# AP-110

# FACILITY-WIDE GW MONITORING WORK PLAN

2017

## Chavez, Carl J, EMNRD

**From:** Combs, Robert <Robert.Combs@HollyFrontier.com>
**Sent:** Thursday, March 22, 2018 2:20 PM
**To:** Chavez, Carl J, EMNRD
**Cc:** Sahba, Arsin M.; Denton, Scott
**Subject:** Lovington Refinery (AP-110) – groundwater sampling event notification

Carl,

The first semi-annual groundwater monitoring event of 2018 will commence on April 5, 2018 at Navajo's Lovington Refinery. The groundwater monitoring event will be conducted in accordance with the *Revised Facility-Wide Groundwater Monitoring Work Plan* that was approved by OCD in an email on February 1, 2018.

If you have any questions regarding the groundwater monitoring schedule, please do not hesitate to contact me at (575) 746-5382.

Thank you,
Robert

**Robert Combs**
Environmental Specialist
The HollyFrontier Companies
P.O. Box 159
Artesia, NM 88211-0159
office: 575-746-5382
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Robert.Combs@hollyfrontier.com

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## Chavez, Carl J, EMNRD

**From:** Chavez, Carl J, EMNRD
**Sent:** Thursday, February 1, 2018 11:57 AM
**To:** 'Combs, Robert'
**Cc:** Sahba, Arsin M.; Denton, Scott; Griswold, Jim, EMNRD
**Subject:** RE: Lovington Revised FWGMWP

Robert, et al.:

Approved. Navajo Refining, LLC (Navajo) may want to add a specific sections in future FWGWMWPs to denote recommendations, and actual changes from previous years.

Thank you.

Mr. Carl J. Chavez, CHMM (#13099)
New Mexico Oil Conservation Division
Energy Minerals and Natural Resources Department
1220 South St Francis Drive
Santa Fe, New Mexico 87505
Ph. (505) 476-3490
E-mail: CarlJ.Chavez@state.nm.us
**"Why not prevent pollution, minimize waste to reduce operating costs, reuse or recycle, and move forward with the rest of the Nation?" (To see how, go to: http://www.emnrd.state.nm.us/OCD and see "Publications")**

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**From:** Combs, Robert [mailto:Robert.Combs@HollyFrontier.com]
**Sent:** Friday, January 26, 2018 1:56 PM
**To:** Chavez, Carl J, EMNRD <CarlJ.Chavez@state.nm.us>
**Cc:** Sahba, Arsin M. <Arsin.Sahba@HollyFrontier.com>; Denton, Scott <Scott.Denton@HollyFrontier.com>
**Subject:** Lovington Revised FWGMWP

Carl,
HollyFrontier Navajo Refining LLC (Navajo) is attempting to schedule the first semi-annual monitoring event for 2018 at the Lovington Refinery (refinery), but the schedule is dependent on the approval of the *Revised Facility-Wide Groundwater Monitoring Work Plan* (2017 Revised FWGMWP) that was submitted to OCD on November 16, 2017. The 2017 Revised FWGMWP proposed a modification of the monitoring schedule to be consistent with the semi-annual monitoring schedule at Navajo's Artesia Refinery (i.e., April and October rather than February and August). Other than the proposed modification to the schedule, the 2017 Revised FWGMWP is consistent with (1) the December 2015 Revised FWGMWP that was approved by the OCD in an email on March 9, 2016 and (2) recommendations in the November 17, 2017, *Additional Investigation of Historical Asphalt Loading Rack Release* letter report that was approved by OCD in an email on December 22, 2017. Navajo requests OCD's approval to implement the 2017 Revised FWGWMWP during this first semi-annual groundwater monitoring event in April 2018. If complete technical review is not possible at this time, Navajo requests a response by email from OCD for the scheduling change. This will allow for the typical February sampling arrangements to be made.

If you have any questions regarding the 2017 Revised FWGMWP, please do not hesitate to contact me at (575) 746-5382.

Thank you,
Robert

**Robert Combs**
Environmental Specialist
The HollyFrontier Companies
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HOLLYFRONTIER

November 16, 2017

Mr. Carl J. Chavez
New Mexico Energy, Minerals & Natural Resources Department
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

**Re: Revised Facility-Wide Groundwater Monitoring Work Plan, HollyFrontier Navajo Refining LLC, Lovington Refinery, Lovington, New Mexico, AP-110.**

Dear Mr. Chavez:

Please find enclosed the original and one electronic copy of the *Revised Facility-Wide Groundwater Monitoring Work Plan* (Revised FWGMWP) for the HollyFrontier Navajo Refining LLC (Navajo) Lovington Refinery (refinery) located in Lovington, New Mexico. The Revised FWGMWP details the facility-wide groundwater monitoring program to be implemented at the refinery under Abatement Plan AP-110. This Revised FWGMWP includes an expanded facility-wide groundwater monitoring well network, proposes a modification to the monitoring schedule, and includes additional laboratory analyses at select wells.

If you should have any questions or comments regarding this Revised FWGMWP, please feel free to contact me at (575) 746-5487 or Robert Combs at (575) 746-5382.

Sincerely,

Scott M. Denton
Environmental Manager

cc: A. Sahba, HFC
R. Combs, HFC
J. Speer, TRC
B. Gilbert, TRC

**HollyFrontier Navajo Refining LLC**
501 East Main • Artesia, NM 88210
(575) 748-3311 • http://www.hollyfrontier.com

# Revised Facility-Wide Groundwater Monitoring Work Plan

**HollyFrontier Navajo Refining LLC**
**Lovington Refinery, AP-110**
**Lovington, New Mexico**

**November 2017**


**Prepared for:**

HOLLYFRONTIER
**HollyFrontier Navajo Refining LLC**
**Artesia, New Mexico**

**Prepared by:**

TRC
**TRC Environmental Corporation**
**Austin, Texas**

# Revised Facility-Wide Groundwater Monitoring Work Plan

**HollyFrontier Navajo Refining LLC**
**Lovington Refinery, AP-110**
**Lovington, New Mexico**

**Prepared for:**

HOLLYFRONTIER

**HollyFrontier Navajo Refining LLC**
**Artesia, New Mexico**

**Prepared by:**

TRC

**TRC Environmental Corporation**
**Austin, Texas**

**TRC Project No. 270076**

**November 2017**

**Principal Lead** Julie Green

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# 1.0 INTRODUCTION

This *Revised Facility-Wide Groundwater Monitoring Work Plan* (Revised FWGMWP) details the facility-wide groundwater monitoring program to be implemented at the HollyFrontier Navajo Refining LLC (Navajo) Lovington Refinery (refinery) located at 7406 South Main Street in Lovington, New Mexico. The facility-wide groundwater monitoring program at the refinery consists of semi-annual groundwater gauging of wells, semi-annual or annual groundwater sampling of monitoring wells, quarterly sampling of refinery water supply wells, and annual reporting. The current facility-wide groundwater monitoring program is detailed in the December 2015 Revised FWGMWP that was approved by the New Mexico Oil Conservation Division (OCD) in an email on March 9, 2016. This Revised FWGMWP includes an expanded facility-wide groundwater monitoring well network, proposes a modification to the monitoring schedule, and includes additional laboratory analyses at select wells. The following changes to the groundwater monitoring program are included in this Revised FWGMWP:

- Three new monitoring wells (MW-31, MW-32, and MW-33) were installed as part of investigation activities in the vicinity of the asphalt loading rack and are now included in the facility-wide groundwater monitoring program;
- Monitoring well MW-11, which had become dry due to decreasing groundwater elevations, was plugged and abandoned, and replaced with a deeper monitoring well (MW-11R);
- Groundwater samples to be collected from select wells (MW-5, MW-21, MW-22, MW-31, MW-32, MW-33, WW-North, WW-South, and WW-East) will be submitted for laboratory analysis of total petroleum hydrocarbon (TPH) diesel range organics (DRO) and gasoline range organics (GRO), in addition to the current analyses; and
- The semi-annual groundwater monitoring schedule is proposed to be consistent with the semi-annual monitoring schedule at Navajo's Artesia Refinery (i.e., April and October).

A site location map is provided as Figure 1-1 and a refinery site plan is provided as Figure 2-1. The sampling plan and schedule is summarized on Table 2-1.

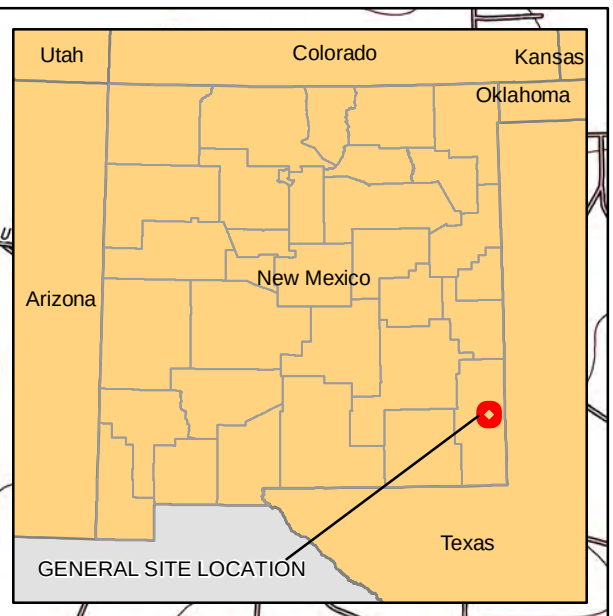
## 1.1 Site Background

The refinery is located approximately five miles south of Lovington in Lea County, New Mexico. The facility is operated by Navajo and consists of refining operations and includes Holly Energy Partners – Operating, L.P. (HEP) pipeline and receiving stations. Monitoring activities were previously conducted in general accordance with a Groundwater Discharge Permit (GW-014) issued by the OCD, which was rescinded by the OCD on February 9, 2012. The refinery is currently regulated under Abatement Plan permit AP-110.

