GW - 001

REPORTS

Investigation
Report Group 3

12/2009

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

January 24, 2011

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

RE: NOTICE OF DISAPPROVAL
INVESTIGATION REPORT GROUP 3
WESTERN REFINING SOUTHWEST INC., BLOOMFIELD REFINERY
EPA ID# NMD089416416
HWB-WRB-10-001

Dear Mr. Schmaltz:

The New Mexico Environment Department (NMED) has received Western Refining Southwest, Inc., Bloomfield Refinery (the Respondents) *Investigation Report Group 3 (SWMU No. 4 Transportation Terminal Sump, SWMU No. 5 Heat Exchanger Bundle Cleaning Area, AOC No. 22 Product Loading Rack and Crude Receiving Loading Racks, AOC No. 23 Southeast Holding Ponds, AOC No. 24 Tank Areas 41 and 43, AOC No. 25 Auxiliary Warehouse and 90-day Storage Area, and AOC NO. 26 Tank Area 44 and 45)* (Report) dated December 2009. NMED has reviewed the Report and hereby issues this Notice of Disapproval (NOD) with the following comments.

Comment 1

In Section 3.3 (Soil Boring Installation, Field Screening, and Soil Sample Collection), under SWMU No. 4, page 10, the Respondents state, "[o]ne soil boring (SWMU 4-1) was drilled in a location west of Bullet 23 within the vicinity of the former transportation sump." It is not clear from the statement if "Bullet 23" is referring to bullet tank 23. Soil boring location SWMU 4-1 is provided in Figure 6 (SWMU No. 4 Sample Location Map); however, the location of "Bullet 23" was not included. Revise the Report to identify the structure of "Bullet 23" and show it on Figure 6.

Comment 2

The Respondents discuss monitoring well development and groundwater sampling in various sections throughout the Report, including Section 3.4 (Monitoring Well Installation, Completion, and Development), Section 3.6 (Ground Water Sampling and Vadose Zone Vapor Sampling), Section 4.5 (Monitor Well Development), Section 6.4 (Ground Water Sampling) and Appendix F (Field Methods). Each Section must be referenced to know what monitoring well development and groundwater sampling activities occurred during the investigation. Revise the Report to include one section, and subsections as appropriate, that addresses all monitoring well development and groundwater sampling activities (e.g. sampling methods and procedures), or include all details in an Appendix (e.g., Appendix F) and reference the Section or Appendix throughout the Report, where appropriate.

Comment 3

In Section 3.6 (Ground Water Sampling and Vadose Zone Vapor Sampling), pages 14 and 15, the Respondents list the analytes and analytical methods conducted for the groundwater samples. The *Investigation Work Plan Group 3, dated June 2008* (Work Plan) required the analysis of manganese as part of the general chemistry parameters. Manganese was not listed in Section 3.6 but was analyzed. Further, the analytical information provided in Section 3.6 does not correspond with the groundwater information provided in Section 6.6 (Groundwater Chemical Analytical Results) (e.g., Section 6.6 includes the analyses of manganese; however, manganese was the only general chemistry parameter not addressed in Section 3.6). Revise the Report to clarify these discrepancies and provide the correct information. The Respondents may choose to cross-reference a section containing the appropriate information, rather than listing the information twice.

Comment 4

In Section 3.6 (Ground Water Sampling and Vadose Zone Vapor Sampling), page 15, bullet 9, the Respondents list analysis for "[d]issolved metals (iron, calcium, magnesium, potassium, and sodium) by USEPA method 6010B." In Section 5.8 (Chemical Analyses), page 14 (Work Plan), the Respondents state, "[i]n addition, groundwater samples will also be analyzed for the following general chemistry parameters" and then lists bicarbonate, chloride, sulfate, calcium, magnesium, sodium, potassium, manganese, nitrate/nitrite, and ferric/ferrous iron. The Respondents do not include a reference to dissolved metals in the Work Plan, nor indicate that the general chemistry parameters would be collected as dissolved. This also does not correspond with the analytical information provided in Section 6.6 (Ground Water Chemical Analytical Results) of the Report. Revise the Report to clarify this discrepancy. If water samples were collected for dissolved metals analysis in addition to sample collection for total metals analysis, the Report must address the sampling methods associated with collecting dissolved samples (e.g., 0.45 micronfilter use).

Comment 5

In Section 3.6 (Ground Water Sampling and Vadose Zone Vapor Sampling), page 15, the Respondents state, "[t]he depth to groundwater and depth-to-SPH were measured to the nearest 0.01 ft and recorded relative to the surveyed well casing rim." The Respondents do not identify the instrument used to collect the depth to water and depth to separate phase hydrocarbon (SPH) measurements. Revise the Report to provide the instrument(s) used to collect these measurements, and revise this section to address how the monitoring wells were purged and the amount purged. Alternatively, reference Appendix F (*see* also Comment 2).

Comment 6

The Respondents discuss quality assurance/quality control measures in Section 3.8 and address the collection of equipment blanks, field duplicates, and field blanks. The Respondents do not discuss the use of trip blanks. Revise the Report to discuss trip blanks, if used. If trip blanks were not used, provide a discussion of why the trip blanks were not included with the sample shipments to and from the laboratory.

Comment 7

In Section 3.10 (Collection and Management of Investigation Derived Waste), page 17, the Respondents state, "[a] total of three composite samples were collected from drums containing soil with known constituent concentrations above NMED residential screening levels. A composite sample was collected to characterize soil for waste disposal from AOC No. 24, AOC No. 26, AOC No. 22, and SWMU No. 4....Each composite soil sample was analyzed for the following: [Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX)] and [Methyl tertiary butyl ether (MTBE)] by EPA Method 8021B; Polycyclic Aromatic Hydrocarbons (PAHs) by EPA Method 8310; TCLP RCRA 8 Metals by EPA Method 6010B; and Ignitability, Corrosivity, and Reactivity." Revise 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.

Comment 8

In Section 4.3 (Subsurface Conditions), page 21, the Respondents describe the underground piping associated with AOC No. 22, AOC No. 24, and AOC No. 26. In accordance with the Order, Section X.C.13 Item 2, utilities must be shown on the site plan/figures. Provide and label all utilities on all figures; New Mexico One Call, Inc. color coding may be used.

Comment 9

In Section 4.4 (Soil Boring Installation, Monitoring Well Construction, and Boring Abandonment) and Section 6.1 (Soil Sampling), the Respondents provide an adequate detailed discussion of the activities associated with soil sampling. Descriptions of the methods used for groundwater sampling are not as detailed. Revise Section 4 (Field Investigation Results) of the Report to provide more information regarding type and purpose of field investigation activities performed, field screening measurements, and sampling results for groundwater, and expand Section 6.4 (Ground Water Sampling) to include more information that explains the methods used for sample logging, and field screening, and field screening results (*see* also Comment 2).

Comment 10

In Section 4.4 (Soil Boring Installation, Monitoring Well Construction, and Boring Abandonment), the Respondents describe the methods and details of soil boring installation, monitoring well construction, and soil boring abandonment activities. However, the Respondents do not use the same format when describing the investigation details for each SWMU or AOC. Examples included:

a. The Respondents address the number of surface samples and soil borings installed at SWMU No. 5, AOC No. 22, AOC No. 24, AOC No. 25, AOC No. 26, but this information was not included for SWMU No. 4.

b. The Respondents discuss impacts being detected or not detected based on field screening results and visual or olfactory observations for some SWMUs and AOCs, while other descriptions do not include this information. For example, AOC No. 22, page 24, the Respondents state, "[t]here was no indications of impacts based on the field screening results nor was there any visual or olfactory evidence of impacts from the surface to a depth of 10 feet bgl [below ground level]." This information was not included for AOC 24-5 and AOC 24-6; the Respondents state, on page 28 that "[o]n April 8, 2009 the drilling rig was set up on location AOC 24-5 [and AOC 24-6]. Sample collection was accomplished using the HSA drilling method and split spoon samplers. The sampling terminated at 10 feet bgl. The borehole was grouted to the surface on April 9, 2009."

Revise this Section of the Report to provide consistent information when describing investigation details for each SWMU and AOC.

Comment 11

In Section 4.4 (Soil Boring Installation, Monitoring Well Construction, and Boring Abandonment), under AOC 22-13, the Respondents state, "[g]round water sample AOC 22-13-GW was collected using a disposable bailer. The ground water in the augers was not purged [prior] to sampling since saturation had been encountered less than 24 hours earlier and would be representative of the formation's ground water." AOC 22-13 was not designated for a well installation, but because of the field screening measurements and visual observation, the Respondents decided to collect a groundwater sample. However, AOC 22-12/TW-01 was completed as a temporary well; the Respondents do not discuss well purging or if a sample was collected after the well was purged. The Respondents state, "[o]n April 14, 2009 the temporary well was gauged and the depth to ground water was measured at 37.95 feet bgl. The total depth of the well was gauged as 42.51 feet bgl. Ground water sample AOC 22-12-GW was collected using a disposable bailer. It was decided to not plug and abandon the boring but rather to complete the boring as a temporary well TW-01." Revise the Report to indicate if the temporary well was purged prior to sampling (*see* also Comment 2).

Comment 12

Section 4.4 (Soil Boring Installation, Monitoring Well Construction, and Boring Abandonment), pages 29 and 30, discusses the drilling of MW-65 and states, "[d]uring the installation of the well the bentonite formed a "bridge" between the ODEX casing and the well casing. When the ODEX casing was being removed from the borehole the well casing moved, which caused the proposed well settings to be adjusted. The ODEX casing and well casing were removed from the borehole and the field activities ceased for the day. On April 17, 2009 the borehole for AOC 26-8/MW-65 was re-entered and reamed out to a depth of 44.5 feet bgl using the HSA drilling method...The rig was sent back to this location on April 20, 2009 to collect and screen the soils from 2 feet to 10 feet bgl. The borehole was grouted to the land surface." It is not clear from the description if a second borehole was drilled to collect soil samples from two to ten feet and then abandoned. Revise the Report to clarify if a second borehole was drilled specifically to collect samples on April 20, 2009.

Comment 13

In Section 5 (Regulatory Criteria), page 34, the Respondents state, "[t]he screening levels in Table 9 are based on residential land use. Since the investigation data for SWMU No. 4, SWMU No. 5, AOC No. 23, and AOC No. 25 indicate there is no threat to ground water in these areas, the applicable screening levels do not include the soil-to-groundwater leachate pathway." Revise this section to explain how it was determined that there is no threat to groundwater at SWMU No. 4, SWMU No. 5, AOC No. 23, and AOC No. 25.

