Marathon Petroleum Company LP

November 28, 2018

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

Re: Response to Approval with Modifications
Revised Facility Wide Groundwater Monitoring Work Plan 2018 - Updates for 2018
Marathon Petroleum Company LP
EPA ID # NMD000333211
HWD-WRG-18-002

Dear Mr. Kieling:

Marathon Petroleum Company LP (Marathon) is in receipt of your Approval with Modifications letter dated September 21, 2018 regarding the Work Plan referenced above. The following responses address each of your comments

NMED Comment 1
The Permittee submitted one hard copy and one electronic version of the revised Work Plan. RCRA Permit Section II.C.7 (Submissions to the Environment Department) requires that two hard copies and an electronic version of submittals must be submitted to NMED. The Permittee submitted another hard copy of the revised Work Plan on August 24, 2018. The submission due date was July 31, 2018· All required documents must be submitted on or before the due date to comply with the Permit. The Permittee must seek an extension of time in accordance with the Permit Section I.J.12. In addition, the Permittee did not submit an electronic version of the response to NMED comments (RTC). The Permittee must submit an electronic version of the RTC no later than **October 12, 2018.**

Marathon Response 1:
An electronic version of the August 24, 2018 response is provided as Attachment A to this letter.

NMED Comment 2
The Permittee's response to NMED's *Disapproval* Comment 2 states that an entry was added to Table 2 to note SVOC analyses were previously removed in 2016 pursuant to the July 24, 2015 approval. A note in Table 2 states, "[p]ursuant to NMED's July 24, 2015 Approval with Modifications, SVOC analyses were previously discontinued with the addition of ORO and ORO-extended." The correct analysis required is GRO, rather than ORO. Revise the note in the table and provide a replacement table.

Marathon Response:
Table 2 has been revised and a hard copy is attached to this response as Attachment B. An electronic

copy is provided in the CD attached to this response.

NMED Comment 3
The Permittee's response to NMED's *Disapproval* Comment 10 states, "[s]ulfate, iron, phenol, and tetrachloroethene (PCE) have been detected above screening levels [in PW wells]." The tetrachloroethene concentration in the groundwater sample collected from well PW-2 was detected above the screening level in October 26, 2011; however, the detection was likely false-positive because the field blank was contaminated during the sampling event. In addition, PCE was not detected during the successive sampling events conducted on December 15,2011 and September 10, 2014. The Permittee is not required to discuss the PCE detection in PW-2 in future reports or work plans. No response is necessary.

Marathon Response 3:
Acknowledged.

NMED Comment 4
The Permittee's response to NMED's *Disapproval* Comment 13 states that the NMED's direction to "[c]orrect the statements in the revised 2018 Work Plan" is somewhat vague as to exactly which statement NMED is referring. The NMED is referring to the Permittee's statements quoted in NMED's Comment 13. The referenced statements were "[r]ecovery through hand-bailing continues on a quarterly basis indicating that the volume of SPH has continued to drop substantially from year to year in several of these recovery wells. In 2016, only Recovery Well (RW-1) and GMW-1 had measurable levels of hydrocarbons." The Permittee's statement that separate phase hydrocarbon (SPH) dropped substantially is not accurate because SPH measurements may not accurately reflect site conditions as pointed out in NMED's *Disapproval* Comment 13. The Permittee revised Section 2.4.1.1, *Main Tank Farm,* to change "continued to drop substantially" to "declined" which also is not accurate. Include a statement noting the fact that SPH measurements may not accurately reflect site conditions and provide a replacement page.

Marathon Response 4:
Section 2.4.1.1 has been modified to include the suggested language. Copies of the redline strike-out and a clean replacement page are included Attachment C this response. Electronic copies are provided in the attached CD.

NMED Comments 5
The Permittee's response to NMED's *Disapproval* Comment 14 states, "[w]e assume per NMED's comment the wells are approved for inclusion." To clarify, NMED approves inclusion of wells OW-53, OW-54, OW-55, OW-56, OW-57 and OW-58 in the groundwater monitoring schedule. No response is necessary.

Marathon Response 5:
Acknowledged.

NMED Comment 6
The Permittee's response to NMED's *Disapproval* Comment 19 states, "[t]he discussion in Section 4.1.2 has been revised to specify DO to be reported in mg/L..." The revision has not been addressed in Appendix A, *Gallup Field Sampling Collection and Handling Standard Procedures.* Revise the units for DO reporting in Appendix A and provide the appropriate

revised replacement page.

Marathon Response 6:
A revised Appendix A is attached to this response as Attachment D along with an electronic version and redline strike-out on the attached CD.

NMED Comment 7
The Permittee's response to NMED's *Disapproval* Comment 21 states, "[t]he references to nitrates in Section 4.2.1, Appendix A and Appendix B - Table 1 have been changed to nitrate and nitrite." According to Appendix B -Table 1, the change was only addressed in the PW wells. It should be noted that the change (inclusion of nitrite analysis) in the analytical suite applies to all monitoring wells where anions are included as a sampling requirement. No response is necessary.

Marathon Response 7:
Acknowledged.

NMED Comments 8
The Permittee's response to NMED's *Disapproval* Comment 24 states, "[t]he rational[e] refers to the fact that the particular well is a "new well". On multiple previous occasions, NMED has specified that all new monitoring/observation wells should be included in the Monitoring Plan and thus Permittee included the new wells... We do not understand how the rationale to add new wells could possibly be ambiguous based on the history of this requirement." To clarify, the intent of Comment 24 is not to change or remove the requirement to add new wells to the Monitoring Plan. Comment 24 states, "[a]ll proposed monitoring schedule and modifications must be discussed." Accordingly, the Permittee made a revision to Section 6.1, *Requests for Modifications to Sampling* to provide information regarding why these new wells (BW-4A, BW-4B, BW-5A, BW-5B, BW-5C, OW-59, and BW-60) are added to the Monitoring Plan by referencing NMED and OCD directives. The references provide the rationale for the new wells. Consequently, Comment 24 was appropriately addressed in the revised Work Plan. However, simply stating that a rationale for adding a well to the Monitoring Plan because the well is new lacks detail with regard to reasons for installation. No response is necessary.

Marathon Response 8:
Acknowledged.

NMED Comment 9
The Permittee's response to NMED's *Disapproval* Comment 26 states, "Appendix B Tables 1 and 2 have been revised to add analyses by method 8011 for OW-13. OW-50, OW-52,NAPIS-3, OAPIS-1, and MKTF wells MKTF-01, 04, 18, 19, 23, 27, 33, 34, 40 and 42." The revision was not made for OAPIS-1 in Table 1. Provide a replacement table that addresses the revision for OAPIS-1.

Marathon Response 9:
Table 1 has been modified to reflect the addition of OAPIS-1 (Attachment E). A replacement table is attached.

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,

Robert S. Hanks on Behalf of Daniel J. Statile

Daniel J Statile
VP Refining

cc K. Van Horn NMED HWB
C. Chavez OCD
L. King EPA Region 6

Appendix E
Table 1

Table 1: Gallup Refinery - Ground Water Monitoring Schedule

Sampling Location ID	Sampling Frequency	Collect GW Elevation, DTW, DTP	Water Quality Parameters	Analytical Suite
NAPI Secondary Containment (3 units)	Q	NA	NA	BTEX+MTBE, GRO/DRO extended, WQCC Metals or check for fluids
NAPI Inlet	Q	NA	NA	BTEX+MTBE, GRO/DRO extended, WQCC Metals
RW-1	Q	X	NA	Measure DTW, DTP (Hydrocarbon recovery). Sample for BTEX, MTBE, GRO/DRO if no SPH is detected
RW-2	Q	X	NA	Same as RW-1
RW-5	Q	X	NA	Same as RW-1
RW-6	Q	X	NA	Same as RW-1
OW-1	Q	X	pH , EC, DO, ORP, Temp, TDS	Visual check for artesian flow conditions: Sample for major cations/anions, WQCC Metals, VOCs (method 8260 & 8011 for 1,2-dibromethane), GRO/DRO extended
OW-10	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-1
OW-13	Q	X	pH , EC, DO, ORP, Temp, TDS	VOCs (methods 8260 & 8011 for 1,2-dibromoethane) , WQCC Metals, GRO/DRO extended
OW-14	Q	X	pH , EC, DO, ORP, Temp, TDS	VOCs (methods 8260 & 8011 for 1,2-dibromoethane), WQCC Metals, GRO/DRO extended
OW-29	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14
OW-30	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14
OW-53	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14
OW-54	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14
OW-55	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14
OW-56	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14
OW-57	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14
OW-58	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14
OW-59	Q	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOCS, SVOCS, GRO/DRO extended, WQCC Metals
OW-60	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-59
GWM-1	Q	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOC, GRO/DRO extended, WQCC Metals
GWM-2	Q	X	NA	Check for Water - if water is detected report to OCD & NMED within 24 hours. Sample for GRO/DRO extended, major cations/anions, VOCs
GWM-3	Q	X	NA	Check for Water - if water is detected report to OCD & NMED within 24 hours. Sample for GRO/DRO extended, major cations/anions, VOCs
NAPIS-1 [1]	Q	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, BTEX+MTBE, SVOC, GRO/DRO EXTENDED. WQCC Metals
NAPIS-2 [1]	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as Napis-1
NAPIS-3 [1]	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as Napis-1, addition of 8011 for 1,2-dibromoethane
KA- 3 [1]	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as Napis-1
OAPIS-1	Q	X	pH , EC, DO, ORP, Temp, TDS	VOCs, SVOC, GRO/DRO EXTENDED, WQCC Metals, Major cations/anions, Cyanide
STP1-NW	Q	X	NA	Major cations/anions, VOCs, SVOCs, GRO/DRO extended, WQCC Metals
STP1-SW	Q	X	NA	Major cations/anions, VOCS, SVOCs, GRO/DRO extended, WQCC Metals
STP-1 TO EP-2 (EP-2 Inlet)	Q	NA	NA	VOC, GRO/DRO extended, BOD, COD, TDS, WQCC Metals

Boiler Water (Reverse Osmosis) inlet to EP-2	SA	NA	pH , EC, DO, ORP, Temp, TDS	Major Cations/Anions
Pond 1 [2]				NO LONGER IN SERVICE
Evaporation Pond 2 [2]	SA		pH , EC, DO, ORP, Temp, TDS	General Chemistry, VOC, SVOC, BOD, COD, E-Coli Bacteria, WQCC Metals
Evaporation Pond 3 [2]	SA		pH , EC, DO, ORP, Temp, TDS	Same as EP-2 with addition of pesticides by method 8081A
Evaporation Pond 4 [2]	SA		pH , EC, DO, ORP, Temp, TDS	Same as EP-2
Evaporation Pond 5 [2]	SA		pH , EC, DO, ORP, Temp, TDS	Same as EP-2
Evaporation Pond 6 [2]	SA		pH , EC, DO, ORP, Temp, TDS	Same as EP-2
Evaporation Pond 7 [2]	SA		pH , EC, DO, ORP, Temp, TDS	Same as EP-2
Evaporation Pond 8 [2]	SA		pH , EC, DO, ORP, Temp, TDS	Same as EP-2
Evaporation Pond 9 [2]	SA		pH , EC, DO, ORP, Temp, TDS	Same as EP-2
Evaporation Pond 11 [2]	SA		pH , EC, DO, ORP, Temp, TDS	Same as EP-2
Evaporation Pond 12A [2]	SA		pH , EC, DO, ORP, Temp, TDS	Same as EP-3
Evaporation Pond 12B [2]	SA		pH , EC, DO, ORP, Temp, TDS	Same as EP-3
Any temporary Pond containing fluid	SA		pH , EC, DO, ORP, Temp, TDS	Same as EP-2
BW-1A	Annual (A)	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOC,WQCC METALS, GRO/DRO extended
BW-1B	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
BW-1C	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
BW-2A	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
BW-2B	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
BW-2C	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
BW-3A	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
BW-3B	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
BW-3C	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
BW-4A	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
BW-4B	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
BW-5A	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
BW-5B	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
BW-5C	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
MW-1	Annual and every 10 years beginning in 2009 per RCRA Post Closure Permit	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOCs, GRO/DRO extended, WQCC Metals, Cyanide, SVOCs
MW-2	Annual and every 10 years beginning in 2009 per RCRA Post Closure Permit	X	pH , EC, DO, ORP, Temp, TDS	Same as MW-1
MW-4	Annual and every 10 years beginning in 2009 per RCRA Post Closure Permit	X	pH , EC, DO, ORP, Temp, TDS	Same as MW-1
MW-5	Annual and every 10 years beginning in 2009 per RCRA Post Closure Permit	X	pH , EC, DO, ORP, Temp, TDS	Same as MW-1
OW-11	A	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOCS, WQCC Metals, GRO/DRO extended
OW-12	A	X	pH , EC, DO, ORP, Temp, TDS	VOCS, WQCC METALS, GRO/DRO extended
OW-50	Q	X	pH , EC, DO, ORP, Temp, TDS	VOCS(methods 8260 & 8011 for 1,2-dibromoethane) , GRO/DRO EXTENDED, WQCC METALS, GEN CHEM
OW-52	Q	X	pH , EC, DO, ORP, Temp, TDS	VOCS(methods 8260 & 8011 for 1,2-dibromoethane) , GRO/DRO EXTENDED, WQCC METALS, GEN CHEM

