GW - 28

EVAPORATION PONDS CA

NEW MEXICO
ENVIRONMENT DEPARTMENT

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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

August 30, 2012

Mr. Robert Combs
Navajo Refining Company
P.O. Box 159
Artesia, New Mexico 88211-0159

RE: APPROVAL WITH MODIFICATIONS
EVAPORATION PONDS PHASE IV CORRECTIVE ACTION INVESTIGATION WORKPLAN, SEPTEMBER 2011
NAVAJO REFINING COMPANY, ARTESIA REFINERY
EPA ID NO. NMD048918817
HWB-NRC-11-007

Dear Mr. Combs:

The New Mexico Environment Department (NMED) has completed its review of Navajo Refining Company, Artesia Refinery's (the Permittee) *Evaporation Ponds Phase IV Corrective Action Investigation Workplan* (Work Plan), dated September 2011. NMED hereby issues this Approval with the following modifications.

Comment 1

Throughout the Work Plan, the Permittee mentions the shallow and valley fill aquifers. Comments 4 and 5 from the June 20, 2011 Approval with Modifications for the Evaporation Pond Phase III Corrective Action Investigation (CAI) Report required the Permittee to revise all references to the "aquifers" as "zones." The Permittee mentions the requirement in Section 3.2 (Site Hydrogeology) but should have carried out the reference throughout the document. In

future work plans and reports, the Permittee must refer to these "aquifers" as "zones" or remove the distinction. No revision necessary.

Comment 2

In Section 2.2 (Previous Investigation of the EP Area), pages 4-11, the Permittee summarizes all investigations that have been performed at the evaporation ponds. The Permittee describes the investigations but does not discuss the major constituents of concern (COCs) and their analytical results. In future work plans and reports, provide additional information about the major COCs and detected concentrations. No revision necessary.

Comment 3

In Section 3 (Site Conditions), page 12, the Permittee refers the reader to "Sections 4.1 through 4.3 of the Phase III CAI Report for the description of the general setting, regional and site specific lithology and regional and site specific hydrogeologic information." The Permittee must provide the referenced information in future work plans and reports. The Permittee can summarize the geology site conditions and refer to specific logs or sections of past reports for specific details, but a sufficient description must be provided for the reader to be able to understand local site conditions. In future work plans and reports, the Permittee must provide adequate descriptions in the site conditions section. No revision necessary.

Comment 4

In Section 3.3 (Previously Identified Soil Impacts), page 15, paragraph 4, the Permittee states, "[i]n Comment 12 of the June 30, 2011 letter, NMED points out that no sample was collected below 5 feet at location EP1-6 and that the concentration of DRO in the 2.5 to 5 foot sample was greater than the concentration of the 0-2.5 foot sample. However, as shown in Figure A-13, soil samples were collected from MW-84 and MW-81 on either side of location EP1-6 at varying depths, including intervals below 5 feet. The concentration at these two locations decrease significantly with depth, with a reported DRO concentration of 50.5 mg/kg in MW-85 at 14 to 15 [feet below ground surface (ft bgs)] and no detectable DRO present at 9 to 10 ft bgs or 17 to 18 ft bgs in MW-81. Likewise, no detectable DRO was present at 5 to 7.5 ft bgs or 12.5 to 15 ft bgs at location EP1-8 as shown in figure A-20. Based on the similarity of the lithology and the means in which the impacts occurred, it is reasonable to presume that the concentrations at location EP1-6 would also decrease significantly with depth."

a. The Permittee references the incorrect monitoring well in this statement. MW-84 is identified as one of the monitoring wells used to evaluate the DRO concentration trend in EP1-6; however, the Permittee states that the "reported DRO concentration is 50.5 mg/kg in MW-85 at 14 to 15 bgs." In future work plans and reports, review all sections of the

document to ensure correct monitoring wells are referenced prior to their submittal. Provide a replacement page with the correct reference.

