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CERTIFIED MAIL – RETURN RECEIPT REQUESTED

June 7, 2018

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

**RE: DISAPPROVAL
INVESTIGATION REPORT SOLID WASTE MANAGEMENT UNITS (SWMU)
NO. 4 OLD BURN PIT AND NO. 5 LANDFILL AREAS
WESTERN REFINING SOUTHWEST INC., GALLUP REFINERY
EPA ID # NMD000333211
HWB-WRG-17-006**

Dear Ms. O'Brien:

The New Mexico Environment Department (NMED) reviewed the *Investigation Report Solid Waste Management Units (SWMU) No. 4 Old Burn Pit and No. 5 Landfill Area* (Report), dated January 2017, submitted on behalf of Western Refining Southwest Inc., Gallup Refinery (Permittee). NMED hereby issues this Disapproval with the following comments.

Comment 1

In Section 2.1 (Old Burn Pit (SWMU No. 4)), the Permittee states, “[a] Visual Site Inspection (VSI) was conducted on November 19 and 20, 1986 as part of the RCRA Facility Assessment. During this inspection, ‘An old metal box uphill from the pit’ was described as being used to feed oil through a metal pipe to the burn pit. There is no subsequent mention of the steel box or pipe in the *SWMU Site-Specific Facility Investigation Workplan*, which provided a detailed discussion of site features and sampling locations (Applied Earth Sciences, Inc., 1990). Apparently the metal box and pipe were removed after the VSI was conducted in 1986 and

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sometime before preparation of the *SWMU Site-Specific Facility Investigation Workplan* in 1990." The 1990 SWMU Site-Specific Facility Investigation Work Plan does not provide a detailed discussion of site features. While it is apparent that the metal box and pipe are no longer present, their removal cannot be verified using historic documents. No revision is necessary.

Comment 2

In Section 7.1 (Conclusions), regarding the Burn Pit, the Permittee states that, "[g]roundwater was not encountered and there was no evidence of historical impacts to groundwater beneath the Old Burn Pit." In the same section, the conclusion for the Landfill Areas states, "[g]roundwater was not encountered at SWMU 5-2. Based on the borings completed per the Investigation Work Plan, there is no evidence of any threats to groundwater and the soil cap is preventing any potential direct contact exposures to buried waste materials." There are several issues regarding these statements:

1. The Permittee notes in Section 4.2.2 (Hydrogeology) that, "[s]hallow groundwater may be present in the general area of the two SWMUs, but its occurrence is sporadic." Which acknowledges the potential presence of intermittent groundwater saturation.
2. Figure 2 (SWMUs No. 4 & No. 5 Location Map) depicts the locations of the SMWUs, soil borings, a monitoring well (OW-56), a temporary monitoring well (NDD-2), and a cross-section A-A'. The Permittee did not include a boring log or well construction diagram for monitoring well OW-56 in the Report. However, Figure 9 (Cross Section A-A') includes a legend depicting monitoring well OW-56 that shows a general well diagram and lithologic information is included within the cross-section. The cross-section does not indicate saturation, but the lithologic information included for well OW-56 describes an interval from 6906 to 6904 ft msl as "clay, gravelly, sandy, moist". Additionally, "damp" intervals were encountered in borings SWMU 5-2 and boring SWMU 4-1 at similar intervals to the moist interval in well OW-56. The Permittee must discuss site-specific groundwater in Section 4.2 (Subsurface Conditions) and discuss the presence of intermittent saturation. As the Permittee is aware, tight clays often prevent timely recharge within borings and wells, so the presence of groundwater may not immediately be observed.
3. Other than well OW-56 and NDD-2, the closest monitoring wells are OW-12 to the south and OW-13 to the east (not depicted on the figures in the Report). These wells monitor the Sonsela aquifer with depths to water at 47.23 ft bgs and approximately 21.5 ft bgs, respectively. There may be water present within the Chinle/Alluvium interface, as recorded in other areas of the refinery, but the boring logs for OW-12 and OW-13 are not detailed enough to determine if saturated intervals were encountered in these wells. Also, because of the difference in reporting the elevation of the subsurface data (ft msl in the Report versus feet bgs on the OW-12 and OW-13 well logs), it is difficult to determine whether the saturated intervals in the OW-12 and OW-13 wells can be correlated to the moist and damp intervals in the monitoring well and borings installed as part of the investigation.

