

ENV1712



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CERTIFIED MAIL – RETURN RECEIPT REQUESTED

June 14, 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 UNIT (SWMU)
NO. 10, SLUDGE PITS
WESTERN REFINING SOUTHWEST INC., GALLUP, NEW MEXICO
EPA ID # NMD000333211
HWB-WRG-16-001**

Dear Ms. O'Brien:

The New Mexico Environment Department (NMED) has reviewed the *Investigation Report, Soil Waste Management Unit (SWMU) No. 10 Sludge Pits* (Report), dated December 2016 submitted on behalf of Western Refining Southwest Inc., Gallup Refinery (the Permittee). NMED hereby issues this Disapproval. The Permittee must address the following comments:

Comment 1

The Permittee's investigation of the Sludge Pits (SWMU 10) discovered widespread soil and groundwater contamination. The Permittee's use of a site-specific dilution attenuation factor (DAF) resulted in investigation beyond the boundary of the SWMU and collected data related to contamination from other sources. The Permittee's intent for the investigation is not clear and the original intent, to determine whether the Sludge Pits affected soils and groundwater, was not resolved. The Permittee must first determine the original location of the Sludge Pits and an investigation must be conducted to evaluate contaminant migration from the pits. Previous aerial

photographs indicate that the Sludge Pits may be located north of the SWMU 10 location shown in Figure 2. Revise the boundary of SWMU 10 in Figure 2, *SWMU No. 10 Location Map* as necessary based on the aerial photographs.

Comment 2

The Permittee's use of a site-specific DAF for comparison was inappropriate for several reasons. The DAF was calculated based on data obtained from the Aeration Basin, which is not related to the Sludge Pits other than by proximity. Additionally, since groundwater contamination beneath the Sludge Pits originates from various upgradient sources, and contamination is already present in the aquifer, the use of a site-specific DAF is not applicable. DAF is used to determine if contaminants in soil can migrate to groundwater, and in this case, groundwater is contaminated in the area. All discussions pertaining to a site-specific DAF must be removed from the revised Report. Use residential screening levels for comparison at this time. All tables and figures must be revised accordingly, and the soil/groundwater concentration maps must address all compounds exceeding residential screening levels. It should be noted that the use of residential screening levels results in fewer contaminants driving risk compared to the use of screening levels derived from a site-specific DAF.

Comment 3

The Permittee must delineate soil contamination within the boundary of SWMU 10. The proposed borings in Figure 35, *Proposed Soil Boring Map*, must aid in defining the boundaries of the Sludge Pits. Revise the boring locations in the revised Report, as necessary. The Permittee must propose to remediate the soil contamination (e.g., through soil excavation) based on the extent of soil contamination in a future work plan. The risk associated with migration of contaminants through soil to groundwater would be negligible after soil contamination is removed from and beneath the Sludge Pits.

Comment 4

There are multiple editorial issues in the Report. The following issues must be addressed in the revised Report:

1. The depth to groundwater in temporary well SWMU 10-14 is recorded as 12.50 feet below ground surface (bgs) according to Table 4, *Groundwater Field Measurements*, while total depth of the well appears to be 12 feet bgs according to Appendix C, *Boring Logs*. Correct the discrepancy in the revised Report.
2. In Section 4.3.1, *Soil Investigation*, the Permittee states, "[a] claystone was encountered from 16.5 feet bgl – 19 feet bgl. The claystone was observed to be very stiff, dry, brown and gray. The claystone did not have an odor. The PID readings were 5 ppm [in boring SWMU 10-25]." Table 3, *Soil Boring Samples – Vapor Screening Results*, does not show the vapor screening results below fourteen feet bgs in boring SWMU 10-25. Revise Table 3 to include the PID data in the revised Report.
3. In Section 4.2.1, *Geology*, the Permittee states, "[a] second map (Figure 11) was prepared to show the current elevation on top of bedrock (Chinle Group)." The ground elevation was not recorded in the boring logs in Appendix C. Provide the survey data for all