b. In addition, the neighboring monitoring wells and soil borings mentioned in the statement above does not support the Permittee's statement that the DRO concentration decreases significantly with depth at EP1-6. The soil lithologies presented in A-2 and A-14 of Appendix A (Updated Lithologic Cross-Sections and Presentation of Analytical Data on Cross-Sections) depict soil boring EP1-6 crossing soil and clay matrices and ending at 15 feet. The Permittee must drill next to the original soil boring EP1-6, collect soil samples and provide lithologic and analytical data to verify that DRO concentration decreases significantly with depth at this location. Include the additional soil boring at location EP1-6 as part of the investigation and provide a figure depicting the soil boring location in the investigation report.

Comment 5

In Section 5.2.1 (Soil Sample Collection Procedures), page 21, paragraph 2, the Permittee states that "[d]iscrete samples will be collected from the background soil boring from both a sand matrix and from a clay matrix, where possible. If only one type of soil is present with a background soil boring, then one sample will be collected from the upper 5 feet of soil and one sample will be collected from the 5 to 10 foot interval." The Permittee must attempt to collect representative soil samples from the fine grained soil matrices that do not contain a large portion of organic material.

Comment 6

In Section 5.2.2 (Soil Analytical Methods), page 22, bullet 3, the Permittee states that they will analyze the soil samples for RCRA 8 metals by methods 6010 and 7471. In addition to RCRA 8 metals analysis, the Permittee must also include analysis of priority pollutant metals to comply with OCD requirements.

Comment 7

In Figures 1 (Site Location Map), 2 (Evaporation Ponds) and all figures in Appendix A (Updated Lithologic Cross-Sections and Presentation of Analytical Data on Cross-Sections), the Permittee uses the incorrect title, "Evaporation Ponds Phase III CAI Report." In future work plans and reports, ensure the titles of each figure reference the subject work plan or report. No revision necessary.

The Permittee must incorporate and address all comments in this Approval with Modifications. The replacement page in Comment 4a must be submitted to NMED by **September 21, 2012**. The Permittee must submit the Investigation Report to NMED by **April 19, 2013**.

If you have any questions regarding this letter, please contact Leona Tsinnajinnie of my staff at (505) 476-6057.

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB
L. Tsinnajinnie, NMED HWB
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File: Reading File and NRC 2012, HWB-NRC-11-007

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DAVE MARTIN
Cabinet Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

January 19, 2011

Darrell Moore
Navajo Refining Company
P.O. Box 159
Artesia, New Mexico 88211-0159

RE: APPROVAL WITH MODIFICATIONS
EVAPORATION PONDS PHASE III CORRECTIVE ACTION
INVESTIGATION WORK PLAN
NAVAJO REFINING COMPANY, ARTESIA REFINERY
EPA ID #: NMD048918817
HWB-NRC-10-003

Dear Mr. Moore:

The New Mexico Environment Department (NMED) has completed its review of Navajo Refining Company's Artesia Refinery (Permittee) *Evaporation Ponds Phase III Corrective Action Investigation Work Plan* (Work Plan) dated February 2010. This document was submitted in response to NMED's September 3, 2009 Notice of Disapproval to the *Evaporation Ponds Additional Corrective Action Investigation Report (Third Revision March 2009)* (NOD). NMED hereby issues this Approval with Modifications, and provides the following comments. The Permittee must implement the Work Plan, as modified by the comments in this letter.

General Comments

1. Work completed prior to NMED approval:

NMED Comment: The Work Plan indicates the Permittee has already completed or nearly completed the proposed work. Any work conducted without NMED approval is ill advised, as NMED could provide direction to conduct different or additional work, or require the Permittee

to "undo" the unapproved work. Additional investigation activities may be required upon review of the Investigation Report.