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Based on this information, the Permittee cannot conclusively state that there were no historic impacts to groundwater. Additionally, prior to construction of the landfill covers in the late 1990s, both SWMUs were open pits. While the landfill covers likely inhibited leachate migration since the late 1990s, prior to their construction there was a potential for contaminants to migrate through the subsurface and encounter the intermittent groundwater which is a contaminant migration pathway as well as leach into undisturbed soils beneath the pits. This is the reason that NMED required further investigation. Revise Section 4.2 (Subsurface Conditions) to discuss site-specific data. Provide a figure depicting the locations of wells OW-12 and OW-13 and add the wells to the cross-section, if appropriate. Also, provide the boring log and well construction diagram for well OW-56 in the revised Report.

Comment 3

Figure 9 (Cross Section A-A') includes data from soil boring NDD-2, boring SMWU 5-2, boring SWMU 5-1, well OW-56, and boring SWMU 4-1. There are several issues regarding the cross-section and conclusions. The boring logs for several of the borings and well OW-56 were not included with the Report. However, the Permittee's *Response to Disapproval No Further Action Report and Supplemental Information* (Response), dated June 15, 2015, includes information regarding boring NDD-2 which was drilled as part of the investigation for the North Drainage Ditch. The boring log indicated that claystone was encountered at approximately 4 feet bgs. Additionally, a soil boring named NDD-3 was drilled a short distance north of the Burn Pit and east of boring NDD-2 as well. The description of NDD-3 in the Response states:

“[i]n this boring, claystone was encountered at 12 feet below the land surface. Saturated clayey, gravelly, sand was observed overlying (10'-12') the claystone and a temporary well completion was installed to facilitate collection of a groundwater sample. The analysis of the water sample indicates the presence of low concentrations of gasoline and diesel range organics, benzene, 1,2-dichloroethane, methyl tert butyl ether, isopropylbenzene, and sec-butylbenzene. Methyl tert butyl ether and 1,2-dichloroethane were detected at concentrations above screening levels.”

Saturation was observed at approximately 12 feet below ground level in a clayey gravelly sand directly above the claystone which correlates to historic boring logs for the Landfill Areas that indicate wet/water/water bearing zones between 6.5 and 17 feet below the ground surface. Historic boring logs for the Burn Pit indicate that no saturated interval was encountered during investigation. The boring logs demonstrate that intermittent groundwater within the Chinle/Alluvium interface is present. The Report did not provide adequate information: provide the boring logs for NDD-2, NDD-3, and OW-56 in the revised Report. Provide a cross-section that includes more information and borings SWMU 4-1, boring NDD-3, well OW-56, boring SWMU 5-2, and boring NDD-2. Evaluate the appropriateness of also including boring SWMU 5-1. Additionally, please mark the locations and depths of the landfills and burn pit on the cross-section.

Comment 4

In Section 4.3.1 (Soil Investigation), in the SWMU 5-1 boring discussion on page 4-5, the Permittee states, “0 feet bgl - 2 feet bgl – PID reading of 28.6 ppm – This sample was collected

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at the surface from fill material. The sediment exhibited a petroleum hydrocarbon odor. There was no visual evidence of impacted soils." In the revised Report, discuss uses of the area that may explain the presence of petroleum odors on the surface soils. If the area is or has been used for facility operations, the landfill cover may be contaminated. If the facility used or is using the SWMU, then the Permittee must collect additional surface samples to demonstrate whether facility activities contaminated the landfill cover. Submit a work plan to propose to collect surface samples (see also Comment 7).

Comment 5

In the Executive Summary, page E-iii, the Permittee states, "[b]ased on a slightly elevated reading with a photo ionization detector (PID), a soil sample was collected from the land surface (0-2') where the highest arsenic concentration of 5.3 mg/kg was detected. This concentration exceeds the residential direct contact screening level and should be further evaluated upon completion of a site-specific evaluation of background concentrations." As NMED noted in its letter *Disapproval No Further Action Report and Supplemental Information* for SWMU 3, SWMU 4, SWMU 5, SWMU 7, SWMU 9, SWMU 10, and SWMU 13 and dated April 13, 2015:

"The arsenic levels reported for some of the SWMUs in the analytical reports in the Phase I and Phase III Investigation Reports (specifically, samples from SWMU 10, SWMU 5 with results ranging from 4.3 mg/kg to 27.9 mg/kg) for the soil investigations are higher than the current residential soil screening level (4.25 mg/kg). According to the USGS, McKinley County arsenic levels generally range from 5.6 to 11 ppm. Because the concentrations of arsenic are significantly higher than the maximum concentration of the background range (11 ppm), the Permittee must conduct a soil background study to account for the higher levels of arsenic in order to reach corrective action complete status."

Elevated arsenic levels must be addressed, because elevated arsenic levels are indicative of petroleum contamination and its degradation in the environment. The Permittee must submit a soil background study work plan for NMED's review, if the Permittee wants to make a comparison to background concentrations for arsenic.

