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**CERTIFIED MAIL – RETURN RECEIPT REQUESTED**

June 5, 2018

Jessica L. O'Brien  
Environmental Supervisor  
Western Refining, Southwest Inc., Gallup Refinery  
92 Giant Crossing Road  
Gallup, New Mexico 87301

**RE: DISAPPROVAL  
FACILITY-WIDE GROUND WATER MONITORING WORK PLANS –  
UPDATES FOR 2016, 2017 AND 2018  
WESTERN REFINING SOUTHWEST INC., GALLUP REFINERY  
EPA ID # NMD000333211  
HWB-WRG-16-003  
HWB-WRG-17-005  
HWB-WRG-18-002**

Dear Ms. O'Brien:

The New Mexico Environment Department (NMED) has reviewed the *Facility-Wide Ground Water Monitoring Work Plans – 2015 Updates for 2016* (2016 Work Plan), dated May 3, 2016 and *Updates for 2017* (2017 Work Plan), dated March 29, 2017 and *Updates for 2018* (2018 Work Plan), dated March 31, 2018, submitted on behalf of Western Refining Southwest Inc., Gallup Refinery (the Permittee). NMED hereby issues this Disapproval. The Permittee must address the following comments provided by both NMED and the New Mexico Energy Minerals and Natural Resources Department (EMNRD) Oil Conservation Division (OCD).

This Disapproval addresses the Work Plans submitted for the 2016, 2017 and 2018 updates on facility-wide groundwater monitoring and schedules. Many of the comments apply to all of the Work Plans; therefore, NMED is providing comments for the Work Plans simultaneously. The Permittee must make all required changes presented in this letter to the 2018 Work Plan. Revise only the 2018 Work Plan and resubmit it for NMED's review.

### **Comments for 2016 Work Plan**

#### **Comment 1**

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.

#### **Comment 2**

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 GRO and DRO-extended [for groundwater monitoring wells BW-1A, BW-1B, BW-1C, 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.

#### **Comment 3**

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.

### **Comments for 2017 Work Plan**

#### **Comment 4**

In Section 6.3.2 of the *2016 Annual Groundwater Monitoring Report* (2016 Report), dated August 31, 2017, the Permittee states, “BTEX, DRO, GRO, 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.

#### **Comment 5**

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.

### **Comments for 2018 Work Plan**

#### **Comment 6**

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.

#### **Comment 7**

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).

#### **Comment 8**

In Section 1.2, *Facility Ownership and Operation*, the owner and operator are listed as Western 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.

#### **Comment 9**

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.

**Comment 10**

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.

**Comment 11**

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.

**Comment 12**

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).

**Comment 13**

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.

**Comment 14**

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.

**Comment 15**

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**.

**Comment 16**

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.

**Comment 17**

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.

**Comment 18**

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.

**Comment 19**

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.

**Comment 20**

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**.

**Comment 21**

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.

**Comment 22**

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.

**Comment 23**

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.

**Comment 24**

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.

**Comment 25**

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.

**Comment 26**

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.

**Comment 27**

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.

**Comment 28**

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.

**Comment 29**

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.

**Comment 30**

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.

**Comment 31**

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**.

**Comment 32**

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.

Ms. O'Brien  
June 5, 2018  
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The Permittee must revise and submit only the 2018 Work Plan for NMED review. The Permittee must address all comments in this Disapproval and submit a revised Work Plan by **July 31, 2018**. The revised Work Plan must be accompanied by a response letter that details where all revisions have been made, cross-referencing NMED's numbered comments. In addition, the Permittee must submit a redline-strikeout version that identifies all changes and edits to the Work Plan. Furthermore, an investigation report addressing Comment 14 and Comment 15 must be submitted to NMED no later than **August 17, 2018** and a work plan addressing Comment 31 must be separately submitted to OCD and NMED for review no later than **August 3, 2018**. The required documentation addressed in Comment 20 must be submitted by no later than **July 16, 2018**.

If you have questions regarding this Disapproval, please contact Kristen Van Horn of my staff at 505-476-6046.

Sincerely,



John E. Kieling  
Chief  
Hazardous Waste Bureau

cc: K. Van Horn NMED HWB  
M. Suzuki NMED HWB  
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File: Reading File and WRG 2018 File  
HWB-WRG-18-002  
HWB-WRG-17-005  
HWB-WRG-16-003