boring locations (e.g., 708.9% RE at 8.57 feet bgs in MKTF-LIF-66). Provide an explanation for why these five sampling locations were selected in the revised Report.

In addition, one soil sample was collected from a depth of 7 - 9 feet bgs from boring MKTF-LIF-85. According to the MKTF-LIF-85 log included in Appendix C, the % RE signals are recorded as less than 100% at the selected sampling interval. The higher % RE signals are recorded at a depth of approximately 11 feet bgs (608.7%) in the boring. Explain why the soil sample was collected from the selected interval of 7 – 9 feet bgs in the revised Report.

Comment 31

In Section 3.4, *Soil Sampling Results*, page 15, the Permittee states, "TPH-DRO ranged from non-detect to 840 milligrams per kilogram (mg/kg) and TPH-GRO ranged from 82 mg/kg to 2,300 mg/kg," and "TPH-DRO and TPH-GRO concentrations maybe lower than might be expected based on the reference emitter (%RE)." The TPH-DRO concentration in the soil sample collected from boring MKTF-LIF-44 at a depth of 18 – 19 feet bgs is recorded as 840 mg/kg, which is the highest TPH-DRO concentration detected; however, the % RE signals at the same sampling interval are recorded as less than 50%. The TPH-DRO concentration in the soil sample collected from boring PA-LIF-07 at a depth of 11 – 13 feet bgs is recorded as 130 mg/kg, which is relatively low; however, the % RE signals at the same sampling interval are recorded as more than 200%. Similarly, the TPH-GRO concentration in the soil sample collected from boring MKTF-LIF-74 at a depth of 4 – 5 feet bgs is recorded as 2,300 mg/kg, which is the highest TPH-GRO concentration detected; however, the % RE signals at the same sampling interval remain less than 300%. The TPH-GRO concentration in the soil sample collected from the same boring (MKTF-LIF-74) at a depth of 2 – 3 feet bgs is recorded as 1,500 mg/kg; however, the % RE signals at the same sampling interval exceed 500%. The TPH concentrations do not correlate with respective % RE signals. % RE signals qualitatively identify the presence or absence of SPH. Provide addition explanation to support the assertion or revise the statement for accuracy.

Comment 32

In Section 3.4, *Soil Sampling Results*, page 15, the Permittee states, "[g]rain-size analysis indicate that the majority of the materials are gravels and sands." Table 3-2, *LIF Investigation – Grain Size Analysis*, indicates that the composition of each soil sample is variable. It is not

accurate to generalize the soil samples as gravels and sands. For example, the majority of materials were silt and clay in the sample collected from location MKTF-LIF-85 at 7 – 9 feet bgs. Revise the Report accordingly.

Comment 33

In Section 3.4, *Soil Sampling Results*, item 1, page 15, the Permittee states, "[t]he higher TPH concentrations, at locations MKTF-LIF-44 (18 to 19 ft) and MKTF-LIF-74 (4 to 5 ft) are around 2,500-3,000 mg/kg total TPH (i.e., the sum of GRO and DRO). This is consistent with SPH saturations in the range of 3% to 5% (Hawthorne and Kirkman 2012) and likely near the residual saturation limit." Table 3-1 indicates that the sums of GRO and DRO for the samples collected from locations MKTF-LIF-44 (18 to 19 ft) and MKTF-LIF-74 (4 to 5 ft) are calculated as 2,340 and 2,480 mg/kg, respectively, that are less than the described range of 2,500-3,000 mg/kg. Revise the statement for accuracy.

According the *TPH in Soil to NAPL Saturation Fraction Conversion Matrix* in the reference (Hawthorne and Kirkman 2012), when TPH value is 5,000 mg/kg, SPH saturation level ranges 2% to 6%, regardless of any differences in the input variables (e.g., soil porosity and SPH density). Note that the saturation range (2% to 6%) is not the residual saturation limit, where non-aqueous phase liquid (NAPL) becomes mobile. The TPH ranging 2,500-3,000 mg/kg may possibly equate the range of 3% to 5% saturation level as stated; however, the range is not near its saturation limit, regardless of the soil and NAPL types. Correct the statement in the revised Report.

In addition, it is not clear how SPH saturation was calculated. Explain how SPH saturation was calculated in the revised Report. Provide explanation for all assumptions used in the calculation.

