

**GW - 028**

**REPORTS**

**Three-Mile Ditch  
Corrective Action**

**2010**



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**NEW MEXICO  
ENVIRONMENT DEPARTMENT**

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**CERTIFIED MAIL - RETURN RECEIPT REQUESTED**

October 18, 2010

Darrell Moore  
Navajo Refining Company  
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Artesia, New Mexico 88211-0159

**RE: NOTICE OF DISAPPROVAL  
REVISED THREE-MILE DITCH ADDITIONAL CORRECTIVE ACTION  
INVESTIGATION REPORT (REVISION 2 JANUARY 30, 2009)  
NAVAJO REFINING COMPANY, ARTESIA REFINERY  
EPA ID #: NMD048918817  
NRC-08-004**

Dear Mr. Moore:

The New Mexico Environment Department (NMED) has received Navajo Refining Company's (Permittee) submittal of *Revised Three-Mile Ditch Additional Corrective Action Investigation Report* (Report), Revision 2, dated January 30, 2009. NMED hereby issues this Notice of Disapproval (NOD). The Permittee must address the following comments.

**General Comments**

**Comment A**

NMED has reviewed three different versions of this Report. Much of the information in the Reports is conflicting and unclear, making it difficult to understand what activities actually occurred during the second phase of investigation at Three Mile Ditch (TMD). NMED must assume that regardless of conflicts, the most recent revision contains the verifiable and accurate report on the investigation.

**Comment B**

The Report includes deviations from the Work Plan. The Permittee may be required to correct or otherwise address some or all of the deviations from the approved Work Plan.

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### **Comment C**

In Comment 4 of NMED's December 18, 2006 Approval with Modifications to the *Three Mile Ditch Corrective Action Investigation Work Plan* (dated October 2006), the NMED stated "[t]he Permittee addresses the collection of confirmation samples from the most contaminated soils removed from the excavated areas; however, the Work Plan does not address the collection of confirmation samples within the excavated areas to demonstrate that all contaminated soils have been removed. The Permittee must collect a representative number of confirmation samples from the sidewalls and bottom of the excavations to demonstrate that soils containing contaminant concentrations greater than the applicable clean up levels have been removed." The Report does not provide data to demonstrate this. The Permittee must provide the data in the revised Report. Based on the information provided in the revised Report, the Permittee may be required to collect more samples, conduct further investigation, or cleanup.

### **Specific Comments**

#### **Comment 1**

In the Background Section, page vi, the Permittee states "[t]he area around the ditch is unpopulated and used for agriculture and ranching purposes. Human or ecological exposure to potentially contaminated ditch soils is unlikely since the ditch is covered." The Permittee also made this statement in the first *Three Mile Ditch and Evaporation Ponds Corrective Action Investigation Report*, dated December 2004. In Specific Comment # 7 of NMED's September 14, 2005 NOD, NMED stated that "[t]he Permittee does not discuss in the report the thickness or type of cover currently overlying the contaminated soil. Exposure to human and ecological receptors could occur; regardless of the cover, if the thickness of cover is shallow (e.g., less than 6 inches for humans and less than 2 feet for animals). In addition, the report does not address ecological receptors. The Permittee must provide additional information about the thickness and type of cover placed over the contaminated soil in TMD. The Permittee must also discuss the potential for human and ecological exposure to soil within the TMD, including burrowing animals, phytotoxicity and the potential for damage to the cover." The Permittee has not completed a human health or ecological risk assessment at this site and cannot make the determination that human or ecological exposure is "unlikely." The Permittee must address the requirements as stated in Specific Comment #7 of NMED's September 14, 2005 NOD or remove this statement from the revised the Report. See also Comment 2.

#### **Comment 2**

The Permittee states on page vi (Background) and on page 1 (1. Introduction) that "[h]uman or ecological exposure to potentially contaminated ditch soils is unlikely since the ditch is covered." The Permittee cannot support this statement since neither a human health or ecological risk assessment has been completed at this site. The Permittee must revise the Report to remove this

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statement.

### **Comment 3**

On page vii, under Recommendations, the Permittee states “[e]xcavation completed as part of the additional corrective action investigation has resulted in the removal of the impacted soil. No additional investigation or delineation of TMD is necessary.” It cannot be determined from this Report if additional investigation activities are necessary at TMD because of discrepancies within the Report, data gaps resulting from questionable sample collection methods, data quality exceptions, and deviations from the Work Plan. The Permittee must be able to clearly demonstrate why no additional investigation or soil removal is necessary. The Permittee must revise the Recommendations in the Executive Summary, the Summary and Conclusions, and Recommendations Sections in the revised Report to provide conclusions and recommendations that are technically supported by data.

### **Comment 4**

Section 2 provides the Background Section of the Report. In Section 2.2, the Permittee includes a timeline that provide activities and document submittal dates associated with TMD after the issuance of the Permit. The time line is not accurate and is not relevant to the background section. The Permittee must remove the timeline from the Report; this information may be provided in a list of references. The Permittee must nevertheless provide a description of the investigation activities that have occurred since the issuance of the Permit. The description of activities should be similar to those describe on page 3 of Section 2.2. The Permittee must revise the Report accordingly.

### **Comment 5**

In Section 2.3 (Current Conditions), page 5, the Permittee states “[g]roundwater monitoring wells in the vicinity of the ditch did not indicate contamination.” There are many wells located along TMD that have contaminants. It is not clear which wells the Permittee is referencing. The Permittee must revise the Report to remove this sentence or identify the wells that are being referenced and provide supporting documentation and data.