## 1.2 Field Sampling Plan Contents

This Revised FWGMWP describes the procedures to be followed during routine groundwater monitoring activities, including well gauging, groundwater sampling, investigation-derived waste (IDW) management, and equipment decontamination. Analytical requirements, data collection rationale, and quality assurance/quality control (QA/QC) requirements for routine groundwater monitoring are also detailed in this Revised FWGMWP. A contingency plan in the event groundwater chemical of concern (COC) concentrations increase is also included. Representative field forms are included in Appendix A. Guidance for release response is presented in Appendix B.

**Figure 1-1. Site Location Map**




COUNTY RD-96

S MAIN ST

East Lovington Oil Field

NEW MEXICO LOVINGTON

NEW MEXICO LOVINGTON SE

S MAIN ST

COUNTY RD-78

COUNTY RD-78

W

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**LEGEND**

SITE

N

0 1,000 2,000 4,000

FEET

SOURCE:
U.S.G.S. 7.5 MINUTE QUAD
LOVINGTON, NEW MEXICO 2010
LOVINGONT SE, NEW MEXICO 2010

# SITE LOCATION MAP

HOLLYFRONTIER NAVAJO REFINING LLC
LOVINGTON REFINERY, LOVINGTON, NM

| | |
|---|---|
| PROJECT NO: 270076 | MXD: Figure1_1 |
| AUTHOR: MFL | DATE: 8/1/2017 |

TRC
505 EAST HUNTLAND DRIVE
SUITE 250
AUSTIN, TEXAS 78752
(512) 329-6080

FIGURE
1-1

# 2.0 MONITORING PROGRAM SUMMARY

The groundwater monitoring program consists of semi-annual gauging of all monitoring wells, semi-annual or annual groundwater sampling of select monitoring wells, quarterly sampling of the Navajo refinery water supply wells, and annual reporting. The objectives of the monitoring program are to (1) determine and monitor groundwater flow direction and gradient, (2) monitor the nature and extent of dissolved-phase COCs in groundwater, and (3) monitor the presence and extent of light non-aqueous phase liquids (LNAPL). Figure 2-1 presents the location of the monitoring and water supply wells that are part of the groundwater monitoring program.

## 2.1 Scheduling and Notification

Semi-annual groundwater monitoring will be conducted in April and October of each calendar year, consistent with the semi-annual groundwater monitoring schedule implemented at Navajo's Artesia Refinery (GW-028). The more comprehensive monitoring event (i.e., the annual event) will be conducted in October. Quarterly sampling of the three refinery water supply wells will be conducted in January, April, July, and October of each calendar year. OCD will be notified of the monitoring schedule prior to each monitoring event.

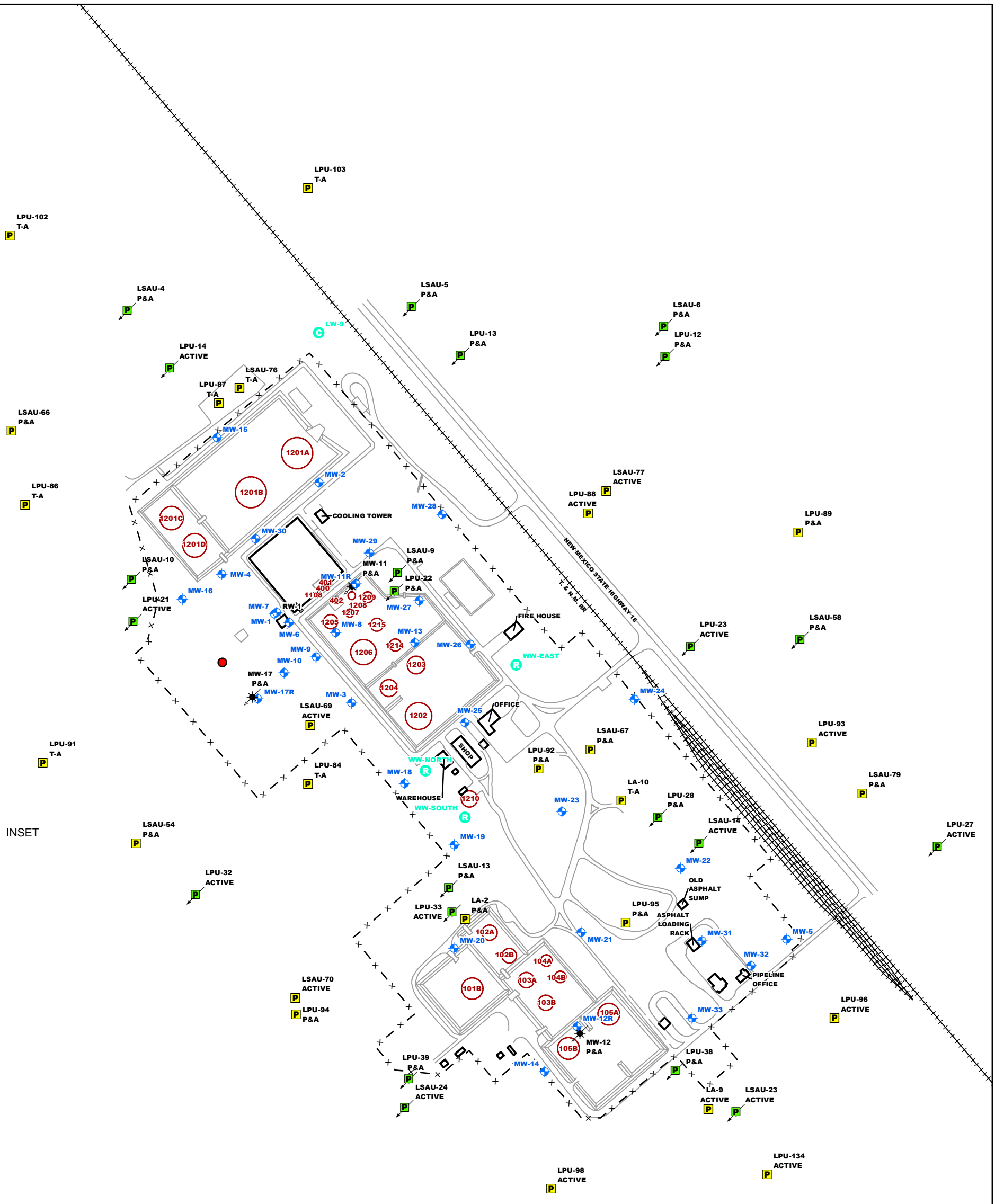
## 2.2 Gauging Requirements

Synoptic fluid level gauging will be completed semi-annually at all monitoring and recovery wells. Wells will be gauged for depth to LNAPL (if present), depth to water, and total depth (if scheduled for sampling and no LNAPL is present in the well). Dedicated equipment (tubing and pumps), if applicable, will remain in the well during gauging to minimize disturbance to the water column. All synoptic well gauging will be completed within one day, if feasible. Each monitoring well will also be gauged immediately prior to commencing purging/sampling activities.

## 2.3 Sampling Requirements

Sampling frequency and target analytes for each monitoring well were selected based on historical COC detections, exceedances of New Mexico Water Quality Control Commission (WQCC) groundwater standards, COC concentration trends, and well location relative to the refinery boundaries and refinery water supply wells. Select groundwater samples will be analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), total mercury, dissolved metals, anions, TPH GRO and DRO, alkalinity, and/or total dissolved solids (TDS). The required sample analytical parameters and sampling frequency for each well are summarized in Table 2-1, Figure 2-2, and Figure 2-3.

**Figure 2-1. Refinery Site Plan**

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## LEGEND

- MONITORING WELL
- MONITORING WELL - PLUGGED AND ABANDONED
- OIL PRODUCTION WELL
- OIL PRODUCTION-CONVERTED TO INJECTION WELL
- RECOVERY WELL
- REFINERY WATER SUPPLY WELL
- CITY OF LOVINGTON WATER SUPPLY WELL
- FLARE
- RAIL
- FENCE
- BUILDINGS
- TANKS