2. Well Identification:

NMED Comment: The Permittee references wells but seldom identifies the wells being referenced. For example, Section 3.2.4.2 (Valley Fill Aquifer) and Section 5.2 (Groundwater Sample Collection from Deeper Wells), all reference monitoring wells but the well locations are not identified. No revision is necessary, however; future documents must identify well locations by name when being referenced. See also Specific Comment 8 and 12.

Specific Comments

3. Executive Summary, page ix and x:

Permittee Statement: "[t]he data obtained during these activities will be summarized and reported to NMED in a status report, along with a recommendation for installation of additional wells or a recommendation that no additional delineation is warranted. Any other recommendations for additional activities will be made based upon the results obtained and will be included in the status report...[t]he Phase III Corrective Action Investigation Report will summarize the actual activities performed and the data obtained along with recommendations for future monitoring or corrective actions. This report will be submitted within 150 days after completion of installation and sampling of additional wells, if such is warranted based on the results of this investigation. If additional wells are not warranted, then the report will be submitted within 120 days of the status report described above."

NMED Comment: NMED cannot evaluate additional activities until an Investigation Report has been submitted and reviewed. The Permittee must submit an Investigation Report rather than a Status Report. If the Permittee determines additional monitoring wells are necessary, information on these wells must be included in the recommendations section of the Investigation Report. Upon review of the Investigation Report, NMED will determine if a separate work plan will be required for the installation of additional wells. See also Specific Comment 14.

4. Section 2 (Background):

NMED Comment: The Permittee summarizes historical investigations that have been conducted at the Evaporation Ponds. NMED does not agree with all of the conclusions drawn from the investigations (e.g., laboratory contaminants and contaminants resulting from stainless steel wells). No revision is necessary.

5. Section 3.2.1 (Site Lithology), page 17:

Permittee Statement: "[a]s shown in Figures 5 through 8, there are several areas where the shallow soil consists of stained sediment. These areas are concentrated near the areas where discharge formerly occurred and within EP1."

NMED Comment: Figures 5 through 8 do not indicate areas where stained sediment is present; they include cross sections at the Evaporation Ponds. This statement appears to be a typographical error; shallow soils contaminants are provided in Figures 9 through 12. No revision is necessary.

6. Section 3.2.3 (Previously Identified Soil Impacts), page 18:

Permittee Statement: "[t]he CAI and ACAI reports compared the soil analytical results to the soil screening levels that were current as of the date of those reports. NMED updated the soil screening guidance and soil screening levels (SSLs) in December 2009; therefore, the data screening has been updated. The December 2009 SSLs are presented in the columns immediately to the right of each analyte in Table 2. Shallow soil samples (less than 5 ft bgs) were compared to the Residential SSL while the deeper soil samples (greater than 5 ft bgs) were compared to the SSL for a dilution/attenuation factor (DAF) of 20 (DAF20)."

NMED Comment: It is not clear why soil samples collected from 0-5 feet were compared to the residential scenario and samples collected from greater than five feet were compared to the Dilution Attenuation Factor 20 (DAF20). The residential scenario applies to soils from the surface to a depth of 10 to 15 feet below ground surface (bgs). It is also not clear why the DAF20 was applied; these values are used where there is a greater degree of dilution and attenuation of contaminants along the migration flowpath and for contaminants not in direct contact with groundwater. A DAF1 is more appropriate because contamination in some locations at the Evaporation Ponds is in direct contact with groundwater. In this case, NMED disagrees with the application of the New Mexico Soil Screening Levels (NM SSLs). In the Investigation Report, the Permittee must use the residential and the DAF1 screening levels for comparison purposes.

7. Section 3.2.4.1 (Shallow Saturated Zone), page 20, bullet two:

Permittee Statement: "[i]f no WQS or MCL value was available, the tap water screening level found in NMED SSG Table A-1, as updated December 2009, was used, if available."

NMED Comment: If a Water Quality Standard (WQS), a Maximum Contaminant Level (MCL), or a tap water screening level does not exist, the Permittee must apply the EPA Regional

Screening Levels (RSL) for tap water as indicated in Section 4.1.1.a, item 2 of the Post Closure Care Permit. No revision is necessary.