### **Comment 6**

In Section 2.3 (Current Conditions), page 5, the Permittee states “[t]he most likely direct contact with ditch soils would occur for the scenario of construction workers installing or maintaining underground pipelines. Other exposure to potentially impacted ditch soils is unlikely since the ditch has been filled.” This statement is not accurate and must be removed from the Report. Although the construction worker scenario may be most likely, other scenarios cannot be ruled

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out because TMD also crosses private property. In addition, the Permittee must revise the Report to consider the residential risk scenario. See also Comment 30.

#### **Comment 7**

In Section 3.2 (Three-Mile Ditch Excavations, Soil Borings and Groundwater Sampling), page 12, the Permittee states "NMED approved the Workplan, which incorporated specific soil and groundwater investigation and corrective action requirements," and then lists some but not all of the requirements of the Work Plan. The Permittee must revise the above sentence in the Report to state ... "some of the corrective action requirements include..."

#### **Comment 8**

In Section 3.2.1 (Excavations), page 13 and 14, the Permittee discusses the excavations along TMD. The Permittee does not provide the depths or dimensions for most of the excavations. The Permittee provided the depths for TMD 17-TMD-20 and east of TMD-11, but did not provide the widths or lengths for these excavations. The Permittee must revise the Report to include the dimensions (length, width, and depth) for all of the excavations (*i.e.*, TMD-1, TMD-7, TMD-11 to TMD-19, and approximately 50 feet west of TMD-10).

#### **Comment 9**

In Section 3.2.1 (Excavations), page 13, bullet 1, the Permittee states "April 2 to 6, 2007: Excavation was performed at the location of previous samples TMD-1, TMD-7, and TMD-10. One sample was collected from the surface interval at each of the previous sample locations to confirm the previous sample results." The Permittee must explain how and why surface samples were used to confirm the locations of the previous sample locations instead of using survey or other measurement methods. Based on the information provided in the Report, the methods used to analyze these surface samples, were not the same methods used in the previous investigation. Additionally, based on Table 3 (Three Mile Ditch Excavation Confirmation Soil Samples) the surface sample for TMD-7 was non-detect (<0.200) for TCLP lead (*i.e.*, there is no value available to compare to the previous investigation). It is not clear how the analytical data were used to determine the sample locations from the previous investigation (*i.e.*, the different methods are not comparable).

The Permittee must revise the Report to clarify why sample data were used to find previous sample locations instead of using surveyed locations. The Permittee must also explain why the analytical results derived from different laboratory methods are expected to be comparable.

**Comment 10**

The reference to the use of surface sampling to confirm the locations of sample locations from previous investigations as discussed in Section 3.2.1 (Excavations) was also referenced later in the Report (e.g., Section 6.7). All such references in the Report must be corrected in the revised the Report.

**Comment 11**

In Section 3.2.1 (Excavations), page 13, bullet 1, the Permittee states “April 2 to 6, 2007: Excavation was performed at the location of previous samples TMD-1, TMD-7, and TMD-10. One sample was collected from the surface interval at each of the previous sample locations to confirm the previous sample results.” In Section 6.7.2.2 (TMD-7), the Permittee states “[t]he coordinates of the original sample location were used to determine the location of the excavation.” The Permittee must revise the Report to clarify if surface sample results, coordinates, or both were used to verify the location of TMD-7.

**Comment 12**

In Section 3.2.1 (Excavations), page 13, bullet 1, the Permittee states “April 2 to 6, 2007: Excavation was performed at the location of previous samples TMD-1, TMD-7, and TMD-10. One sample was collected from the surface interval at each of the previous sample locations to confirm the previous sample results.” TMD-10 was not previously investigated because the contamination in this area was discovered by PNM. Therefore, a surface sample could not have been used to confirm the location of TMD-10. The Permittee must revise the Report to clearly explain how the area west of TMD-10 was located, and otherwise resolve this discrepancy.

**Comment 13**

In Section 3.2.1 (Excavations), pages 13 and 14, the Permittee states “[e]xcavation was performed [at the TMD] by Sweatt Construction and proceeded in stages as follows.” Bullet items listed the following dates and months: April 2 to 6, 2007...April 18 to 26, 2007...June 2007...August 8-11, 2007...September 4 to 5, 2007. In Section 6.7.2.4 (TMD 11 to TMD-20), the Permittee indicates that an excavation also occurred in May 2007. The May 2007 excavation was not mentioned in Section 3.2.1. The Permittee must clarify this discrepancy in the revised Report. See also Comment 38.

**Comment 14**

In Section 3.3.2 (Boring and Monitor Well Soil Samples), page 15, the Permittee states “[s]oil samples were collected every foot from the ground surface to the maximum depth of the boring.”

The boring logs for SB-1 2007 and SB-2 2007 (found in Appendix A) do not show recoveries for the entire boring. The Permittee must revise these boring logs to include the missing recovery information or explain why this information was not included. Also, some boring logs in the recovery column state "NR." The Permittee must define "NR" in the boring logs, where applicable. In addition, the Report does not discuss the method for determining the boring locations. The Permittee must also revise the Report to describe how the soil boring locations were located (e.g., measured or surveyed) and include this on the boring logs. The Permittee must revise the Report accordingly.