N

0 250 500 1,000

FEET

# REFINERY SITE PLAN

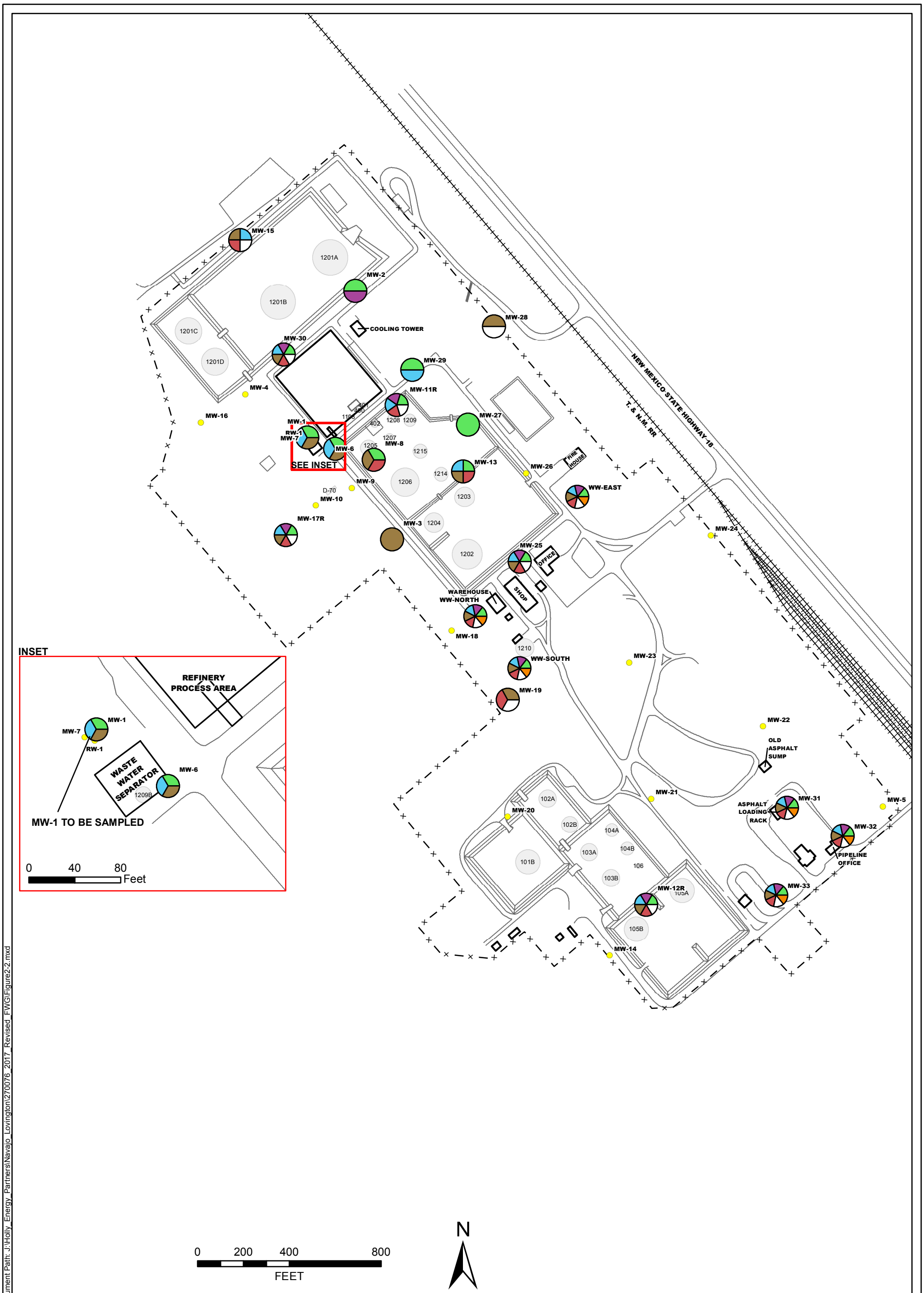
HOLLYFRONTIER NAVAJO REFINING LLC
AP-110, LOVINGTON REFINERY, LOVINGTON, NM

| | |
|---|---|
| PROJECT NO: 270076 | MXD: Figure2-1 |
| AUTHOR: MLOVELACE | DATE: 8/4/2017 |

TRC
505 EAST HUNTLAND DRIVE
SUITE 250
AUSTIN, TEXAS 78752
(512) 329-6080

FIGURE
2-1

**Figure 2-2. April Sampling Plan**

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**PIE CHART KEY**

WELLS NOT SAMPLED DURING THIS SEMI-ANNUAL MONITORING EVENT

- ANALYSIS OF VOCS BY SW8260
- ANALYSIS OF SVOCS BY SW8270
- ANALYSIS OF DISSOLVED METALS BY SW6020 AND TOTAL METALS (MERCURY) BY SW7470
- ANALYSIS OF ANIONS (CHLORIDE, FLUORIDE, SULFATE, AND NITRATE/NITRITE) BY E300 AND/OR SW9056
- ANALYSIS OF TOTAL DISSOLVED SOLIDS BY M2450C
- ANALYSIS OF TOTAL ALKALINITY BY SM2320B
- ANALYSIS OF TOTAL PETROLEUM HYDROCARBONS (DRO AND GRO) BY SW8015

# APRIL SAMPLING PLAN

HOLLYFRONTIER NAVAJO REFINING LLC
AP-110, LOVINGTON REFINERY, LOVINGTON, NM

| | |
|---|---|
| PROJECT NO: 270076 | MXD: Figure2-2 |
| AUTHOR: MFL | DATE: 11/14/2017 |

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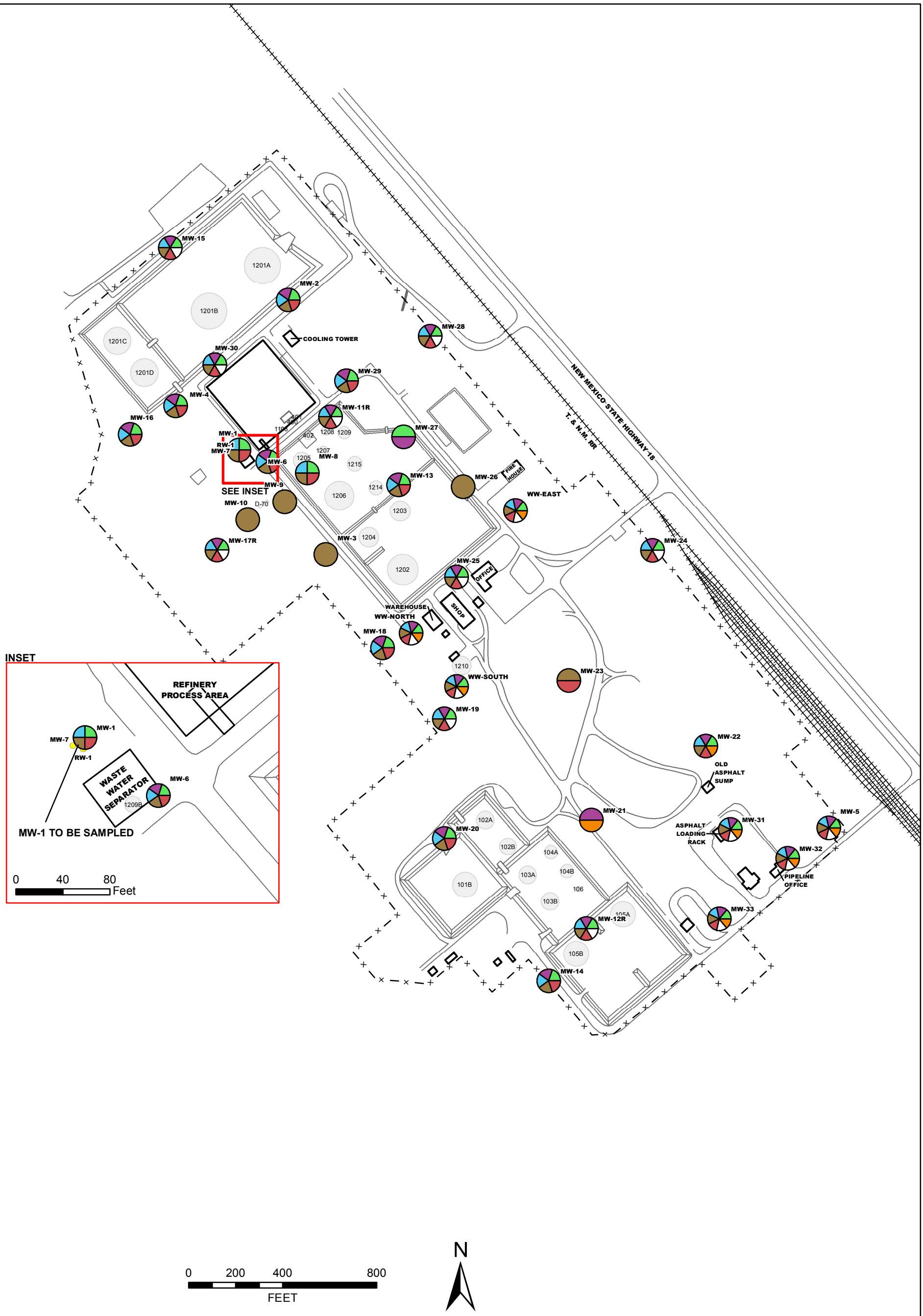
SUITE 250
AUSTIN, TEXAS 78752
(512) 329-6080

FIGURE 2-2

**Figure 2-3. October Sampling Plan**

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**PIE CHART KEY**

WELLS NOT SAMPLED DURING THIS SEMI-ANNUAL MONITORING EVENT

- ANALYSIS OF VOCS BY SW8260
- ANALYSIS OF SVOCS BY SW8270
- ANALYSIS OF DISSOLVED METALS BY SW6020 AND TOTAL METALS (MERCURY) BY SW7470
- ANALYSIS OF ANIONS (CHLORIDE, FLUORIDE, SULFATE, AND NITRATE/NITRITE) BY E300 AND/OR SW9056
- ANALYSIS OF TOTAL DISSOLVED SOLIDS BY M2450C
- ANALYSIS OF TOTAL ALKALINITY BY SM2320B
- ANALYSIS OF TOTAL PETROLEUM HYDROCARBONS (DRO AND GRO) BY SW8015

# OCTOBER SAMPLING PLAN

HOLLYFRONTIER NAVAJO REFINING LLC
AP-110, LOVINGTON REFINERY, LOVINGTON, NM

| | |
|---|---|
| PROJECT NO: 270076 | MXD: Figure2-3 |
| AUTHOR: MFL | DATE: 11/14/2017 |

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SUITE 250
AUSTIN, TEXAS 78752
(512) 329-6080