8. Section 3.2.4.2 (Valley Fill Aquifer), page 22:

Permittee Statement: "[w]ells completed in the underlying valley fill alluvium were sampled in 1994 and 1995 and the results were presented in the Phase III RFI report. Groundwater samples from these wells were analyzed for VOCs and SVOCs as well as for metals. Tables 4-6 and 4-7 of the Phase III RFI report summarized the results of the Phase III RFI sampling event and are included in Appendix A of this Work Plan."

NMED Comment: Future documents must identify the well locations being addressed in the text and in a referenced figure, or reference the Section where the wells are identified. In addition, many conclusions drawn in this section are based on data collected in 1994 and 1995. The same conclusions may not be appropriate using data from 2010. No revision is necessary. See also General Comment 2 and Specific Comment 12.

9. Section 4.3.1 (Evaluation of Communication Between Shallow Saturated Zone Groundwater and Pecos River, page 24:

Permittee Statement: "[t]he elevation of surface water in the river will be measured at the same time that the water levels are measured in the existing groundwater wells during the first semiannual groundwater monitoring event. That monitoring event is scheduled to occur in March or April 2010."

NMED Comment: The Investigation Report must include a detailed discussion of the Pecos River (e.g., flow rate, ephemeral or perennial, depth and width of the river, proximity to the evaporation ponds). In addition, during the first year, the surface water-elevation of the river must be measured in conjunction with both semi-annual groundwater monitoring events; the measurement methodology must be described.

10. Section 4.3.3 (Evaluation of DRO Concentrations in Groundwater), page 26:

Permittee Statement: "[g]roundwater samples have been analyzed for DRO using Method 8015 Modified. This method measures the concentration of all organic hydrocarbon compounds, including petroleum hydrocarbons and biogenic material that may be present in groundwater. In order to determine if the DRO concentrations reported in samples collected from downgradient wells actually represent the presence of petroleum hydrocarbons in that area, a rigorous review of the analytical data will be performed. Specifically, the chromatograms from the laboratory analyses of DRO from both the shallow and the deeper wells will be requested for all samples

collected during the first semiannual sampling event in 2010. The chromatograms will be reviewed to determine if the reported concentrations include biogenic compounds or other non-petroleum hydrocarbons.

"In the event that the review of the chromatograms indicates that the reported concentrations of DRO in downgradient wells accurately reflect petroleum hydrocarbon impacts, further evaluation of the petroleum hydrocarbons will be performed to determine an appropriate risk-based screening level.

"In the event that the review of the chromatograms indicates that the reported concentrations of DRO in downgradient wells include non-petroleum hydrocarbon compounds, additional evaluation procedures will be proposed to determine the concentrations of petroleum hydrocarbons present in the groundwater downgradiant from the EPs."

NMED Comment: This evaluation is further discussed in Section 5.3 (Evaluation of DRO Concentrations in Groundwater), page 30. Address the following in the Investigation Report:

a. Explain how biogenic compounds (non-petroleum hydrocarbons) can be identified from reviewing chromatograms.

b. Explain how it will be determined that the biogenic material is not the result of the degradation of hydrocarbons.

c. Since there is known hydrocarbon contamination, including the presence of separate-phase hydrocarbons at the Evaporation Ponds, explain the purpose of this study.

11. Section 4.3.4 (Evaluation of Arsenic Concentrations in Groundwater), page 26-27:

Permittee Statement: "[i]n order to evaluate whether the arsenic concentrations present in groundwater are due to dissolved arsenic or the presence of naturally occurring colloidal matter, groundwater samples collection from the wells in the EP area will be collected using low-flow purging and sampling techniques. This method should reduce agitation of groundwater during the purging process and reduce suspended solid matter.