#### **Comment 15**

In Section 3.3.3 (Excavation Soil Samples), page 16, the Permittee states "May 7 and 15, 2007: Confirmation soil samples were collected as composite samples of the north side wall, the south side wall and the bottom of the excavation between TMD-13 to TMD-20 at approximately 200 ft intervals. These samples were labeled "W-1" to "W-6" and "West Ditch 7" to "West Ditch 11." These confirmation samples were analyzed for gasoline range organics (GRO), diesel range organics (DRO), volatile organic compounds (VOCs), and RCRA 8 metals (totals). NMED has the following concerns pertaining to this excavation:

- a. The Permittee collected composite confirmation samples that were analyzed for VOCs and GRO. Composite confirmation samples analyzed for VOCs are inappropriate because of the likely loss of VOCs. All confirmation samples analyzed for VOCs must be collected as discrete samples.
- b. The Report does not provide a length for the final excavation, only stating that confirmation samplings were collected every 200 feet. The Permittee must revise the Report to define the length of the excavation and describe how one confirmation sample collected every 200 feet is a representative number of confirmation samples to demonstrate that all soils containing concentrations of contaminants greater than applicable cleanup levels have been removed from this location.

#### **Comment 16**

Section 3.3.3 (Excavation Soil Samples), pages 16 to 17, the Permittee discusses the collection of soil samples from the excavations. For example, some text includes discussion of confirmation sample collection, but does not indicate if the sample was discrete or composite. Other passages discuss the collection of composite samples but do not indicate the type of samples collected. The Permittee must revise this Section of the Report to clearly indicate which confirmation samples were collected as composite or discrete.

**Comment 17**

In Section 3.3.3 (Excavation Soil Samples), pages 16-17, bullet 3, the Permittee states “June 2007: Confirmation samples were collected from the sides and bottom of the additional excavation between TMD-13 to TMD-15 from locations designated W1A, W1B, W3A, and W3B. Samples collected from the south side wall were designated W1A-SS, W1B-SS, W3A-SS, and W3B-SS. Samples collected from the north side wall were designated W1A-SN, W1B-SN, W3A-SN, and W3B-SN. Samples collected from the bottom of the excavation were designated W1A-B, W1B-B, W3A-B, and W3B-B. The sample locations are shown on Figure 5.” Because the south side wall, north side wall, and bottom excavation samples are not shown in Figure 5, the Permittee must clarify in the text of the revised Report if the location designated as W1A is the location where W1A-SN, W1A-SS, and W1A-B were collected. This must also be clarified for sample locations W1B, W3A, and W3B. The Permittee must include the sample locations in a Figure.

**Comment 18**

In Section 3.3.3 (Excavation Soil Samples), page 17, bullet two, the Permittee states “September 5, 2007: One composite sample was collected from the four side walls and bottom of the additional excavation west of TMD-11 and was designated as “E-1.” The Permittee must clarify why the additional excavation was necessary west of TMD-11, explain if sample location E-1 is considered a confirmation sample, and explain why only metals analyses were conducted. The Permittee must revise the Report accordingly.

**Comment 19**

In section 3.3.4 (Stockpile Soil Samples), page 17, the Permittee states “[t]he locations of the stockpiles can be seen on Figure 3. Another stockpile, Stockpile #4 was used to contain unimpacted backfill material.” Figure 3 does not include the location of Stockpile #4. The Permittee must revise the Report to include the location of Stockpile #4 and describe the source of the uncontaminated backfill.

**Comment 20**

Section 3.4 and 6.5 are both entitled Quality Control Samples, and are repetitive. The Permittee must revise the Report to provide only one quality control section.

**Comment 21**

In Section 3.5 (Investigation Derived Waste), page 19, the Permittee indicates that drill cuttings and water were stored in 55 gallon drums. The Permittee does not address the number of drums

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used, volume of waste generated, or if analytical data were collected to characterize the waste to determine the disposal options (e.g., was the sampling proposed in the Work Plan and in Appendix D completed). The Permittee must revise the Report to include the number of drums used to store soil, water, and any other waste, identify the contents of all drums and the volumes of the different wastes generated, identify where within the refinery these drums were stored, discuss if any waste profiling was conducted and, if so, include a summary of the results and the laboratory reports. The Permittee must identify if water was disposed of and where within the refinery's wastewater treatment system the IDW water was disposed (e.g., upstream or downstream from the API separator). The Permittee must revise the Report accordingly.

#### **Comment 22**

In Section 4 (Field Investigation Results), page 20, the Permittee states "[t]his section provides a summary of the field procedures used and the results of field investigation activities." This section does not address the results of the field investigations which are discussed in Section 6. The Permittee must revise the Report accordingly and ensure the title headings represent the text of that Section.

#### **Comment 23**

In Section 4.1 (Surface Conditions), page 21, the Permittee states "Navajo owns the property around the EPs, which is fenced and locked to prevent access. The Navajo property is not used for agricultural, ranching or other purposes and there are no nearby residences or structures." In Section 5.2 (New Mexico Soil Screening Levels), page 29, the Permittee states, "TMD extends from Navajo property along Eagle Creek for most of its distance to the EPs, crossing agricultural property owned by three different individuals." While the Navajo property is not used for agricultural, ranching or other purposes, TMD crosses land that is used for these practices. The Permittee must therefore revise the Surface Conditions section to discuss pertinent information for TMD and the properties that it crosses. The sections discussing surface conditions, subsurface conditions, groundwater, and surface water must also be revised in the Report to discuss conditions in the vicinity of TMD.