SMW-2	A	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOCS, GRO/DRO extended, WQCC Metals, Cyanide, SVOCs
SMW-4	Annual and every 10 years beginning in 2009 per RCRA Post Closure Permit	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOCS, SVOCS, GRO/DRO extended, WQCC Metals, Cyanide
PW-3	Q	X	pH , EC, DO, ORP, Temp, TDS	VOC, SVOC, WQCC Metals, Cyanide, Nitrate, Nitrite
PW-2	Every 3 years. Starting in 2008	X	pH , EC, DO, ORP, Temp, TDS	VOC, SVOC, WQCC Metals, Cyanide, Nitrate, Nitrite
PW-4	Q	X	pH , EC, DO, ORP, Temp, TDS	VOC, SVOC, WQCC Metals, Cyanide, Nitrate, Nitrite
MKTF-01	Q	X	pH , EC, DO, ORP, Temp, TDS	VOC (method 8060 & 8011 for 1,2-dibromoethane), SVOC, WQCC Metals, GRO/DRO extended, Major cations/anions.
MKTF-02	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-03	Q	X	pH , EC, DO, ORP, Temp, TDS	VOC, SVOC, WQCC Metals, GRO/DRO extended, Major cations/anions.
MKTF-04	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-05	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-06	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-07	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-08	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-09	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-10	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-11	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-12	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-13	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-14	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-15	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-16	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-17	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-18	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-19	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-20	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-21	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-22	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-23	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-24	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-25	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-26	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-27	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-28	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-29	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-30	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-31	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-32	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-33	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-34	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01

MKTF-35	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-36	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-37	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-38	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-39	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-40	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-41	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-42	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-43	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-44	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-45	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
OAPIS-1	Q	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, BTEX+MTBE, SVOC, GRO/DRO EXTENDED. WQCC Metals

DEFINITIONS:

DO- Dissolved Oxygen	DTW - Depth to Water	MW - Monitor Well	DRO - Diesel Range Organics	BTEX - Benzene, Toluene, Ethylbenzene, Xylene, plus Methyl Tert-Butyl Ether (MTBE) - EPA Method 8021+MTBE
ORP - Oxygen Reduction Potential	DTP - Depth to Product	OW - Observation Well	MRO - Motor oil range organics	General Chemistry - pH, specific conductance, cations, Anions
Temp - Temperature	DTB - Depth to Bottom	RW - Recovery Well	GRO - Gasoline Range Organics	WQCC metals include the RCRA 8 metals, must be analyzed as totals and dissolved
EC - Electrical or Specific Conductivity	EP - Evaporation Pond	NA - Not Applicable	MKTF - Marketing Tank Farm Well	VOC - Volatile Organic Compounds-EPA Method 8260, must include MTBE
TDS - Total Dissolved Solids	BW - Boundary Well		PW - Raw Water Production Well	SVOC - Semi-Volatile Organic Compounds - EPA Method 8270, must include phenol

NOTES:

1. NAPIS 1, NAPIS 2, NAPIS 3, and KA-3: Detection of product during quarterly monitoring must comply with Section II.F.2 (24-hour reporting) of NMED Post-Closure Care Permit
2. Sample using the State of New Mexico approved analytical methods as required by 20.6.4.14 NMAC, as amended through February 16, 2006 (use methods 9221-E, until EPA approves 40 CFR 136 Methods (Colilert, Colilert-18, m-Coliblue24, membrane filter method)). Parameters are subject to change. Evaporation pond samples must be collected at the inlet where waste water flows into the evaporation ponds.

Table 1: Gallup Refinery - Ground Water Monitoring Schedule

Sampling Location ID	Sampling Frequency	Collect GW Elevation, DTW, DTP	Water Quality Parameters	Analytical Suite
NAPI Secondary Containment (3 units)	Q	NA	NA	BTEX+MTBE, GRO/DRO extended, WQCC Metals or check for fluids
NAPI Inlet	Q	NA	NA	BTEX+MTBE, GRO/DRO extended, WQCC Metals
RW-1	Q	X	NA	Measure DTW, DTP (Hydrocarbon recovery). Sample for BTEX, MTBE, GRO/DRO if no SPH is detected
RW-2	Q	X	NA	Same as RW-1
RW-5	Q	X	NA	Same as RW-1
RW-6	Q	X	NA	Same as RW-1
OW-1	Q	X	pH , EC, DO, ORP, Temp, TDS	Visual check for artesian flow conditions: Sample for major cations/anions, WQCC Metals, VOCs (method 8260 & 8011 for 1,2-dibromethane), GRO/DRO extended
OW-10	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-1
OW-13	Q	X	pH , EC, DO, ORP, Temp, TDS	VOCs (methods 8260 & 8011 for 1,2-dibromoethane) , WQCC Metals, GRO/DRO extended
OW-14	Q	X	pH , EC, DO, ORP, Temp, TDS	VOCs (methods 8260 & 8011 for 1,2-dibromoethane), WQCC Metals, GRO/DRO extended
OW-29	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14
OW-30	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14
OW-53	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14
OW-54	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14
OW-55	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14
OW-56	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14
OW-57	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14
OW-58	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14
OW-59	Q	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOCS, SVOCS, GRO/DRO extended, WQCC Metals
OW-60	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-59
GWM-1	Q	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOC, GRO/DRO extended, WQCC Metals
GWM-2	Q	X	NA	Check for Water - if water is detected report to OCD & NMED within 24 hours. Sample for GRO/DRO extended, major cations/anions, VOCs
GWM-3	Q	X	NA	Check for Water - if water is detected report to OCD & NMED within 24 hours. Sample for GRO/DRO extended, major cations/anions, VOCs
NAPIS-1 [1]	Q	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, BTEX+MTBE, SVOC, GRO/DRO EXTENDED. WQCC Metals
NAPIS-2 [1]	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as Napis-1
NAPIS-3 [1]	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as Napis-1, addition of 8011 for 1,2-dibromoethane
KA- 3 [1]	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as Napis-1
OAPIS-1	Q	X	pH , EC, DO, ORP, Temp, TDS	VOCs, SVOC, GRO/DRO EXTENDED, WQCC Metals, Major cations/anions, Cyanide
STP1-NW	Q	X	NA	Major cations/anions, VOCs, SVOCs, GRO/DRO extended, WQCC Metals
STP1-SW	Q	X	NA	Major cations/anions, VOCS, SVOCs, GRO/DRO extended, WQCC Metals
STP-1 TO EP-2 (EP-2 Inlet)	Q	NA	NA	VOC, GRO/DRO extended, BOD, COD, TDS, WQCC Metals

Boiler Water (Reverse Osmosis) inlet to EP-2	SA	NA	pH , EC, DO, ORP, Temp, TDS	Major Cations/Anions
Pond 1 [2]				NO LONGER IN SERVICE
Evaporation Pond 2 [2]	SA		pH , EC, DO, ORP, Temp, TDS	General Chemistry, VOC, SVOC, BOD, COD, E-Coli Bacteria, WQCC Metals
Evaporation Pond 3 [2]	SA		pH , EC, DO, ORP, Temp, TDS	Same as EP-2 with addition of pesticides by method 8081A
Evaporation Pond 4 [2]	SA		pH , EC, DO, ORP, Temp, TDS	Same as EP-2
Evaporation Pond 5 [2]	SA		pH , EC, DO, ORP, Temp, TDS	Same as EP-2
Evaporation Pond 6 [2]	SA		pH , EC, DO, ORP, Temp, TDS	Same as EP-2
Evaporation Pond 7 [2]	SA		pH , EC, DO, ORP, Temp, TDS	Same as EP-2
Evaporation Pond 8 [2]	SA		pH , EC, DO, ORP, Temp, TDS	Same as EP-2
Evaporation Pond 9 [2]	SA		pH , EC, DO, ORP, Temp, TDS	Same as EP-2
Evaporation Pond 11 [2]	SA		pH , EC, DO, ORP, Temp, TDS	Same as EP-2
Evaporation Pond 12A [2]	SA		pH , EC, DO, ORP, Temp, TDS	Same as EP-3
Evaporation Pond 12B [2]	SA		pH , EC, DO, ORP, Temp, TDS	Same as EP-3
Any temporary Pond containing fluid	SA		pH , EC, DO, ORP, Temp, TDS	Same as EP-2
BW-1A	Annual (A)	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOC,WQCC METALS, GRO/DRO extended
BW-1B	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
BW-1C	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
BW-2A	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
BW-2B	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
BW-2C	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
BW-3A	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
BW-3B	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
BW-3C	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
BW-4A	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
BW-4B	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
BW-5A	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
BW-5B	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
BW-5C	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A
MW-1	Annual and every 10 years beginning in 2009 per RCRA Post Closure Permit	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOCs, GRO/DRO extended, WQCC Metals, Cyanide, SVOCs
MW-2	Annual and every 10 years beginning in 2009 per RCRA Post Closure Permit	X	pH , EC, DO, ORP, Temp, TDS	Same as MW-1
MW-4	Annual and every 10 years beginning in 2009 per RCRA Post Closure Permit	X	pH , EC, DO, ORP, Temp, TDS	Same as MW-1
MW-5	Annual and every 10 years beginning in 2009 per RCRA Post Closure Permit	X	pH , EC, DO, ORP, Temp, TDS	Same as MW-1
OW-11	A	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOCS, WQCC Metals, GRO/DRO extended
OW-12	A	X	pH , EC, DO, ORP, Temp, TDS	VOCS, WQCC METALS, GRO/DRO extended
OW-50	Q	X	pH , EC, DO, ORP, Temp, TDS	VOCS(methods 8260 & 8011 for 1,2-dibromoethane) , GRO/DRO EXTENDED, WQCC METALS, GEN CHEM
OW-52	Q	X	pH , EC, DO, ORP, Temp, TDS	VOCS(methods 8260 & 8011 for 1,2-dibromoethane) , GRO/DRO EXTENDED, WQCC METALS, GEN CHEM

SMW-2	A	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOCS, GRO/DRO extended, WQCC Metals, Cyanide, SVOCs
SMW-4	Annual and every 10 years beginning in 2009 per RCRA Post Closure Permit	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOCS, SVOCS, GRO/DRO extended, WQCC Metals, Cyanide
PW-3	Q	X	pH , EC, DO, ORP, Temp, TDS	VOC, SVOC, WQCC Metals, Cyanide, Nitrate, Nitrite
PW-2	Every 3 years. Starting in 2008	X	pH , EC, DO, ORP, Temp, TDS	VOC, SVOC, WQCC Metals, Cyanide, Nitrate, Nitrite
PW-4	Q	X	pH , EC, DO, ORP, Temp, TDS	VOC, SVOC, WQCC Metals, Cyanide, Nitrate, Nitrite
MKTF-01	Q	X	pH , EC, DO, ORP, Temp, TDS	VOC (method 8060 & 8011 for 1,2-dibromoethane), SVOC, WQCC Metals, GRO/DRO extended, Major cations/anions.
MKTF-02	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-03	Q	X	pH , EC, DO, ORP, Temp, TDS	VOC, SVOC, WQCC Metals, GRO/DRO extended, Major cations/anions.
MKTF-04	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-05	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-06	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-07	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-08	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-09	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-10	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-11	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-12	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-13	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-14	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-15	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-16	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-17	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-18	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-19	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-20	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-21	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-22	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-23	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-24	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-25	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-26	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-27	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-28	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-29	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-30	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-31	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-32	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-33	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-34	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01