FIGURE 2-3

**Table 2-1. Groundwater Monitoring Plan**

## Table 2-1. GROUNDWATER MONITORING PLAN
## Lovington Refinery (AP-110) - Lovington, New Mexico

| Monitor Well Number | Semi-Annual Monitoring Event Analytical Program | | Well Location Relative to Refinery Boundary | Sampling Frequency and Analytical Program Rationale |
|---|---|---|---|---|
| | 1st Half (April) | 2nd Half (October) | | |
| **MW-1** | A, C, D | A, C, D, E | Interior | VOC, SVOC, anion, and TDS stable to decreasing; no historical VOC or SVOC exceedances |
| **MW-2** | A, B | A, B, C, D, E | Perimeter | All COCs stable to decreasing; no historical VOC, SVOC, or metal exceedances |
| **MW-3** | D | D | Interior | All COCs stable to decreasing; no historical VOC, SVOC, metal, or TDS exceedances |
| **MW-4** | - - - | A, B, C, D, E | Interior | All COCs stable to decreasing; no historical COC exceedances |
| **MW-5** | - - - | A, B, C, D, E, F, G | Perimeter | All COCs stable to decreasing; no historical COC exceedances |
| **MW-6** | A, C, D | A, B, C, D, E | Interior | Metals, anions, and TDS stable to decreasing; no VOC, SVOC, anion, or TDS exceedances since March 2011 |
| **MW-7** | - - - | - - - | Interior | Located immediately adjacent to MW-1 (redundant) |
| **MW-8** | A, D, E | A, C, D, E | Interior | All COCs stable to decreasing; no historical VOC or SVOC exceedances |
| **MW-9** | - - - | D | Interior | All COCs stable to decreasing; no historical VOC, SVOC, metal, or TDS exceedances |
| **MW-10** | - - - | D | Interior | All COCs stable to decreasing; no historical COC exceedances |
| **MW-11R** | A, B, C, E, F | A, B, C, D, E, F | Interior | Anions and TDS stable to decreasing |
| **MW-12R** | A, B, C, D, E, F | A, B, C, D, E, F | Perimeter | All COCs stable to decreasing; no historical COC exceedances; well installed in June 2013 to replace MW-12 (establishing trends) |
| **MW-13** | A, C, D, E | A, B, C, D, E | Interior | Metals and anions stable to decreasing |
| **MW-14** | - - - | A, B, C, D, E | Perimeter | VOCS, SVOCs, anions, and TDS stable to decreasing; no historical VOC, SVOC, anion, or TDS exceedances |
| **MW-15** | C, D, E, F | A, B, C, D, E, F | Perimeter | Upgradient boundary well; all COCs stable to decreasing; no historical VOC or SVOC exceedances |
| **MW-16** | - - - | A, B, C, D, E | Perimeter | Upgradient boundary well; all COCs stable to decreasing; no historical COC exceedances |
| **MW-17R** | A, B, C, D, E, F | A, B, C, D, E, F | Perimeter | All COCs stable to decreasing; no historical VOC, SVOC, or metal exceedances; well installed in June 2013 to replace MW-17 (establishing trends) |
| **MW-18** | - - - | A, B, C, D, E | Perimeter | All COCs stable to decreasing; no historical VOC, SVOC, and metal exceedances |
| **MW-19** | D, E, F | A, B, C, D, E, F | Perimeter | VOC, SVOC, metals, and anions stable to decreasing; no historical VOC, SVOC, and metal exceedances |
| **MW-20** | - - - | A, B, C, D, E | Perimeter | All COCs stable to decreasing; no historical VOC, SVOC, anions, and metal exceedances |
| **MW-21** | - - - | B, G | Interior | All COCs stable to decreasing; no historical VOC, SVOC, anions, and metal exceedances |
| **MW-22** | - - - | A, B, C, D, E, G | Perimeter | All COCs stable to decreasing; no historical COC exceedances |
| **MW-23** | - - - | D, E | Interior | VOCs, SVOCs, metals, and anions stable to decreasing; no historical VOC, SVOC, anions, and metal exceedances |
| **MW-24** | - - - | A, B, C, D, E, F | Perimeter | All COCs stable to decreasing; no historical VOC, SVOC, metal, and TDS exceedances |
| **MW-25** | A, B, C, D, E, F | A, B, C, D, E, F | Interior | VOCs, SVOCs, metals, and TDS stable to decreasing; no historical VOC or SVOC exceedances |
| **MW-26** | - - - | D | Interior | All COCs stable to decreasing; no historical VOC, SVOC, anion, and metal exceedances |
| **MW-27** | A | A, B | Interior | All COCs stable to decreasing; no historical COC exceedances |
| **MW-28** | D, F | A, B, C, D, E, F | Perimeter | All COCs stable to decreasing; no historical VOC, SVOC, metal, and TDS exceedances |
| **MW-29** | A, C | A, B, C, D, E | Interior | All COCs stable to decreasing; no historical VOC and SVOC exceedances |
| **MW-30** | A, B, C, D, E, F | A, B, C, D, E, F | Interior | Installed in June 2013 (establishing historical trends) |
| **MW-31** | A, B, C, D, E, F, G | A, B, C, D, E, F, G | Interior | Installed in December 2016; contains LNAPL |
| **MW-32** | A, B, C, D, E, F, G | A, B, C, D, E, F, G | Perimeter | Installed in June 2017 (establishing historical trends) |
| **MW-33** | A, B, C, D, E, F, G | A, B, C, D, E, F, G | Perimeter | Installed in June 2017 (establishing historical trends) |
| **RW-1** | - - - | - - - | Interior | All COCs stable to decreasing; no historical COC exceedances; located immediately adjacent to MW-1 (redundant) |
| **WW-North** | A, B, C, D, E, F, G | A, B, C, D, E, F, G | Interior | Water supply well; all COCs stable to decreasing; no historical COC exceedances |
| **WW-South** | A, B, C, D, E, F, G | A, B, C, D, E, F, G | Interior | Water supply well; all COCs stable to decreasing; no historical VOC, SVOC, and metal exceedances |
| **WW-East** | A, B, C, D, E, F, G | A, B, C, D, E, F, G | Interior | Water supply well, VOCs, SVOCs, anions, and TDS stable to decreasing; no historical COC exceedances |

**Notes:**
Wells with measurable LNAPL will not be sampled.
All monitoring and recovery wells will be gauged semi-annually.
Water supply wells WW-North, WW-South, and WW-East will be sampled on a quarterly basis for the same constituents as semi-annual events.
All wells to be sampled will also be field-screened using a water quality meter for temperature, specific conductivity, pH, oxidation reduction potential, dissolved oxygen, and turbidity.

A = Analysis of VOCs by SW8260B
B = Analysis of SVOCs by SW8270C
C = Analysis of dissolved metals by SW6020 and total metals (mercury) by SW7470A
D = Analysis of anions (chloride, fluoride, sulfate, and nitrate/nitrite) by SW9056A or E300
E = Analysis of TDS by M2540C
F = Analysis of total alkalinity by SM2320B
G = Analysis of TPH DRO and GRO by SW8015D

COCs = Chemicals of Concern
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
TDS = Total Dissolved Solids
TPH = Total Petroleum Hydrocarbons
DRO = Diesel Range Organics
GRO = Gasoline Range Organics
Dissolved Metals = Aluminum, Arsenic, Barium, Boron, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Uranium, Zinc
LNAPL = Light Non-Aqueous Phase Liquid

# 3.0 GROUNDWATER MONITORING PROCEDURES

Monitoring activities will consist of the following tasks: field documentation, well inspection, well gauging, groundwater purging and sampling, handling of samples for laboratory analysis, QA/QC sampling, and managing IDW. These tasks are described in detail below.

## 3.1 Field Documentation

Documentation of field activities associated with groundwater monitoring events will be recorded each day in a bound field logbook and associated field sampling forms. Each page of the logbook and field sampling forms will be signed by the person(s) making entries on that page. The following information will be collected during groundwater sampling activities:

- Sampling and oversight personnel identification
- Instrument calibrations
- Well conditions
- Monitoring well measurements including static water level depth, total well depth, and water column height
- Depth to LNAPL, if present
- Weather conditions at the time of sample collection and throughout the sampling event
- Well purging procedures including: equipment, purge volume, rate, and elapsed time
- Water quality parameters recorded during purging including appearance, odor, pH, temperature, conductivity, TDS, oxidation-reduction potential (ORP), dissolved oxygen (DO), and turbidity
- Sample collection dates and times
- Reasons for deviating from the sampling and analysis plan (if applicable)

## 3.2 Well Inspection

During each gauging and sampling event, all monitoring and recovery wells will be inspected for well integrity. The information will be recorded on the groundwater gauging form and the Project Manager will be notified of any significant changes. Each inspection will include:

- Identification of the well
- Inspection of the well pad for deterioration or damage
- Inspection of the protective casing for deterioration or damage
- Inspection of the well casing for deterioration or damage
- Notation of the presence or absence and condition of the lock and expandable well cap
- Measurement of the total depth of the well

## 3.3 Well Gauging

The depth to LNAPL, if present, and groundwater will be gauged at each monitoring well prior to sampling. A list of all refinery wells is presented in Table 2-1 and well locations are depicted in Figure 2-1. Prior to gauging, each well cap will be removed to allow groundwater to equilibrate with atmospheric pressure. Fluid level measurements will be collected using an oil/water interface probe with an accuracy of 0.01 feet. Measurements will be made from a marked measuring point or the north side of the top of casing (TOC). Data will be recorded on a Fluid Gauging Form consistent with the one included in Appendix A. The oil/water interface probe will be decontaminated before use and between wells following the procedures outlined in Section 3.7.