Comment 14

In Section 5 (Regulatory Criteria), page 34, the Respondents state, "[t]he total petroleum hydrocarbon (TPH) screening levels are taken from NMED's October 2006 TPH Screening Guidelines [NM TPH SSL]...Where information is available to identify particular product types, the screening level is selected accordingly from either Table 2a or 2b of NMED guidance. If two products have been handled in the same area (e.g., both diesel and gasoline at the product loading rack), then the most conservative (lowest) screening level of the two products is used." It is not clear how the Respondents will apply the lowest screening level of two products (gasoline and diesel) when there is no numeric standard for one of them (gasoline). Revise the Report to clarify this discrepancy.

Comment 15

In Section 5 (Regulatory Criteria), page 34, the Respondents state, "[t]he total petroleum hydrocarbon (TPH) screening levels are taken from NMED's October 2006 TPH Screening Guidelines...[w]here information is available to identify particular product types, the screening level is selected accordingly from either Table 2a or 2b of NMED guidance...[s]creening values from Table 2b are used only in situations where impacts to shallow soils do not pose a threat to underlying groundwater and there is limited potential for exposure to impacted soil (e.g., elevated concentrations occur mostly at depth and not at the land surface)."

a. In accordance with the NM TPH SSLs, the values from Table 2b should only be applied to situations where "depth to groundwater is less than 15 feet from the ground surface and within 30 feet of an occupied structure." According to the boring logs, groundwater was encountered from approximately 36 to 55 feet bgs. Values from Table 2b are therefore not appropriate. Revise the Tables to reflect the use of only Table 2a.

b. Revise the Report to describe the specific site conditions for applying Table 2a.

Comment 16

In Section 5 (Regulatory Criteria), pages 34 and 35, the Respondents state, "[s]imilarly, there were detections of constituents in ground water samples that do not have screening levels. This includes the four constituents listed above for soil and magnesium, phenanthrene, bicarbonate, calcium, potassium and sodium. None of these constituents are classified as a carcinogen." The first sentence references detections in groundwater while the second sentence addresses constituents in soil. Revise the Report to correct this discrepancy, or otherwise clarify the meaning.

Comment 17

In Section 6.1.3 (AOC No. 22 – Product Loading Racks and Crude Receiving Loading Racks) and Section 6.1.7 (AOC No. 26 – Tank Area 44 and 45), pages 44, 50 and 51, the Respondents describe cumulative risk evaluations for AOC No. 22 and 26. The Respondents indicate the cumulative effects of certain constituents (e.g. cobalt, manganese) are not a concern because they are non-carcinogenic. It is inappropriate to make cumulative risk conclusions solely on whether the constituent is a carcinogen or a non-carcinogen. The Respondents must refer to Section 5 of the *Technical Background Document for Development of Soil Screening Levels (Revision 5.0 dated August 2009)* to determine cumulative risk. The Respondents must evaluate the data using a conservative approach by applying the maximum concentrations across the entire data set. All calculations and results from the assessments must be included in the revised Report.

Comment 18

In Section 6.1.3 (AOC No. 22 – Product Loading Racks and Crude Receiving Loading Racks), page 45, the Respondents state, "[f]ive of the constituents are listed as potential carcinogens based on the NMED and EPA sources referenced in Section 5.0. This could result in a cumulative carcinogenic risk level of 5.0 E-5." The Respondents must provide all calculations, results, and other supporting information from the risk assessments in the revised Report.

Comment 19

In Section 6.1.4 (AOC No. 23 – Southeast Holding Ponds) and Section 6.1.6 (AOC No. 25 – Auxiliary Warehouse and 90-Day Storage Area), the Respondents references the DAF of 20. Table 9 applies the DAF of 1. Revise the Report to clarify this discrepancy.

Comment 20

In Section 6.1.5, (AOC No. 24 – Tank Areas 41 and 43), under AOC 24-6, page 47, the Respondents state, "[a]ll the analytical results for the samples collected at AOC 24-6 were less than the non-residential screening levels with the exception of DRO in sample AOC 24-6 (1.5-2.0')." According to Table 11 the DRO concentration for AOC 24-6 is 1,400 mg/kg, which is less than the industrial screening level for DRO of 2.00E+03 mg/kg, as indicated in Table 11. Revise the Report to correct this discrepancy.

Comment 21

In Section 6.1.7 (AOC No. 26 – Tank Area 44 and 45), under AOC 26-9/MW-66, page 50, the Respondents state, "[t]here are numerous organic constituents, including volatile and semi-volatile organics that have concentrations above the non-residential screening levels in soil sample AOC 26-9 (36-38'). The concentration detected in AOC 26-9 at 36-38' are believed to be associated with ground water impacts in the area and not a soil source in the immediate area." Explain why the detections are believed to result from groundwater impacts and not a soil source, and discuss the suspected source of groundwater contamination that is affecting soils at 36-38 ft bgs. Revise the Report accordingly.

Comment 22

In Section 6.1.7, (AOC No. 26 – Tank Areas 44 and 45) under AOC 26-9/MW-66, and Section 7 (Conclusions and Recommendations) under AOC No. 22 – Product Loading Racks and Crude Receiving Loading Racks, pages 51, 59, and 60, the Respondents state, "[t]he screening level included in Table 10 for cobalt assumes a DAF of 1 for the soil-to-ground water pathway; however, cobalt is not detected in concentrations above the screening level in any of the ground water samples collected during the site investigation effort. Cobalt does not appear to present a threat to ground water and the soil-to-ground water pathway should not be considered to be complete at AOC No. [22 and 26]." Cobalt can be found in the catalyst used to remove sulfur from crude oil and its presence could be a result of refinery operations and not representative of a background concentration. Provide evidence for the assertion that cobalt is not a threat to groundwater. Concomitantly, re-evaluate the applicability of the DAF of 1 and consider calculating a site-specific DAF to determine if cobalt is a threat to groundwater. If a site-specific DAF is calculated, all calculations and results must be included in the revised Report.

Comment 23

In Section 7, (Conclusions and Recommendations) under AOC No. 22 and AOC No. 24, pages 60 and 61, the Respondents state that certain constituents (e.g., lead, arsenic, and manganese) "may not be an indication of actual impacted ground water but rather possible sampling artifacts resulting from the use of a bailer to purge the wells and collect ground water samples." The Respondents do not provide a description of the potential effects of the use of a bailer. In any event, such a conclusion cannot be made until the background study has been completed. No revision is necessary.

Comment 24

In Section 7 (Conclusions and Recommendations), pages 58 through 62, the Respondents recommend additional assessment for SWMU No. 4, and SWMU No. 5, and additional investigation for AOC No. 22 and AOC No. 26.

a. Provide the current and future status (operational/active, interim, and inactive) of all the SWMUs and AOCs in the Group 3 Investigation Report. Indicate if the SWMUs/AOCs are operational and how long will they remain active. Indicate if the structures in the SWMUs/AOCs will be completely removed once they are no longer in operation.

b. The Respondents recommend "[a]dditional assessment...to delineate the lateral extent of the impacts in soils near [SWMU 4-1]." Revise the Report to provide more information regarding the sump, including but not limited to dimensions of the sump, history of releases, if sampling was completed over the entire cross-section of the old sump area prior to backfilling, and if the Respondents intend on removing soil from the former sump area.

c. The Respondents recommend "[a]dditional assessment...at SWMU No. 5 to delineate the lateral impact to surface soils based on the reported concentrations of mercury." Revise the Report to include more information describing how cleaning activities were conducted for the heat exchangers and provide information regarding historical uses of the bundle cleaning pad (e.g., documentation of overflows from the concrete pad to the ground surface, and historical management of waste not associated with bundle cleaning).

d. The Respondents recommend "[a]dditional investigation ...for the impacted soils within AOC No. 22 for the area near borings AOC 22-4, and AOC 22-13. Some additional delineation of ground water impacts may also be useful and should be completed in consideration of any additional investigation to be completed at other nearby SWMUs/AOCs." Revise the Report to provide more information about the underground piping in relation to groundwater contamination. Indicate if all lines are still active/abandoned, and if any lengths have been replaced because of damage. Also provide information about historical releases that occurred near this area and list possible contaminants of concern.

e. The Respondents recommend "[a]dditional soil sampling near AOC 26-5...to confirm the limited presence of MTBE that was detected in the 1.5-2.0' sample interval. Additional monitoring wells may be considered to better define the up-gradient extent of ground water impacts." The Respondents must provide more information about the tanks, including but not limited to history of releases, condition of containment structures, valves, fittings, piping, and if tanks 44 and 45 are currently in use.

Comment 25

In Section 7 (Conclusions and Recommendations), under AOC No. 23, page 61, the Respondents state, "[t]he analyses for the soil samples did not detect the presence of any constituents at concentrations above the residential screening levels and most of the organic results were non-detect, with the exception of a few constituents that were qualified … due to laboratory contaminants (e.g., methylene chloride and acetone)…The ground water samples collected from MW-62 identified only manganese at concentrations above the screening levels (Table 16). The presence of only manganese above screening levels and no detections of petroleum constituents in water samples collected from MW-62 indicates that the manganese could be representative of background conditions rather than impacts from site operations; however, no background value has been established for manganese at this time…Corrective Action Complete without Controls is recommended for AOC No. 23."

a. Provide additional information for AOC No. 23 to include the current and future status of the AOC. Indicate if the AOC is operational/inactive, if the AOC structures will be completely removed once it becomes inactive, and discuss any history of releases.

b. Provide additional information to demonstrate that all groundwater and soil detections are below the Residential SSLs in order for AOC No. 23 to be considered for Corrective Action Complete. The Respondents must be able to demonstrate manganese is not a concern, and will not be a concern in the future, through a risk assessment or demonstrate that the detected concentration is within the range of background concentrations.

Comment 26

In Section 7, (Conclusions and Recommendations) under AOC No. 24 – Tank Areas 41 and 43, page 61-62, the Respondents state, "[o]ther inorganic constituents detected above screening levels include chloride, nitrate, and sulfate. Chloride and sulfate are naturally occurring constituents with wide-spread occurrence in ground water in the San Juan River Basin (Stone, W.J. and others, 1983). The absences of any refinery-related constituents (i.e. petroleum hydrocarbons) in the ground water sample collect[ed] from MW-64 indicates that the inorganic constituents might not be related to site operations." Chloride, sulfate, and high total dissolved solids are commonly found at high concentrations in refinery-produced water and at petroleum-contaminated sites. No response required.

Comment 27

In Section 7, (Conclusions and Recommendations) under AOC No. 24 – Tank Areas 41 and 43, page 61-62, the Respondents state, "[a]n assessment to evaluate the risk posed by the limited occurrence of TPH at location AOC 24-6 is recommended instead of any additional assessment and/or remediation." Discuss how the risk will be evaluated without conducting additional investigation activities and revise the Report accordingly.