#### **Comment 24**

In Section 4.2.2.1 (Excavation Methodology), page 23, the Permittee states "[e]xcavated soils were placed in stockpile areas for final characterization and determination of disposal options. Each stockpile area was constructed by pushing up a berm of native soil, covering the berms and bottom of the excavation with plastic, then covering the plastic with a thin layer of soil to prevent damage to the plastic." The Permittee must revise the Report to explain if the thin layer of soil was contaminated soil, if any damage to the plastic occurred, if all soils on the plastic were removed, and where the soils were disposed.

**Comment 25**

In Section 4.2.1.4 (Decontamination Procedures), page 23, the Permittee states “[t]he sample only touched the tip of the drill rod, which was cleaned as above, and the disposable plastic sleeve. The sleeves were destroyed in the sampling process. Used sleeves were discarded in the plant trash.” This description suggests that a geoprobe was used to collect samples; however, the Report never mentions use of a geoprobe but describes the use of a hollow stem auger and split spoon sampling method. The Permittee must revise the Report to clarify the type of equipment used to collect samples.

**Comment 26**

In Section 4.2.2.2 (Sampling and Field Screening), page 24, the Permittee states “[a]s described in Section 3, confirmation samples were collected from each excavation. The samples were collected using the backhoe bucket to obtain a representative portion of soil from either the bottom or side walls of the excavation. This allowed for collection of confirmation samples without requiring entry of personnel into the excavation.” The Permittee must ensure the revised Report clearly identifies whether the confirmation samples collected from within the excavation were discrete or composite samples.

**Comment 27**

In Section 5.1 (Required Analyses), page 28, the Permittee states “[b]ased upon the analytical requirements in Appendix A of the Navajo RCRA Post-Closure Permit, and the approved investigation Workplan, the following analyses were approved by NMED.” The Permittee then lists the analytical methods for soils, groundwater, and excavation confirmation samples. A reference to the analytical requirements outlined in Appendix A of the Permit for TMD were part of the 2004 investigation and do not apply to this investigation. The analytical requirements for this investigation are outlined in NMED’s June 5, 2006 letter *Requirements for Work Plan Submittal Regarding Three Mile Ditch and Evaporation Ponds Corrective Action Investigation Report*, the October 2006 *Three-Mile Ditch Corrective Action Investigation Workplan* (Work Plan), and NMED’s December 28, 2006 *Approval with Modifications Three-Mile Ditch Corrective Action Investigation Workplan*. The Permittee must revise this section to remove the reference to Appendix A.

**Comment 28**

In Section 5.1 (Required Analyses), page 28, the Permittee lists the analytical methods for groundwater analyses. In accordance with the Work Plan, groundwater samples were to be analyzed for specific conductivity. The analyses for specific conductivity were not found in this Section, nor were the results found in Table 5 (Three Mile Ditch Groundwater Analytical

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Results) or in the laboratory reports. The Permittee must revise the Report to explain why groundwater samples were not analyzed for specific conductivity.

#### **Comment 29**

Section 5.1 (Analytical Methods), page 29, the Permittee states “Excavation Confirmation Samples: [bullet 1] excavations near TMD-1 and TMD-7 – TCLP Lead (Method 6010), [bullet 2] all other excavations – GRO, DRO, BTEX, MTBE, RCRA 8 Metals (same methods as for soil boring samples).” Section 5.1 (Three Mile Ditch) of the Work Plan states “[s]oil samples will be analyzed for the following: gasoline-range organics (GRO), diesel-range organics (DRO), benzene, toluene, ethylbenzene and xylenes (BTEX), methyl tertiary-butyl ether (MTBE) and RCRA 8 metals.” It is not clear why the confirmation samples collected from TMD-1 and TMD-7 were analyzed only for TCLP lead. The Permittee must revise the Report to explain why the required analyses were not conducted for samples obtained at these locations. The Permittee may be required to complete additional sampling to address this omission.

#### **Comment 30**

In Section 5.2 (New Mexico Soil Screening Levels), the Permittee discusses the application of the New Mexico risk-based soil screening levels for the purpose of identifying appropriate clean-up levels for soils. The Permittee states on page 29 that “TMD extends from Navajo property along Eagle Creek for most of its distance to the EPs, crossing agricultural property owned by three different individuals. There are no residences near TMD and none would be expected in the future because of the proximity to the floodplain of Eagle Creek and the Pecos River. Given the setting and potential exposure scenarios for TMD soils, concentration levels for detected compounds in this investigation have been compared with the lower of the Industrial/Occupational screening level or the DAF-20 screening level.” TMD crosses private property and the contamination is in direct contact with groundwater. The Permittee must therefore apply the following standards to the analytical data: If investigation activities occurred onsite within the refinery, the analytical data must be compared to the industrial/occupational and DAF 1 scenarios. If the investigation activities occurred off-site (whether Holly-owned or private property), the residential, DAF 1, and construction worker scenarios must be applied. The Permittee must use the December 2009 NMED Soil Screening Levels (NMED SSLs) instead of the 2006 version. Note if a DAF 1 standard is not available for a constituent, then the Permittee must apply the residential standard (*e.g.*, for lead, 400 mg/kg must be applied). The Permittee must revise the Report accordingly. See also Comment 6.