"To further evaluate the amount of arsenic present in groundwater from colloidal matter, samples from five wells will be evaluated using field filtration. The selected wells include two wells with known hydrocarbon impacts (MW-83 inside EP1 and MW-78 inside EP2) and the three most downgradient wells (MW-10, MW-18A, and MW-70). Three sets of samples will be collected: one set will be unfiltered, one set will be field filtered using a 0.45 micron filter, and one set will

be field filtered using a 0.1 micron filter. The 0.45 micron filter is the specified size for filtered samples discussed in the guidance document published by NMED. However, 0.1 micron filters can be used to determine if there are arsenic species that pass through a 0.45 micron filter yet are not truly dissolved. Therefore, ARCADIS recommends an evaluation using both sizes of filters. All three sets of samples from each of these five wells will be analyzed of arsenic using Method 6020. The resulting concentrations will be reviewed and evaluated to develop an understanding of the arsenic distribution in groundwater."

NMED Comment: This is also discussed in further detail in Section 5.4 (Evaluation of Arsenic Concentrations in Groundwater). In the Investigation Report, clearly explain and demonstrate how the comparison of filtered and unfiltered water samples will help determine if detected arsenic concentrations are from background or are related to refinery operations without conducting a background study. Pending the results of this comparison, a background study may need to be conducted.

12. Section 5.2 (Groundwater Sample Collection from Deeper Wells), page 28; Section 7 (Schedule), bullet 6, page 38:

Permittee Statement: "[g]roundwater samples will be collected from 11 monitoring wells completed in the deeper valley fill alluvium during the first semiannual groundwater monitoring event of 2010" and "[c]ollection of filtered samples from five selected wells..."

NMED Comment: The Investigation Report and future documents must identify the well locations by name, or reference the section that lists the wells by name (e.g., groundwater samples will be collected from the eleven wells identified in Section 4.3.2 (Groundwater Sample Collection from Deeper Wells) during the first semiannual...). See General Comment 2 and Specific Comment 8.

13. Section 4.3.2 (Groundwater Sample Collection from Deeper Wells), page 25 and Section 5.2 (Ground Sample Collection from Deeper Wells), page 28-29:

NMED Comment: The Permittee discusses the collection of groundwater samples from 11 wells and lists the proposed chemical analyses. Comment 4, item c of NMED's September 3, 2009 NOD listed the required analyses for groundwater samples. The Permittee did not include the analysis of major cations/anions (e.g., Ca, Mg, K, Na, Cl, F, sulfates), total dissolved solids, nitrite/nitrate, methane, alkalinity, dissolved iron, and manganese as previously required by NMED. NMED acknowledges that during the meeting in January 2010, it was discussed that not all the information requested in the September 2009 NOD was appropriate; however, chemical analysis was not specifically discussed. The Investigation Report must provide an explanation for omitting the analysis of major cations/anions (e.g., Ca, Mg, K, Na, Cl, F, sulfates), total

dissolved solids, nitrite/nitrate, methane, alkalinity, dissolved iron, and manganese from the 11 wells sampled. The Permittee may be required to conduct additional chemical analysis for samples obtained from these wells in the future.

14. Section 5.3 Evaluation of DRO Concentrations in Groundwater), page 30:

Permittee Statement: "[i]n the event that the review indicates that non-petroleum hydrocarbons are present in the samples, alternatives will be evaluated for a more accurate evaluation of the sample concentrations. These alternatives will be described in a status report and discussed with NMED prior to implementation."

NMED Comment: The alternatives must be described in the Investigation Report. See Specific Comment 3.

15. Section 5.5 (Optional Installation of Additional Groundwater Monitoring Wells), page 31:

Permittee Statement: "[i]n the event that the review of DRO or arsenic concentrations indicates that the true extent of impacts of either of these compounds emanating from the EPs has not been defined in the downgradient direction, additional groundwater wells may be installed. The location and depth of the additional wells, if necessary, will be proposed in a status report submitted to NMED.