### *3.3.1 Fluid Level Gauging Procedures*

The following procedure will be used to measure the depths to LNAPL and groundwater:

- The probe will be lowered into the well slowly until the probe alarm sounds or light illuminates, withdraw the tape and lower it again slowly until the alarm is again audible or light again illuminates. Check the depth to fluid on the tape and record the depth to within 0.01 feet. Raise and lower the probe again slowly and repeat measurements for accuracy.
- Well identification, date, time, depth to water, depth to LNAPL (if applicable), and other pertinent observations will be recorded on a Fluid Gauging Form consistent with the one included in Appendix A.

### *3.3.2 Total Depth Gauging*

Total well depth is measured to detect the amount of silt accumulation in a well. This measurement will be collected during sampling events and well inspections. If a well contains LNAPL, the total depth will not be measured. The following procedures will be followed to determine the total depth of the well:

- The oil/water interface probe will be slowly lowered until the bottom of the well is detected.
- The total well depth will be measured when the tape becomes slack for hard bottoms.
- The point of "pick-up" (where the weight of the probe is felt when reeling up the probe) will be used to determine the total depth in the case of soft sediment bottoms.
- The hardness of the bottom of the well will be documented in the field logbook.

## 3.4 Groundwater Sampling

Groundwater will be purged and sampled from refinery monitoring wells using United States Environmental Protection Agency (US EPA) low flow/low stress methods. Groundwater

will be purged and sampled from Navajo refinery water supply wells using standard procedures described below. Data collected during the purging and sampling of each well will be recorded on a Groundwater Sampling Form consistent with the one included in Appendix A.

Groundwater will be purged and sampled from monitoring wells using a dedicated pneumatic bladder pump. The monitoring well locations are depicted in Figure 2-1. Each dedicated pump will be adjusted as necessary so that the pump intake is at the approximate middle of the water column within the screened interval of the well. The tubing and pump safety line will be secured at the top of the well casing to ensure the pump intake remains at the same elevation during purging and sampling. A decontaminated oil/water interface probe will be lowered into the monitoring well to monitor the depth to water during the purging process.

Groundwater will be purged and sampled from the three refinery water supply wells by attaching a decontaminated or dedicated hose barb to the available spigot. The spigot is located at a point before the water supply is introduced into any storage tanks or treatment units. The groundwater will be purged from the spigot for a minimum of ten minutes prior to sample collection to remove any stagnant water from the well casing and surface piping.

A multi-parameter meter (YSI 556 or equivalent) with flow-through cell and a hand-held turbidity meter will be used during the purging process to monitor for field water quality parameters (pH, temperature, conductivity, TDS, ORP, DO, and turbidity) and demonstrate stabilization. Water quality parameters will be recorded approximately every three minutes during purging. Water quality meters used to measure field parameters will be calibrated each day according to the manufacturer's specifications. The make, model, calibration fluids, and calibration results for the water quality meters will be recorded in the field logbook. The turbidity meter test cell will be triple rinsed with groundwater from the next sample aliquot prior to each reading. The water quality parameters and depth to water (in monitoring wells only) will be recorded on a Groundwater Sampling Form consistent with the one included in Appendix A. A description of the water quality (e.g., turbidity, sheen, odor) will be recorded during the purging process.

The purging process will be considered complete and groundwater sampling will commence when at least three of the seven water quality parameters achieve stabilization for three consecutive readings. A stabilization criterion for each parameter is as follows:

- pH ±0.1 unit
- Temperature within 3 percent
- Conductivity within 3 percent
- DO within 10 percent or three consecutive readings below 0.5 milligrams per liter (mg/L)

- TDS within 10 percent
- ORP within 10 millivolts (mV)
- Turbidity within 10 percent nephelometric turbidity units (NTUs) or three readings below 5 NTUs

If the well goes dry during purging, a sample will be collected as soon after the water level sufficiently recovers to a level from which a sample can be collected.

The samples will be collected in clean, labeled laboratory-supplied containers prepared with the appropriate amount and type of preservative. Samples will be collected in the following order: VOCs, SVOCs, TPH GRO and DRO, anions, TDS, alkalinity, total mercury, and dissolved metals. The groundwater samples will be submitted for laboratory analysis following the schedule in Table 2-1.

Samples submitted for total mercury analysis will either be filtered in the field or in the laboratory using a 10-micron filter if the turbidity is greater than 10 NTUs. Samples submitted for dissolved metals analysis will either be filtered in the field or in the laboratory using a 0.45-micron filter. The filtering method (i.e., laboratory or field) will affect the type of preservative and handling methods as shown in Table 3-2. Filtering methods will be documented on the Groundwater Sampling Form, field logbook, and chain-of-custody.

The laboratory sample analyses and frequency is presented in Table 3-1. Table 3-2 presents the laboratory sample container and preservation specifications and analysis hold times. Table 3-3 presents the container labeling nomenclature for the groundwater samples collected.

## 3.5 Handling of Samples for Laboratory Analysis

The sample containers will be labeled, secured with bubble wrap, placed in a resealable plastic bag, and immediately placed on ice in a cooler and stored below 4° C. The sample labels will include the client name (Navajo), site name (Lovington Refinery), unique sample identification as presented in Table 3-3, sample collection time and date, preservatives, and the name(s) of the sampler(s). The samples will be secured with packing material and kept below 4° C with double-bagged, wet ice in accordance with laboratory cooler shipping guidelines. The cooler will be secured with packing tape, and a signed and dated custody seal will be placed over the cooler lid and secured with tape. The samples and a completed chain-of-custody documentation will be shipped via priority overnight delivery to the analytical laboratory. The chain-of-custody forms are to be maintained as a record of sample collection, transfer, shipment, and receipt by the laboratory. The samples may be shipped as a single shipment at the end of the sampling event or throughout the week as appropriate. The laboratory will be informed that samples are being submitted for analysis and it will be confirmed that the samples were received the following day.

If samples are shipped on Friday for Saturday delivery, the receiving laboratory will be contacted so provisions can be made for laboratory sample receipt.

## 3.6 Quality Assurance/Quality Control Sampling

Field QA/QC samples for groundwater will be collected as follows:

- Duplicates: Collected at a frequency of ten percent at the same time and from the same location as the original sample.
- Equipment blanks: Collected from non-dedicated, decontaminated equipment at a frequency of five percent by pouring distilled water over the equipment and collecting the sample in the appropriate laboratory containers.
- Trip blanks: One included in each cooler shipped to the laboratory that contains samples for VOC analyses. The trip blank consists of two 40-ml vials of reagent water provided by the laboratory that were stored in the sample cooler at all times.

The QA/QC samples will be labeled as presented in Table 3-3.

## 3.7 Decontamination

The interface probe and other non-dedicated equipment coming into contact with groundwater will be decontaminated by the following procedures:

1. Remove LNAPL, if present, with an absorbent pad.
2. Remove any solids to the degree possible with a brush and tap or distilled water. Wash with a brush, laboratory-grade non-phosphate detergent (e.g., Liquinox, Alconox), and potable tap water. Allow excess soap to drain off the equipment when finished.
3. Rinse with potable tap water or distilled water.
4. Rinse with 70-percent grade isopropyl alcohol.
5. Rinse with distilled water, preferably by spraying.

All decontamination fluids will be managed per methods discussed in Section 3.8.

## 3.8 Investigation Derived Waste Management

The IDW (e.g., purge water, decontamination water) generated during monitoring activities will be disposed of at the refinery naphtha sump for recycling or disposal. Miscellaneous IDW (e.g., gloves, bailers) in contact with investigative material deemed to have no or de minimus contamination will be disposed of in a general refuse container. Any IDW deemed to have greater than de minimus contamination will be stored in labeled drums and disposed appropriately on a per case basis.