Comment 28

In Section 7 (Conclusions and Recommendations), under AOC No. 25, page 62, the Respondents state, "[t]here were not detections of any constituents at concentrations above the residential screening levels in the soil samples. There were also no constituents detected in the ground water samples above the screening levels, with the single exception of manganese, which was only slightly over the screening level. There was not a sufficient volume of ground water present in MW-60 to collect a ground water sample during the second sampling event conducted in July 2009. Corrective Action Complete without Controls is recommended for AOC No. 25."

a. Provide additional information to include the current and future status of AOC No. 25. Indicate if AOC No. 25 is operational/inactive, discuss if the AOC No. 25 structures will be completely removed once it becomes inactive, and discuss the history of releases.

b. There is insufficient historical data for MW-60 to demonstrate that manganese or other constituents are not a concern. All groundwater and soil detections must be below the Residential SSLs in order for Corrective Action Complete to be considered. The Respondents must be able to demonstrate manganese is not a concern, and will not be a concern in the future, through a risk assessment or demonstrate that the detected concentration is within the range of background concentrations.

Comment 29

In Section 7 (Conclusions and Recommendations), under SWMU No. 4 Transportation Terminal Sump, page 58, the Respondents state, "[a]n additional assessment is recommended to delineate the lateral extent of the impacts in soils near AOC 4-1." The text of the Report references the Transportation Terminal Sump as SWMU No. 4 and Figure 6 (*SWMU No. 4 Sample Locations Map*) which identifies SWMU 4-1/MW-59 as a boring/monitoring well. There is no reference to an AOC 4-1. Revise the Report to correct this discrepancy.

Comment 30

Table 6 (Residential Soil Screening Levels) contains some apparent typographical errors. The residential values presented in the Table for arsenic and ethylbenzene are 3.59E+00 and 6.96E+01, respectively. The residential values listed in the New Mexico Soil Screening Levels (NMSSLs) for these constituents are 3.90E+00 and 6.97E+01, respectively. These errors were also carried over into the other tables within the Report. Revise all tables within the Report to correct these discrepancies.

Comment 31

The Respondents titled Table 9 as *Group 3 Soil Analytical Results Summary – AOC 23 and AOC 25*, which implies the table only presents data collected from AOCs 23 and 25. The table also includes data for SWMU No. 4 and SWMU No. 5. The Respondents titled Table 11 as *Group 3 Soil Analytical Results Summary – SWMUs No. 4 and 5, AOC 22 (Crude Receiving Rack) and AOC 24*, which implies the data provided in the table is only from these sites. The table does not include data from SWMUs 4 and 5. Ensure table titles correctly reference the data presented.

Comment 32

The Respondents apply non-residential screening levels in Tables 10 and 11. It is not clear how the Respondents determined which of the seven standards indicated in the footnotes were applied (e.g., Table 10 applied the DAF 1 to acetone for all depths; for bromobenzene the EPA Protection of Groundwater Risk-based SSL was applied for all depths). The data were applied to a mix of screening levels. To alleviate confusion and apply a more systematic approach, revise the tables and text of the Report to apply the data to the most conservative non-residential scenario (e.g., construction worker or industrial) and the residential scenario. Upon determining the most conservative scenario, explain why the selected screening level was chosen. Revise the Report accordingly.

Comment 33

In Table 11, column "AOC 22-16 (36-38')" has a superscript "1." This superscript is not defined in the footnotes on page 10 of 15 of Table 11. Revise the Report to define the superscript.

Comment 34

In Table 16, columns "MW-61, 05/13/2009," "MW-61, 07/16/2009," and "MW-62, 05/13/2009" the Respondents did not highlight the sample results above the screening level for manganese. Revise Table 16 accordingly.

Comment 35

NMED has the following comments on figures:

a. Report all sample results, including non-detects, in the figures. If a sample was not collected or the well is dry, this must be noted and indicated on the legend and the figure. For example, Figure 6 (SWMU No. 6 Sample Locations Map) reports the sample results for benzene and DRO for all the sampling locations, but Figure 14 (AOC No. 23 Sample Location Map) does not present any results for the sampling location at AOC No. 23.

b. Expand the scale of Figures 17 through 20 to include all Group 3 SWMUs and AOCs (i.e. include AOC No. 23) and report all sample results for all new, temporary, and current monitoring wells. If a sample was not collected or the well is dry, indicate this in the legend and note it as such on the figures.

c. Define all symbols on all figures (e.g., cross hatch shading on Figures 8 through 15).

Comment 36

On Figures 2, 5, 8 through 13, and 16 through 20, there are several tanks that are not identified.

a. Identify the unlabeled tanks west of Tank 44 in Figures 2, 5, 8 through 13 and 16 through 20.

b. Identify the unlabeled tanks south of SWMU No. 4 and west of Tank 41 in Figures 2, 5, and 17 through 20.

c. Identify the unlabeled tank north of B-12 thru B-21 in Figures 2, 5, and 17 through 20.

d. Provide an additional figure that identifies all Group 3 SWMU and AOC locations similar to Figure 17 to include AOC No. 23 and the diesel AST southwest of AOC No. 25.

e. Verify that tank 34 holds water and not product (e.g., label contents on the map or provide color symbolizing tank contents).

f. All tank details addressed in items a through e above must be summarized in a table and included in the revised Report. The table must contain the following headings: Tank ID, status (Active/Inactive), contents (e.g., gas, water, crude), location (e.g., southwest of AOC No. 25), and comments (e.g., release history, if known).

Comment 37

Provide more information for the crude sampling rack east of AOC No. 22, the L.P.G. loading area north of SWMU No. 4, the diesel AST southwest of AOC No. 25, and the gasoline pumps west of AOC No. 25 to determine whether they are operational/inactive. Include a discussion of any historical releases, description of the activities conducted at the SWMUs/AOCs, and indicate if these SWMUs/AOCs should be included in the Phase II investigation.

Comment 38

Revise Appendix F to include sections that describe field methods pertaining to the soil investigation and groundwater monitoring activities. The groundwater monitoring section must be expanded to describe how the monitoring wells were sampled (e.g., at each monitoring well the depth to water and depth to product measurements were collected using an oil/water interface probe, monitoring wells were purged and sampled using a dedicated bailer, samples were collected in pre-cleaned laboratory prepared containers). Include description of purging methods and how purge volumes were calculated, and all field equipment used while collecting soil and groundwater samples (_see_ also Comment 2).

The Respondents must address all comments contained in this NOD and submit a revised Report to NMED on or before May 1, 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 were made in red-line strikeout format.

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

Sincerely,

James P. Bearzi
Chief
Hazardous Waste Bureau

cc: J. Kieling, NMED HWB
D. Cobrain, NMED HWB
H. Monzeglio, NMED HWB
L. Tsinnajinnie, NMED HWB
C. Chavez, OCD
A. Hains, Western

File: HWB-WRB-10-001 and Reading 2010

Western
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December 17, 2009

James Bearzi, Bureau Chief
New Mexico Environmental Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

Re: Giant Refining Company, Bloomfield Refinery (currently know as Western Refinery Southwest, Inc. – Bloomfield Refinery) Order No. HWB 07-34 (CO) Investigation Report Group No. 3

Dear Mr. Bearzi:

Western Refining Southwest Inc. - Bloomfield Refinery submits the referenced Investigation Report pursuant to Section IV.B.7 of the July 2007 HWB Order. The Investigation Report summarizes the site environmental investigation activities completed for the SWMUs and AOCs designated as Group 3. These include SWMU No. 4 Transportation Terminal Sump, SWMU No. 5 Heat Exchanger Bundle Cleaning Area, AOC No. 22 Product Loading Rack and Crude Receiving Loading Racks, AOC No. 23 Southeast Holding Ponds, AOC No. 24 Tank Areas 41 and 43, AOC No. 25 Auxiliary Warehouse and 90-Day Storage Area, and AOC No. 26 Tank Area 44 and 45. The Report was developed and formatted to meet the requirements of Section X.C of the July 2007 HWB Order.

If you have any questions or would like to discuss the Investigation Report, please contact me at (505) 632-4171.

Sincerely,

James R. Schmaltz
Environmental Manager
Western Refining Southwest, Inc.
Bloomfield Refinery

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INVESTIGATION REPORT
GROUP 3

(SWMU No. 4 Transportation Terminal Sump, SWMU No. 5 Heat Exchanger Bundle Cleaning Area, AOC No. 22 Product Loading Rack and Crude Receiving Loading Racks, AOC No. 23 Southeast Holding Ponds, AOC No. 24 Tank Areas 41 and 43, AOC No. 25 Auxiliary Warehouse and 90-Day Storage Area, and AOC No. 26 Tank Area 44 and 45)

Bloomfield Refinery
Western Refining Southwest, Inc.
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December 2009

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Executive Summary

The Bloomfield Refinery, which is located in the Four Corners Area of New Mexico, has been in operation since the late 1950s. Past inspections by State and federal environmental inspectors have identified locations where releases to the environment may have occurred. These locations are generally referred to as Solid Waste Management Units (SWMUs) or Areas of Concern (AOCs).

Pursuant to the terms and conditions of an Order issued on July 27, 2007 by the New Mexico Environment Department (NMED) to San Juan Refining Company and Giant Industries Arizona, Inc. for the Bloomfield Refinery, this environmental site investigation was completed for the SWMUs and AOCs designated as Group 3. This group includes SWMU No. 4 Transportation Terminal Sump; SWMU No. 5 Heat Exchanger Bundle Cleaning Area; AOC No. 22 Product Loading Rack and Crude Receiving Loading Racks; AOC No. 23 Southeast Holding Ponds; AOC No. 24 Tank Areas 41 and 43; AOC No. 25 Auxiliary Warehouse and 90-Day Storage Area; and AOC No. 26 Tank Areas 44 and 45.

The Order requires that San Juan Refining Company and Giant Industries Arizona, Inc. determine and evaluate the presence, nature, and extent of historical releases of contaminants at the aforementioned SWMUs and AOCs. A Class I permit modification was approved on June 10, 2008 to reflect the change in ownership of the refinery to Western Refining Southwest, Inc. The operator is now Western Refining Southwest, Inc. – Bloomfield Refinery.