- borings or explain how the elevation on top of the bedrock was determined in the revised Report.
4. The chromium concentration in the soil sample collected from SWMU 10-20 (2-2.5') exceeds residential and non-residential screening levels; however, the concentration is not highlighted to show the exceedance in Table 7. Highlight the exceedance in the revised Report.
 5. Table 8, *Groundwater Analytical Results Summary*, lists chloride, fluoride and sulfate in the category of total metals. They must be listed under a separate category for anions. Revise Table 8 accordingly.
 6. Table 8 lists cyanide in the category of total metals. It must be listed under a separate category. Revise Table 8 accordingly.
 7. In Section 6.2, *Groundwater Analytical Results*, the Permittee states, "[1]-methyl-naphthalene was detected above the screening level of 11 ug/l in the groundwater samples collected at SWMU 10-11, SWMU 10-20, and SWMU 10-25 at a concentration of 70 ug/l, 170 ug/l, and 120 ug/l, respectively." The 1-methyl-naphthalene concentration in the groundwater sample collected from SWMU 10-25 is recorded as 110 ug/L in Figure 30, *1-Methyl-naphthalene Groundwater Concentration Map*. Revise the figure to correct the discrepancy.
 8. In Section 6.2, the Permittee states, "[2]-methyl-naphthalene was detected above the screening level of 36 ug/l in the groundwater samples collected at SWMU 10-11, SWMU 10-20, and SWMU 10-25 at a concentration of 98 ug/l, 240 ug/l, and 180 ug/l, respectively." The 2-methyl-naphthalene concentration in the groundwater sample collected from SWMU 10-25 is recorded as 140 ug/L in Figure 31, *2-Methyl-naphthalene Groundwater Concentration Map*. Revise the figure to correct the discrepancy.
 9. In the Executive Summary and Section 7.1, *Conclusions*, the Permittee states, "[t]hirteen organic constituents (1 methyl-naphthalene, 2-methyl-naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, benzene, bromodichloromethane, MTBE, naphthalene, toluene, xylenes, 2,4-dimethylphenol, 3+4-methylphenol, and phenol) were detected in groundwater samples collected from soil borings at concentrations above screening levels." The 2-methylphenol concentrations in groundwater samples collected from temporary wells SWMU 10-20 and 10-25 also exceed the screening level according to Table 8, *Groundwater Analytical Results*. Revise the Report accordingly.
 10. In Section 7.1, the Permittee states, "[m]any of the reported concentrations are only slightly above the screening levels (i.e., generally less than one order of magnitude above the screening levels)." The benzene, 2,4-dimethylphenol, 3+4-methylphenol, 2-methylphenol and naphthalene concentrations exceed the screen levels by more than two orders of magnitude. Revise the Report accordingly.
 11. Table 9, *Soil Cumulative Risk and Hazard Index Evaluation*, does not include all compounds detected at SWMU 10. Revise Table 9 to include all detected compounds in the Report; otherwise, provide an explanation for excluding the compounds from the cumulative risk evaluation.

Comment 5

According to Table 4, *Groundwater Field Measurements* and Appendix C, the screened intervals in temporary wells SWMU 10-5, SWMU 10-12, and SWMU 10-15 were submerged below the water table. When the screened interval is submerged below the water table, separate phase hydrocarbons (SPH) will likely not be detected, if present. Also, a well with a submerged screen will not provide accurate information regarding the vertical extent of the potential hydrocarbon smear zone. No revisions to the Report are necessary at this time; however, address the concern when proposing to install new temporary wells in future work plans.

Comment 6

In Section 3.2, *Collection and Management of Investigation Derived Waste*, the Permittee states, “[a]ll purge water and decontamination water was disposed in the refinery wastewater system upstream of the API Separator.” The API Separator separates free phase hydrocarbon from water, and the sanitary treatment pond addresses the dissolved phase organics, but it is not clear whether the wastewater treatment system is capable of removing metals from wastewater. Clarify whether metals are removed through the wastewater treatment system in the revised Report. Since the concentrations of metals exceed the screening levels in many groundwater samples, as indicated in Table 8, the groundwater must not be disposed to the wastewater treatment system unless it is capable of removing metals.