## Table 3-1. Summary of Sample Type, Sample Location, Laboratory Sample Analyses, and Frequency

| Sample Type | Location | Analyses | Frequency |
|---|---|---|---|
| Groundwater | Monitoring wells (See Table 2-1) | VOCs, SVOCs, Anions, TDS, Total Metals (mercury), TPH DRO and GRO, and/or Dissolved Metals (Well specific - see Table 2-1) | See Table 2-1 |
| Duplicate | Monitoring wells | Same as original sample | 10 percent |
| Equipment Blank | Not applicable | VOCs, SVOCs, Anions, TDS, TPH DRO and GRO, and Total Metals (mercury) | 5 percent |
| Trip Blanks | Not applicable | VOCs | One per cooler containing VOC samples |

Dissolved Metals = aluminum, arsenic, barium, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, selenium, silver, uranium, and zinc

## Table 3-2. Laboratory Sample Specifications

| Laboratory Analysis | Method | Sample Container | Preservative & Handling | Holding Time | Lab |
|---|---|---|---|---|---|
| VOCs | SW8260B | Three 40-mL glass vials with Teflon-lined septum | Cool to 4ºC; HCl | 14 days | ESC |
| SVOCs | SW8270 C | Two 100-mL glass ambers | Cool to 4ºC | 7 days | |
| Total Metals (Mercury) | SW7470A | One 250-mL poly | If field-filtered: Cool to 4ºC; $HNO_3$; Filter sample in field with 10 micron filter if turbidity >10 NTUs | 28 days | |
| | | | If lab-filtered: Cool to 4ºC; Laboratory will filter sample with 10 micron filter if turbidity >10 NTUs | | |
| Dissolved Metals | SW6020 | One 250-mL poly | If field-filtered: Cool to 4ºC; $HNO_3$; Filter sample in field with 0.45 micron filter | 6 months | |
| | | | If lab-filtered: Cool to 4ºC; Laboratory will filter sample with 0.45 micron filter | | |
| Chloride | SW9056A | One 1-L poly | Cool to 4ºC | 28 days | |
| Fluoride | | | | | |
| Sulfate | | | | | |
| TDS | M2540 C | | | 7 days | |
| Total Alkalinity | SM2320B | | | 14 days | |
| Nitrate/Nitrite | E 300 | One 250-mL poly | Cool to 4ºC; $H_2SO_4$ | 28 days | |
| TPH DRO and GRO | SW8015D | Two 40-mL glass vials with Teflon-lined septum | Cool to 4ºC; HCl | 14 days | |

ESC Lab Sciences, 12065 Lebanon Road, Mt. Juliet, TN 37122

## Table 3-3. Sample Nomenclature

| Sample Type | Identification | Notes |
|---|---|---|
| Groundwater | MW-xx<br>WW-nn | MW = monitoring well<br>WW = water well<br>xx = designated monitoring well identification number<br>nn = designated water well identification name |
| Duplicate Groundwater | DUP-zz | zz = sequential duplicate sample per event (start with 1) |
| Equipment Blanks | EB-mm-dd-yy-z | EB = identifies equipment blank (QA/QC) sample<br>mm-dd-yy = month, day, and year (2 digits each)<br>z = sequential sample collected per day (start with 1 each day) |
| Trip Blanks | TB-mm-dd-yy-z | TB = identifies trip blank (QA/QC) sample<br>mm-dd-yy = month, day, and year (2 digits each)<br>z = sequential sample collected per day (start with 1 each day) |

# 4.0 ANNUAL FACILITY-WIDE GROUNDWATER MONITORING REPORT

Semi-annual and quarterly groundwater monitoring activities and results from each calendar year will be documented in an *Annual Facility-Wide Groundwater Monitoring Report*. The *Annual Facility-Wide Groundwater Monitoring Report* will include the following:

- Site background summary;
- Summary of groundwater monitoring activities conducted during the reporting period;
- Data tables summarizing groundwater elevation and analytical results collected during the reporting period;
- Maps depicting water surface elevation, LNAPL thickness, if present, and groundwater COC concentration contours;
- Plots of groundwater elevations and groundwater COC concentrations over time;
- Copies of laboratory analytical reports;
- QA/QC evaluation of the laboratory analytical results;
- A brief summary of releases and remediation conducted during the reporting period; and
- Conclusions and recommendations for the next reporting period.

The *Annual Facility-Wide Groundwater Monitoring Report* will be submitted to the OCD by April 15th of each year.

# 5.0 GROUNDWATER MONITORING CONTINGENCY PLAN

Groundwater COC concentrations are regularly evaluated as part of routine groundwater monitoring activities. To aid in the evaluation process, plots of concentration over time for detected COCs are updated after each groundwater monitoring event and provided in *Annual Facility-Wide Groundwater Monitoring Reports*. In the event that increasing COC concentrations are identified, Navajo will do the following:

1. Evaluate validity of data by performing quality assurance review of field and laboratory quality control.
2. Perform re-sampling, if deemed appropriate.
3. Evaluate concentration time-series plots to determine if there is a statistically valid concentration increase or whether there are other factors affecting concentrations (e.g., seasonal fluctuations, groundwater level fluctuations, etc.).
4. If not associated with seasonal or groundwater level fluctuations, investigate the potential source of the increasing COC concentrations by evaluating the condition of potential sources (e.g., a leaking pipe nearby).
5. Investigate the potential source by collecting subsurface soil and/or groundwater data.
6. If the potential source of the increasing COC concentrations is determined to be located at the refinery, implement corrective actions to mitigate the source and determine if additional abatement actions are warranted.

## 6.0 REFERENCES

EPA, 1996. *Low Stress (Low Flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells*. Revised January 19, 2010.

NMED, 2017. *Risk Assessment Guidance for Site Investigations and Remediation*.

NM OCD, 1993. *Guidelines for Remediation of Leaks, Spills and Releases*.

Puls and Barcelona, 1996. *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures.*

19.15.29 NMAC. Natural Resources and Wildlife, Oil and Gas, Release Notification.

19.15.30 NMAC. Natural Resources and Wildlife, Oil and Gas, Remediation.

20.6.2 NMAC Environmental Protection, Water Quality, Ground and Surface Water Protection.

# APPENDIX A

# FIELD FORMS

**FLUID GAUGING FORM**

| | | | | | |
|---|---|---|---|---|---|
| TRC | Project # | | Date & Time | Start | |
| | Site | Lovington Refinery | | Finish | |
| On-site TRC Personnel : | | | | | |

| Well ID | Depth to Water (BTOC) | Depth to LNAPL (BTOC) | Other Observations |
|---|---|---|---|
| MW-1 | | | |
| MW-2 | | | |
| MW-3 | | | |
| MW-4 | | | |
| MW-5 | | | |
| MW-6 | | | |
| MW-7 | | | |
| MW-8 | | | |
| MW-9 | | | |
| MW-10 | | | |
| MW-11R | | | |
| MW-12R | | | |
| MW-13 | | | |
| MW-14 | | | |
| MW-15 | | | |
| MW-16 | | | |
| MW-17R | | | |
| MW-18 | | | |
| MW-19 | | | |
| MW-20 | | | |
| MW-21 | | | |
| MW-22 | | | |
| MW-23 | | | |
| MW-24 | | | |
| MW-25 | | | |
| MW-26 | | | |
| MW-27 | | | |
| MW-28 | | | |
| MW-29 | | | |
| MW-30 | | | |
| MW-31 | | | |
| MW-32 | | | |
| MW-33 | | | |
| RW-1 | | | |

# GROUNDWATER SAMPLING FORM: LOW-FLOW, LOW-STRESS METHOD

| | | |
|---|---|---|
| TRC | Sample Location | |
| | Date | |
| | Client | HollyFrontier Navajo Refining LLC |
| | Site | Lovington Refinery |

| | | | |
|---|---|---|---|
| Static Depth to Water (ft) | | Sample Collection Time | |
| Total Purge Volume (gal) | | Purge Method | |
| Total Depth (ft) | | Sample Method | |
| Screen Depth Interval (ft) | | Water Description | |
| Pump Intake Depth (feet) | | Sampling Personnel | |

| Time (min) | Volume Purged (L) | Flow Rate (mL/min) | Depth to Water (ft) | Drawdown (ft) | pH (SU) +/- 0.1 | Temp © +/- 3% | Conductivity (u-siemens/cm) +/- 3% | TDS (ppm) +/- 10% | ORP (mV) +/- 10 mV | Dissolved Oxygen (mg/L) +/- 10% | Turbidity (NTUs) +/- 10% |
|---|---|---|---|---|---|---|---|---|---|---|---|
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# APPENDIX B

# RELEASE RESPONSE GUIDANCE

The objective of the Release Response Guidance described in this appendix is to provide guidance on the initial response, notification requirements, and initial assessment for releases at the HollyFrontier Navajo Refining LLC (Navajo) Lovington Refinery in Lovington, New Mexico (refinery). The guidance is based on New Mexico Oil Conservation Division (OCD) rules and guidance pursuant to Title 19 of the New Mexico Administrative Code (NMAC), Natural Resources and Wildlife, Chapter 15 (Oil and Gas), Sections 29 and 30 (Release Notification and Remediation, respectively).

The sequence of tasks for the Release Response Guidance will be as follows, with further descriptions below:

- Identify and eliminate the source of the release.
- Conduct initial response (i.e., abatement) and notification.
- Perform immediate recovery of released material (i.e., cleanup), if possible.
- Determine if excavation is appropriate and safe, document excavation plan and/or activities to OCD in initial Form C-141.
- Collect confirmation soil samples from the release area or excavation.
- Compare soil chemical of concern (COC) concentrations to OCD remediation action levels (RALs) or New Mexico Water Quality Control Commission (WQCC) Human Health Standards (WQCC Standards) with an applied dilution factor (DF) of 20 (i.e., 20x DF).
- If soil COC concentrations are below RALs and/or WQCC Standards with 20x DF, no further action is required and the final Form C-141 form is submitted to OCD.
- If soil COC concentrations are above RALs and/or WQCC Standards with 20x DF, additional responses may be required.

A copy of Form C-141 is included as Attachment B-1. A Release Response Guidance Procedural Checklist is included as Attachment B-2.

While the procedures included herein are default, the Navajo Environmental Department must be contacted following all releases to confirm the appropriate and safe path forward.

## B1. INITIAL RELEASE RESPONSE AND NOTIFICATION

Initial release abatement/cleanup activities will be conducted immediately upon discovery of a release. If practicable, released liquids should be immediately recovered using a vacuum truck while released heavy oils (e.g., asphalt and gas-oil) should be recovered via excavation. It may also be appropriate to collect samples of the released substance for laboratory analysis.