The investigation activities included collection and analysis of soil and ground water samples for potential site-related constituents beginning on April 6, 2009 and continuing through July 29, 2009. This included the completion of 13 soil borings with two of the borings completed as temporary monitoring wells and eight completed as permanent monitoring wells. In addition, surface soil samples (i.e., 0-0.5' and 1.5-2.0') were collected at 29 locations. A summary of the results of the investigation is provided as follows:

- SWMU No. 4: One soil boring (SWMU 4-1) that was completed as a permanent monitoring well (MW-59) at SWMU No. 4 encountered impacted soils that appear to be associated with the historical transportation terminal sump. Ground water impacts were also observed in MW-59, which is down-gradient of a larger area of impact that extends up-gradient to the product loading rack.
- SWMU No. 5 and AOC No. 25: Six surface sample locations around SWMU No. 5 contained mercury in concentration soil above the NMED residential screening level of 7.71 mg/kg. Mercury impacts are limited to within the upper 6-inches of surface soils. An

additional surface soil sample and deeper soil boring (AOC 25-2/MW-60) was completed at AOC No. 25, which is adjacent to SWMU No. 5. There were no detections of constituents in soil above the respective residential screening levels. The ground water sample collected from MW-60 did not indicate impacts to ground water from SWMU No. 5 or AOC No. 25.

- AOC No. 22: At the Crude Receiving area, two soil borings (AOC 22-14) and AOC 22-16) were installed, with AOC 22-16 completed as a permanent monitoring well (MW-63). At the Product Loading Rack area, a total of three soil borings (AOC 22-13, AOC 22-12, and AOC 22-15) were installed; soil boring AOC 22-15 was completed as a permanent monitoring well (MW-61), and soil boring AOC 22-12 was completed as a temporary well (TW-01). A total of 40 soil samples were collected within AOC No. 22. Soil impacts are evident near the sump located north of the product loading rack. Ground water impacts, while extending over a larger area, appear to be centered near the product loading sump and product loading rack.
- AOC No. 23: One soil boring/monitoring well (AOC 23-1/MW-62) was installed near and down gradient of AOC No. 23. There were no documented impacts to soil and only manganese was identified in ground water above the screening levels.
- AOC No. 24: Four surface soil sample locations and three soil borings, one of which was converted to a monitoring well (AOC 24-7/MW-64), were completed at AOC No. 24. Limited soil impacts were observed at one sampling location. Site-related constituents (e.g., petroleum hydrocarbons) were not detected in ground water, but two metals (arsenic and manganese) and three naturally occurring inorganic constituents (chloride, sulfate, and nitrate) were identified at concentrations above the screening levels.
- AOC No. 26: Seven surface soil sample locations and two soil borings, both of which were completed as permanent monitoring wells (AOC 26-8/MW-65 and AOC 26-9/MW-66), were completed at AOC No. 26. Only MTBE was detected in one vadose zone soil sample at low concentrations that exceeded the screening level protective of soil-to-ground water, yet below the EPA Regional screening level for residential soil. Ground water samples collected at MW-65 and MW-66 both indicated the presence of petroleum hydrocarbons and fuel additives.

Conclusions and Recommendations

Based on the investigation results, “Corrective Action Complete without Controls” designation is recommended for AOC No. 23 and AOC No. 25. Additional assessment and delineation of impacted soils is recommended for SWMU No. 4, SWMU No. 5, AOC No. 22-4, AOC No. 22-13, and near AOC 26-5. Additional assessment of risk posed by the limited occurrence of TPH at AOC No. 24-6 is recommended instead of additional assessment and/or remediation.

Ground water impacts documented during the assessment of SWMU No. 4 and AOCs No. 22 and 26 indicate that the primary constituents exceeding the screening levels across these areas are similar and appear to be associated with operations at the product loading rack. Additional delineation of ground water impacts at AOCs No. 22 and 26 is recommended to better define the distribution of constituents within these areas and to distinguish potential sources.

A separate investigation work plan will be prepared to detail proposed additional investigation activities for soil and ground water.

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Section 1
Introduction

The Bloomfield Refinery is located immediately south of Bloomfield, New Mexico in San Juan County (Figure 1). The physical address is #50 Road 4990, Bloomfield, New Mexico 87413. The Bloomfield Refinery is located on approximately 263 acres. Bordering the facility is a combination of federal and private properties. Public property managed by the Bureau of Land Management lies to the south. The majority of undeveloped land in the vicinity of the facility is used extensively for oil and gas production and, in some instances, grazing. U.S. Highway 44 is located approximately one-half mile west of the facility. The topography of the main portion of the site is generally flat with steep bluffs to the north where the San Juan River intersects Tertiary terrace deposits.

The Bloomfield Refinery is a crude oil refinery currently owned by Western Refining Southwest, Inc., which is a wholly owned subsidiary of Western Refining Company, and it is operated by Western Refining Southwest, Inc. – Bloomfield Refinery. The Bloomfield Refinery has an approximate refining capacity of 18,000 barrels per day. Various process units are operated at the facility, including crude distillation, reforming, fluidized catalytic cracking, sulfur recovery, merox treater, catalytic polymerization, and diesel hydro treating. Current and past operations have produced gasoline, diesel fuels, jet fuels, kerosene, propane, butane, naphtha, residual fuel, fuel oils, and LPG.

On July 27, 2007, the New Mexico Environment Department (NMED) issued an Order to San Juan Refining Company and Giant Industries Arizona, Inc. ("Western") requiring investigation and corrective action at the Bloomfield Refinery. This Investigation Report has been prepared for the Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) designated as Group 3 in the Order. This includes:

- SWMU No. 4 Transportation Terminal Sump;
- SWMU No. 5 Heat Exchanger Bundle Cleaning Area;
- AOC No. 22 Product Loading Rack and Crude Receiving Loading Racks;
- AOC No. 23 Southeast Holding Ponds;
- AOC No. 24 Tank Areas 41 and 43;
- AOC No. 25 Auxiliary Warehouse and 90-Day Storage Area; and
- AOC No. 26 Tank Areas 44 and 45.

The locations of the individual investigation units are shown on Figure 2 and all of the Group 3 SWMUs/AOCs are located on the southeastern portion of the refinery property, south of Country Road 4990.

The purpose of the site investigation is to determine and evaluate the presence, nature, and extent of releases of contaminants in accordance with 20.4.1.500 New Mexico Administrative Code (NMAC) incorporating 40 Code of Federal Regulations (CFR) Section 264.101. The investigation activities were conducted in accordance with Section IV of the Order and focused on soils and ground water as those are the environmental media in these areas that may potentially contain contaminants. The investigation was completed pursuant to the Investigation Work Plan dated June 2008 (revised January 2009), which was approved by the NMED on February 18, 2009. Activities conducted that deviate from the approved Investigation Work Plan are discussed in Section 3.3, Section 6.3, and Section 6.6 of this report.

Soil and ground water samples were analyzed for volatile and semi-volatile organic constituents, total petroleum hydrocarbons, and metals. In addition, ground water samples were analyzed for inorganic general chemistry constituents. The results of these analyses are compared to applicable State or federal cleanup and screening levels as specified in Section VII. of the Order.

Section 2
Background

This section presents background information for each of the investigation units, including a review of historical waste management activities for each location to identity the following:

- Type and characteristics of waste and contaminants handled in the subject SWMU or AOC;
- Known and possible sources of impacts;
- History of releases; and
- Known extent of impacts prior to the current investigation.

2.1 SWMU No. 4 Transportation Terminal Sump

The Transportation Terminal Sump is located to the northeast of the auxiliary warehouse/90-day storage area and immediately west of bullet tanks B-22 and B-23. The use of the sump was discontinued in 1986 and the sump was backfilled. There are no documented specific instances of releases at the sump but use of the area for truck cleaning may have resulted in small releases over time.

During an inspection conducted by EPA in 1984, two water samples (an aqueous phase and oily phase) and one soil sample were collected from the sump for analysis of cadmium and chromium. The soil sample contained cadmium at a concentration of 2.2 ppm and an oily phase water sample contained 1.3 ppm cadmium and 40 ppm chromium (Giant Industries, 2003). During a subsequent Phase II RCRA Facility Investigation (RFI) conducted in 1994, two soil borings (B-1 and B-2) were installed near the sump (Figure 6). Soils were screened continuously at each boring to a depth of 12 feet (ft) below ground level (bgl). Based on the highest photo ionization detection (PID) readings, one sample was collected from each boring for analysis. The samples were analyzed for volatile organic compounds (VOCs; USEPA method 8240), semi-volatile organic compounds (SVOCs; USEPA method 8270), total petroleum hydrocarbons (TPH; USEPA method 418.1), and metals (USEPA method 6010/7000 series). The results of these soil analyses are summarized in Table 5. Because no organic constituents were detected in either sample and the metal concentrations were reported within background ranges included in the Phase II RFI Report, Giant Refining Company requested no further action for this SWMU in their Solid Waste Management Unit Assessment Report (Giant Industries, 2003).

2.2 SWMU No. 5 Heat Exchanger Bundle Cleaning Area

The Heat Exchanger Bundle Cleaning Area, which has been identified as SWMU No. 5, is located at the east end of the auxiliary warehouse (Figure 2). Heat exchanger bundles are periodically cleaned at this location to remove scale deposits. The cleaning usually takes place on a concrete slab at the east end of the auxiliary warehouse, which has concrete curbs, portable side wall curtains, and drains to a sump located inside the warehouse. There are large metal doors that open at the east end of the warehouse and occasionally during the winter, cleaning operations take place inside the warehouse in a fully enclosed room with sheet metal walls, concrete floor, and concrete lined collection sump (i.e., the 90-day storage area). The sump, which is designed to collect all wash water and any waste materials generated during cleaning operations, is approximately four feet wide, four feet deep and 50 feet long. Any sludge that collects in the sump is removed upon completion of cleaning operations, containerized and sent off-site for disposal as hazardous waste in accordance with 90-day on-site storage regulations. There is no indication of documented spills in this area. The likely constituents of concern are organic petroleum constituents and metals.

No soil samples have been collected and analyzed from the Heat Exchanger Bundle Cleaning Area in the past; however, ground water quality has been assessed down-gradient of this area. Figure 5 shows the potentiometric surface of the shallow ground water, which underlies the refinery property. Monitor well MW-13 is located approximately 250 feet down-gradient and ground water samples have been routinely collected from this well and analyzed for potential constituents of concern. Methyl tertiary butyl ether (MTBE) is the only potential refinery-related constituent detected in the ground water samples. The historical ground water analyses are summarized in Tables 1 through 4.

2.3 AOC No. 22 Product Loading Rack And Crude Receiving Loading Racks

The loading racks are used to unload crude oil, which is transported to the refinery via tanker trucks, and to load out refined product onto tanker trucks for distribution at retail gasoline stations (Figure 2). The primary constituents of concern are petroleum constituents and to a lesser extent additives (e.g., MTBE and ethanol), which may be present in the area of the product loading racks. Documented releases of petroleum products and crude oil have occurred at the loading racks.

