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**Certified Mail - Return Receipt Requested**

June 6, 2011

Mr. Randy Schmaltz  
Environmental Manager  
Western Refining, Bloomfield Refinery  
P.O. Box 159  
Bloomfield, New Mexico 87413

**RE: APPROVAL WITH MODIFICATIONS  
INVESTIGATION REPORT GROUP 2  
WESTERN REFINING SOUTHWEST INC., BLOOMFIELD REFINERY  
EPA ID# NMD089416416  
HWB-GRCB-09-004**

Dear Mr. Schmaltz:

The New Mexico Environment Department (NMED) has reviewed Western Refining Southwest Inc., Bloomfield Refinery's (Western) revised *Investigation Report Group 2 (SWMU No. 2 Drum Storage Area North Bone Yard, SWMU No. 8 Inactive landfill, SWMU No. 9 Landfill Pond, SWMU No. 11 Spray Irrigation Area, and SWMU No. 18 Warehouse Yard)* (Report) dated March 2010. NMED has reviewed the Report and hereby issues this Approval with the following Modifications.

**1. Report Format**

**NMED Comment:** The Report contains formatting concerns that have been discussed with Western in meetings with NMED and were also included in NMED's January 24, 2011 Notice of Disapproval (NOD) to the Group 3 Investigation Report. Formatting comments were not included in this approval unless deemed necessary. Western must apply these changes to the report format in future submittals. No response is necessary.

Mr. Schmaltz  
June 6, 2011  
Page 2 of 9

## **2. Executive Summary, page iv:**

**Western's Statement:** "[t]here were low concentrations of naturally occurring metals, all of which are well below their applicable screening levels with the exception of arsenic."

**NMED Comment:** Western references naturally occurring metals in other sections of the document (e.g., Section 7). References to naturally occurring metals must be qualified until background concentrations are established. Ensure that unsupported assumptions are not made using the term naturally occurring in future documents. No revision is necessary.

## **3. Section 3.3 (Collection and Management of Investigation Derived Waste), page 9-10:**

**Western's Statement:** "Four composite samples were collected for IDW characterization (one composite sample from the drums generated for each SWMU). The analytical methods for the IDW analysis included TCLP RCRA 8 Metals and TCLP VOCs. The soil (11,000 pounds or approximately 5.5 cubic yards) was sent to the Painted Desert Landfill in Joseph City, AZ."

**NMED Comment:** The collection of composite samples analyzed for VOC analysis was addressed in NMED's January 24, 2011 NOD Group 3 Investigation Report in Comment 7. In Comment 7, NMED stated, "[r]evise the Report to explain how the composite samples were collected so that VOC loss was minimized (e.g., soils were mixed in a steel bowl and placed into a four ounce glass jar; soil samples were placed directly into a four-ounce jar and compacted for zero headspace). Homogenized samples analyzed for BTEX are inappropriate because of the potential loss of volatiles. All future samples analyzed for VOCs must be collected as discrete samples unless the composite sampling method is approved by NMED."

To ensure that the soils generated during the investigation process are properly characterized for disposal; future IDW sections of investigation reports must describe how the composite samples were collected. Composite samples collected for TCLP metals must be homogenized to obtain a representative sample. However, to eliminate the potential loss of VOCs, samples collected for VOC analysis must be discrete and not homogenized. NMED recognizes that sample data from the investigation can also be used to characterize soils. Future documents must describe the soil profile sampling process in detail. No revision is necessary.

## **4. Section 5 (Regulatory Criteria):**

**NMED Comment:** NMED discussed the application of the soil screening levels with Western in a conference call on March 9, 2011. Screening levels were also addressed in the January 24, 2011 NOD to the Group 3 Investigation Report. Western indicated they will compare all results to the residential, dilution attenuation factor (DAF), and either industrial or construction worker screening levels. This comparison must be applied to future documents. No revision is necessary.

**5. Section 5 (Regulatory Criteria), page 23**

**Western's Statement:** "[t]he ground water cleanup levels are based on New Mexico WQCC standards (20.6.2.7 WW NMAC, 20.6.2.3103, and 20.6.2.4103) unless there is a federal maximum contaminant level (MCL), in which case the lower of the two values is selected as the cleanup level. If neither a WCQQ standard nor an MCL is available, then the cleanup level is based on an EPA Regional Screening Level. Table 8 presents the ground water cleanup levels, with the applicable cleanup level highlighted."