MKTF-35	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-36	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-37	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-38	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-39	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-40	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-41	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-42	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01
MKTF-43	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-44	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
MKTF-45	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03
OAPIS-1	Q	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, BTEX+MTBE, SVOC, GRO/DRO EXTENDED. WQCC Metals

DEFINITIONS:

DO- Dissolved Oxygen	DTW - Depth to Water	MW - Monitor Well	DRO - Diesel Range Organics	BTEX - Benzene, Toluene, Ethylbenzene, Xylene, plus Methyl Tert-Butyl Ether (MTBE) - EPA Method 8021+MTBE
ORP - Oxygen Reduction Potential	DTP - Depth to Product	OW - Observation Well	MRO - Motor oil range organics	General Chemistry - pH, specific conductance, cations, Anions
Temp - Temperature	DTB - Depth to Bottom	RW - Recovery Well	GRO - Gasoline Range Organics	WQCC metals include the RCRA 8 metals, must be analyzed as totals and dissolved
EC - Electrical or Specific Conductivity	EP - Evaporation Pond	NA - Not Applicable	MKTF - Marketing Tank Farm Well	VOC - Volatile Organic Compounds-EPA Method 8260, must include MTBE
TDS - Total Dissolved Solids	BW - Boundary Well		PW - Raw Water Production Well	SVOC - Semi-Volatile Organic Compounds - EPA Method 8270, must include phenol

NOTES:

1. NAPIS 1, NAPIS 2, NAPIS 3, and KA-3: Detection of product during quarterly monitoring must comply with Section II.F.2 (24-hour reporting) of NMED Post-Closure Care Permit
2. Sample using the State of New Mexico approved analytical methods as required by 20.6.4.14 NMAC, as amended through February 16, 2006 (use methods 9221-E, until EPA approves 40 CFR 136 Methods (Colilert, Colilert-18, m-Coliblue24, membrane filter method)). Parameters are subject to change. Evaporation pond samples must be collected at the inlet where waste water flows into the evaporation ponds.

Attachment A
CD's Containing August 24, 2118 Response to Comments

Comment Number	NMED Comment	Gallup Refinery Response	2018 Work Plan Section
1	[2016 Work Plan (HWB-WRG-16-003)] The titles for several sections (e.g., Sections 2.4.1 and 2.4.2) are missing from the 2016 Work Plan. However, these errors were corrected in the 2017 and 2018 Work Plans. No revisions are necessary.	None required.	n/a
2	[2016 Work Plan (HWB-WRG-16-003)] Comment 7.b in the July 24, 2015 Approval with Modifications states, "[t]he Permittee may discontinue sampling for SVOCs, but must add analysis for ORO and DRO-extended [for groundwater monitoring wells BW-lA, BW-IB, BW-lC, BW-2A, BW-2B, BW-2C, BW-3A, BW-3B, BW-3C]." The approved analytical suites for these wells (major cations/anions, VOC, WQCC metals, GRO/DRO extended) are appropriately updated in Appendix B Table 1 and Table 2 in the 2018 Work Plan; however, discontinuation of SVOCs analysis is not addressed in the table. Similarly, Comments 7.c and 7.d allow discontinuation of SVOC analysis for the OW wells. The change (elimination of SVOC analysis) must be addressed in the revised 2018 Work Plan.	The change to remove the SVOC analysis did not occur from the 2017 Work Plan to the 2018 Work Plan and therefore was not identified as a requested or approved change in the 2018 Work Plan. As noted by NMED, the approval for this change occurred on July 24, 2015 and as such was previously updated in Appendix B-Table 2 of the 2016 Work Plan. The 2018 Work Plan (Appendix B-Table 2) carries forward the same sampling requirements for these wells as included in the previous work plan; however, an entry was added to Table 2 to note the SVOCs were previously removed in 2016 pursuant to the July 24, 2015 approval.	App B - Table 2
3	[2016 Work Plan (HWB-WRG-16-003)] Comment 12.b in the July 24, 2015 Approval with Modifications states, "[t]he Permittee lists "DRY" for several wells and "0.00" for several other wells. For the wells with 0.00 reported in the Depth to Water (ft) column, there are groundwater elevations listed in the Groundwater Elevation (ft) column. A reading of 0.00 indicates that groundwater is at the top of the well casing. NMED suspects that 0.00 is not an indicator that groundwater is at the top of casing. Either explain the difference between a dry well and a well with 0.00 recorded for the depth to water (ft) or revise the table to display the correct data." Neither explanation or revision is found in Appendix C-1, Annual, Quarterly Measurements in the 2016 Work Plan; however, the discrepancy was corrected in the 2018 Work Plan. No revisions are necessary.	None required.	n/a

Comment Number	NMED Comment	Gallup Refinery Response	2018 Work Plan Section
4	[2017 Work Plan (HWB-WRG-17-005)] In Section 6.3.2 of the 2016 Annual Groundwater Monitoring Report (2016 Report), dated August 31, 2017, the Permittee states, "BTEX, DRO, ORO, and MRO constituents have not been detected in either OW-50 or OW-52 since 2010 through 2016, however a low concentration of MTBE was detected in both wells in 2016 (Tables 8.5 and 8.5.1)." Current sampling frequency for wells OW-50 and OW-52 is on an annual basis according to Appendix B, Table 1, Groundwater Monitoring Schedule in the 2017 Work Plan. However, MTBE is observed in both wells according to the 2016 Report; therefore, the wells must be monitored more frequently. Future groundwater monitoring and sampling for wells OW-50 and OW-52 must be conducted on a quarterly basis. Update the sampling frequency in the revised 2018 Work Plan accordingly.	Section 6.1 and Appendix B-Tables 1 and 2 have been updated to reflect a change to quarterly sampling at OW-50 and OW-52.	Section 6.1, App B - Table 1 and 2
5	[2017 Work Plan (HWB-WRG-17-005)] In Section 6.1, Modifications to Sampling Plan, the Permittee states, "[t]he following are required changes to the Facility Wide Groundwater Monitoring Work Plan taken from NMED correspondence (HWB-WRG-14-006), Approval with Modifications Annual Facility Wide Groundwater Monitoring Report: Gallup refinery 2013, dated May 18, 2006." The correspondence is dated May 18, 2016. In addition, the Permittee states, "Comment 6: Permittee must sample the EP-2 inlet on a quarterly basis to monitor the level of benzene being discharged from STP-2 to EP-2." The discharge is from STP-1, not STP-2. The errors were corrected in the 2018 Work Plan. No revisions are necessary.	None required.	
6	[2018 Work Plan (HWB-WRG-18-002)] The Permittee included a red-line strikeout version with the 2018 Work Plan. A red-line strikeout version is only required to be submitted with a revised document. The 2018 Work Plan was a first-time submittal. Generally, when NMED disapproves a document, it must be re- submitted as a revised document with a red-line strikeout version that illustrates where all changes to text, tables and figures were made to aid in review of the revised document. When the revised 2018 Work Plan is submitted pursuant to this correspondence, the Permittee must submit a red-line strikeout version showing the revisions to the Work Plan along with the revised 2018 Work Plan.	Permittee acknowledges such direction.	n/a

Comment Number	NMED Comment	Gallup Refinery Response	2018 Work Plan Section
7	[2018 Work Plan (HWB-WRG-18-002)] In Section 1.1, Scope of Activities, the Permittee states, "[t]his plan also includes sampling requirements for the evaporation ponds and for the effluent from the sanitary treatment pond." The facility is divided into five groups (Group A, B, C, D and E) for periodic monitoring; however, evaporation ponds are not categorized. Revise the 2018 Work Plan to include the evaporation ponds as a monitoring group (i.e., Group F).	The discussion on monitoring at the evaporation ponds and effluent from the sanitary treatment pond has been moved into a new Group F. This is reflected in the Executive Summary (page iii), Section 1.1, Section 5.0, and the removal of Section 5.2 Evaporation Ponds and Outfall with the content moved to Section 5.1 Group A Through Group F.	Exec. Summary, Section 1.1, Section 5.0, Section 5.1
8	[2018 Work Plan (HWB-WRG-18-002)] In Section 1.2, Facility Ownership and Operation, the owner and operator are listed as Permittee Refining. During the May 2, 2018 meeting, the Permittee notified NMED that the owner had changed. Accordingly, update the owner and operator information in the revised 2018 Work Plan.	At this time, the names of the owner and operator remain unchanged. The proposed name change to Andeavor has been canceled. The Marathon merger has been announced, but not completed.	n/a
9	[2018 Work Plan (HWB-WRG-18-002)] In Section 2.1, Historical Site Use, the Permittee states, "[t]he clarified water is routed to the new waste water treatment plant (WWTP) where benzene is removed and the treated water flows into the new pond STP-1. STP-1 consists of two bays, north and south and each bay is equipped with five aerators per bay. Effluent from STP-1 then flows into Evaporation Pond 2 and gravitated to the rest of the ponds." The new waste water treatment plant (WWTP) uses granular activated carbon (GAC) to remove organic constituents from wastewater; however, it is not clear how the Permittee determines the timing of contaminant breakthrough from the GAC. Discuss in the revised Work Plan how the timing of breakthrough is monitored and whether the carbon is either replaced with fresh or virgin carbon, or removed, reactivated at high temperatures and returned to the vessel when the GAC is exhausted and constituents begin to break through. Water samples are collected at the pond EP-2 inlet on a quarterly basis; however, the sampling frequency may not be sufficient to monitor the timing of breakthrough from the GAC system. Revise the sampling frequency in the revised 2018 Work Plan to correspond to the observed breakthrough frequency.	There are two GAC canisters placed at the effluent from the Dissolved Gas Flotation (DGF) unit that are utilized to remove the organic constituents from wastewater discharging into STP-1. Wastewater treatment plant operations alternate the configuration of these GAC canisters from a single setup to an in-series setup (primary and secondary canister). To help monitor the breakthrough of these GAC canisters, several water samples are taken at the effluent from the end GAC canister. Specifically, wastewater treatment plant operations take three samples per shift (day shift samples are taken at 8:00 am, 12:00 pm, 4:00 pm and night shift samples are taken at 8:00 pm, 12:00 am and 4:00 am). These samples are sent to Permittee's internal lab for analysis of benzene, toluene, ethylene and xylene (BTEX). In addition to the aforementioned samples, another daily sample is taken around 8:00am at the effluent from the end GAC canister and sent to an off-site lab for analysis. Specifically, a single daily grab sample of wastewater effluent from the end GAC canister is sent to Hall Analytical Lab to be analyzed for the following parameters: DRO-extended, benzene, toluene, ethylbenzene, total xylenes, general chemistry, and pH. Results from benzene analysis of the daily BTEX samples sent to Permittee's internal lab are monitored to manage the breakthrough from the GAC canisters. When benzene values exceed 0.4 ppm, one or more of the following actions are taken: GAC canister configuration is modified to an in-series set-up (primary and secondary canister); GAC canister is replaced with fresh carbon; GAC canister effluent is recirculated to the API. Before revising the sampling frequency per the above-mentioned breakthrough monitoring, Permittee requests such sampling be discussed with NMED during the next quarterly progress meeting that is scheduled to be held on September 19, 2018.	Section 2.1