Two soil borings (B-3 and B-4) were installed at the loading racks during the Phase II RFI in 1994 (Figure 8). Each boring was completed to a depth of 12 ft bgl with soil samples continuously screened with a PID. No indication of impacts was recorded at the B-3 location and a sample was collected from the 6-8' interval based on the depth of underground piping in the area. The 10-12' interval was selected at B-4 based on the highest PID reading. These samples were analyzed for VOCs, SVOCs, TPH, and metals, and the results are presented in Table 5. Only one organic constituent was detected in the sample collected at B-3 (methylene chloride at 0.11 mg/kg). Benzene, toluene, ethylbenzene, and xylene (BTEX) were detected at low concentrations in sample B-4 (10-12'). Metals were detected in both samples but were reported to be within background ranges included in the Phase II RFI Report (Groundwater Technology, Inc., 1994).

2.4 AOC No. 23 Southeast Holding Ponds

The southeast holding ponds are located at the southeastern most corner of the active portion of the refinery property (Figure 2). There are two ponds, which each cover approximately 4.5 acres. The "ponds" were constructed in 1995 as double lined (60-milimeter high density polyethylene) surface impoundments with a leak detection system. Treated process water is routinely pumped directly from the Refinery aeration lagoons to the on-site injection well for disposal. However, as needed during scheduled injection well maintenance events and/or process conditions, the ponds serve as temporary storage for treated process water. Any temporary accumulation of treated process water at the ponds is pumped to the injection well for final disposal.

There has not been any indication of leaks from the ponds. As the pond are used sporadically to store treated wastewater, the potential constituents of concern would be petroleum constituents.

2.5 AOC No. 24 Tank Areas 41 and 43

Tanks 41 and 43 are located at the southern edge of the active portion of the refinery property (Figure 2). These tanks are associated with the crude oil receiving racks and have been used to temporarily store crude oil that contains an unacceptably high fraction of water. Tank 43 is not currently in service. There was a small spill of approximately 100 to 150 gallons of oily water that spilled near Tank 43 in 2006.

No soil investigations were previously conducted in this area but a monitor well (MW-6) was installed immediately to the west during the 1994 RFI. This well was dry when installed and remains dry.

2.6 AOC No. 25 Auxiliary Warehouse and 90-Day Storage Area

The auxiliary warehouse and 90-day storage area are located in the same building, which is approximately 300 feet south of Sullivan Road and 650 feet west of the crude oil loading rack (Figure 2). Photographs of the area are provided in Appendix A. The metal building was originally used as a truck terminal prior to relocation of the terminal to its current location in 1984. The truck terminal was used for general maintenance and repair of tanker trucks and auxiliary equipment. No drains or sumps are located within the portion of the building currently used as the warehouse, but there is a sump in the 90-day storage area that collects water that drains from the Heat Exchanger Bundle Cleaning Pad. The sump, which is designed to collect all wash water and any waste materials generated during cleaning operations, is approximately four feet wide, four feet deep and 50 feet long. Any sludge that collects in the sump is removed upon completion of cleaning operations, containerized and sent off-site for disposal as hazardous waste in accordance with 90-day on-site storage regulations. There are no documented releases associated with the historical truck terminal operations; however, the types of potential constituents of concern associated with these activities include petroleum constituents (e.g., fuels, motor oil, transmission fluids, etc.) and chlorinated solvents (e.g., tetrachloroethylene and trichloroethylene).

The auxiliary warehouse is currently used to store dry materials (e.g., large bags of catalyst beads) and auxiliary equipment (e.g., small pumps and generators). An employee health center is located in the far western end of the warehouse. There have been no documented spills at the warehouse and there are no associated potential types of constituents for assessment beyond those identified above for the historical truck terminal operations. The 90-day storage area is used for temporary storage of wastes that are shipped off-site for disposal at approved disposal facilities. The types of wastes stored primarily include spill cleanup materials (e.g., contaminated soil and absorbent materials), heat exchange bundle sludge, tank bottoms, etc. that are containerized in steel drums or plastic lined totes. The storage area has a roof to prevent contact with stormwater, a concrete floor and a large concrete lined sump to collect any material that may leak. There have not been any documented releases from the 90-day storage area.

No soil samples were previously collected and analyzed from the area near the auxiliary warehouse or 90-day storage area; however, ground water quality has been assessed down-gradient of this area. Figure 5 shows the potentiometric surface of the shallow ground water, which underlies the refinery property. Monitor well MW-13 is located approximately 250 feet down-gradient and ground water samples have been routinely collected from this well and analyzed for potential constituents of concern. MTBE is the only organic constituent detected in the ground water samples above screening levels. The historical ground water analyses are summarized in Tables 1 through 4.

2.7 AOC No. 26 Tank Areas 44 and 45

Tanks 44 and 45 are located a short distance south of Sullivan Road and immediately northeast of the product loading rack (Figure 2). These tanks are used to store additives, which are blended at the product loading racks. The materials stored in the tanks have included MTBE, naphtha, and ethanol. There are no documented reportable spills from these tanks.

No soil samples or ground water samples were previously collected in the immediate vicinity of Tanks 44 and 45. The types of potential constituents of concern in the area include petroleum constituents, MTBE, and ethanol.

Section 3
Scope of Activities

Pursuant to Section IV of the Order, an investigation of soils and ground water was conducted to determine and evaluate the presence, nature, extent, fate, and transport of contaminants for designated AOC and SWMU areas associated with Group 3. The section provides a brief summary of the activities performed during this investigation event. A more detailed description of each activity is included in Section 4 Field Investigation Results and Section 6 Site Impacts.

3.1 Background Information Research

Documents containing the results of previous investigations and subsequent routine ground water monitoring data from monitoring wells were reviewed to facilitate development of the Investigation Work Plan. The previously collected data provides valuable information on the overall subsurface conditions, including hydrogeology and contaminant distribution within ground water. The data collected under this investigation supplements the historical ground water data and provide SWMU/AOC-specific information regarding contaminant occurrence and distribution within soils and ground water. Section 2 provides a more detailed summary of historic operations and review of historical waste management activities for each Group 3 SWMU and AOC area.

3.2 Utility Clearance

Prior to the start of drilling and field sampling activities, Western initiated the New Mexico One Call System notification to identify existing active utility lines within the vicinity of each proposed soil boring and monitoring well location. Historic and current Refinery process unit and utility site drawings were also reviewed to identify abandoned and/or active Refinery pipelines. The locations of each proposed soil boring and monitoring well were marked in the field prior to drilling, and the locations were reviewed in the field by the Refinery Safety Manager and Terminals Manager to ensure drilling activities would not impact current Site operations, nor cause any additional safety concerns during drilling and sampling activities.

3.3 Soil Boring Installation, Field Screening, and Soil Sample Collection

In efforts to determine and evaluate the presence, nature, extent, fate, and transport of contaminants, soil borings were drilled and/or soil samples were collected at the following SWMUs/AOCs:

- SWMU No. 4 - Transportation Terminal Sump;
- SWMU No. 5 - Heat Exchanger Bundle Cleaning Area;
- AOC No. 22 - Product Loading Racks and Crude Receiving Loading Racks;
- AOC No. 23 - Southeast Holding Ponds;
- AOC No. 24 - Tank Areas 41 and 43;
- AOC No. 25 - Auxiliary Warehouse and 90- Day Storage Area; and
- AOC No. 26 - Tank Areas 44 and 45.

A total of 13 soil borings were drilled using hollow-stem auguring (HSA) method or air rotary-ODEX method to a minimum depth of 10 feet bgl. Soils were screened continuously using split spoon samplers and logged by a qualified geologist in accordance with USCS nomenclature (Appendix E).

Surface soil samples (0 to 2 ft bgl) and subsurface soil samples (deeper than 2 ft bgl) were collected at each soil boring location using split spoon samplers. In general, soil samples were collected from the following depth intervals:

- 0-0.5' bgl;
- 1.5'-2.0' bgl;
- 6-inch interval above the top of saturation (for deeper soil borings only;
- The interval from each boring with the greatest apparent degree of impact based on field observations and field screening; and
- Any additional intervals as determined based on field screening to exhibit potentially significant impacts.

At least one boring at each of the individual SWMUs/AOCs was drilled to the top of saturation, with the exception of SWMU No. 5 where only surface soil sampling was conducted. At designated locations where only surface soil samples were collected (i.e. sample collected from 0-0.5' bgl and 1.5-2.0' bgl), sampling was accomplished using a hand auger with the soil samples collected from the auger bucket. The soil samples were logged by a qualified geologist in accordance with USCS nomenclature (Appendix E).

All surface and subsurface soil samples were field screened. Field screening included visual screening for evidence of staining caused by petroleum-related compounds, and headspace vapor screening using a photo-ionization detector (PID). The maximum PID reading was documented. Field screening results were recorded on the exploratory boring logs (see Appendix E). The field screening results were used to aid in the selection of additional soil samples for laboratory analysis.

All soil samples were sent to Hall Environmental Analytical Laboratory in Albuquerque, New Mexico and analyzed for the following in accordance with the approved Work Plan:

- Volatile organic compounds (VOCs) by USEPA Method 8260B;
- Semi-volatile organic compounds (SVOCs) by USEPA Method 8270;
- Gasoline and diesel range organics by SW-846 Method 8015B;
- Total recoverable metals (Antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, lead, nickel, selenium, silver, vanadium, and zinc) by SW846 Method 6010/6020;
- Cyanide by SW-846 method 9012; and
- Mercury by EPA Method 7470.

Soil samples were placed in pre-cleaned, laboratory-prepared sample containers for laboratory analysis. All soil samples were collected and soil boring installed in locations pursuant to the approved Investigation Work Plan, with the exception of three soil borings, which were moved with NMED concurrence. A request was submitted to the NMED on March 27, 2009 via email to move the locations of two monitoring wells (MW-61 and MW-65) and one soil boring (AOC 24-6) based on the presence of underground utilities. Approval was granted via email on March 27, 2009 and a copy of the correspondence with a map showing the changed locations is included in Appendix B. The number of soil samples collected, soil borings drilled, and monitoring wells installed for each of the SWMUs/AOCs is discussed below.

SWMU No. 4

One soil boring (SWMU 4-1) was drilled in a location west of Bullet 23 within the vicinity of the former transportation sump. The soil boring extended to approximately 44.25 ft bgl and was completed as a permanent monitoring well (MW-59).

A total of 4 soil samples were collected at this location for laboratory analysis. Figure 6 shows the sample location for SWMU No.4.

SWMU No. 5

Surface soil samples were collected from six locations (SWMU 5-1, SWMU 5-2, SWMU 5-3, SWMU 5-4, SWMU 5-5, AND SWMU 5-6) around the perimeter of SWMU No. 5 on the north, east, and south sides. The sample locations were approximately 3 ft beyond the existing concrete containment curbing.

A total of 13 soil samples, including one field duplicate, were collected for laboratory analysis. Figure 7 shows the sample locations for SWMU No. 5.