#### **Comment 31**

In Section 5.2 (New Mexico Soil Screening Levels), page 29, the Permittee states “[g]iven the setting and potential exposure scenarios for TMD soils, concentration levels for detected

compounds in this investigation have been compared with the lower of the Industrial/Occupational screening level or the DAF-20 screening level. This value is referred to as the Critical Soil Screening Level (CSSL). The CSSL and the source of that value are provided in the soil analytical summary tables (Tables 2, 3, and 4).” In the Report, when referencing the CSSLs, the Permittee must identify which soil screening level is being applied (e.g., residential, industrial).

### **Comment 32**

In Section 6.6.1 (Sample Data Tables), page 36 and 37, bullet 4, the Permittee states “**Result:** the concentration for the listed analyte, if detected. If not detected, the Result will be the Standard Quantitation Limit (SQL). A result with a yellow highlight and red bold font means that the analyte was detected above the indicated CSSL or GWS.” The SQL does not seem to be mentioned anywhere else within the Report. It is not clear where within the tables the SQL is presented, nor is the SQL defined. The Permittee must revise the Report to address the SQL.

### **Comment 33**

In Sections 6.7.2.1 (TMD-1) and 6.7.2.2 (TMD-7), page 38, the Permittee states “[t]he samples collected from this area were analyzed for TCLP lead only.” It is not clear why the confirmation samples were not analyzed for GRO, DRO, BTEX plus MTBE, and RCRA metals as required by the Work Plan. The Permittee must provide an explanation in the revised Report. Based on the information provided in the revised Report, additional work may be required. See also Comment 29.

### **Comment 34**

In Section 6.7.2.1 (TMD-1), page 38, the Permittee states “[t]he samples collected from this area were analyzed for TCLP lead only. The concentration of TCLP lead reported for the composite sample from the near surface soils was 5.73 mg/L. The original sample from the 0-1 ft bgs interval in TMD-1 contained total lead at a concentration of 7,850 mg/kg. This composite sample confirmed that the excavation occurred in the correct area.” In the revised Report, the Permittee must explain why a composite sample was used to confirm the location of where the excavation occurred rather than using the surveyed coordinates from the previous investigation. The Permittee must also revise the Report to further explain how TCLP metals (lead) data from this investigation are comparable to total metals (lead) data from the previous investigation and how these data allowed the Permittee to determine that the investigation occurred in the correct location. See also Comment 9.

**Comment 35**

In Section 6.7.2.1 (TMD-1), page 38, the Permittee states “[t]he reported concentrations for TCLP lead from the bottom and side wall samples were below the RL of 0.2 mg/L with the exception of the east and west side wall samples. The east side wall sample contained TCLP lead at a concentration of 2.06 mg/L, which is below the TCLP limit for hazardous waste characterization. The west side wall sample contained TCLP lead at a concentration of 7.22 mg/L, which is above the TCLP limit for hazardous waste characterization.” This location still contains hazardous levels of lead. In addition, it is unknown if total lead concentrations are present at concentrations above or below the residential or industrial NM SSLs (the soil was not analyzed for total lead). The Permittee must justify why additional work is unnecessary in this area, or propose additional work. Based on the review of the revised Report, the Permittee will likely be required to conduct additional work at this location.

**Comment 36**

In Section 6.7.2.3 (TMD-10), page 39, the Permittee states “[t]he samples from this excavation area were analyzed for GRO, DRO, BTEX, MTBE and total metals. The concentrations of GRO, DRO and VOCs (BTEX and MTBE) were either below the RL or below the CSSL for the respective compounds in all samples. The composite sample from the surface soils near TMD-10 contained total arsenic, selenium and mercury at concentrations exceeding the CSSL. None of the confirmation samples from the excavation contained selenium above the CSSL. One sample (northeast sidewall) contained arsenic above the CSSL. Samples from the northeast sidewall, southwest sidewall, northwest sidewall and bottom of the excavation contained mercury above the CSSL.” The Permittee must address the following in the revise Report:

- a. This paragraph references the CSSL; the Permittee must identify which CSSL is being referenced (e.g. DAF 20, DAF 1, Industrial/Occupational).
- b. The Permittee must clarify if there was only one composite confirmation sample collected, and identify if confirmation samples TMD-10 N.E. Side, TMD-10 S.W. Corner, TMD-10 N.W. Corner, TMD-10 Middle Pit, and TMD-10 E.E. Corner were discrete samples.
- c. “TMD-10 Composite” was analyzed for VOCs (no VOCs were detected). Due to the likelihood of volatilization during mixing, the VOC results for composite samples are not considered valid. Therefore, additional investigation activities may be required.

**Comment 37**

In Section 6.7.2.4 (TMD-11 to TMD-20), page 39, the Permittee states “[m]ultiple stages of excavation occurred in the area between TMD-11 and TMD-20. The samples from these excavations were analyzed for GRO, DRO, BTEX, MTBE and total metals. Additionally, one set of samples from this area was analyzed for metals.” The last two sentences make reference to the analyses for metals. The Permittee must clarify what set of samples were analyzed for metals and provide the list of metals included in the analyses.

**Comment 38**

In Section 6.7.2.4 (TMD-11 to TMD-20), page 39, the Permittee indicates the excavation between locations TMD-11 to TMD-20 was conducted in multiple stages during May, June, August, and September of 2007. With the exception of the May 2007 description, the Permittee describes the segment of the ditch between TMD-11 and TMD-20 that was excavated during the other months (e.g., June 2007 states that the June 2007 excavation was conducted in the areas around W-1 and W-3; August 2007 states the August 2007 excavation was conducted in the areas between TMD-11 and TMD-12). The Permittee must revise the Report to identify the location between TMD-11 and TMD-20 that was excavated during May 2007. See also Comment 13.