Release notifications will be performed in accordance with NMAC 19.15.29 *Release Notification*. Releases are categorized as follows:

- Major Release: at least 25 barrels and/or release results in fire, reaches water course, endangers public health, or results in substantial damage to property or the environment – provide immediate verbal notice within one hour and timely written notice within one week
- Minor Release: 5 to 25 barrels – provide verbal notice within one day and timely written notice within one week

Verbal notifications are to be provided to the OCD district office and the Environmental Bureau Chief and should include the information requested on Form C-141 (Attachment 1) as part of the notification.

Written notifications are to be provided to the OCD district office and the Environmental Bureau Chief and should include the initial Form C-141, additional comments, and corrections to any previous verbal notification provided as part of the notification.

## B2. INITIAL INSPECTION AND EXCAVATION

Following the release and any initial recovery (i.e., abatement/cleanup), the potentially affected soils beneath the release should be inspected to determine if excavation of shallow soils is appropriate and safe.

In the case of a release of fluids other than petroleum hydrocarbons (e.g. cooling tower water, etc.), observations of potential impacts (i.e., odor, staining, or elevated photoionization detector [PID] readings) may not be useful to determine if excavation is appropriate. Thus, the response will proceed as follows:

1. Discuss potential hazards with the Navajo Health and Safety Department before entering and assessing the release area.
2. Initial soil samples will be collected for laboratory analysis prior to any excavation as discussed in Section B3.
3. The extent of the release will be mapped on site plans/aerial photographs, photographs of the initial release will be taken, and stakes will be used to demarcate the release boundaries.

In the case of a release of petroleum hydrocarbons, the standard practice is to excavate visible soil contamination and screen the excavation via observations of potential impacts. If petroleum hydrocarbons were released, the response should proceed as follows:

1. Discuss potential hazards with the Navajo Health and Safety Department before entering and assessing the release area.
2. Surface soils will be inspected for potential hydrocarbon impacts via observations of hydrocarbon staining or odor and elevated PID readings.
3. The release area will be inspected to ensure excavation will not endanger any sensitive infrastructure (e.g. buried pipelines, buried cables, storage tanks, electric lines, buildings, etc.).
4. The extent of the release will be mapped on site plans/aerial photographs, photographs of the initial release will be taken, and stakes will be used to demarcate the release boundaries.
5. Excavation of surface soils will be conducted if warranted based on Steps 1 and 2 until no impacts are observed or until practicable. Bedrock will not be excavated.
6. Confirmation soil samples will be collected as discussed in Section B3.

Wastes generated as a result of cleanup activities will be properly managed in accordance with all local, state, and federal regulations and refinery procedures.

## B3. SOIL CONFIRMATION SAMPLING

Discrete (not composite) confirmation soil samples will be collected from the affected area for laboratory analysis. All soil samples should be handled with Nitrile gloves and new gloves should be used for each sample location. For hydrocarbon releases, selection of the precise sample location may be determined by using a PID. Releases that are not expected to contain petroleum hydrocarbons will be characterized by laboratory analysis.

Following initial response activities, confirmation soil samples will be collected to determine if initial cleanup activities were sufficient in the following manner:

- For releases without initial excavation – 5 samples minimum
    - Initial soil confirmation soil samples will be collected at a rate of one sample for every 400 square feet of surface soil potentially affected by the release (biased to the soil that is most impacted).
    - If necessary, soil confirmation samples will also be collected every 20 linear feet immediately (i.e., one foot) outside the perimeter of affected soils to delineate the lateral extent of the release in the event the initial soil sample analytical results exceeded RALs or WQCC Standards with a 20x DF.
- For releases with initial excavation – 5 samples minimum

  - Initial confirmation soil samples will be collected from the bottom of the excavation at a rate of one sample for every 400 square feet of excavation (biased to the soil that is most impacted).
  - Soil confirmation samples will also be collected every 20 linear feet along the sidewall of the excavation if the excavation is at least 6-inches in depth. If the excavation is less than 6-inches in depth, soil samples will be collected every 20 linear feet immediately (i.e., one foot) outside the perimeter of the excavation to delineate the lateral extent of the release.
- For releases to ditches, soil samples should be taken every 20 linear feet and analyzed separately.
- Additional samples may be required for further delineation where deemed necessary.
- Soil samples will be analyzed according to Table B-1.

It is anticipated that only surface and vadose soils will be affected by any release because the depth to groundwater beneath the refinery is approximately 100 feet below ground surface (bgs).

For releases where excavation is not practicable (e.g. large releases, located within immediate proximity to sensitive infrastructure, pipe racks, etc.), additional assessment may be conducted as discussed in Section B5.

## B4. DEVELOPMENT OF RALS AND WQCC STANDARDS WITH 20X DF

Analytical results for benzene, toluene, ethylbenzene, and xylenes (BTEX) and total petroleum hydrocarbons (TPH) will be compared to the OCD RALs as listed in the OCD's *Guidelines for Remediation of Leaks, Spills and Releases* dated August 13, 1993. As discussed therein, the RALs for benzene, BTEX, and TPH are determined using a ranking score based on the depth to groundwater, the proximity to a wellhead protection area, and distance to a surface water body (there are no surface water bodies within 1,000 feet of the refiner). The depth to groundwater (which generally ranges from 95 to 115 feet bgs at the refinery) will be determined by gauging the nearest existing monitoring well. Wellhead protection areas at the refinery are based on the above referenced OCD Guidelines and shown on Figure B-1. A 1,000-foot wellhead protection area is provided for City of Lovington well LW-9, located immediately northeast of the refinery, while 200-foot wellhead protection areas are provided for refinery water supply wells WW-North, WW-South, and WW-East even though water from these wells is not used for drinking. The RALs for the different ranking criteria are presented below.

**OCD Soil Recommended Action Levels**

| COC | Total Ranking Score | | |
|---|---|---|---|
| | >19 | 10 - 19 | 0 - 9 |
| Benzene (mg/kg) | 10 | 10 | 10 |
| BTEX (mg/kg) | 50 | 50 | 50 |
| TPH (mg/kg) | 100 | 1,000 | 5,000 |

Notes:

mg/kg – milligrams per kilogram

BTEX – total benzene, toluene, ethylbenzene, and xylenes

If within wellhead protection areas shown on Figure B-1, add ranking score of 20.

If groundwater is at depth of 50 to 99 feet, add ranking score of 10.

If is greater than depth of 100 feet, add ranking score of 0.

If COCs other than BTEX and TPH are analyzed, the COC concentrations will be compared to their respective WQCC Standard with a 20x DF.

If confirmation soil sample analytical results indicate that COC concentrations are below RALs and/or WQCC Standards with a 20x DF and no further action is necessary, a final C-141 form and letter summarizing response actions and assessment will be prepared and submitted to OCD to document successful completion of response actions. The final Form C-141 will include, at a minimum, the following: photographs of the excavated area; site plans/aerial photographs depicting the soil sample locations, affected area, and excavation limits; laboratory analytical reports; and waste manifests.

If confirmation soil sample analytical results indicate COC concentrations are above RALs and/or WQCC Standards with a 20x DF, a determination will be made to conduct additional response action and confirmation sampling. If it is determined that limited additional response action (e.g., over-excavation) is needed, additional confirmation soil sampling and data evaluation will be conducted as discussed above. Otherwise, additional assessment may be required as discussed in Section B5.

## B5. ADDITIONAL ASSESSMENT

Additional assessment may be warranted after initial spill abatement measures have been completed and the initial C-141 Form has been submitted based on the following criteria:

- the volume and type of substance released;
- the nature and extent of soil COC concentrations;
- surface soil conditions;
- the proximity of existing monitor wells; and
- the proximity to existing infrastructure that could preclude additional response.

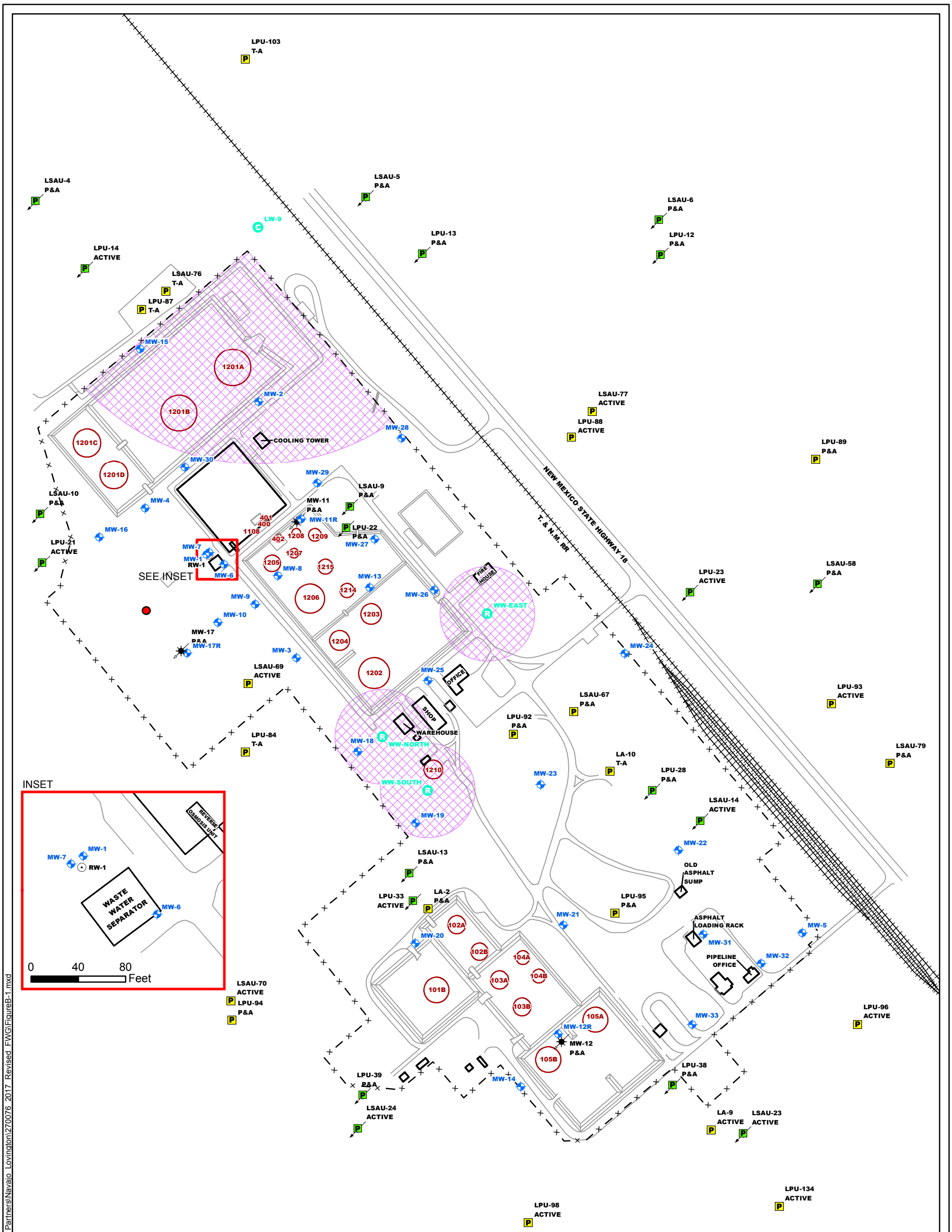
Assessment will be conducted in accordance with the OCD's aforementioned *Guidelines for Remediation of Leaks, Spills and Releases* to complete source area characterization and determine what, if any, additional response may be required.