Comment Number	NMED Comment	Gallup Refinery Response	2018 Work Plan Section
10	[2018 Work Plan (HWB-WRG-18-002)] In Section 2.2, Potential Receptors, the Permittee states, "[c]urrently, PW-2 is sampled every three years, PW-4 is sampled semi-annually and PW-3 is sampled on an annual basis. Annual sampling results from 2009 through 2016 have indicated no detections of volatile organic compounds (VOCs) or semi-volatile organic compounds (SVOCs) above screening levels." In Section 6.4.1 of the 2016 Report, the Permittee states, "[t]here were a total of five organic constituents detected in PW-3 all at concentrations below the applicable standards in 2016 ... 10 organic compounds were detected at concentrations levels below the applicable standards in PW- 4." Revise the statement regarding the VOC detections in the revised 2018 Work Plan. In addition, the number of constituent detections is increasing and the water from these wells is used for human consumption; therefore, the contaminant concentrations must be monitored more frequently. Both wells PW-4 and PW-3 must be sampled on a quarterly basis to monitor for changes in VOC detections and concentrations. Propose the change in sampling frequency in the revised 2018 Work Plan.	The statement in Section 2.2 has been revised to reflect the number of detections above screening levels. Sulfate, iron, phenol, and tetrachloroethene have been detected above screening levels. Section 6.1 and Tables 1 and 2 in Appendix B have been revised to increase the monitoring frequency at PW-3 and PW-4.	Section 2.1, Section 6.1, App B - Table 1 and 2
11	[2018 Work Plan (HWB-WRG-18-002)] In Section 2.3, Type and Characteristics of the Waste and Contaminants and Any Known and Possible Sources, the Permittee states, "[d]ry wastes could stem from wind-blown metallic powders used as catalysts, and regular municipal solid wastes stored in covered containers destined for municipal landfills." Provide information as to what metals are used as catalysts in the refining process at the facility and describe how wastes stored in covered containers could be a source (e.g., leaks, spills) in the revised 2018 Work Plan.	Covered containers are not possible sources and the discussion in Section 2.3 has been revised accordingly. Based on the manner in which the refinery manages catalyst, there is not a potential for metallic powders to be wind-blown. Fresh and spent catalyst is stored in closed containers, with the exception of the removal and refilling process. Small amounts of catalyst inadvertently spilled to the ground surface during the removal or refill process is immediately cleaned up, placed in appropriate disposal containers and sent for proper disposal. The revised 2018 Work Plan has been revised to remove the statements related to wind-blown powders from catalyst.	Section 2.3
12	[2018 Work Plan (HWB-WRG-18-002)] In Section 2.4.1, Separate Phase Hydrocarbons (SPH), the Permittee states, "Separate-Phase Hydrocarbons (SPH) floating on shallow ground water has been found at the northeast end of the facility." The presence of SPH is not limited to the northeast end of the facility; revise the 2018 Work Plan to identify the presence of SPH across the facility (e.g., MKTF wells).	The discussion in Section 2.4.1 has been revised to explain the presence of SPH in other areas of the refinery.	Section 2.4.1

Comment Number	NMED Comment	Gallup Refinery Response	2018 Work Plan Section
13	[2018 Work Plan (HWB-WRG-18-002)] In Section 2.4.1, Separate Phase Hydrocarbons (SPH), the Permittee states, "[r]ecovery through hand-bailing continues on a quarterly basis indicating that the volume of SPH has continued to drop substantially from year to year in several of these recovery wells. In 2016, only Recovery Well (RW-1) and GMW-1 had measurable levels of hydrocarbons." Although the volume of SPH recovery may have dropped, SPH has not likely been eliminated. The screened intervals for some wells are submerged and these wells cannot properly assess the presence of SPH (e.g., RW-2). During the May 2, 2018 meeting, the Permittee asserted that well RW-2 was installed in artesian conditions; therefore, it was screened below the confining layer and the position of the screened interval was appropriate. However, most confined aquifers are not totally isolated from sources of vertical recharge, often referred as a semipermeable or leaky confining layer. Well RW-2 is most likely installed in a leaky confined aquifer. SPH will accumulate at the water table in a leaky confined aquifer. Well RW-1 also may exhibit the conditions of a leaky confined aquifer. In order to assess the presence of SPH at the site, wells must be screened across the water table. Furthermore, the elevated benzene, toluene, ethylbenzene and xylenes (BTEX) concentrations in groundwater samples collected from wells RW-2, OW-57 and OW-58 in September 2016 suggest potential presence of SPH. Correct the statements in the revised 2018 Work Plan.	NMED's direction to "[C]orrect the statements in the revised 2018 Work Plan" is somewhat vague as to exactly which statements NMED is referring; however, the discussion regarding the presence of SPH in Section 2.4.1 has been revised to more accurately reflect the presence of SPH.	Section 2.4.1
14	[2018 Work Plan (HWB-WRG-18-002)] In Section 2.4.2, Methyl Tert Butyl Ether (MTBE), five new monitoring wells (OW-53, OW-54, OW-55, OW-57, and OW-58) are listed as observation wells. These wells have not been included in the previous groundwater monitoring plans. Revise the 2018 Work Plan to indicate that the wells are newly added to the monitoring plan. In addition, well boring logs for OW-57 and OW-58 are included in Appendix D; however, the logs for OW-53, OW-54 and OW-55 are not included. Provide well boring logs and well construction diagrams for OW-53, OW-54 and OW-55 in the revised 2018 Work Plan. If these well boring logs and construction diagrams were previously submitted, provide a reference to the submittal. The Permittee must submit a well completion report for each new well installed at the facility or must include the information in the associated investigation report.	Wells OW-53, OW-54, OW-55, OW-56, OW-57, and OW-58 were included in Appendix B, Table 2 of the 2017 Monitoring Plan to request they be added to the monitoring schedule. We assume per NMED's comment the wells are approved for inclusion. The inclusion of the new wells is discussed in the Executive Summary (page iii), Section 2.4.2 and a new Section 2.4.6 – OW-14 Source Area. The boring/well completion logs for OW-53, OW-54, and OW-55 have been added to Appendix D. It was noted that well OW-56 was left out of the listing of wells in Section 2.4.2 and this is corrected. Also, the reference to OW-57 and OW-58 has been removed from the list of wells in Section 2.4.2 as they are now discussed in new Section 2.4.6.	Exec. Summary Section 2.4.2, Section 2.4.6 App B - Table 2

Comment Number	NMED Comment	Gallup Refinery Response	2018 Work Plan Section
15	[2018 Work Plan (HWB-WRG-18-002)] In Section 2.4.5, North Drainage Ditch, the Permittee states, "[a]n investigation work plan was submitted to NMED for review on August 13, 2015 and was subsequently implemented in May 2016 with installation of well OW-56." Although the Permittee states that investigation was implemented in 2016, the investigation report has not been submitted and reviewed by NMED. The Permittee must submit the investigation report no later than **August 17, 2018**.	The report will be submitted as requested by NMED.	n/a
16	[2018 Work Plan (HWB-WRG-18-002)] In Section 3.2, Drainages, storm water flow paths and drainage locations are described. However, it is difficult to understand the description without a figure. In order for readers to understand the description, provide a figure showing the flow paths and drainage locations in the revised 2018 Work Plan.	A new Figure 7 has been added to show the surface drainage flow paths.	Figure 7
17	[2018 Work Plan (HWB-WRG-18-002)] In Section 4.1, Ground Water Sampling Methodology, the Permittee states, "Appendix C-2 includes [a] well elevation summary for all the Marketing (MKTF) wells which includes date of establishment, ground elevation, top of casing elevation, well casing stick-up length, well depth, screening intervals and stratigraphic units in which the wells are located." Appendix C-1.1 includes well elevation and groundwater measurement data for MKTF wells. Appendix C-2.1 similarly includes well elevation data for MKTF wells. Appendix C-2.1 appears to be redundant; remove Appendix C-2.1 from the revised 2018 Work Plan or explain the purpose for Appendix C-2.1. In addition, Appendix C-2 does not include well elevation summary for MKTF wells. Appendix C-2 includes the elevation summary for all wells except the MKTF wells. Revise the 2018 Work Plan accordingly.	There is only one column of information (measuring point description) that is unique to Table C-2.1, thus this information has been added as a footnote to Table C-1.1 and Table C-2.1 has been removed. The description of Appendix C-2 has been revised in Section 4.1.	Section 4.1 App C, Table C-1.1
18	[2018 Work Plan (HWB-WRG-18-002)] In Section 4.1, Ground Water Sampling Methodology, the Permittee states, "[n]o changes were made to Tables in C-2 and C-2.1 for 2016 as there were no new monitoring wells added to the list." Appendix C-2 includes several wells that were installed in 2016 and 2017. These wells were added to the table in Appendix C-2. Revise the statement in the 2018 Work Plan accordingly.	The statement has been revised to reflect the addition of new wells installed in 2016 and 2017.	Section 4.1

Comment Number	NMED Comment	Gallup Refinery Response	2018 Work Plan Section
19	[2018 Work Plan (HWB-WRG-18-002)] In Section 4.1.2, Well Purging, the Permittee states, "[f]ield water quality measurements will include pH, electrical conductivity, temperature, and dissolved oxygen (DO) %." The unit of dissolved oxygen concentration is shown as a percent (%). It is conventional to report the DO concentration with a unit in milligrams per liter (mg/L). Use mg/L when reporting DO values in future reports. Revise the 2018 Work Plan accordingly. In addition, include Oxidation- Reduction Potential (ORP) to the field water quality testing suite in the revised 2018 Work Plan. All water quality parameters must be tabulated and presented in an organized manner in all future groundwater monitoring reports.	The discussion in Section 4.1.2 has been revised to specify DO to be reported in mg/l and we have added ORP to the discussion. ORP has also been added to the list of acronyms. It is noted that ORP was already included Appendix B Tables 1 and 2, thus the change in only Section 4.1.2.	Acronyms Section 4.1.2
20	[2018 Work Plan (HWB-WRG-18-002)] In Section 4.1.2, Well Purging, the Permittee states, "[a]ll purged ground water and decontamination water from monitoring wells will be drained into the refinery waste water treatment system upstream of the NAPIS." Although one of the sewer leaks was repaired in October 23, 2013, unidentified sewer leaks were still present in the sewer system according to the results of the September 2013 and May 2016 dye tests. The Permittee must not discharge wastewater into the sewer system upstream of the New American Petroleum Institute Separator (NAPIS) until the Permittee demonstrates that the sewer system has been adequately repaired. In addition, various organic and metal constituent concentrations in the samples collected from the leak detection units (LDU) exceeded their respective standards in 2016 according to the 2016 Report. These results indicate that the NAPIS has on-going leakage; therefore, the source of the leaks must be identified and repaired in the NAPIS. The Permittee must not dispose any investigation-derived waste (IDW) into the refinery sewer system until the issues are resolved. During the May 2, 2018 meeting, the Permittee indicated to NMED and OCD that the NAPIS was repaired; however, no documentation demonstrating the completion of repairs has been officially submitted. The documentation must be submitted to OCD and NMED by no later than **July 16, 2018.**	The information requested to be submitted to NMED no later than July 16, 2018 documenting repairs to the NAPI was submitted.	n/a

Comment Number	NMED Comment	Gallup Refinery Response	2018 Work Plan Section
21	[2018 Work Plan (HWB-WRG-18-002)] In Section 4.2.1, Sample Handling, the Permittee states, "[c]ollection of containerized ground water samples are in the order of most volatile to least volatile, such as: VOCs, SVOCs, metals, phenols, cyanide, sulfate, chloride, and nitrates." Comment 4 in the Disapproval letter for the 2015 Annual Groundwater Monitoring Report, dated January 31, 2018 states, "[a]ctual nitrate and nitrite concentrations provide valuable information to evaluate groundwater conditions." Further, Comment 11 in the Disapproval letter states, "[f]or all future monitoring, the method must be revised to provide actual and separate nitrate and nitrite concentrations." Revise the analytical suite to include separate analysis for nitrate and nitrite in the 2018 Work Plan.	The references to nitrates in Section 4.2.1, Appendix A, and Appendix B – Table 1 have been changed to nitrate and nitrite. The change is reflected in Section 6.1.	Section 4.2.1 Section 6.1 App A App B - Table 1
22	[2018 Work Plan (HWB-WRG-18-002)] In Section 5.2.1, Sampling Locations, "Boiler Water Inlet to EP-2" is indicated as one of the outfall sampling locations. However, the record indicates that boiler water is no longer discharged to pond EP-2. Provide clarification whether the water is still discharged to pond EP-2; otherwise, revise the 2018 Work Plan accordingly.	Boiler Reverse Osmosis (RO) water is discharged into EP-2, thus Section 5.2.1 (now Section 5.1) has not been revised to remove the reference to the sampling location for the boiler water inlet. Appendix B, Table 2 has been revised to reflect the RO water discharge.	App B - Table 2
23	[2018 Work Plan (HWB-WRG-18-002)] In Section 6.1, Requests for Modifications, the separate analysis for nitrate and nitrite addressed in Comments 4 and 11 in the January 31, 2018 Disapproval letter was not included. The Permittee must individually report the concentrations of nitrate and nitrite. Revise the 2018 Work Plan to include the modification. Refer to Comment 21.	As described above in the response to Comment 21, the Work Plan has been revised to include analyses for both nitrate and nitrite.	Section 6.1