**Comment 39**

In Section 6.7.2.4 (TMD-11 to TMD-20), page 40, the Permittee indicates that in June and August 2007, 12 and 20 additional confirmation samples were collected, respectively. The Permittee must revise the Report to list the locations and designations of the additional samples. The Permittee must also identify where the analytical data is presented in the Report and what figure(s) show these locations.

**Comment 40**

In Section 6.7.3 (Stock Pile Soil Samples), page 41, the Permittee states “[e]xcavation stockpile soil samples were analyzed for GRO, DRO, BTEX, MTBE, and total metals.” The stock pile samples were composited, allowing for the potential loss of VOCs; these data are not valid. No revision to this Report is necessary; however, in the future, the Permittee must always collect discrete samples for VOC analysis. See also Comment 15a.

**Comment 41**

In Section 6.7.3.4 (SP5), page 42, the Permittee states “[t]he 12 composite samples collected from the largest stockpile, SP5, contained detectable concentrations of DRO ranging from 24.6

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to 1990 mg/kg, which are below the CSSL.” The NM SSLs do not have a numerical value for DRO. The Permittee must use the *New Mexico Environment Department TPH Screening Guideline*, October 2006 (NMED TPH SG) for DRO and apply the standard for Unknown Oil in Table 2a (200 mg/kg). The Permittee must revise the Report to reference the correct screening and cleanup levels and clarify the above statement. The Permittee must also revise the Report to identify the designations for the 12 composite samples and identify where the soils from stockpile SP5 were disposed. See also Comment 56.

#### **Comment 42**

In Section 6.7.4.5 (QC Samples), page 44, the Permittee states “QC samples included field duplicates, equipment blanks, field blanks, and trip blanks associated with groundwater samples.” It is unclear if QC samples were collected for soil. The Permittee must revise the Report either to include the QC information collected for soils or to explain why this information was not collected.

#### **Comment 43**

In Section 6.7.4.5 (QC Samples), page 44, the Permittee states “QC samples included field duplicates, equipment blanks, field blanks, and trip blanks associated with groundwater samples...Field duplicates are collected from randomly selected wells. None of the field duplicates collected in 2007 were from wells associated with TMD. Thus, the results are not discussed in the report.” In the future, if the investigation requires monitoring wells to be sampled, the sampling must occur during the time of the investigation and the appropriate number of duplicates must be collected from locations directly related to the investigation. No revision is necessary.

#### **Comment 44**

Section 6.7.5 (Sample Analysis Issues), page 45, addresses confirmation samples W-1, W-2, W-3, W-4, W-5, and W-6. These samples were collected from TMD-11 to TMD-20 and exceeded their holding times because of late sample receipt or by conducting re-extraction after the holding time had expired. In addition, many of the samples were not collected using proper sampling protocol. The validity of these results is questionable. Upon review of the revised Report, NMED will determine whether additional sampling is required. No revision is necessary.

#### **Comment 45**

In Section 7.1 (Summary of Investigation and Analytical Results), page 47, bullet 5, the Permittee states “[a]s noted in the field logs, a heavily stained material was encountered and

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removed from depths ranging to 8 to 15 ft bgs.” This sentence references field logs; however, field logs were not provided in the Report. The Permittee must revise the Report to include the field logs.

#### **Comment 46**

In Section 7.1 (Summary of Investigation and Analytical Results), page 48, the Permittee states “[m]onitor well results also indicate that TMD has had little impact on metals in groundwater. Metals concentrations appear to be related to deteriorating pipe. These older wells were cased with stainless steel and the results are consistent with corroding stainless steel pipe. Previous results on samples from these wells in prior studies and monitoring events have also indicated the effects of deteriorating pipe.” The Permittee must provide information, including data, supporting the claim that the metals concentrations are the result from the corrosion of stainless steel pipe, as well as explain how this was determined (e.g., provide technical reports documenting experimental results). The Permittee must identify the applicable wells and which metals are thought to be contributing to this contamination. NMED suggests the Permittee review the attached document titled *Report on the Corrosion of Certain Alloys* (EPA, July 2001). NMED may require the Permittee to submit a well replacement work plan that addresses the replacement of wells along TMD. The Permittee must revise the Report accordingly. See also Comment 56.

#### **Comment 47**

The Permittee states in Section 7.2 (Conclusions) (TMD-1), page 49, that “[a]n exceedance for TCLP lead [was detected] in the confirmation sample from the western sidewall of the excavation. However, this location is within the refinery property just east of Truck Bypass Road. In previous sampling events, nearby soil samples from locations TMD-2 and TMD-3 did not exhibit elevated levels for lead. Wells MW-29, MW-41, MW-42, MW-55, and MW-56 are located near TMD-1 with MW-55 adjacent to the northwest of the excavation. Lead was not detected above the detection limit in the 2006 and 2007 groundwater samples from these wells. The lead at this location does not appear to be mobile. Worker exposure to lead within the Refinery is controlled by the Refinery health and safety program. No further action is warranted in this area.” As stated in previous NOD’s, the Permittee must address contamination regardless of whether the contamination is on property owned by the refinery. Based on review of the revised Report, additional investigation/excavation activities may be required at this location. The Permittee may choose to revise this statement to demonstrate why leaving contamination in place is justified for reasons other than refinery ownership of the land (e.g., risk assessment shows no unacceptable risk).