Groundwater sampling may be warranted if the vertical extent of soil COC concentrations above RALs and/or WQCC Standards with a 20x DF is not delineated. Table B-1 identifies the groundwater COCs to be analyzed based on the substance released.

An evaluation of potential risk and development of site-specific soil screening levels (SSLs) may also be performed in accordance with the NMED's *Risk Assessment Guidance for Site Investigations and Remediation* dated March 2017, should the OCD approve of such an approach.

The results of additional assessment activities and risk evaluation will be summarized in a letter to be submitted to OCD. Based on the results of the assessment, no further action will be requested or additional response and assessment actions will be proposed. A final C-141 Form will be submitted to the OCD if no further action is requested.

**Figure B-1**




Document Path: J:\Holly Energy Partners\Navajo Lovington\270076 2017 Revised FWG\FigureB-1.mxd

NOTES:

1. WATER SUPPLY WELLS WW-NORTH, WW-SOUTH, AND WW-EAST CONSIDERED "PRIVATE DOMESTIC SOURCES".
2. WATER FROM WATER SUPPLY WELLS WW-NORTH, WW-SOUTH, AND WW-EAST NOT USED FOR DRINKING.

## LEGEND

- MONITORING WELL
- MONITORING WELL - PLUGGED AND ABANDONED
- OIL PRODUCTION WELL
- OIL PRODUCTION-CONVERTED TO INJECTION WELL
- RECOVERY WELL
- REFINERY WATER SUPPLY WELL
- CITY OF LOVINGTON WATER SUPPLY WELL
- WELLHEAD PROTECTION AREAS
- FLARE
- RAIL
- FENCE
- BUILDINGS
- TANKS

N

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FEET

# WELLHEAD PROTECTION PLAN

HOLLYFRONTIER NAVAJO REFINING LLC
AP-110, LOVINGTON REFINERY, LOVINGTON, NM

| | |
|---|---|
| PROJECT NO: 270076 | MXD: FigureB-1 |
| AUTHOR: MLOVELACE | DATE: 8/4/2017 |

TRC
505 EAST HUNTLAND DRIVE
SUITE 250
AUSTIN, TEXAS 78752
(512) 329-6080

FIGURE
B-1

**Table B-1**

Table B-1. Recommended Analytical Methods for Released Substances
Release Response Guidance
Lovington Refinery, AP-110
Lovington, New Mexico

| Released Substance | Soil COCs and Analytical Methods | Groundwater COCs and Analytical Methods |
|---|---|---|
| Naphtha, Kerosene, Diesel, Gas-Oil, Crude Oil, Asphalt, Slop, API Slop, Heavy Slop, Petroleum Distillate, Casing Head | BTEX by EPA SW-846 Method 8260 | BTEX by EPA SW-846 Method 8260 |
| | | SVOCs by EPA SW-846 Method 8270 |
| | TPH by EPA SW-846 Method 8015 (GRO, DRO, ORO) | TPH by EPA SW-846 Method 8015 (GRO, DRO, ORO) |
| | | [2]Metals by EPA SW-846 Method 6020 / 7471 |
| | | Anions by EPA SW-846 Method E300 |
| Process Water (effluent) | BTEX by EPA SW-846 Method 8260C | BTEX by EPA SW-846 Method 8260 |
| | TPH by EPA SW-846 Method 8015 (GRO, DRO, ORO) | TPH by EPA SW-846 Method 8015 (GRO, DRO, ORO) |
| Caustic 20%, Caustic (Spent) | pH by EPA SW-846 Method 945D | Field pH by multi-parameter meter |
| Cooling Tower Water | Anions by EPA SW-846 Method E300 | Anions by EPA SW-846 Method E300 |
| | [1]Metals by EPA SW-846 Method 6020 / 7471 | [2]Metals by EPA SW-846 Method 6020 / 7471 |

Notes:
1 – Metals to be analyzed in soils are consistent with those currently monitored in groundwater during semi-annual events and include aluminum, arsenic, barium, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium, silver, uranium, and zinc.
2 – Metals to be analyzed in groundwater are consistent with those currently monitored in groundwater during semi-annual events and include dissolved aluminum, arsenic, barium, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, selenium, silver, uranium, and zinc, and total mercury.
COC – contaminants of concern
EPA – Environmental Protection Agency
SVOCs – semi-volatile organic compounds
GRO – gasoline range organics
DRO – diesel range organics
ORO – oil range organics
BTEX – benzene, toluene, ethylbenzene, and total xylenes
TPH – total petroleum hydrocarbons
RCRA – Resource Conservation and Recovery Act

**Attachment B-1**

**Form C-141**

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised August 8, 2011

Submit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

# Release Notification and Corrective Action

## OPERATOR

☐ Initial Report ☐ Final Report

| | |
|---|---|
| Name of Company | Contact |
| Address | Telephone No. |
| Facility Name | Facility Type |

| | | |
|---|---|---|
| Surface Owner | Mineral Owner | API No. |

## LOCATION OF RELEASE

| Unit Letter | Section | Township | Range | Feet from the | North/South Line | Feet from the | East/West Line | County |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |

**Latitude**_____ **Longitude**_____

## NATURE OF RELEASE

| | | |
|---|---|---|
| Type of Release | Volume of Release | Volume Recovered |
| Source of Release | Date and Hour of Occurrence | Date and Hour of Discovery |
| Was Immediate Notice Given? ☐ Yes ☐ No ☐ Not Required | If YES, To Whom? | |
| By Whom? | Date and Hour | |
| Was a Watercourse Reached? ☐ Yes ☐ No | If YES, Volume Impacting the Watercourse. | |

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

Describe Area Affected and Cleanup Action Taken.*

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

| | | |
|---|---|---|
| Signature: | OIL CONSERVATION DIVISION | |
| Printed Name: | Approved by Environmental Specialist: | |
| Title: | Approval Date: | Expiration Date: |
| E-mail Address: | Conditions of Approval: | Attached ☐ |
| Date: Phone: | | |

* Attach Additional Sheets If Necessary

## Attachment B-2

## Release Response Guidance Procedural Check List

**Attachment B-2**
**Release Response Guidance Procedural Check List**
**HollyFrontier Navajo Refining LLC, Lovington Refinery, Lovington, New Mexico**

- ☐ Have liquids been contained and recovered? If not, do so.
- ☐ What was spilled? _____
- ☐ How much was spilled? Barrels _____ Dimensions of affected area? _____
- ☐ Major or minor release? _____
- ☐ Have appropriate internal and external notifications been made?
- ☐ Have photographs been taken of the spill?
- ☐ Do samples of the spilled product need to be submitted for laboratory analysis? If yes, do so.
- ☐ Is the spill located within a wellhead protection area shown on Figure B-1?
- ☐ Is excavation of surface soils appropriate or safe? If so, excavate.
- ☐ If initial excavation is not appropriate or safe, have soil samples been collected? (one sample for every 400 square feet of potentially affected area and one sample per 20 linear feet outside perimeter of potentially affected area)
- ☐ If excavation is conducted, has visibly contaminated soil been excavated? If petroleum hydrocarbons released, field screen via observations of hydrocarbon staining/odors and with PID.
- ☐ If excavation is conducted, have confirmation soil samples been collected? (one sample for every 400 square feet of excavation bottom and one sample per 20 linear feet of excavation sidewall)
- ☐ Have contaminated soils been properly managed?
- ☐ Were samples analyzed in accordance with Table B-1?
- ☐ Do soil sample COC concentrations meet appropriate RALs or SSLs? If not, determine if additional excavation is appropriate or safe.
- ☐ Draw map and note relevant features, soil sample locations and depths, stockpile locations, etc.