**NMED Comment:** If neither a WQCC standard nor an MCL is available, Western must use the NMED Soil Screening Levels (SSLs) tap water column found in Table A-1 of the August 2009 NM SSLs for comparison. In the absence of a NMED tap water value, the EPA Regional Screening Level for tap water must be used. This must be applied to future documents. No revision is necessary.

**6. Section 5 (Regulatory Criteria), page 24:**

**Western's Statement:** "[a] review of the NMED TPH Screening Guidelines (dated 2006) indicates that the screening levels were developed based on screening levels and compositional assumptions developed by the Massachusetts Department of Environmental Protection (MADEP). The screening levels used by the NMED in 2006 were developed by the MADEP in 2002 and 2003. A review of current MADEP soil standards from their website ([http://www.mass.gov/dep/cleanup/laws/0975\\_6a.htm](http://www.mass.gov/dep/cleanup/laws/0975_6a.htm)) indicates that screening levels have been updated for two of the TPH carbon ranges. The screening level for C11-C22 aromatic hydrocarbons has changed from 200 mg/kg to 1,000 mg/kg and C19-C36 aliphatics has changed from 2,500 mg/kg to 3,000 mg/kg."

**NMED Comment:** Even though the MADEP TPH screening levels have been updated, NMED has neither updated nor adopted these screening levels. Western must continue to apply NMED's October 2006 TPH screening levels with the exception of the value developed by Western. See also Comment 7.

**7. Section 5 (Regulatory Criteria), TPH and DAF:**

Western developed a Total Petroleum Hydrocarbon (TPH) screening level for the "direct contact" pathway. The residential scenario TPH screening value developed for carbon range C-11-C-21 aromatics is 1.83E+03 mg/kg. Western also developed a site specific soil-to-groundwater pathway based on a DAF value of 11.25. NMED accepts the use of both the TPH and DAF values. Future documents must include both values in a table (e.g., include the DAF11.25 column in Table 6 and 7).

**8. Section 6.1.4 (SWMU No. 18 Warehouse Yard), page 31:**

**Western's Statement:** "[o]n September 26, 2008 discrete soil samples were collected from the four soil boring locations at SWMU No. 18 for laboratory analyses from 0 to 0.5 feet [below ground level] bgl and 1.5 to 2 feet bgl (Figure 9).

**NMED Comment:** Figure 9 (SWMU No. 18 TPH MRO Soils Map) was not included in the Report. NMED requested this figure from Western by e-mail and received the figure on March 25, 2011. NMED has inserted Figure 17 (SWMU 18 TPH MRO-Soil Map) into the Report. Western must ensure all figures are included in future reports. No revision is necessary.

**9. Conclusions and Recommendations:**

**NMED Comment:** Western discusses the conclusions and recommendations for each SWMU in Section 7. With the exception of SWMU No. 11 (Spray Irrigation Area), the other SWMUs (2, 8, 9, and 18) may require remedial activities. These determinations will be made upon completion of the background study. In addition, evaluation of cumulative risk/hazard must be completed at some of the SWMUs. The following must be considered when deciding if a SWMU is ready for a corrective action complete determination:

- a. Soils; compare detections to background concentrations once these are determined.
- b. At SWMUs containing detections of multiple constituents above background, calculate the cumulative risk/hazard using the maximum values for each constituent detected (See Section 5 of the NM SSL guidance). If the risk is greater than  $1 \times 10^{-5}$  or the hazard index is greater than 1.0, then a remedial action, further site-specific evaluation or a site-specific risk assessment is necessary.
- c. Groundwater; New Mexico views all groundwater as a resource. Compare detections to background values once these are established.
- d. Groundwater detections above background levels and the groundwater standards; groundwater must be further evaluated. Determine the sources of contamination.
- e. Recommend site attribution analysis for metals (demonstrate if metals are a site related contaminant or are presented at naturally occurring concentrations) in soil and groundwater.

In each case, Western must be able to support their recommendation for a corrective action complete determination. For example, Western makes varying statements in the Report that

indicated soil and groundwater do not “present”, “indicate”, or “pose” an unacceptable risk to human health and the environment but this conclusion was not substantiated. Any conclusions made by Western must be supported by data or left out of the Report.

Upon completion of the background study, Western must re-evaluate the data collected at each SWMU to determine if additional corrective action is warranted or if the SWMU qualifies for a corrective action complete determination. NMED provides specific comments for each SWMU below. Western maybe required to submit a work plan if additional work is necessary or provide additional information that demonstrates no further corrective action is necessary.