Comment 7

In Section 4.4.1, *Groundwater Investigation*, the Permittee states, “[a]ll purge/development water was disposed at the bundle cleaning pad.” Although the sewer leak at the bundle cleaning pad was repaired in 2013, other on-going leaks in the wastewater treatment system have not been repaired according to the *Revised Interim Measures Report Hydrocarbon Seep Area*, submitted in July 2016. Unless corrective measures have been already implemented, the investigation derived wastes (IDW) must not be discharged to the wastewater treatment system. Propose a work plan for handling IDW without using the on-site wastewater treatment system, as necessary.

Comment 8

The motor oil range organics concentration in the soil sample collected from boring SWMU 10-17 at depths between six and eight feet bgs is recorded as <4,776 mg/kg according to Table 7. The residential and non-residential soil screening levels for motor oil range organics are 1,000 and 3,800 mg/kg, respectively. The referenced concentration (<4,776 mg/kg) is not acceptable and must be addressed as a data quality exception because the result exceeds the screening levels. Similarly, several concentrations of semi-volatile organic compounds in the soil sample collected from boring SWMU 10-20 (2-2.5') are reported in the same manner. No revisions to the Report are necessary at this time; however, the Permittee must conduct analyses with appropriate dilution factors to avoid inappropriate reporting in the future or discuss the results in relation to the dilution factor and treat the results as screening level exceedances.

Comment 9

The groundwater concentration maps for the dissolved metals constituents exceeding the screening levels are presented in the Report. Figures 24 through 26 depict the maps for arsenic, iron, manganese and nickel; however, the figure for the dissolved barium concentration is not included although concentrations exceed the screening level. The dissolved barium concentration map must be included in the revised Report.

Comment 10

Although many total metals are detected above the screening levels in groundwater samples collected from the temporary wells, concentration maps are not provided in the Report. Provide the figures for total metals where concentrations exceed the respective screening levels in the revised Report.

Comment 11

According to Figure 27, *Chloride and Sulfate Groundwater Concentration Map*, the highest chloride and sulfate concentrations are detected in the groundwater sample collected from temporary well SWMU 10-3. Since temporary well SWMU 10-3 is located less than 30 feet from the wastewater pipeline and the concentrations are significantly higher than the others, the pipeline may be leaking. The Permittee must investigate the pipeline in the vicinity of SWMU 10-3. In the revised Report, propose to submit a work plan to investigate the pipeline leak.

Comment 12

The organic constituents whose concentrations were detected above the screening levels are discussed in Section 6.2, *Groundwater Analytical Results*. However, the discussion of toluene, xylenes, bromodichloromethane, 2,4-dimethylphenol, 2-methylphenol, 3+4-methylphenol and phenol are not included although the concentrations of these constituents exceed the screening levels according to Table 8. Discuss the exceedances in the revised Report. Additional groundwater concentration maps must be presented for the compounds with detected concentrations above screening levels. Provide the figures in the revised Report.

Comment 13

In Section 6.2, the Permittee states, “[i]n addition to the SWMU 10 groundwater results, the MTBE concentration detected at boring location SWMU 1-37, which was installed during investigation of nearby SWMU 1, is also shown [in Figure 33] as it defines the eastern extent of MTBE concentration above the screening level (Western Refining Southwest, Inc., 2015).” The MTBE concentrations in groundwater samples collected from wells OAPIS-1 and NAPIS-2, located east of SWMU 10, consistently exceed the screening level of 143 ug/L according to the *2015 Annual Groundwater Monitoring Report*; thus, the observation of MTBE in boring SWMU 1-37 does not define the eastern extent of MTBE. Remove the statement from the Report and include a discussion of the MTBE source(s) in the revised Report. In addition, include the MTBE concentration observed in well OAPIS-1 in Figure 33, *MTBE Groundwater Concentration Map*, in the revised Report.

Comment 14

In Section 7.1, *Conclusions*, the Permittee states, “[a] cumulative risk evaluation for soils is presented in Table 9.” All discussions pertaining to cumulative risk evaluation must be removed from the revised Report. The risk must be reevaluated once the Permittee fully investigates SWMU 10 and all soils containing contaminant concentrations greater than screening levels are removed from the Sludge Pits (please see Comment 3).