Comment 6

From the boring logs it does not appear that the Permittee encountered landfill debris. The SWMU 5-1 boring log indicates "FILL" from the surface to 7 feet below ground surface; however, it is not clear if this is the landfill cover or landfill material (there is no indication on the boring logs that debris was encountered). Historic boring logs indicate the presence of metal, wood, rubber, general debris, and rusty material. The Permittee's boring location and samples do not appear to be representative of site conditions. No revision to the Report is required.

Comment 7

In Section 7.1 (Conclusions), the Permittee conducted a cumulative risk evaluation. The Permittee did not collect a sufficient number of samples to properly conduct a cumulative risk evaluation. The Permittee also used historical data in the calculation, which is not appropriate. Additionally, some of the historic data is questionable based on prior NMED review and comments. The Permittee states,

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“[t]he maximum concentration for metals includes both the historical analyses and recently collected data. These calculations are separated for carcinogenic and non-carcinogenic constituents. At the Old Burn Pit, the cumulative carcinogenic risk is 1.08×10^{-5} assuming residential land use and 2.14×10^{-6} for non-residential land use. The hazard index for residential land use is 0.477 and for non-residential land use is 0.622. At the Landfill Areas, the cumulative carcinogenic risk is 8.25×10^{-5} assuming residential land use and 1.63×10^{-5} for non-residential land use. The hazard index for residential land use is 3.09 and for non-residential land use is 2.49.”

The Permittee's calculations demonstrate that the carcinogenic risk for the Burn Pit does not meet the 1×10^{-5} threshold for carcinogens and the Landfill Areas do not meet the acceptable criteria for either carcinogenic risk or the hazard index (HI) of 1 for non-carcinogens. Based on these calculations, the Permittee must conduct additional site-specific refinements of the assessment (i.e., collect additional data) or implement corrective actions. The Permittee must collect additional soil data to provide sufficient data points to conduct an appropriate risk assessment to move the sites forward in the corrective action process. The Permittee must also submit a work plan proposing additional data collection for NMED review and approval.

Comment 8

Appendix E (Analytical Data Reports) includes three laboratory reports for aqueous samples collected on 9/21/2016, 9/29/2016, and 10/3/2016. The lab reports indicate that the samples were collected at “SWMUs 4 & 5” and the sample ID's are EB092116, EB092916, and EB100316. The aqueous sample collected under the EB092116 ID was analyzed for TPH as DRO and MRO and GRO, anions, dissolved metals, metals, mercury, semi-volatiles, and volatiles. The results demonstrate low levels of GRO (0.016 mg/L (J)), bis(2-ethylhexyl)phthalate (20.9 ug/L (J)), benzoic acid (4.7 ug/L (J)), and chloride (0.17 mg/L (J)). The aqueous sample collected under ID EB092916 was analyzed for the sample constituents and very low levels of mercury (0.000056 mg/L (J)), bis(2-ethylhexyl)phthalate (3.0 ug/L (J)), and benzoic acid (5.4 ug/L (J)) were reported. The sample labeled ID EB100316 contained low levels of benzoic acid (6.4 ug/L (J)), bis(2-chloroisopropyl)ether (2.1 ug/L (J)), and mercury (0.00013 mg/L (J)). The Report does not discuss collecting these samples and states that no groundwater was encountered during the investigation. In the revised Report, discuss the reasons why these aqueous samples were collected, where they were collected, and the methods used to collect them.

The Permittee must address all comments in this Disapproval letter and submit a revised Report. Provide NMED with two hard copies and an electronic version of the revised Report. Include a red-line strikeout version, in electronic format, showing where all the revisions to the Report have been made. The revised Report must also be accompanied with a response letter that details where all the revisions to the Report have been made, cross-referencing NMED's numbered comments noted herein above. The revised Report must be submitted to NMED by no later than **December 14, 2018**.

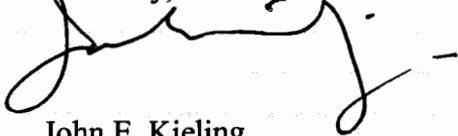
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The Permittee must submit a soil background study work plan, if the Permittee wants to assess background arsenic levels in soil. NMED's Soil Screening Guidance for Human Health Risk Assessment Volume I (Guidance), page 57, outlines the criteria necessary to obtain a defensible background data set. The soil background study work plan must be submitted to NMED by no later than **November 30, 2018**.

The Permittee must submit a work plan to collect additional soil and groundwater data to complete a risk assessment per Comments 4 and 7, above. NMED's Guidance also includes information regarding data collection for risk assessments. The work plan must be submitted to NMED by no later than **August 29, 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
C. Chavez OCD
L. King EPA Region 6

File: Reading File and WRG 2018 File
HWB-WRG-17-006