Comment Number	NMED Comment	Gallup Refinery Response	2018 Work Plan Section
24	[2018 Work Plan (HWB-WRG-18-002)] In Section 6.1, Requests for Modifications, all changes that were made to the previous sampling plan must be presented. Some changes are not addressed in Section 6.1. For example, several new wells (e.g., OW-60) were added to the 2018 Work Plan. However, the changes were not discussed in this section. All proposed monitoring schedule and modifications must be discussed. Appendix B, Table 2, Requested/Approved Changes to the Ground Water Monitoring Schedule, lists these new wells. Rationale for the requested changes is provided in Appendix B, Table 2; however, the description lacks detail and is ambiguous. Revise the 2018 Work Plan to include a discussion of all changes that were made from the previous plan.	Additional discussion has been added to Section 6.1 regarding changes from the 2017 Work Plan. NMED references new wells (e.g., OW-60) as being added to the plan and the description provided in Appendix B, Table "lacks detail and is ambiguous." The 2018 Requested Changes column states, "add to monitoring schedule" to explain what is requested. Permittee is requesting to add these new wells to the monitoring schedule. That is the only requested change for the listed wells for which this change is described. In total, it includes BW-4A, BW-4B, BW-5A, BW-5B, BW-5C, OW-59, and OW-60. The rational refers to the fact that the particular well is a "new well." On multiple previous occasions, NMED has specified that all new monitoring/observation wells should be included in the Monitoring Plan and thus Permittee included the new wells. For OW-59 and OW-60, we have further included a specific reference to the exact comment letter in which NMED directed Permittee to add these wells to the Monitoring Plan (NMED Comment 2 – "The new wells must be added to the Facility-Wide Groundwater Monitoring Plan."). We do not understand how the rationale to add new wells could possibly be ambiguous based on the history of this requirement. However, if we have misunderstood and it is not a requirement to add these new wells to the Monitoring Plan, please advise and Permittee will remove them. The duplicate entry for OW-59 and OW-60 was removed in Appendix B Table 2.	Section 6.1 App B - Table 2
25	[2018 Work Plan (HWB-WRG-18-002)] In Section 6.1, Requests for Modifications, the Permittee states, "[p]ursuant to previous discussions and agreement with NMED, the sampling frequency at the MKTF wells is being changed from quarterly to either semi-annual or annual. NMED requested that samples be collected quarterly at the MKTF wells for two years and this requirement has been satisfied. The monitoring data has been reviewed and wells that showing potentially increasing concentration trends and/or are located near the leading edge of the plume have been selected for semi-annual monitoring. The remaining wells have been changed to annual monitoring." In general, contaminant plumes in the vicinity of MKTF wells remain and have been expanding. The proposed reduction in sampling frequency is not appropriate at this time. Groundwater samples must continue to be collected from all MKTF wells on a quarterly basis. Revise the 2018 Work Plan accordingly.	The request to change the monitoring frequency at the MKTF wells has been removed from Section 6.1 and associated revisions made to Appendix B Tables 1 and 2.	Section 6.1 App B - Table 1 and 2

Comment Number	NMED Comment	Gallup Refinery Response	2018 Work Plan Section
26	[2018 Work Plan (HWB-WRG-18-002)] According to the analytical data tables in the 2016 Report, 1,2-dichloroethane (EDC) was detected in the groundwater samples collected from wells OW-50, OW52, OW-13, NAPIS-3, OAPIS-1, and MKTF wells MKTF-01, 04, 18, 19, 23, 27, 33, 34, 40 and 42 in 2016. The Permittee must add analysis for 1,2-dibromoethane (EDB) to all monitoring wells where EDC has been detected. The analysis of EDB for the groundwater samples collected these wells are not included in Appendix, Table 1. The analytical method must be capable of detecting EDB at concentrations less than 0.004 micrograms per liter (e.g., EPA Method 8011). Revise the 2018 Work Plan accordingly.	Appendix B Tables 1 and 2 have been revised to add analyses by method 8011 for OW-13, OW-50, OW-52, NAPI-3, OAPIS-1, and MKTF wells MKTF-01, 04, 18, 19, 23, 27, 33, 34, 40 and 42. References to this comment are included in Table 2 to distinguish between wells for which method 8011 was already included in earlier versions of the monitoring plans.	App B - Table 1 and 2
27	[2018 Work Plan (HWB-WRG-18-002)] According to Table 8.16.3 of the 2016 Report, analysis for total and dissolved metals have not been conducted for samples collected from the STP-1 outfall since 2014. Since several metals concentrations exceed their respective standards in the evaporation ponds, effluent from STP-1 may contain metals. Resume analyses for total and dissolved metals for the samples collected from the STP-1 outfall. Update Appendix B, Table 1 and Table 2 in the revised 2018 Work Plan.	The requested analyses have been included in revised Section 6.1 and Appendix B, Tables 1 and 2.	Section 6.1 App B - Table 1 and 2
28	[2018 Work Plan (HWB-WRG-18-002)] The bromomethane concentrations in the water samples collected from ponds EP-3, EP-12A and EP-12B are recorded as 0.016, 0.04 and 0.038 mg/L, respectively exceeding the standard of 0.00754 mg/L in 2016 according to Table 8.15.4 of the 2016 Report. Since bromomethane is highly volatile, nearly all environmental releases of bromomethane partition into the air. When bromomethane is detected in surface water bodies, pesticides may have been used intensely nearby. Collect water samples from ponds EP-3, EP-12A and EP-12B for pesticides analysis using EPA Method 8081A during the 2018 sampling events. Unless pesticide constituents are detected, the pesticides analysis may be discontinued in 2019. Update the analytical suite in the 2018 Work Plan accordingly.	The analysis for pesticides using method 8081A has been added in Section 6.1 and Appendix B Tables 1 and 2 for ponds EP-3, EP-12A and EP-12B.	Section 6.1 App B - Table 1 and 2
29	[2018 Work Plan (HWB-WRG-18-002)] The Permittee lists "0.00" for wells RW-2, RW-5, and RW-6 in the Depth to SPH column in Appendix C-1, Groundwater Measurements. Correct the typographical errors in the revised 2018 Work Plan.	The reference to 0.00 for the depth to SPH has been changed to N/A to be consistent with the other wells in Appendix C- Tables C-1 and C-1.1. Also, the definition in C-1 for N/A has been changed to “Not Applicable” from Not Available” to avoid possible confusion that the measurement was not available. The fact is the reading is not applicable because no SPH was identified in the well. Appendix C-1.1 already has N/A defined as not applicable.	App C - Table C-1 and C 1.1

Comment Number	NMED Comment	Gallup Refinery Response	2018 Work Plan Section
30	[2018 Work Plan (HWB-WRG-18-002)] In Appendix B, Table 2, the sampling frequency for well OW-56 is not specified. Groundwater samples must be collected from well OW-56 on a quarterly basis. Revise the table accordingly in the 2018 Work Plan.	Appendix B, Table 2 has been revised to show quarterly monitoring at OW-56.	App B - Table 1 and 2
31	[2018 Work Plan (HWB-WRG-18-002)] In Appendix C-1, the screened interval of new well OW-58 is indicated as 38 to 48 feet below ground surface (bgs) while the depth to water was measured as 24.67 feet bgs during the December 2017 gauging event. Although well OW-58 is appropriately positioned to monitor the SPH plume, its screened interval is submerged approximately 12 feet below the water table. Submerged well screens hinder investigation of SPH. Refer to Comment 13. A work plan to install well OW-58 was not submitted to NMED and the Permittee conducted the investigation at risk. Propose to install new well with an appropriate screened interval at the location of OW-58 in a separate work plan. The Work Plan must be submitted no later than August 3, 2018.	The requested work plan will be submitted as requested. It is noted that well OW-58 was installed pursuant to NMED's May 12, 2016 approval with mods of the OW-14 Source Area Investigation Work Plan dated April 2016.	n/a
32	[2018 Work Plan (HWB-WRG-18-002)] Appendix D, Well Boring Logs presents the boring logs for new wells. It should be noted that NMED will conduct a full review of the new well installations when investigation reports and well completion reports are submitted. Review of this report does not constitute review of the newly installed wells.	None required.	n/a

Attachment B

Table 2

Table 2: Requested/Approved Changes to the Ground Water Monitoring Schedule

Sampling Location ID	Sampling Frequency (Q - Quarterly A - Annual SA - Semi-Annual)	Collect GW Elevation, DTW, DTP	Water Quality Parameters	Analytical Suite	2018 Requested Changes	Rationale for Requested Changes
NAPI Secondary Containment (3 units)	Q	NA	NA	BTEX+MTBE, GRO/DRO extended, WQCC Metals or check for fluids	None	
NAPI Inlet	Q	NA	NA	Same as above (SAA)	Add sampling point	Per NMED comments (HWB-WRG-17-007)
RW-1	Q	X	NA	Measure DTW, DTP (Hydrocarbon recovery) Sample for BTEX + MTBE, GRO/DRO extended. Sample only if no SPH is detected.	None	
RW-2	Q	X	NA	Same as RW-1	None	
RW-5	Q	X	NA	Same as RW-1	None	
RW-6	Q	X	NA	Same as RW-1	None	
OW-1	Q	X	pH , EC, DO, ORP, Temp, TDS	Visual check for artesian flow conditions: Sample for major cations/anions, WQCC Metals, VOCS (methods 8260 & 8011), GRO/DRO extended	None	
OW-10	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-1	None	
OW-13	Q	X	pH , EC, DO, ORP, Temp, TDS	VOCS (method 8260 & 8011), WQCC Metals, GRO/DRO extended	add method 8011	NMED Comment 26 in 6-5-18 Disapproval of Facility-Wide Groundwater Monitoring Plans, updates for 2016, 2017 and 2018
OW-14	Q	X	pH , EC, DO, ORP, Temp, TDS	VOCS (method 8260 & 8011), WQCC Metals, GRO/DRO extended	None	
OW-29	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14	None	
OW-30	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14	None	
OW-53	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14	None [6]	See note #6.
OW-54	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14	None [6]	See note #6.
OW-55	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14	None [6]	See note #6.
OW-56	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14	added quarterly [6]	See note #6.
OW-57	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14	None [6]	See note #6.
OW-58	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14	None [6]	See note #6.
OW-59	Q	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOCS, SVOCS, GRO/DRO extended, WQCC Metals	Add to Monitoring Schedule	New well per NMED approval/Mods Work Plan SMW-2 Area Inv & Boundary Well Install. (3/17/17)
OW-60	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-59	Add to Monitoring Schedule	New well per NMED approval/Mods Work Plan