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**Comment 48**

The Permittee states in Section 7.2 (Conclusions) (TMD-10), page 49, that “[e]xcavation of impacted soil in this area has been completed. Although arsenic was present above the CSSL in one confirmation sample and mercury was present above the CSSL in all but one of the confirmation samples, the concentrations are below the industrial/occupational and construction worker SSLs. No further action is warranted on this section of TMD.” The Permittee must revise the Report to identify which CSSL arsenic and mercury exceeded. VOC analysis was also conducted; it is not clear if these samples were composited. The Permittee must revise the Report to indicate which sample locations at TMD-10 were composited and which samples were discrete samples. Based on review of the revised Report, additional investigation activities may be required in this area.

**Comment 49**

The Permittee states in Section 7.2 (Conclusions) (TMD-11 to TMD-20), page 49 that “[c]onfirmation samples demonstrate that organic compounds have been adequately removed from the area to levels below the CSSL.” The data results from the confirmation samples do not necessarily demonstrate that organic compounds have been adequately removed from TMD-13 to TMD-20 due to compositing of confirmation samples, which likely caused a loss of VOCs prior to being analyzed by the laboratory. The Permittee must evaluate whether it can be demonstrated that all contaminated soils containing VOCs at concentrations greater than applicable cleanup levels have been removed from this area. See also Comment 15a.

**Comment 50**

The Permittee states in Section 7.2 (Conclusions), page 50, “[m]onitor wells in the area do not contain concentrations of organic compounds above the GWS. Although a few metals are present at concentrations above the GWS, these metals appear to be the result of deteriorating well screens and not due to leaching of metals from soil.” The Permittee must revise the Report to support the above statement, demonstrate how the presence of metals are the result of deteriorating well screens, and identify the specific metals referred to in the assertion. See also Comment 46.

**Comment 51**

In Section 8 (Recommendations), page 51, the Permittee states “[b]ased on the information obtained from previous studies and from the additional corrective action investigation, limited soil impacts were present along TMD. Excavation completed as part of the additional corrective action investigation has resulted in the removal of the impacted soil. No additional investigation or delineation of TMD is necessary.” The investigation has many data gaps ranging from data

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quality exceptions, incorrect sampling methods (e.g., compositing VOC samples), known contaminants left in place (lead at hazardous concentrations), and general inconsistencies within the Report. The Permittee should consider revising the Report to include information demonstrating why additional corrective action is not needed along TMD. The Permittee will likely be required to redo some investigative activities.

#### **Comment 52**

In Section 8 (Recommendations), page 51, the Permittee states “[s]elected existing monitor wells along TMD (MW-8, MW-9, MW-17, MW-20, MW-21 MW-27, MW-29 and MW-89) should be monitored semi-annually for three years for chromium, lead and selenium as well as general water quality parameters, TDS and nitrates/nitrites. At the end of three years, results will be evaluated to determine groundwater trends and if monitoring can be terminated.” The monitoring schedule for these wells is addressed in the Facility Wide Groundwater Monitoring Work Plan. The Permittee must revise the Report to indicate that the monitoring schedule for these wells is included in the Facility Wide Groundwater Monitoring Work Plan.

#### **Comment 53**

In reference to TMD-10: The Permittee states in Section 6.2 (TMD-10 Investigation Area), page 11 of the Work Plan that “[i]n order to determine the composition and concentrations of contaminants in that area, a test pit will be excavated along the newly installed pipeline where contaminants were discovered by PNM. Soil samples will be collected at the surface, between the surface and the water table, directly above the water table and at the depth that corresponds with the maximum depth of the trench dug by PNM. Correspondence with PNM will be necessary to determine the exact location of the petroleum contamination and the depth of the trench.” The Report does not fully address the details of this excavation or indicate if any of these activities were previously conducted. The Permittee must revise the Report to discuss if samples were collected at the surface and between the surface and the water table, identify the location of the excavation and where PNM discovered contamination, describe correspondence with PNM, and describe the depth of the excavation compared to the maximum depth of the trench dug by PNM. The Permittee must fully address the details of this excavation and describe any deviations from the Work Plan.

#### **Comment 54**

Table 3 (Three Mile Ditch Excavation Confirmation Soil Samples) provides the analytical results for the surface composite samples collected at TMD-1, TMD-7, and TMD-10. The Permittee must clarify in the text of the Report if the soils from these surface composite samples were removed from the excavation or left in place. If the soil was removed, the Report must indicate that these were not confirmation samples.

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**Comment 55**

In Table 3 (Three Mile Ditch Excavation Confirmation Soil Samples), the results for TMD-1 include TCLP lead results for the Surface Composite sample (5.73 mg/L) and a bottom sample (TMD-1 Bottom Pit) (<0.200 mg/L). The Permittee must clarify if the soil from the Surface Composite sample was removed from TMD-1 and if the sample designated as TMD-1 Bottom Pit was collected below the Surface Composite sample. If the Surface Composite soil was removed, the Permittee must explain why the sample collected at this location is considered a confirmation sample. The Permittee must revise the Report accordingly.