AOC No. 22

The drilling and sample collection effort at AOC No. 22 includes the Crude Receiving Rack and the Product Loading Rack. Figure 8 shows the sample locations for AOC No. 22.

Crude Receiving Rack Area

At the Crude Receiving Rack area, two soil borings (AOC 22-14 and AOC 22-16) were drilled near the Crude Receiving sump area. The soil borings extended to approximately 10 ft bgl and 46 ft bgl, respectively. Soil boring AOC 22-16 was completed as a permanent monitoring well (MW-63).

A total of 16 soil samples, including one field duplicate sample, were collected from the two soil borings and five additional surface sample locations (AOC 22-7 through AOC 22-11) within the Crude Receiving Rack area. All soil samples were submitted to the analytical laboratory for analysis.

Product Loading Rack Area

At the Product Loading Rack, a total of three soil boring (AOC 22-13, AOC 22-12, and AOC 22-15) were drilled near the Product Loading Rack sump area and adjacent to the west. The soil borings extended to approximately 42.5 ft bgl, 42 ft bgl, and 40.25 ft bgl, respectively. Soil boring AOC 22-15 was completed as permanent monitoring well (MW-61), and soil boring AOC 22-12 was completed as a temporary well (TW-01).

A total of 27 soil samples, including two field duplicate samples, were collected from the three soil borings and from six additional surface sample locations (AOC 22-1 through AOC 22-6) within the Product Loading Rack area. All soil samples were submitted to the analytical laboratory for analysis.

AOC No. 23

At AOC No. 23, one soil boring (AOC 23-1) was drilled in a location down gradient of the Evaporation Ponds, south of the Truck Shop. The soil boring extended to approximately 58.25 ft bgl and was completed as a permanent monitoring well (MW-62).

A total of 4 soil samples, including one field duplicate sample, were collected for laboratory analysis. Figure 14 shows the sample locations for AOC No. 23.

AOC No. 24

At AOC No. 24, three soil borings (AOC 24-5, AOC 24-6, and AOC 24-7) were drilled in locations north and west of Tank 41 and slightly down gradient of the AOC No. 24 area. The soil borings extended to approximately 10 ft, 10 ft, and 50.25 ft bgl, respectively. Soil boring AOC 24-7 was completed as a permanent monitoring well (MW-64).

A total of 17 soil samples, including two field duplicate samples, were collected from the three soil borings and four additional surface soil sample locations (AOC 24-1 through AOC 24-4) for laboratory analysis. Figure 15 shows the sample locations for AOC No. 24.

AOC No. 25

At AOC No. 25, one soil boring (AOC 25-2) was drilled in a location along the north side of current auxiliary warehouse. The soil boring extended to approximately 45.5 ft bgl and was completed as a permanent monitoring well (MW-60).

A total of 6 soil samples, including one field duplicate sample, were collected from the one soil boring and one additional surface soil sample location (AOC 25-1) for laboratory analysis. In addition, one set of ground water samples were collected from MW-60 following monitoring well completion and development activities. A second set of ground water samples were not collected due to the lack of ground water in the well. Figure 7 shows the sample locations for AOC No. 25.

AOC No. 26

At AOC No. 26, two soil boring (AOC 26-8 and AOC 26-9) were drilled in a location west of Tank 44 and slightly down gradient of the AOC No. 26 area. The soil borings extended to approximately 44.25 ft and 43.25 ft bgl, respectively. Soil boring AOC 26-8 and AOC 26-9 were completed as permanent monitoring wells (MW-65 and MW-66, respectively).

A total of 22 soil samples, including two field duplicate samples, were collected from the two soil boring and seven additional surface soil sample locations (AOC 26-1 through AOC 26-7) for laboratory analysis

3.4 Monitoring Well Installation, Completion, and Development

Monitoring Well Installation

Each of the eight permanent monitoring wells (MW-59 through MW-66) were completed in accordance with the requirements of Section IX of the Order. Each monitoring well was drilled to the top of bedrock (Nacimiento Formation). Slotted (0.01-inch) PVC well screen was placed at the bottom of the well, extending for 10 to 15 feet to ensure that each well is screened across the water table and, to the extent possible; the entire saturated zone is open to the well, with approximately five feet of screen above the water table. A 10/20 sand filter pack was installed a minimum of two feet over the top of the well screen, and a bentonite annular seal was installed on top of the filter pack at a minimum of 2 feet thick. A grout seal was installed on top of the annular seal, and extends to within a few feet of ground surface. The grout seal was allowed to cure for a minimum of 24-hours before the concrete surface pad was installed.

Monitoring Well Completion

The surface completions consisted of either flush mount completions or stickup completions. The flush mount completions consisted of an 8-inch well vault centered within a concrete pad. The concrete pad was wire reinforced. The stickup completions consisted of a protective aluminum enclosure with a cap that was secured in a concrete pad. The aluminum protective casing extended approximately 4 ft above the top surface of the concrete pad. One permanent monitoring well (MW-60) was completed as a flush-mounted well. The other seven monitoring wells, including the one temporary monitoring well (TW-01) was completed with above-grade completions. MW-60 is protected with a well cap and steel meter box installed around the well casing, which is equipped with a rubber gasket to minimize surface water accumulation. Each monitoring well above-grade completion includes the installation of four bollards located near each corner of the surface pad.

Monitoring Well Development

Following monitoring well completion activities, each of the new monitoring wells were developed using a combination of mechanical surging and air-lift techniques. Initially, a surge block attached to the end of the drill rod was used to swab the inside of the well casing within the screen interval. The repeated plunging motion drew filter pack fines and loosened sediment into the well casing, improving the water quality within the surrounding formation and filter pack.

Once the well was surged, the air-lift apparatus was used to remove the loosened sediment and fines from inside the well casing. Using an air compressor and dedicated 1-inch PVC eductor piping, compressed air was injected into the well. The air flow rate was manually adjusted to produce a continuous flow of water/sediment mixture out the top of the well casing via the 1-inch eductor piping. Air lifting ceased once the purge water was relatively clear.

3.5 Soil Boring Plug and Abandonment

Each soil boring not completed as a permanent or temporary monitoring well was pressure grouted via the tremie pipe method from the bottom of the borehole to the ground surface. The soil borings were plugged so that the borehole would not act as a conduit for migration of surface water to the lower soil and to ground water.

3.6 Ground Water Sampling and Vadose Zone Vapor Sampling

Two rounds of water sampling were conducted following completion of well development activities at each of the eight permanent monitoring wells (MW-59 through MW-66). In addition, two sets of ground water samples were collected from temporary well TW-01 (located at boring AOC 22-12) and one set of ground water samples were collected at AOC 22-13 (sample ID was AOC 22-13 (GW)). A total of 18 ground water samples were collected as part of the Group 3 investigation activities using disposable bailers. All ground water samples were sent to Hall Environmental Analytical Laboratory in Albuquerque, New Mexico and analyzed using the following:

- Volatile Organic Compounds (VOCs) by SW-846 Method 8260;

- Semi-Volatile Organic Compounds (SVOCs) by SW-846 Method 8270;
- Gasoline, diesel, and motor oil range petroleum hydrocarbons by SW-846 Method 8015B;
- Total recoverable metals (Antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, lead, nickel, selenium, silver, vanadium, and zinc) by SW846 Method 6010/6020;
- Cyanide by SW-846 method 9012;
- Mercury by EPA Method 7470;
- Ethanol by SW-846 Method 8015 (AOC 26 samples only);
- Anions (chloride, Nitrate/Nitrite, and sulfate) by USEPA Method 300.0;
- Alkalinity (total alkalinity, carbonate, and bicarbonate) by USEPA Method 310.1;
- Dissolved metals (iron, calcium, magnesium, potassium, and sodium) by USEPA Method 6010B; and
- Total dissolved solids by SM-2540C

All samples were placed in pre-cleaned, laboratory-prepared sample containers for laboratory chemical analysis. Prior to collection of the ground water sample at each well, a total well vapor sample was collected and field analyzed for percent carbon dioxide and oxygen. Field vapor measurements were collected using a multi-gas meter, and the results recorded on a field sampling log.

In addition, ground water level and separate-phase hydrocarbon (SPH) thickness measurements were collected from each new monitoring well prior to well purging. Measurement data and pertinent field information was recorded on field sampling log. The depth-to-groundwater and depth-to-SPH were measured to the nearest 0.01 ft and recorded relative to the surveyed well casing rim.

3.7 Decontamination Procedures

Drilling equipment was decontaminated between each borehole using a high pressure portable water wash. Sampling equipment that were in direct contact with the samples (e.g. hand augers and split-spoon samplers) were decontaminated using a brush, as necessary, to remove larger particulate matter followed by a rinse with potable water, wash with non-phosphate detergent, rise with potable water, and double rinse with deionized water. The field methods are also summarized in Appendix F.

In the event that more than one SWMU/AOC was investigated during the day, a new batch of wash water and rinse water was prepared for the new SWMU/AOC prior to decontamination. The decontamination water was collected in buckets and placed in open top 55-gallon drums, which were labeled and sealed at the end of each work day.

3.8 Quality Assurance / Quality Control Measures

Quality Assurance/Quality Control (QA/QC) samples were collected to monitor the validity of the soil sample and ground water sample collection procedures, as well as to monitor any cross contamination during sample shipment and/or sample contamination during laboratory analysis activities. QA/QC samples collected during field investigation activities included the collection of field duplicates at a rate of 10%, equipment blanks at a rate of 10% or one per day when disposable sampling equipment was used, and field blanks at a rate of one per day.

A total of 80 QA/QC samples were collected during the Group 3 investigation event. A data validation assessment was completed that included review of the field sample data, laboratory QA/QC summaries, and results of the QA/QC samples. The field data was qualified accordingly based on results of the data validation process. Appendix H provides a detailed data validation summary for the field samples collected as part of the Group 3 investigation activities.

3.9 Field Equipment Calibration

Field sampling equipment was calibrated daily prior to commencement of field sampling activities. For soil sampling, headspace vapor screening for soil samples was conducted using a MiniRae 2000 portable VOC monitor. The instrument was calibrated at the beginning of each work day to a concentration of 100 ppm isobutylene.

Field vapor monitoring was completed using a multi-gas Eagle Meter manufactured by RKI Instruments, Inc. The meter was calibrated with 15% CO_2, 12.0% O_2, and 100 ppm isobutylene each work day.

An Ultrameter 6P manufactured by Myron L Company was used to measure ground water stabilization parameters. The calibration solutions used at the beginning of each day are as follows:

- 4.0 pH solution;
- 7.0 pH solution;
- 10.0 pH solution; and
- 1.413 mS/cm conductivity solution.