Table 2: Requested/Approved Changes to the Ground Water Monitoring Schedule

Sampling Location ID	Sampling Frequency (Q - Quarterly A - Annual SA - Semi-Annual)	Collect GW Elevation, DTW, DTP	Water Quality Parameters	Analytical Suite	2018 Requested Changes	Rationale for Requested Changes
						SMW-2 Area Inv & Boundary Well Install. (3/17/17)
GWM-1	Q	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOCS, GRO/DRO extended, WQCC Metals	None	
GWM-2	Q	X	NA	Check for Water - if water is detected report to OCD & NMED within 24 hours. Sample for GRO/DRO extended, major cations/anions, VOCS	None	
GWM-3	Q	X	NA	Same as GWM-2	None	
NAPIS-1 [1]	Q	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, BTEX+MTBE, SVOCS, GRO/DRO EXTENDED. WQCC Metals	None	
NAPIS-2 [1]	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as Napis-1	None	
NAPIS-3 [1]	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as Napis-1 with addition of method 8011 for 1,2-dibromoethane	add method 8011	NMED Comment 26 in 6-5-18 Disapproval of Facility-Wide Groundwater Monitoring Plans, updates for 2016, 2017 and 2018
KA-3 [1]	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as Napis-1	None	
OAPIS-1	Q	X	pH , EC, DO, ORP, Temp, TDS	Major Cations/anions, VOCS (methods 8260 and 8011), SVOCS, GRO/DRO EXTENDED, WQCC Metals, Cyanide	add method 8011	NMED Comment 26 in 6-5-18 Disapproval of Facility-Wide Groundwater Monitoring Plans, updates for 2016, 2017 and 2018
STP1-NW	Q	X	NA	Major cations/anions, VOCS, SVOCS, GRO/DRO extended, WQCC Metals	None	
STP1-SW	Q	X	NA	Same as STP1-NW	None	
Boiler Water (Reverse Osmosis)inlet to EP-2	SA	NA	pH , EC, DO, ORP, Temp, TDS	Major Cations/Anions	None	NMED Comment 22 in 6-5-18 Disapproval of Facility-Wide Groundwater Monitoring Plans, updates for 2016, 2017 and 2018
Pond 1 [2]		NA		NO LONGER IN SERVICE	None	
Evaporation Ponds 2 - 9 [2]	SA	NA	pH , EC, DO, ORP, Temp, TDS	General Chemistry, VOCS, SVOCS, BOD, COD, E-Coli Bacteria, WQCC Metals (add pesticides by method 8081A for EP-3)	add pesticides at EP-3	Per NMED comment 28 in 6-5-2018 Disapproval of Facility-Wide Groundwater Monitoring Plans, updates for 2016, 2017 and 2018
Evaporation Pond 11 [2]	SA	NA	pH , EC, DO, ORP, Temp, TDS	Same as EP-2	None	

Table 2: Requested/Approved Changes to the Ground Water Monitoring Schedule

Sampling Location ID	Sampling Frequency (Q - Quarterly A - Annual SA - Semi-Annual)	Collect GW Elevation, DTW, DTP	Water Quality Parameters	Analytical Suite	2018 Requested Changes	Rationale for Requested Changes
Evaporation Pond 12a [2]	SA	NA	pH , EC, DO, ORP, Temp, TDS	Same as EP-2, with addition of pesticides by method 8081A	add pesticides	Per NMED comment 28 in 6-5-2018 Disapproval of Facility-Wide Groundwater Monitoring Plans, updates for 2016, 2017 and 2018
Evaporation Pond 12b [2]	SA	NA	pH , EC, DO, ORP, Temp, TDS	Same as EP-2, with addition of pesticides by method 8081A	add pesticides	Per NMED comment 28 in 6-5-2018 Disapproval of Facility-Wide Groundwater Monitoring Plans, updates for 2016, 2017 and 2018
Any temporary Pond containing fluid	SA	NA	pH , EC, DO, ORP, Temp, TDS	Same as EP-2	None	
STP-1 TO EP-2 (EP-2 Inlet)	Q	NA	NA	VOCS, GRO/DRO extended, BOD, COD, TDS, WQCC Metals	add metals analyses	Per NMED comment 27 in 6-5-2018 Disapproval of Facility-Wide Groundwater Monitoring Plans, updates for 2016, 2017 and 2018
BW-1A	A	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOCS, WQCC METALS, GRO/DRO-extended	None [4]	
BW-1B	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	None [4]	
BW-1C	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	None [4]	
BW-2A	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	None [4]	
BW-2B	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	None [4]	
BW-2C	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	None[4]	
BW-3A	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	None [4]	
BW-3B	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	None [4]	
BW-3C	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	None [4]	
BW-4A	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	Add to schedule	New well
BW-4B	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	Add to schedule	New well
BW-5A	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	Add to schedule	New well

Table 2: Requested/Approved Changes to the Ground Water Monitoring Schedule

Sampling Location ID	Sampling Frequency (Q - Quarterly A - Annual SA - Semi-Annual)	Collect GW Elevation, DTW, DTP	Water Quality Parameters	Analytical Suite	2018 Requested Changes	Rationale for Requested Changes
BW-5B	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	Add to schedule	New well
BW-5C	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	Add to schedule	New well
MW-1	A	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOCS, SVOCs, GRO/DRO extended, WQCC Metals, Cyanide	None	
MW-2	A	X	pH , EC, DO, ORP, Temp, TDS	Same as MW-1	None	
MW-4	A	X	pH , EC, DO, ORP, Temp, TDS	Same as MW-1	None	
MW-5	A	X	pH , EC, DO, ORP, Temp, TDS	Same as MW-1	None	
OW-11	A	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOCS, WQCC Metals, GRO/DRO-extended	None [4]	
OW-12	A	X	pH , EC, DO, ORP, Temp, TDS	VOCS, WQCC METALS, GRO/DRO extended	None	
OW-50	Q	X	pH , EC, DO, ORP, Temp, TDS	VOCS(methods 8260 & 8011 for 1,2-dibromoethane) , GRO/DRO EXTENDED, WQCC METALS, GEN CHEM.	add method 8011 & change frequency [4]	NMED directive 6-5-2018[5]
OW-52	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-50	add method 8011 & change frequency [4]	NMED directive 6-5-2018[5]
SMW-2	A	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOCS, SVOCs, GRO/DRO extended, WQCC Metals, Cyanide	None	
SMW-4	A	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOCS, SVOCS, GRO/DRO extended, WQCC Metals, Cyanide	None	
PW-3	Q	X	pH , EC, DO, ORP, Temp, TDS	VOCS, SVOCS, WQCC Metals, Cyanide, Nitrate, Nitrite	change frequency & add nitrite	NMED directive 6-5-2018[5]
PW-2	Every 3 years. Starting in 2008	X	pH , EC, DO, ORP, Temp, TDS	VOCS, SVOCS, WQCC Metals, Cyanide, Nitrate, Nitrite	add nitrite	NMED directive 6-5-2018[5]
PW-4	Q	X	pH , EC, DO, ORP, Temp, TDS	VOCS, SVOCS, WQCC Metals, Cyanide, Nitrate, Nitrite	change frequency & add nitrite	NMED directive 6-5-2018[5]
MKTF-01	Q	X	pH , EC, DO, ORP, Temp, TDS	VOCS (method 8260 & 8011 for 1,2-dibromoethane [3]), SVOCS, WQCC Metals, GRO/DRO extended, Major Cations/anions. Ground water samples will not be collected if SPH is present in any of the wells.	add water quality parameters & method 8011	NMED (8/22/16) approval/mods 2014 updates to Facility-Wide Ground Water Monitoring Plan for water quality parameters and NMED Comment 26 in 6-5-18 Disapproval of Facility-Wide Groundwater Monitoring Plans, updates for 2016, 2017 and 2018 for addition of method 8011

Table 2: Requested/Approved Changes to the Ground Water Monitoring Schedule

Sampling Location ID	Sampling Frequency (Q - Quarterly A - Annual SA - Semi-Annual)	Collect GW Elevation, DTW, DTP	Water Quality Parameters	Analytical Suite	2018 Requested Changes	Rationale for Requested Changes
MKTF-02	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	add water quality parameters	NMED (8/22/16) approval/mods 2014 updates to Facility-Wide Ground Water Monitoring Plan
MKTF-03	Q	X	pH , EC, DO, ORP, Temp, TDS	VOCS, SVOCS, WQCC Metals, GRO/DRO extended, Major Cations/anions	SAA	SAA
MKTF-04	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	Same as MKTF-01	Same as MKTF-01
MKTF-05	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-06	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-07	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-08	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-09	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-10	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-11	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-12	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-13	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-14	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-15	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-16	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-17	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-18	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-01	same as MKTF-01
MKTF-19	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-01	same as MKTF-01
MKTF-20	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-21	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-22	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-23	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-01	same as MKTF-01

Table 2: Requested/Approved Changes to the Ground Water Monitoring Schedule

Sampling Location ID	Sampling Frequency (Q - Quarterly A - Annual SA - Semi-Annual)	Collect GW Elevation, DTW, DTP	Water Quality Parameters	Analytical Suite	2018 Requested Changes	Rationale for Requested Changes
MKTF-24	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-02	same as MKTF-02
MKTF-25	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-02	same as MKTF-02
MKTF-26	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-02	same as MKTF-02
MKTF-27	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-01	same as MKTF-01
MKTF-28	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-29	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-30	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-02	same as MKTF-02
MKTF-31	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-02	same as MKTF-02
MKTF-32	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-02	same as MKTF-02
MKTF-33	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-01	same as MKTF-01
MKTF-34	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-01	same as MKTF-01
MKTF-35	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-02	same as MKTF-02
MKTF-36	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-02	same as MKTF-02
MKTF-37	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-02	same as MKTF-02
MKTF-38	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-39	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-40	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-01	same as MKTF-01
MKTF-41	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-02	same as MKTF-02
MKTF-42	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-01	same as MKTF-01
MKTF-43	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-44	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-45	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03

Table 2: Requested/Approved Changes to the Ground Water Monitoring Schedule

Sampling Location ID	Sampling Frequency (Q - Quarterly A - Annual SA - Semi-Annual)	Collect GW Elevation, DTW, DTP	Water Quality Parameters	Analytical Suite	2018 Requested Changes	Rationale for Requested Changes

DEFINITIONS:

STP-1 TO EP-2 - Sample collected at the inlet to Evaporation Pond 2 from STP-1
NAPIS 1 = (KA-1R); NAPIS-2 = (KA-2R), NAPIS-3 = KA-3R) - monitor wells positioned around NAPIS to detect leakage
DO- Dissolved Oxygen; ORP - Oxygen Reduction Potential; Temp - Temperature; EC - Electrical or Specific Conductivity
TDS - Total Dissolved Solids; VOC - Volatile Organic Compounds-EPA Method 8260, must include MTBE
SVOC - Semi-Volatile Organic Compounds - EPA Method 8270, must include phenol
DRO - Diesel Range Organics - EPA Method 8015B (or as modified); GRO - Gasoline Range Organics - EPA Method 8015B (or as modified)
BTEX - Benzene, Toluene, Ethylbenzene, Xylene, plus Methyl Tert-Butyl Ether (MTBE) - EPA Method 8021+MTBE
General Chemistry - pH, specific conductance, cations, Anions
DTW - Depth to Water; DTP - Depth to Product; EP - Evaporation Pond; BW - Boundary Wells
GWM wells - located around the aeration lagoons to detect leakage
MW - Monitor Well; OW - Observation Well; RW - Recovery Well; PW - Raw Water Production Well
WQCC metals include the RCRA 8 metals, must be analyzed as totals and dissolved
NA - Not Applicable

NOTES:

1) NAPIS 1, NAPIS 2, NAPIS 3, KA-3: Detection of product during quarterly monitoring must comply with Section II.F.2 (twenty-four hour reporting) of NMED Post-Closure Care Permit

2) Sample using the State of New Mexico approved analytical methods as required by 20.6.4.14 NMAC, as amended through February 16, 2006 (use methods 9221-E and 9221-F, until EPA approves 40 CFR 136 methods. (Colilert, Colilert - 18, m-Coliblue24, membrane filter method)). Parameters are subject to change. Evaporation Pond samples must be collected at the inlet where waste water flows into the evaporation ponds.

3. EPA Method 8011 for 1,2-dibromethane(EDB) capable of detecting at concentrations less than 0.004 micrograms per liter.
4. Pursuant to NMED's July 24, 2015 Approval with Modifications, SVOC analyses were previously discontinued with the addition of GO~~O~~RO and DRO-extended.
5. See discussion in Section 6.1 regarding NMED's June 5, 2018 Disapproval Facility-Wide Groundwater Monitoring Work Plans – Updates for 2016, 2017, and 2018 regarding increased frequency and analysis for nitrite.
6. The changes were previously requested in the 2017 Work Plan Updates and there are no additional changes requested in the 2018 Work Plan Updates. Per NMED's comment 14 in the June 5, 2018 Disapproval Facility-Wide Groundwater Monitoring Work Plans – Updates for 2016, 2017, and 2018, it appears these wells are approved for inclusion in the Monitoring Plan .