Comment 15

In Section 7.1, the Permittee states, “[t]here are no reported concentrations in soil for individual constituents that exceed the residential soil screening levels, with the exception of one sample [SWMU 10-20 (2-2.5’)], which exceeded for arsenic.” The concentration of chromium in the sample collected from SWMU 10-20 (2-2.5’) is recorded as 150 mg/kg, exceeding the residential soil screening level of 96.6 mg/kg. Similarly, the concentration of manganese in the sample collected from SWMU 10-21 (20-22’) is recorded as 1,800 mg/kg, equivalent to the residential soil screening level of 1,800 mg/kg. Address the exceedances in the revised Report.

Comment 16

In Section 7.1, the Permittee states, “DRO and/or MRO were detected at concentrations above the screening levels in the same soil samples [at borings SWMU 10-5, SWMU 10-8, SWMU 10-9, SWMU 10-10, SWMU 10-17, and SWMU 10-20] that had detections of individual organics constituents above screening levels with the single exception of SWMU 10-14 (6-8’).” The DRO concentrations in soil samples collected from borings SWMU 10-4 (2-4’), SWMU 10-11 (4-6’) and SWMU 10-13 (6-8’) are detected at 4,100, 3,800, and 2,300 mg/kg, respectively, exceeding the screening level of 1,000 mg/kg. These soil samples also contained concentrations of individual organic constituents above screening levels. Correct the statement to address the exceedances in soil samples collected from boring SWMU 10-4 (2-4’), SWMU 10-11 (4-6’) and SWMU 10-13 (6-8’) in the revised Report.

Comment 17

In Section 7.1, the Permittee states, “[b]ased on the distribution of the MTBE concentrations and the hydraulic gradient, it appears that the elevated concentration of MTBE in boring SWMU 10-15 is more likely associated with the Aeration Basin than the former Sludge Pits.” NMED concurs that MTBE likely did not come from the former Sludge Pits, because none of the soil samples contained MTBE. However, the source of MTBE is a far more complex issue; the Permittee must provide a basis for stating that MTBE was associated solely with the Aeration Basin (see Comment 13). The MTBE concentration in the groundwater sample collected from well GWM-1, located on the eastern perimeter of the Aeration Basin, has been detected at concentrations below the screening level; however, the MTBE concentration in the groundwater sample collected from well OAPIS-1, located east of the OAPIS and south of the Aeration Basin, has consistently exceeded the screening level. In addition, a large MTBE plume originating from the Marketing Tank area, located southeast of SWMU 10, has migrated to the west and northwest, and extends into the investigated area. Furthermore, the hydrocarbon seep area,

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sanitary lagoon, and unidentified leaking sewer lines may also be contributing to groundwater contamination beneath SWMU 10.

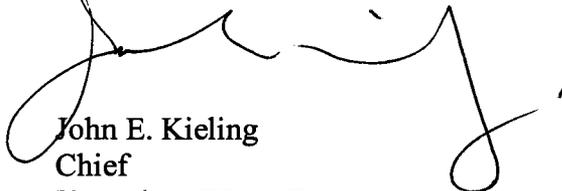
Comment 18

Most temporary wells that were removed after groundwater samples were collected within a few days. The wells should have been monitored for the presence of SPH. A sheen was observed in the groundwater collected from temporary well SWMU 10-14 during the purging event; however, the temporary well was immediately removed on the same day after purging and collecting groundwater samples. As the transport velocity of SPH may be slower compared to groundwater, temporary wells must be preserved and monitored for the presence of SPH for a minimum of seven days in the future.

The Permittee must address all comments in this Disapproval and submit a revised Report. Two hard copies and an electronic version must be submitted to NMED. Include a red-line strikeout version in electronic format showing where all the revisions to the Report have been made. The revised Report must be accompanied with a response letter that details where all the revisions have been made, cross-referencing NMED's numbered comments. The revised Report must be submitted to NMED by no later than **October 12, 2018**. In addition, submit work plans to address Comments 7 and 11 for NMED's review by no later than **November 9, 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
C. Chavez OCD
L. King EPA Region 6

File: Reading File and WRG 2018 File
HWB-WRG-16-001