**Comment 56**

In the Tables Section, the TPH-DRO SSL was applied incorrectly. The tables show the standard as 2.00E +3 (NMED DAF 20); however a DAF 20 numerical value for DRO does not exist. The Permittee must revise the Report to use the *New Mexico Environment Department TPH Screening Guideline*, October 2006 (NMED TPH SG) for DRO. The standard for Unknown Oil in Table 2a of the NMED TPH SG is 200 mg/kg and must be applied. The Permittee must revise all of the tables in the Report to reflect this correction. See also Comment 41

**Comment 57**

Table 6 provides the depth to groundwater measurements for the monitoring wells sampled. The Permittee must revise Table 6 to include the elevation measurements for the top of the well casing, as well as the groundwater elevations.

**Comment 58**

Tables 2, 3, and 4 have an "SSL Source Column" that either states "NMED-DAF 20" or "NMED-SSL." The DAF 20 is a NMED SSL. The Permittee must revise the Tables to specifically identify which SSL is being applied (e.g., industrial/Occupational, DAF 1, Residential). The Permittee must revise the tables of the Report accordingly.

**Comment 59**

Table 3 (Three Mile Ditch Excavation Confirmation Soil Samples), provides data for sampling locations 000N, 000B, 000S, 000W, 100S, 100N, 100B, 200B, 200N, 200S, 300B, 300S, 300N, 400N, 400S, 400B, 438N, 438B, and 438E. Some of these locations are vaguely addressed in the text of the Report. The Permittee must revise the text of the Report to discuss the locations for each of the samples collected. In addition, Figure 5 (Approximate Extent of Excavations Between TMD-11 and TMD-20) shows the locations for samples 000, 100, 200, 300, 400, and 483, but does not show the locations for 000N, 000B, 000S, 000W, 100S, 100N, 100B, 200B,

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200N, 200S, 300B, 300S, 300N, 400N, 400S, 400B, 438N, 438B, and 438E. The Permittee must explain how sample locations 000N, 000B, 000S, 000W, 100S, 100N, 100B, 200B, 200N, 200 S, 200B, 300S, 300N, 400N, 400S, 400B, 438N, 438B, and 438E are represented/identified in Figure 5 or add the locations to the figure. The Permittee must revise the Report accordingly.

**Comment 60**

In Table 3 (Three Mile Ditch Excavation Confirmation Soil Sample), the Permittee includes a footnote that states “in the diesel range, although there was no diesel pattern observed in the blank. The samples were re-extracted. Re-extractions were performed outside the holding time. The chromatographic patterns and sample results of the re-analyses were similar to those of the original analyses.” The first sentence is incomplete and therefore unclear. The Permittee must correct this footnote (in all applicable locations) in the revised Report.

**Comment 61**

Table 3 (Three Mile Ditch Excavation Confirmation Soil Sample), pages 3 and 6 have a column for a “Qualifier” which denotes a “N” and “D2.” The “N” and “D2” are not defined in the footnotes. The footnotes define a B (this analyte was detected in the method blank) but a B is not found within the table. The Permittee must revise Table 3 to define “N” and D2” and only include footnote “B” if it is actually cited.

**Comment 62**

Tables 2, 3, and 4 contain the footnote “SSL Source – Soil Screening Level Regulatory Document.” This footnote does not provide the source of the SSL. The Permittee must revise this footnote in the revised Report to specify which regulatory document is being referred to (e.g., SSL Source –NM SSL Rev 5.0 (2009)).

**Comment 63**

In Table 5 (Three Mile Ditch for Groundwater Analytical Results), the Permittee includes a footnote “H” for “Analyze[d] outside of Hold Time.” Soil samples were also analyzed outside of holding times as described in Section 6.7.5 (Sample Analysis Issues) but were not identified in the Tables. The Permittee must revise the Tables to identify all samples where holding times were exceeded. In addition, the text does not discuss holding times for the water samples as identified in Table 5. The Permittee must revise the Report to discuss the implications of the missed holding times in the text. See also Comment 44.

**Comment 64**

Figure 5 (Approximate Extent of Excavations Between TMD-11 and TMD-20) shows the confirmation sample locations for West Ditch 7 through West Ditch 11. While the length of the excavation in the vicinity of West Ditch 7 and 8 is approximately 500 feet long, only two confirmation samples were collected. The excavation at West Ditch 9 is approximately 300 feet long; only one confirmation sample was collected. The excavation area of West Ditch 10 and 11 is approximately 250 feet long and only two confirmation samples were collected. Based on the length of the excavations and the number of confirmation samples collected, a representative number of confirmation samples were not collected (NMED does not view 200 foot spacing or greater to be representative). The Permittee must revise the text of the Report to include an explanation for the limited number of confirmation samples collected in these areas. The Permittee will likely be required to conduct additional sampling at these locations.

**Comment 65**

Appendix D is written as if the work has not yet been completed (*i.e.*, in future tense). The Permittee must revise Appendix D of the revised Report to describe what was actually completed during the investigation rather than stating what will be completed.

**Comment 66**

The Report does not address well development procedures for the newly installed monitoring well. The Permittee must revise the Report to include all well development activities (e.g., method(s) used for development, dates when development occurred).

The Permittee must submit a revised *Three-Mile Ditch Additional Corrective Action Investigation Report* to NMED no later than January 21, 2011. The revised Report must be submitted with a response letter that details where all revisions have been made, cross-referencing NMED's numbered comments. In addition, an electronic version of the revised Report must be submitted that identifies where all changes have been made in redline strikeout format.

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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

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