Furthermore, Table 3-2, *LIF Investigation – Grain Size Analysis,* indicates that the composition of the soils at locations MKTF-LIF-44 (18 to 19 ft) and MKTF-LIF-74 (4 to 5 ft) is different. Explain how porosity and soil density of each soil were determined in the revised Report. According to the reference (Hawthorne and Kirkman 2012), SPH saturation is a function of grain/soil density, porosity and density of the SPH. Among these variables, the porosity value appears to influence the result of the calculation the most. Since some soils at the site consist of fine sediments (e.g., silt and clay), the values of effective and total porosity would be widely different. Clarify whether the porosity used to calculate SPH saturation is an effective or total porosity in the revised Report.

Comment 34

In Section 3.4, *Soil Sampling Results*, item 1, page 15, the Permittee states, "[a]lthough the highest soil TPH concentrations [in locations MKTF-LIF-44 (18 to 19 ft) and MKTF-LIF-74 (4 to 5 ft)] are consistent with SPH at or near residual saturation at those locations, the LIF data

suggest that SPH at higher saturations exist in portions of the subsurface from which soil samples were not collected." A total of three soil samples including the one with the highest % RE intervals were collected from both borings MKTF-LIF-44 and MKTF-LIF-74. It is not clear what data suggest that SPH at higher saturations may exist in portions of the subsurface from which soil samples were not collected. Provide an explanation in the revised Report.

Comment 35
In Section 3.4, *Soil Sampling Results*, item 2, page 15, the Permittee states, "[d]iscrete soil sampling intervals commonly miss small intervals of very high SPH saturation in the subsurface and/or average those small intervals across larger intervals with lower saturation overall." Provide a discussion of the sampling technique used to collect a discrete soil sample from each sampling interval in the revised Report.

Comment 36
In Section 3.4, *Soil Sampling Results*, page 15, the Permittee states, "LIF data are a better indicator of the presence/absence and/or location of SPH than the TPH data, while the TPH data are a better indicator of SPH saturation than the LIF data. Therefore, the two datasets aren't really measuring the same thing." NMED concurs with the statement. However, the Permittee attempted to provide discussion regarding the correlation between soil TPH concentrations and % RE signals in the Report. The discussion is unnecessary. Remove the discussion from the revised Report, as appropriate.

Comment 37
In Section 4.0, *Conclusion*, page 16, the Permittee states, "Based on the information collected during this investigation, the recommendations include:

- Installing a row of five sumps in the borrow pit to cut off the western migration of the north gasoline occurrence.
- Installing a recovery well between MKTF-LIF-77 and MKTF-LIF-90 to intercept migration of the south gasoline occurrence."

NMED concurs with the recommendations. Comment 5 of the NMED's *Approval with Modifications Hydrocarbon Seep Interim Measures 2020 Fourth Quarter Status Report,* dated March 30, 2021, states, "[s]ubmit an interim measure work plan to eliminate the source of the gasoline plume no later than **July 30, 2021**." The interim measure work plan required by Comment 5 of the NMED's March 30, 2021 Approval with Modifications is no longer necessary because of the recommendations provided in the Report. However, when the remediation system is implemented, its effectiveness must be evaluated and reported to the NMED. Submit an interim measures report that summarizes the monitoring data collected and effectiveness of the remediation system no later than **December 31, 2021**.

Comment 38
Table 3-1, *LIF Investigation – Soil Sample Results,* does not include soil screening levels for an evaluation of the risk associated with the constituents in the samples. Revise the table to include all applicable soil screening levels. In addition, it is not necessary to tabulate a reporting limit for every sampling result. Rather, the constituent concentrations recorded as "ND (not detected)" must only indicate their reporting limits (e.g., < 50 mg/kg for MRO at 6 – 7 feet bgs collected from MKTF-LIF-44). Revise the table accordingly.

Comment 39
Figures 3-3 and 3-4 include historical borings designated as "LR". Provide a copy of the boring logs in the revised Report. In addition, Figure 3-4 includes the cross section of 12 MKTF wells. A copy of these boring logs must also be provided in the revised Report.

The Permittee must submit a revised Report that addresses all comments contained in the letter. Two hard copies and an electronic version of the revised Report must be submitted to the NMED. The Permittee must also include a redline-strikeout version in electronic format showing where all revisions to the Report have been made. The revised Report must be accompanied with a response letter that details where all revisions have been made, cross-referencing NMED's numbered comments. The revised Report must be submitted to NMED no later than **September 14, 2021**. In addition, a work plan proposing to investigate the Process Area required by Comment 9 above must be submitted no later than **November 30, 2021** and an interim measures report that summarizes the effectiveness of the remediation system required by Comment 37 above must be submitted no later than **December 31, 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