3.10 Collection and Management of Investigation Derived Waste

Drill cuttings, excess sample material and decontamination fluids, and all other investigation derived waste (IDW) associated with soil borings were contained and characterized based on the boring location and type of contaminants suspected or encountered in DOT certified 55-gallon drums.

A total of three composite samples were collected from drums containing soil with known constituent concentrations above NMED residential soil screening levels. A composite sample was collected to characterize soil for waste disposal from AOC No. 24, AOC No. 26, AOC No. 22, and SWMU No. 4. One composite sample was collected for soil from AOC No. 22 and SWMU No. 4 since less than one drum of cuttings was generated from investigations at SWMU No. 4, and the investigation results shown that only a limited impact of TPH was detected at a concentration higher than NMED residential screening levels, but below NMED industrial screening level for waste oil. Each composite soil sample was analyzed for the following:

- BTEX and MTBE by EPA Method 8021B;
- Polycyclic Aromatic Hydrocarbons (PAHs) by EPA Method 8310;
- TCLP RCRA 8 Metals by EPA Method 6010B; and
- Ignitability, Corrosivity, and Reactivity.

The associated analytical is included in Appendix C. Composite samples were not collected for soils cuttings generated from AOC 23 and AOC 25 because investigation sample results show that the detected concentrations in the soil were below NMED residential screening levels. All analytical results for waste characterization purposes were submitted to Waste Management, Inc. for review and approval of acceptance. Soils were disposal of at the Painted Desert Landfill, In Joseph City, Arizona.

All purged ground water and decontamination water was disposed in the refinery wastewater treatment system upstream of the API Separator. Personal protective equipment (e.g., gloves) was disposed in the refinery's general waste bins.

3.11 Surveys

Known site features and/or site survey grid markers were used as references to locate each boring and surface sample location prior to surveying the locations using a registered professional land surveyor. The boring locations were measured to the nearest foot, and locations were placed on a scaled map. In addition, a hand-held GPS receiver was used to record the coordinates of each soil boring. These coordinates were recorded on the boring logs. The soil boring locations were subsequently surveyed by a registered surveyor.

The horizontal coordinates and elevation of each surface sampling location; the surface coordinates and elevation of each boring, the top of each monitoring well casing, and the ground surface at each monitoring well location; and the locations of all other pertinent structures were determined by a registered New Mexico professional land surveyor in accordance with the State Plane Coordinate System (NMSA 1978 47-1-49-56 (Repl. Pamp. 1993)). The surveys were conducted in accordance with Sections 500.1 through 500.12 of the Regulations and Rules of the Board of Registration for Professional Engineers and Surveyors Minimum Standards for Surveying in New Mexico. Horizontal positions were measured to the nearest 0.1-ft, and vertical elevations were measured to the nearest 0.01-ft. The survey data is included in Appendix D.

Section 4
Field Investigation Results

This section provides a summary of the procedures used and the results of all field investigation activities conducted at the site as part of Group 3 investigation activities. This summary includes the dates that investigation activities were conducted, the type and purpose of field investigation activities performed, field screening measurements, logging and sampling results, monitoring well construction details and conditions observed. Field observations or conditions that altered the planned work or may have influenced the results of sampling, testing and logging are also reported in this section.

4.1 Surface Conditions

Regionally, the surface topography slopes toward the floodplain of the San Juan River, which runs along the northern boundary of the refinery complex. To the south of the refinery, the drainage is to the northwest. North of the refinery, across the San Juan River, surface water flows in a southeasterly direction toward the San Juan River. The active portion of the refinery property, where the process units and storage tanks are located, is generally of low relief with an overall northwest gradient of approximately 0.02 ft/ft. The refinery sits on an alluvial floodplain terrace deposit and there is a steep bluff (approx. drop of 90 feet) at the northern boundary of the refinery where the San Juan River intersects the floodplain terrace, which marks the southern boundary of the floodplain.

There are two locally significant arroyos, one immediately east and another immediately west of the refinery, which collect most of the surface water flows in the area, thus significantly reducing surface water flows across the refinery. A minor drainage feature is located on the eastern portion of the refinery, where the Landfill Pond (SWMU No. 9) was located and there are several steep arroyos along the northern refinery boundary that primarily capture local surface water flows and minor ground water discharges.

The refinery complex is bisected by County Rd #4990 (Sullivan Road), which runs east-west. The process units, storage tanks (crude oil and liquid products), and wastewater treatment systems are located north of the county road. The crude oil and product loading racks, LPG storage tanks and loading racks, maintenance buildings/90-day storage area, pipeline offices, transportation truck shop, and the Class I injection well are located south of the county road. There is very little vegetation throughout these areas with most surfaces composed of concrete, asphalt, or gravel. The area between the refinery and the San Juan River does have limited vegetation on slopes that are not too steep to support vegetation.

4.2 Exploratory Drilling Investigations

A total of 13 soil borings were drilled as part of Group 3 investigation activities using hollow-stem auguring (HSA) method or air rotary-ODEX method. All soil borings were drilled to a minimum depth of 10 feet with at least one boring at each of the individual potential source areas drilled to the top of saturation, with the exception of SWMU No. 5 where only surface soil samples were collected. If there was any indication of impacts based on field screening results at 10 feet or evidence of waste materials or other signs of impacts, then the boring was drilled deeper until reaching a depth of five feet below any observed impacts (e.g., odors or elevated PID readings) or to the top of saturation, whichever was achieved first. If impacted media was detected at the water table, then the boring was drilled five feet below the water table or to refusal (whichever occurred first) to facilitate collection of ground water samples. Total depths of each soil boring completed as a permanent monitoring well ranged between 10 ft to 59 ft bgl, with the deepest soil boring/monitoring well being AOC 23-1/MW-62.

At designated locations where only surface soil samples were collected (i.e. sample intervals being (0-0.5') and (1.5-2.0') below ground level only), sampling was accomplished using a hand auger with the soil samples collected from the auger bucket. Soil samples collected from soil borings extending greater than 2 ft below ground level were collected using split spoon samplers.

Soil samples were screened continuously from split spoon samplers or hand auger and logged by a qualified geologist. The soil descriptions were made in accordance with USCS nomenclature and recorded on the individual field boring logs. As shown on the boring logs (Appendix E), the data recorded included the lithologic interval, USCS symbol, percent recovery and a sample description of the cuttings and core samples.

The drilling equipment was decontaminated between each borehole using a high pressure potable water wash. The split-spoon samplers and hand augers were decontaminated between each use using a potable water rinse, an Alconox wash and then a distilled water rinse. In the event that more than one SWMU/AOC was investigated during the day, a new batch of wash water and rinse water was prepared for the new SWMU/AOC prior to decontamination. The decontamination water was collected in buckets and placed in open top 55-gallon drums, which were labeled and sealed at the end of each work day. Soil cuttings were also placed in labeled open top 55-gallon drums and were sealed when not in use.

4.3 Subsurface Conditions

Numerous soil borings and monitoring wells have been completed across the refinery property during previous site investigations and installation of the slurry wall, which runs along the northern and western refinery boundary. Thirteen soil borings, eight of which were completed as permanent monitoring wells, were completed under this scope of work for Group No. 3. One additional temporary well designated as TW-01 was installed in the AOC No. 22 area.

Based on the available site-specific and regional subsurface information, the site is underlain by the Quaternary Jackson Lake terrace deposits, which unconformably overlie the Tertiary Nacimiento Formation. The Jackson Lake deposits consist of fine grained sand, silt and clay that grades to coarse sand, gravel and cobble size material closer to the contact with the Nacimiento Formation. The Jackson Lake Formation is over 40 feet near thick near the southeast portion of the site and generally thins to the northwest toward the San Juan River. The Nacimiento Formation is primarily composed of fine grained materials (e.g., carbonaceous mudstone/claystone with interbedded sandstones) with a reported local thickness of approximately 570 feet (Groundwater Technology, 1994).

Figures 3 and 4 present cross-sections of the shallow subsurface based on borings logs from on-site monitoring well completions.

Underground piping is present in the area of AOC Nos. 22, 24, and 26 (see Figure No. 2), which includes piping used to transfer crude oil from the loading racks to AOC No. 22, piping for gasoline additives from AOC No. 26 to the product loading rack, crude oil transfer piping to the tank farm north of County Rd. 4990, product transfer piping from the tank farm to product loading rack, and piping used to transfer product and crude oil within the individual loading racks. There was no indication that the underground piping is acting as a preferential pathway for contaminant migration and the generally transmissive nature of the native soils would tend to lesson any affects from the underground utilities.

4.4 Soil Boring Installation, Monitoring Well Construction, and Boring Abandonment

This section describes the methods and details of soil boring installation, monitoring well construction, and soil boring abandonment activities. Details of soil sample collection activities conducted during soil boring installation are provided in Section 6. Each soil boring is discussed under the appropriate SWMU or AOC. The borings are discussed in chronological order within each SWMU/AOC. Copies of the boring and well construction logs are provided in Appendix E. A description of the surface soil sampling at each SWMU or AOC is discussed in Section 6.1.

Soil borings completed as a permanent or temporary monitoring well were drilled to the top of bedrock (Nacimiento Formation). The completion depths ranged between 40 to 59 feet. Slotted (0.01 inch) rigid PVC well screen was placed at the bottom of the well and extended for 10 to 15 feet to ensure that the entire saturated zone is open to the well. Rigid PVC with threads was utilized for the well casing and no glues/solvents were utilized. Permanent monitoring wells were constructed with 4-inch diameter PVC casing; the temporary wells were constructed using 2-inch diameter PVC casing. A 10/20 sand filter pack was installed to a minimum of two feet over the top of the well screen. A 6-inch sand bed was also installed at the base of the monitor well. Pursuant to Section IX.C. of the Order, a minimum of two feet of bentonite seal was placed over the filter pack and hydrated. An annular grout was pumped by tremie method to within two feet of the ground surface and allowed to cure for a minimum of 24 hours before surface pad and protective casing were installed.

The surface completions consisted of either flush mount completions or stickup completions. The flush mount completions consisted of an 8-inch well vault centered within a concrete pad measuring 4-feet by 4-feet wide by 6-inches thick. The concrete pad was wire reinforced. The stickup completions consisted of a protective aluminum enclosure with cap that was secured in a concrete pad measuring 4-feet by 4-feet wide by 6-inches thick. The concrete pad was wire reinforced. The aluminum protective casing extended 4 feet above the top surface of the concrete pad.

Four-inch diameter steel bollards were installed 6 inches from each corner of the concrete pad to further protect the monitoring wells constructed with stick-up completions. Bollards were not placed around temporary well TW-01 since its location is not near vehicle access areas. The bollards were installed two feet below grade and extended three feet above grade. The bollards were installed vertically level and extend the same height. The holes for the bollards were dug by hand with the diameter of the borehole measured a minimum of 6-inches. Each bollard was cemented into the ground with the cement extending from the bottom of the hole to the surface. The bollard was filled with cement. Each bollard was pretreated to remove rust, primed, and painted with two coats of safety-yellow paint.