**10. Section 7 (Conclusions and Recommendations), SWMU No. 2, page 38-40:**

**Western’s Statement:** Western states “[a]t the SWMU No. 2 there were only two constituents (cobalt and mercury) that were present at concentrations that exceed the soil screening level. Cobalt was present in a single sample (SWMU 2-3 (13.5-14’)) at a concentration that only slightly exceeded the soil-to-ground water screening level (5.9 mg/kg vs. 5.51 mg/kg)... “[t]he sampling data for SWMU No. 2 does not indicate any threat to human health or the environment as the result of site operations. SWMU No. 2 should qualify for a Corrective Action Complete designation.”

**NMED Comment:** Mercury was detected above the residential screening level (7.71 mg/kg) at soil boring 2-2, with a concentration of 11 mg/kg at a depth of 1.5 to 2.0 feet. Cobalt was detected above the DAF11.25 (5.51 mg/kg) at a concentration of 5.9 mg/kg from a depth of 13.5-14 feet below ground surface (bgs). Groundwater contaminants mainly consist of metals concentrations that exceed the groundwater standards. Contaminants detected in the newly installed permanent monitoring wells include arsenic, barium, manganese, lead, chloride, sulfate, nitrate, and dissolved iron. Arsenic, barium, beryllium, chromium, cobalt, lead, and manganese were detected in samples obtained from the temporary wells during the investigation.

Western must compare the detected contaminants in soil and groundwater to the background levels once the study has been completed. For soils containing detections above background, determine if hot spot soil removal is appropriate at specific location(s), calculate cumulative risk/hazard or, if necessary, conduct a site-specific risk assessment. For groundwater, discuss the source(s) of the contaminants and whether groundwater controls are necessary. Demonstrate why SWMU No. 2 should qualify for a Corrective Action Complete status. See Comment 9.

**11. Section 7 (Conclusions and Recommendations), SWMU 8 (Inactive Landfill), pages 40 - 41:left off**

**Western’s statement:** [c]hloride and sulfate are present in concentrations above the WQCC standards but both of these are naturally occurring in ground water in the San Juan Basin (Stone,

W.J. and others, 1983). Isoconcentration maps for chloride and sulfate were prepared using data from the most recent facility-wide sampling event and the analytical results from the new RFI wells. These maps are included as Figures 15 and 16. As shown on the maps, the concentrations of these naturally occurring constituents are highest in the up-gradient portions of facility, although there is an area of elevated sulfate concentrations near the Sulferox Unit. The distribution of the concentrations of these constituents is clear evidence of their natural occurrence and that the concentrations of chloride and sulfate beneath SWMU No. 8 may not be the result of waste management activities.”

**NMED Comment:** The description above does not demonstrate that chloride and sulfate concentrations are naturally occurring at the detected concentrations. Although both chloride and sulfate in groundwater are naturally occurring in the San Juan Basin; the study does not account for potential sources resulting from refinery operations. The distribution of chloride and sulfate in the isoconcentration maps does not indicate that these constituents are naturally occurring. It is possible that the detected chloride and sulfate concentrations are not a result of operations at SWMU No. 8. The chloride and sulfate concentrations must be compared to the background concentrations once they are established. See Comment 9.

**12. Section 7 (Conclusions and Recommendations), SWMU 8 (Inactive Landfill), pages 40 - 41:**

**Western’s Statement:** “SWMU No. 8 may quali[f]y for a Corrective Action Complete designation. The two detections of arsenic in surface soils above the residential screening level should be compared to background concentrations to determine if they...pose a threat to human health and the environment. The low concentrations of inorganic constituents detected in ground water do not warrant remediation of ground water beneath SWMU No. 8 and the Facility-Wide Ground Water Monitoring Program will include monitoring of ground water in this area.”

**NMED Comment:** The soil and groundwater constituents must be compared to background concentrations once the values are established. In soils, arsenic and chromium are the constituents of concern above the residential soil screening levels. Chromium was detected at concentrations above the chromium VI residential value of 219 mg/kg. After the background study is completed, Western must determine if additional soil removal is warranted at locations 8-5 (0-0.5 ft) and 8-7 (1.5-2.0 ft) for arsenic and 8-5 (0-0.5 and 1.5 -2.0 ft) for chromium. Calculate the cumulative risk/hazard at SWMU No. 8 or conduct a risk assessment, as necessary. Groundwater samples from the two newly installed permanent monitoring wells MW-52 and MW-53 contained arsenic, barium, dissolved iron, lead, manganese, chloride, nitrite, and sulfate that exceed the groundwater standards. If detected groundwater concentrations are determined to be above background, Western must determine the source of groundwater contamination and determine whether cleanup is necessary. See also Comment 9 and Comment 15.