"The optional additional wells will not be installed until NMED concurrence on the location and depth of these wells has been obtained. This subsection provides the well installation procedures in the event that a determination is made to install additional wells."

NMED Comment:

a. If the Permittee determines that additional monitoring wells are necessary, the rationale and proposed installation and drilling methods must be presented in a work plan and not a status report.

b. NMED does not pre-approve well installation activities prior to knowing if wells will be installed. For example, it is unknown if additional monitoring wells will be needed and Sections 5.5 (Optional Installation of Additional Groundwater Monitoring Wells), 5.5.1 (Drilling Methods), 5.5.2 (Well Construction), 5.5.3 (Well Development), 5.5.4 (Groundwater Sampling), 5.5.5 (Analytical Methods), 5.5.6 (Quality Assurance, Quality Control Samples), and 5.5.7 (Decontamination

Procedures and Investigation Derived Wastes) all discuss activities that will occur only if it is determined that additional wells are necessary.

c. NMED does not approve Sections 5.5 through Section 5.5.7 because they pertain to activities that may not occur, or may change if additional wells are needed.

d. The need for additional wells must be discussed and recommended in the Investigation Report.

16. Section 7 (Schedule), page 39:

Permittee Statement: "[t]he data obtained during these activities will be summarized and reported to NMED in a status report, along with a recommendation for installation of additional wells or a recommendation that no additional delineation is warranted. Any other recommendations for additional activities will be made based upon the results obtained and will be included in the status report. In the event that additional well installation is recommended, the additional wells will be installed within 90 days of receipt of concurrence from NMED on the locations and depths of those wells. The Phase III Corrective Action Investigation Report will summarize the actual activities performed and the data obtained along with recommendations for future monitoring or corrective actions. This report will be submitted within 150 days after completion of installation and sampling of additional wells, if such is warranted based on the results of this investigation. If additional wells are not warranted, then the report will be submitted within 120 days of the status report described above."

NMED Comment: Upon completion of all activities outlined in this Work Plan, an Investigation Report not a status report must be submitted. NMED will notify the Permittee in writing of further required corrective action.

17. Table 2 (Summary of Soil Analytical Data From Corrective Action Investigation and Additional Corrective Action Investigation):

NMED Comment: In Table 2 (Summary of Soil Analytical Data From Corrective Action Investigation and Additional Corrective Action Investigation), some of the standards are incorrect (e.g. residential standard for arsenic is 3.90 mg/kg and ethylbenzene is 69,700 µg/l; the table indicates 3.59 mg/kg and 69,600 µg/L, respectively). No revision is necessary; however, the Permittee must take note of these typographical errors and take care to correct them in future documents.

18. Table 3 (Summary of Groundwater Analytical Data Evaporation Pond Wells from 2004 to 2009):

NMED Comment: Table 3 does not include groundwater standards for some constituents where a standard exists (e.g., antimony, beryllium, 2-butanone (MEK)). No revision is necessary; however, standards must be included in future documents.

19. Figures:

NMED Comment: In the Figures section, some figures include action levels that are incorrectly denoted. For example, Figure 10 (Ethylbenzene Concentrations In Shallow Soil (<5 Feet BGS)) includes an action level for ethylbenzene at 69,600 µg/kg; the action level is 69,700 µg/kg. No revision is necessary.

20. Appendix B (Trend Plots for Select COCs in Shallow Saturated Zone Wells):

NMED Comment: The trend plots include data for OCD-8. It is not clear if the data are for OCD-8A or OCD-8B, as there is no well OCD-8. No revision is necessary; however, if the trend plots are included in the Investigation Report, this error must be corrected.

The Permittee must submit an Investigation Report to NMED on or before April 18, 2011. Upon review of the Investigation Report, additional investigation at the evaporation ponds may be required.

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

Sincerely,

James P. Bearzi
Chief
Hazardous Waste Bureau

cc: J. Kieling, NMED HWB
D. Cobrain, NMED HWB
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