Table 2: Requested/Approved Changes to the Ground Water Monitoring Schedule

Sampling Location ID	Sampling Frequency (Q - Quarterly A - Annual SA - Semi-Annual)	Collect GW Elevation, DTW, DTP	Water Quality Parameters	Analytical Suite	2018 Requested Changes	Rationale for Requested Changes
NAPI Secondary Containment (3 units)	Q	NA	NA	BTEX+MTBE, GRO/DRO extended, WQCC Metals or check for fluids	None	
NAPI Inlet	Q	NA	NA	Same as above (SAA)	Add sampling point	Per NMED comments (HWB-WRG-17-007)
RW-1	Q	X	NA	Measure DTW, DTP (Hydrocarbon recovery) Sample for BTEX + MTBE, GRO/DRO extended. Sample only if no SPH is detected.	None	
RW-2	Q	X	NA	Same as RW-1	None	
RW-5	Q	X	NA	Same as RW-1	None	
RW-6	Q	X	NA	Same as RW-1	None	
OW-1	Q	X	pH , EC, DO, ORP, Temp, TDS	Visual check for artesian flow conditions: Sample for major cations/anions, WQCC Metals, VOCS (methods 8260 & 8011), GRO/DRO extended	None	
OW-10	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-1	None	
OW-13	Q	X	pH , EC, DO, ORP, Temp, TDS	VOCS (method 8260 & 8011), WQCC Metals, GRO/DRO extended	add method 8011	NMED Comment 26 in 6-5-18 Disapproval of Facility-Wide Groundwater Monitoring Plans, updates for 2016, 2017 and 2018
OW-14	Q	X	pH , EC, DO, ORP, Temp, TDS	VOCS (method 8260 & 8011), WQCC Metals, GRO/DRO extended	None	
OW-29	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14	None	
OW-30	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14	None	
OW-53	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14	None [6]	See note #6.
OW-54	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14	None [6]	See note #6.
OW-55	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14	None [6]	See note #6.
OW-56	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14	added quarterly [6]	See note #6.
OW-57	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14	None [6]	See note #6.
OW-58	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-14	None [6]	See note #6.
OW-59	Q	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOCS, SVOCS, GRO/DRO extended, WQCC Metals	Add to Monitoring Schedule	New well per NMED approval/Mods Work Plan SMW-2 Area Inv & Boundary Well Install. (3/17/17)
OW-60	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-59	Add to Monitoring Schedule	New well per NMED approval/Mods Work Plan

Table 2: Requested/Approved Changes to the Ground Water Monitoring Schedule

Sampling Location ID	Sampling Frequency (Q - Quarterly A - Annual SA - Semi-Annual)	Collect GW Elevation, DTW, DTP	Water Quality Parameters	Analytical Suite	2018 Requested Changes	Rationale for Requested Changes
						SMW-2 Area Inv & Boundary Well Install. (3/17/17)
GWM-1	Q	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOCS, GRO/DRO extended, WQCC Metals	None	
GWM-2	Q	X	NA	Check for Water - if water is detected report to OCD & NMED within 24 hours. Sample for GRO/DRO extended, major cations/anions, VOCS	None	
GWM-3	Q	X	NA	Same as GWM-2	None	
NAPIS-1 [1]	Q	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, BTEX+MTBE, SVOCS, GRO/DRO EXTENDED. WQCC Metals	None	
NAPIS-2 [1]	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as Napis-1	None	
NAPIS-3 [1]	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as Napis-1 with addition of method 8011 for 1,2-dibromoethane	add method 8011	NMED Comment 26 in 6-5-18 Disapproval of Facility-Wide Groundwater Monitoring Plans, updates for 2016, 2017 and 2018
KA-3 [1]	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as Napis-1	None	
OAPIS-1	Q	X	pH , EC, DO, ORP, Temp, TDS	Major Cations/anions, VOCS (methods 8260 and 8011), SVOCS, GRO/DRO EXTENDED, WQCC Metals, Cyanide	add method 8011	NMED Comment 26 in 6-5-18 Disapproval of Facility-Wide Groundwater Monitoring Plans, updates for 2016, 2017 and 2018
STP1-NW	Q	X	NA	Major cations/anions, VOCS, SVOCS, GRO/DRO extended, WQCC Metals	None	
STP1-SW	Q	X	NA	Same as STP1-NW	None	
Boiler Water (Reverse Osmosis)inlet to EP-2	SA	NA	pH , EC, DO, ORP, Temp, TDS	Major Cations/Anions	None	NMED Comment 22 in 6-5-18 Disapproval of Facility-Wide Groundwater Monitoring Plans, updates for 2016, 2017 and 2018
Pond 1 [2]		NA		NO LONGER IN SERVICE	None	
Evaporation Ponds 2 - 9 [2]	SA	NA	pH , EC, DO, ORP, Temp, TDS	General Chemistry, VOCS, SVOCS, BOD, COD, E-Coli Bacteria, WQCC Metals (add pesticides by method 8081A for EP-3)	add pesticides at EP-3	Per NMED comment 28 in 6-5-2018 Disapproval of Facility-Wide Groundwater Monitoring Plans, updates for 2016, 2017 and 2018
Evaporation Pond 11 [2]	SA	NA	pH , EC, DO, ORP, Temp, TDS	Same as EP-2	None	

Table 2: Requested/Approved Changes to the Ground Water Monitoring Schedule

Sampling Location ID	Sampling Frequency (Q - Quarterly A - Annual SA - Semi-Annual)	Collect GW Elevation, DTW, DTP	Water Quality Parameters	Analytical Suite	2018 Requested Changes	Rationale for Requested Changes
Evaporation Pond 12a [2]	SA	NA	pH , EC, DO, ORP, Temp, TDS	Same as EP-2, with addition of pesticides by method 8081A	add pesticides	Per NMED comment 28 in 6-5-2018 Disapproval of Facility-Wide Groundwater Monitoring Plans, updates for 2016, 2017 and 2018
Evaporation Pond 12b [2]	SA	NA	pH , EC, DO, ORP, Temp, TDS	Same as EP-2, with addition of pesticides by method 8081A	add pesticides	Per NMED comment 28 in 6-5-2018 Disapproval of Facility-Wide Groundwater Monitoring Plans, updates for 2016, 2017 and 2018
Any temporary Pond containing fluid	SA	NA	pH , EC, DO, ORP, Temp, TDS	Same as EP-2	None	
STP-1 TO EP-2 (EP-2 Inlet)	Q	NA	NA	VOCS, GRO/DRO extended, BOD, COD, TDS, WQCC Metals	add metals analyses	Per NMED comment 27 in 6-5-2018 Disapproval of Facility-Wide Groundwater Monitoring Plans, updates for 2016, 2017 and 2018
BW-1A	A	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOCS, WQCC METALS, GRO/DRO-extended	None [4]	
BW-1B	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	None [4]	
BW-1C	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	None [4]	
BW-2A	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	None [4]	
BW-2B	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	None [4]	
BW-2C	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	None[4]	
BW-3A	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	None [4]	
BW-3B	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	None [4]	
BW-3C	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	None [4]	
BW-4A	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	Add to schedule	New well
BW-4B	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	Add to schedule	New well
BW-5A	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	Add to schedule	New well

Table 2: Requested/Approved Changes to the Ground Water Monitoring Schedule

Sampling Location ID	Sampling Frequency (Q - Quarterly A - Annual SA - Semi-Annual)	Collect GW Elevation, DTW, DTP	Water Quality Parameters	Analytical Suite	2018 Requested Changes	Rationale for Requested Changes
BW-5B	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	Add to schedule	New well
BW-5C	A	X	pH , EC, DO, ORP, Temp, TDS	Same as BW-1A	Add to schedule	New well
MW-1	A	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOCS, SVOCs, GRO/DRO extended, WQCC Metals, Cyanide	None	
MW-2	A	X	pH , EC, DO, ORP, Temp, TDS	Same as MW-1	None	
MW-4	A	X	pH , EC, DO, ORP, Temp, TDS	Same as MW-1	None	
MW-5	A	X	pH , EC, DO, ORP, Temp, TDS	Same as MW-1	None	
OW-11	A	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOCS, WQCC Metals, GRO/DRO-extended	None [4]	
OW-12	A	X	pH , EC, DO, ORP, Temp, TDS	VOCS, WQCC METALS, GRO/DRO extended	None	
OW-50	Q	X	pH , EC, DO, ORP, Temp, TDS	VOCS(methods 8260 & 8011 for 1,2-dibromoethane) , GRO/DRO EXTENDED, WQCC METALS, GEN CHEM.	add method 8011 & change frequency [4]	NMED directive 6-5-2018[5]
OW-52	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as OW-50	add method 8011 & change frequency [4]	NMED directive 6-5-2018[5]
SMW-2	A	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOCS, SVOCs, GRO/DRO extended, WQCC Metals, Cyanide	None	
SMW-4	A	X	pH , EC, DO, ORP, Temp, TDS	Major cations/anions, VOCS, SVOCS, GRO/DRO extended, WQCC Metals, Cyanide	None	
PW-3	Q	X	pH , EC, DO, ORP, Temp, TDS	VOCS, SVOCS, WQCC Metals, Cyanide, Nitrate, Nitrite	change frequency & add nitrite	NMED directive 6-5-2018[5]
PW-2	Every 3 years. Starting in 2008	X	pH , EC, DO, ORP, Temp, TDS	VOCS, SVOCS, WQCC Metals, Cyanide, Nitrate, Nitrite	add nitrite	NMED directive 6-5-2018[5]
PW-4	Q	X	pH , EC, DO, ORP, Temp, TDS	VOCS, SVOCS, WQCC Metals, Cyanide, Nitrate, Nitrite	change frequency & add nitrite	NMED directive 6-5-2018[5]
MKTF-01	Q	X	pH , EC, DO, ORP, Temp, TDS	VOCS (method 8260 & 8011 for 1,2-dibromoethane [3]), SVOCS, WQCC Metals, GRO/DRO extended, Major Cations/anions. Ground water samples will not be collected if SPH is present in any of the wells.	add water quality parameters & method 8011	NMED (8/22/16) approval/mods 2014 updates to Facility-Wide Ground Water Monitoring Plan for water quality parameters and NMED Comment 26 in 6-5-18 Disapproval of Facility-Wide Groundwater Monitoring Plans, updates for 2016, 2017 and 2018 for addition of method 8011

Table 2: Requested/Approved Changes to the Ground Water Monitoring Schedule

Sampling Location ID	Sampling Frequency (Q - Quarterly A - Annual SA - Semi-Annual)	Collect GW Elevation, DTW, DTP	Water Quality Parameters	Analytical Suite	2018 Requested Changes	Rationale for Requested Changes
MKTF-02	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	add water quality parameters	NMED (8/22/16) approval/mods 2014 updates to Facility-Wide Ground Water Monitoring Plan
MKTF-03	Q	X	pH , EC, DO, ORP, Temp, TDS	VOCS, SVOCS, WQCC Metals, GRO/DRO extended, Major Cations/anions	SAA	SAA
MKTF-04	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	Same as MKTF-01	Same as MKTF-01
MKTF-05	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-06	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-07	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-08	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-09	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-10	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-11	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-12	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-13	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-14	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-15	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-16	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-17	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-18	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-01	same as MKTF-01
MKTF-19	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-01	same as MKTF-01
MKTF-20	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-21	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-22	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-23	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-01	same as MKTF-01

Table 2: Requested/Approved Changes to the Ground Water Monitoring Schedule

Sampling Location ID	Sampling Frequency (Q - Quarterly A - Annual SA - Semi-Annual)	Collect GW Elevation, DTW, DTP	Water Quality Parameters	Analytical Suite	2018 Requested Changes	Rationale for Requested Changes
MKTF-24	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-02	same as MKTF-02
MKTF-25	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-02	same as MKTF-02
MKTF-26	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-02	same as MKTF-02
MKTF-27	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-01	same as MKTF-01
MKTF-28	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-29	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-30	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-02	same as MKTF-02
MKTF-31	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-02	same as MKTF-02
MKTF-32	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-02	same as MKTF-02
MKTF-33	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-01	same as MKTF-01
MKTF-34	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-01	same as MKTF-01
MKTF-35	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-02	same as MKTF-02
MKTF-36	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-02	same as MKTF-02
MKTF-37	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-02	same as MKTF-02
MKTF-38	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-39	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-40	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-01	same as MKTF-01
MKTF-41	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-02	same as MKTF-02
MKTF-42	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-01	same as MKTF-01	same as MKTF-01
MKTF-43	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-44	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03
MKTF-45	Q	X	pH , EC, DO, ORP, Temp, TDS	Same as MKTF-03	Same as MKTF-03	Same as MKTF-03