**13. Section 7 (Conclusions and Recommendations), SWMU No. 9 (Landfill Pond), pages 41-43:**

**Western's Statement:** "[t]he soils and ground water data indicate that the former landfill pond does not present an unacceptable risk to human health or the environment if the area was limited to industrial/occupational use; arsenic does exceed the residential screening level in surface (0-2') soils."

**NMED Comment:** The investigation results indicate multiple constituent detections. Western must calculate the cumulative risk/hazard in accordance with the NM SSL guidance. Compare results to background concentrations and determine whether additional corrective action is necessary. Western must demonstrate how it determined that the former landfill pond does not present an unacceptable risk to human health or the environment. See Comment 9.

**14. Section 7 (Conclusions and Recommendations), SWMU No. 11 (Spray Irrigation Area), page 43:**

**Western's Comment:** "[a]dditional assessment of this area was not conducted because historical site investigation data did not indicate any unacceptable threat to human health or the environment. Based on the earlier assessment information, Western believes that the Spray Irrigation Area qualifies for a Corrective Action Complete designation."

**NMED Comment:** Additional investigation activities were not required for this SWMU based on the results of historical investigations and the current setting of the SWMU. Western must submit a request for a Certificate of Completion that documents completion of corrective action required at a SWMU (i.e., identify the SWMU, summarize of investigation activities and conclusions, demonstrate that the SWMU does not require cleanup). Western must demonstrate that all corrective action requirements for the SWMU have been satisfied.

**15. Table 6 (Residential Soil Screening levels) and Table 7 (Industrial/Occupational Soil Screening Levels):**

**NMED Comment:** Western used the chromium III residential and Industrial value rather than chromium VI value for comparison. Western must apply the chromium VI standard unless an explanation is provided for using the chromium III value. This applies to future documents. See also Comment 12.

**16. Table 9 (SWMU 2 Soil Analytical Results Summary), Table 10 (SWMU 8 Analytical Results Summary), Table 11 (SWMU 9 Soil Analytical Results Summary), and Table 12 (SWMU 18 Soil Analytical Results Summary):**

**NMED Comment:** The first three columns in each of the Tables are titled either “Non-Residential Screening Levels 0-2’ bgs,” “Non-Residential Screening Levels 2-10’ bgs”, Non-Residential Screening Levels >10’ bgs” or “Residential Soil Screening Levels (0-2 ft),” Residential Soil Screening Levels (2-10 ft),” and Residential Soil Screening Levels (>10 ft).” The soil screening levels represented in these columns are from various sources making it unclear as to which standard and value the detection is being compared. NMED discussed the application of the soil screening levels with Western in a conference call on March 9, 2011. Western indicated that they will apply all values to the DAF, the residential screening levels, and either the industrial or construction worker screening level. Upon making a determination about future land use, the depths of detected contamination and the applicable screening level(s) will be further addressed. No revision is necessary, future tables must be revised based on the March 9, 2011 conference call discussions. See also Comment 4.

**17. Figures:**

- a. Figures 6-9 depict concentrations of constituents detected in soils during the investigation of SWMUs 8, 9, and 18. These figures are of limited use because they do not include any site features. Further, a figure was not included that exclusively depicts the newly installed boring and monitoring well locations relative to associated site features. Future investigation reports must include a figure that includes the soil boring(s), monitoring well(s), temporary well(s) locations at the SWMUs and AOCs, and associated site features. This type of figure must be included in addition to the isoconcentration maps.
- b. The Figures (6-9) depicting SWMU 8 and 9 do not include any site features or references that help identify where within the refinery these SWMUs are located. Future figures must include reference points and facility features.

**18. Appendix A (Field Methods):**

**NMED Comment:** The field methods section of future documents must provide the instrument used to measure separate phase hydrocarbon and groundwater level measurements.

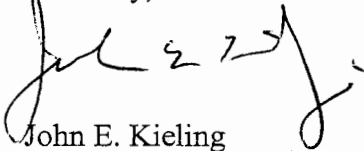


Mr. Schmaltz  
June 6, 2011  
Page 9 of 9

Additional investigation activities may be required for the SWMUs within Group 2. However, many decisions cannot be determined until the background study has been completed. Western must evaluate each SWMU to determine if additional corrective action is necessary once the background study is completed. Western must submit a work plan if additional work is determined to be necessary. If additional investigation activities are not considered to be necessary, Western may submit requests for certificates of completion that include the additional information required by this letter for the subject site.

If you have any questions regarding this letter, please contact Hope Petrie of my staff at (505) 476-6045.

Sincerely,



John E. Kieling  
Acting Chief  
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB  
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