Table 2: Requested/Approved Changes to the Ground Water Monitoring Schedule

Sampling Location ID	Sampling Frequency (Q - Quarterly A - Annual SA - Semi-Annual)	Collect GW Elevation, DTW, DTP	Water Quality Parameters	Analytical Suite	2018 Requested Changes	Rationale for Requested Changes

DEFINITIONS:

STP-1 TO EP-2 - Sample collected at the inlet to Evaporation Pond 2 from STP-1
NAPIS 1 = (KA-1R); NAPIS-2 = (KA-2R), NAPIS-3 = KA-3R) - monitor wells positioned around NAPIS to detect leakage
DO- Dissolved Oxygen; ORP - Oxygen Reduction Potential; Temp - Temperature; EC - Electrical or Specific Conductivity
TDS - Total Dissolved Solids; VOC - Volatile Organic Compounds-EPA Method 8260, must include MTBE
SVOC - Semi-Volatile Organic Compounds - EPA Method 8270, must include phenol
DRO - Diesel Range Organics - EPA Method 8015B (or as modified); GRO - Gasoline Range Organics - EPA Method 8015B (or as modified)
BTEX - Benzene, Toluene, Ethylbenzene, Xylene, plus Methyl Tert-Butyl Ether (MTBE) - EPA Method 8021+MTBE
General Chemistry - pH, specific conductance, cations, Anions
DTW - Depth to Water; DTP - Depth to Product; EP - Evaporation Pond; BW - Boundary Wells
GWM wells - located around the aeration lagoons to detect leakage
MW - Monitor Well; OW - Observation Well; RW - Recovery Well; PW - Raw Water Production Well
WQCC metals include the RCRA 8 metals, must be analyzed as totals and dissolved
NA - Not Applicable

NOTES:

1) NAPIS 1, NAPIS 2, NAPIS 3, KA-3: Detection of product during quarterly monitoring must comply with Section II.F.2 (twenty-four hour reporting) of NMED Post-Closure Care Permit
2) Sample using the State of New Mexico approved analytical methods as required by 20.6.4.14 NMAC, as amended through February 16, 2006 (use methods 9221-E and 9221-F, until EPA approves 40 CFR 136 methods. (Colilert, Colilert - 18, m-Coliblue24, membrane filter method)). Parameters are subject to change. Evaporation Pond samples must be collected at the inlet where waste water flows into the evaporation ponds.
3. EPA Method 8011 for 1,2-dibromethane(EDB) capable of detecting at concentrations less than 0.004 micrograms per liter.
4. Pursuant to NMED's July 24, 2015 Approval with Modifications, SVOC analyses were previously discontinued with the addition of GRO and DRO-extended.
5. See discussion in Section 6.1 regarding NMED's June 5, 2018 Disapproval Facility-Wide Groundwater Monitoring Work Plans – Updates for 2016, 2017, and 2018 regarding increased frequency and analysis for nitrite.
6. The changes were previously requested in the 2017 Work Plan Updates and there are no additional changes requested in the 2018 Work Plan Updates. Per NMED's comment 14 in the June 5, 2018 Disapproval Facility-Wide Groundwater Monitoring Work Plans – Updates for 2016, 2017, and 2018, it appears these wells are approved for inclusion in the Monitoring Plan .

Attachment C
Section 7.4.1.1

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

2.4 Summary of contaminant releases that could contribute to possible ground water contamination.

Spills and leaks are known to have occurred on the site in various locations. Although most hydrocarbons are immediately picked up for recovery and contaminated soil is removed, some of the liquids present in a spill may enter the subsurface. With precipitation, there is the possibility that some of the contaminants could leach and reach ground water.

2.4.1 Separate Phase Hydrocarbons (SPH)

2.4.1.1 Main Tank Farm

Separate-Phase Hydrocarbons (SPH) floating on shallow ground water was found in the mid-1990s at the northeast end of the facility in the main tank farm. A series of recovery wells were installed and SPH has been recovered since the initial discovery. Recovery through hand-bailing continues on a quarterly basis. It is noted that observed SPH measurements may not accurately reflect site conditions. In 2016, Recovery Well RW-1 was the only recovery well in the tank farm that had measurable levels of hydrocarbons. Elevated levels of benzene have also been found in the wells near RW-1 and possibly linked to past spills. Recovery wells in the main tank farm are listed as follows:

RECOVERY WELLS			
RW-1	RW-2	RW-5	RW-6

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RECOVERY WELLS			
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Attachment D
Appendix A

Appendix A
Gallup Field Sampling Collection and Handling Standard Procedures

Field Data Collection: Elevation and Purging

All facility monitoring wells and recovery wells are gauged as required throughout the year. Gallup does not have any recovery well pumps that need to be shut off and removed prior to water elevation measurements.

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

All water/product levels are measured to an accuracy of the nearest 0.01 foot using an electrical conductivity based meter, the Heron Instruments 100 ft. DipperT electric water depth tape complying with US GGG-T-106E, EEC Class II and a WaterMark Oil Water Interface Meter (100 ft), Model 101L/SMOIL. After determining water levels, well volumes are calculated using the appropriate conversion factors for a given well based on its internal diameter. Volume is equal to the height of the liquid column times the internal cross-sectional area of the well.

Generally, at least three well volumes (or a minimum of two if the well has low recharge) are purged from each well prior to sampling. Field water quality parameters measured during purging (pH, electrical conductivity, temperature, and dissolved oxygen), must stabilize to within 10% for a minimum of three consecutive measurements before collection of ground water samples from each well.

Before sample collection can begin, the water collected from each monitoring well must be fresh aquifer water. Well evacuation replaces stagnant well water with fresh aquifer water. The water level in the well, total depth of well and thickness of floating product (if any) will be measured using the WaterMark Oil Water Interface Meter depth tape. If product is present, a ground water sample is not obtained.

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

Wells MW-1, MW-2, MW-4, MW-5, BW-1C, BW-2A, BW-2B, BW-3B, SMW-4, OW-1, OW-10, OW-13, OW-14, OW-29 and OW-30 are each equipped with a dedicated electrical pump. The remaining wells are purged using a portable Grundfos pump. Recovery wells and NAPIS-1, NAPIS-2, NAPIS-3 and KA-3 are hand-bailed as well as GWM-1, GWM-2, GWM-3 and OAPIS-1 is hand-bailed if the presence of water is detected.

New wells MKTF 1 thru 45 and STP1-NW and STP1-SW are all hand-bailed if the presence of water is detected. If SPH is detected in any of these wells, no samples are collected.

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

Sampling Equipment at Gallup

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

- Heron Instruments 100 ft. DipperT electric water depth tape complying with US GGG-T-106E, EEC Class II.

- Pall Corporation Acro 50A 0.45 micron disposable filter used with 60 ml disposable syringes for filtering water in the field.
- YSI pH/Conductivity meter Model 63, calibrated with a one-point, two-point, or three-point calibration procedure using pH standards of 7, 4 and 10.
- IQ Scientific Instruments, pH/Temperature/Conductivity/ Dissolved Oxygen meter, Model IQ1806LP.
- Grundfos 2-inch pumps with Grundfos 115-volt AC–to-DC converter.
- WaterMark Oil Water Interface Meter (100 ft), Model 101L/SMOIL, S/N 01-5509.

Calibration and maintenance procedures will be performed according to the manufacturer's specifications.

Order of Collection

Samples will be collected in the order listed below:

Parameter

VOC, SVOC
TOC
Extractable Organics
Metals* Total and Dissolved
Phenols, Cyanide
Chloride, Sulfate, Nitrate, and Nitrite

Bottle Type

40 ml VOA vials, (H_2SO_4)
1 liter glass jar, H_2SO_4
1 liter glass jar with Teflon™ cap
500 ml, 125 ml plastic, HNO_3
1 liter glass jar
1 liter plastic, no preservative

*Pre-filtration bottle for dissolved metals which is subsequently filtered in the field and transferred to a pint plastic bottle with HNO3 preservative.

Filtration

Ground water samples are filtered prior to dissolve metals analysis. For dissolved metals, sample water is poured into a jar and then extracted with a syringe. The syringe is then used to force the sample water through a 0.45 micron pore filter paper filter into the proper sample bottle to collect dissolved metals samples. Filtration must be performed within two hours of sample collection. Pour the filtrate into a sample bottle containing HNO3 preservative.

For samples destined for total metals analysis, do not filter the sample, and preserve with HNO3 to pH <2 in the field.

Gallup sampling personnel carry a cell phone when gathering ground water and other water samples. While sampling procedures are generally well known and the appropriate sample bottles are ordered to match each sampling event, occasional questions do arise from unforeseen circumstances which may develop during sampling. At such times, sampling personnel contact Hall Environmental Analytical Laboratory to verify that sampling is correctly performed.

Sample Handling Procedures

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

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

Immediately after the samples are collected, they will be stored in a cooler with ice or other appropriate storage method until they are delivered to the analytical laboratory. Standard chain-of-custody

procedures, as described in Section 4.2.1 of this Plan, will be followed for all samples collected. All samples will be submitted to the laboratory to allow the laboratory to conduct the analyses within the method holding times.

General Well Sampling Procedures

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

Prepare for sampling event by making out sample bottle labels and have bottles separated into plastic bags for each well to be sampled and placed in an ice chest ready to take into the field. Bring along a note book and sample log. Document weather conditions, sample date and time. Fill in label with location, date, time, analysis, preservative, and your name. Start sampling by adjusting converter speed for each well. Affix sample label and fill bottle according to lab instructions. For samples intended for VOC analysis, use bottles with septa lids, fill bottle to neck and add final amount of water with cap to form meniscus. Turn bottles upside down to examine for bubbles, if bubbles are detected in the vial, repeat collection procedure. If no bubbles show, secure lids and pack in bubble wrap and place in cooler until sampling is completed.

Decontaminate equipment that is not dedicated for use in a particular well. Refrigerate completed samples until shipping to lab. Be sure to check holding times and arrange for appropriate shipping method. Be sure that the field effort is adequately staffed and equipped. Check QC requirements before departing—QC samples require additional equipment and supplies.

Surface Water Sample Collection

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

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

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

Decontamination Procedures

The objective of the decontamination procedures is to minimize the potential for cross-contamination.

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

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

Field Equipment Calibration Procedures

Field equipment requiring calibration will be calibrated to known standards, in accordance with the manufacturers' recommended schedules and procedures. Calibration checks will be conducted daily and the instruments will be recalibrated if necessary. Calibration measurements will be recorded in the daily field logs.

If field equipment becomes inoperable, its use will be discontinued until the necessary repairs are made. A properly calibrated replacement instrument will be used in the interim. Instrumentation used during sampling events will be recorded in the daily field logs.

Collection and Management of Investigation Derived Waste

Investigation derived waste (IDW) generated during each groundwater sampling event may include purge water, decontamination water, excess sample material, and disposable sampling equipment. All water from all wells generated during sampling and decontamination activities will be temporarily stored in labeled 55-gallon drums until placed in the refinery wastewater treatment system upstream of the API separator. All other solid waste generated during sampling activities (including sampling gloves, tubing, etc.) will be disposed of with the Refinery's general municipal waste.

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- Equipment used and calibration records, if appropriate
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Sample Custody

All samples collected for analysis will be recorded in the field report or data sheets. Chain-of-custody forms will be completed at the end of each sampling day, prior to the transfer of samples off site, and will accompany the samples during shipment to the laboratory. A signed and dated custody seal will be affixed to the lid of the shipping container. Upon receipt of the samples at the laboratory, the custody seals will be broken, the chain-of-custody form will be signed as received by the laboratory, and the

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

Sample Custody

All samples collected for analysis will be recorded in the field report or data sheets. Chain-of-custody forms will be completed at the end of each sampling day, prior to the transfer of samples off site, and will accompany the samples during shipment to the laboratory. A signed and dated custody seal will be affixed to the lid of the shipping container. Upon receipt of the samples at the laboratory, the custody seals will be broken, the chain-of-custody form will be signed as received by the laboratory, and the

conditions of the samples will be recorded on the form. The original chain-of-custody form will remain with the laboratory. Gallup Refinery will maintain copies of all chain-of-custody forms generated as part of sampling activities. Copies of the chain-of-custody records will be included with all draft and final laboratory reports submitted to NMED and OCD.