SWMU No. 4 - Transportation Terminal Sump

SWMU 4-1/MW-59

On April 6, 2009 the drilling rig was set up on location SWMU 4-1/MW-59 (Figure 6). Sample collection began with the use of the HSA drilling method and split spoon samplers. The borehole was advanced to a depth of 36 feet bgl. The rig was modified to drill using the ODEX drilling method and sampling continued. The sampling was terminated at 43.5 feet bgl.

As shown on the well construction log for MW-59, the Nacimiento Formation was encountered at 42.5 feet bgl and consisted of dense, damp, yellowish brown sandstone. In order to accommodate the well setting, the borehole was advanced to a depth of 44.25 feet bgl.

Slotted (0.01 inch) rigid PVC well screen was placed at the bottom of the well and extended for 15 feet (28 to 43 feet) to ensure that the entire saturated zone was open to the well. Rigid Schedule 40 PVC with threads was utilized for the well casing. A 6-inch sand bed was placed at the bottom of the well bore. The 10/20 sand filter pack was installed to two feet over the top of the well screen. As the sand was installed in the wellbore the ODEX casing was removed. Two feet of bentonite was placed over the filter pack and hydrated. On April 7, 2009 an annular grout was pumped by tremie method to within two feet of the ground surface and allowed to cure for a minimum of 24 hours. On April 10, 2009, the surface pad and protective aluminum stick-up cover were installed. Soil cuttings were placed in open-top 55 gallon drums that were sealed when not in use.

SWMU No. 5 - Heat Exchanger Bundle Cleaning Area

As described in Section 6, 12 surface soil samples (i.e., 0-0.5’ and 1.5–2’) were collected in the SWMU No. 5 area (Figure 7). The samples were collected from sample locations SWMU 5-1, SWMU 5-2, SWMU 5-3, SWMU 5-4, SWMU 5-5, and SWMU 5-6. No deep soil borings or monitor wells were installed at the SWMU; however, a soil boring and permanent monitoring well (AOC 25-2/MW-60) was installed at AOC No. 25, which is adjacent to SWMU No. 5.

AOC No. 22 - Product Loading Racks and Crude Receiving Loading Racks

In addition to the five soil borings installed at AOC No. 22 as described below, surface samples only were collected at eleven additional designated locations (AOC 22-1 through AOC 22-11). Details pertaining to surface sample collection is provided in Section 6 of this report.

AOC 22-14

On April 8, 2009 the drilling rig was set up on location AOC 22-14 (Figure 8). Sample collection was accomplished using the HSA drilling method and split spoon samplers. There were no indications of impacts based on the field screening results nor was there any visual or olfactory evidence of impacts from the surface to a depth of 10 feet bgl. The sampling terminated at 10 feet bgl. The borehole was grouted to the surface on April 9, 2009.

AOC 22-13

On April 8, 2009 the drilling rig was set up on location AOC 22-13. Sample collection was accomplished using the HSA drilling method and split spoon samplers. As shown on the soil boring log, AOC 22-13, the Nacimiento Formation was encountered at 40.5 feet bgl. The sampling was terminated at 42.5 feet bgl.

This location was not designated for a well installation. However, due the elevated PID readings, the visual observation of staining, and the presence of odor throughout the soil boring it was decided that a ground water sample would be collected from the boring. As temporary well supplies were not immediately available for installation, the augers were left in the borehole overnight. Soil cuttings were placed in open-top 55 gallon drums and that sealed when not in use.

On April 9, 2009 the borehole was gauged and the depth to ground water was measured at 37.80 feet bgl. The total depth of the borehole was gauged as 38.75 feet bgl. Ground water sample AOC 22-13-GW was collected using a disposable bailer. The ground water in the augers was not purged prior to sampling since saturation had been encountered less than 24 hours earlier and would be representative of the formation's ground water. The augers were removed and the borehole was grouted to the surface.

AOC 22-12/TW-01

On April 13, 2009 the drilling rig was set up on location AOC 22-12. Sample collection was accomplished using the HSA drilling method and split spoon samplers. As shown on the soil boring log for AOC 22-12, the Nacimiento Formation was encountered at 41 feet bgl and consisted of clayey/sand-weathered sandstone. The sampling was terminated at 42 feet bgl.

Due the elevated PID readings, the visual observation of soil discoloration, and the presence of odor, it was decided that a ground water sample would be collected from the boring. Slotted (0.01 inch) rigid PVC well screen was placed at the bottom and extended for five feet (36.5 to 41.5 feet). Rigid 2-inch diameter Schedule 40 PVC with threads was utilized for the well casing. A 10/20 sand filter pack was installed to 3.5 feet over the top of the well screen. As the sand was installed in the wellbore the hollow stem augers were removed. Two feet of bentonite was placed over the filter pack and hydrated. Soil cuttings were placed in open-top 55 gallon drums that were sealed when not in use.

On April 14, 2009 the temporary well was gauged and the depth to ground water was measured at 37.95 feet bgl. The total depth of the well was gauged as 42.51 feet bgl. Ground water sample AOC 22-12-GW was collected using a disposable bailer. It was decided to not plug and abandon the boring but rather to complete the boring as a temporary well TW-01. On April 17, 2009 an annular grout was pumped by tremie method to within two feet of the ground surface and allowed to cure for a minimum of 24 hours. A stickup surface completion was installed at this location.

AOC 22-16/MW-63

On April 13, 2009 the drilling rig was set up on location AOC 22-16. Sample collection was accomplished using the HSA drilling method and split spoon samplers. There were no indications of impacts based on the field screening results nor was there any visual or olfactory evidence of impacts from the surface to a depth of 34 feet bgl. The drilling and sampling continued to a depth of 34 feet bgl before shutting down for the day.

On April 14, 2009 the drilling and sampling resumed with the ODEX drilling method and split spoon samplers. As shown on the well construction log for MW-63, the Nacimiento Formation was encountered at 44 feet bgl and consisted of dense, fine grained, dry, greenish gray weathered sandstone. In order to accommodate the well setting the borehole was advanced to a depth of 46 feet bgl.

Slotted (0.01 inch) rigid PVC well screen was placed at the bottom of the well and extended for 15 feet (29.75 to 44.75 feet) to ensure that the entire saturated zone was open to the well. Rigid Schedule 40 PVC with threads was utilized for the well casing. A 6-inch sand bed was placed at the bottom of the well bore. The 10/20 sand filter pack was installed to 2.75 feet over the top of the well screen. As the sand was installed in the well bore the ODEX casing was removed. Two feet of bentonite was placed over the filter pack and hydrated. On April 17, 2009 an annular grout was pumped by tremie method to within two feet of the ground surface and allowed to cure for a minimum of 24 hours. On April 23, 2009 the surface pad and protective aluminum cover were installed. Soil cuttings were placed in open-top 55 gallon drums that were sealed when not in use.

AOC 22-15/MW-61

On April 15, 2009 the drilling rig was set up on location AOC 22-15. Sample collection was accomplished using the HSA drilling method and split spoon samplers to a depth of 36 feet. The rig was modified to drill using the ODEX drilling method and sampling continued. As shown on the well construction log, MW-61, the Nacimiento Formation was encountered at 38 feet bgl and consisted of low plasticity, firm, dry to damp, yellowish brown to greenish gray silty sandy clay. In order to accommodate the well setting the borehole was advanced to a depth of 40.25 feet bgl.

Slotted (0.01 inch) rigid PVC well screen was placed at the bottom of the well and extended for 15 feet (24 to 39 feet) to ensure that the entire saturated zone was open to the well. Rigid Schedule 40 PVC with threads was utilized for the well casing. A 6-inch sand bed was placed at the bottom of the well bore. The 10/20 sand filter pack was installed to two feet over the top of the well screen. As the sand was installed in the well bore the ODEX casing was removed. Two feet of bentonite was placed over the filter pack and hydrated. On April 17, 2009 an annular grout was pumped by tremie method to within two feet of the ground surface and allowed to cure for a minimum of 24 hours. On April 23, 2009 the surface pad and a flush mount vault were installed. Soil cuttings were placed in open-top 55 gallon drums that were sealed when not in use.

AOC No. 23 - Southeast Holding Ponds

AOC 23-1/MW-62

On April 21, 2009 the drilling rig was set up on location AOC 23-1 (Figure 14). Sample collection was initially accomplished using the HSA drilling method and split spoon samplers. After encountering gravelly sand at 8 to 10 feet bgl the rig was modified to drill using the ODEX drilling method. Sampling continued to a depth of 31 feet bgl before shutting down for the day.

On April 22, 2009 the drilling and sampling resumed with the ODEX drilling method and split spoon samplers. As shown on the well construction log for MW-62, the Nacimiento Formation was encountered at 55.5 feet bgl and consisted of very dense, black, dry, silt/shale. In order to accommodate the well setting, the borehole was advanced to a depth of 58.25 feet bgl.

Slotted (0.01 inch) rigid PVC well screen was placed at the bottom of the well and extended for 15 feet (42 to 57 feet) to ensure that the entire saturated zone was open to the well. Rigid Schedule 40 PVC with threads was utilized for the well casing. A 6-inch sand bed was placed at the bottom of the well bore. The 10/20 sand filter pack was installed to two feet over the top of the well screen. As the sand was installed in the well bore the ODEX casing was removed. Two feet of bentonite was placed over the filter pack and hydrated. On April 23, 2009 an annular grout was pumped by tremie method to within two feet of the ground surface and allowed to cure for a minimum of 24 hours. On April 24, 2009 the surface pad and protective aluminum cover were installed. Soil cuttings were placed in open-top 55 gallon drums that were sealed when not in use.

AOC No. 24 - Tank Areas 41 and 43

In addition to the three soil borings installed at AOC No. 24 as described below, surface samples only were collected at four additional designated locations (AOC 24-1 through AOC 24-4). Details pertaining to surface sample collection is provided in Section 6 of this report.

AOC 24-7/MW-64

On April 7, 2009 the drilling rig was set up on location AOC 24-7 (Figure 15). Sample collection was initially accomplished using the HSA drilling method and split spoon samplers. After encountering gravelly sand at 38 feet bgl, the rig was modified to drill using the ODEX drilling method. Sampling continued to a depth of 51 feet bgl before shutting down for the day. As shown on the well construction log for MW-64, the Nacimiento Formation was encountered at 49 feet bgl and consisted of dense, very stiff, dry to damp, yellowish brown sandy clay. On April 8, 2009, the borehole was advanced to a depth of 58.25 feet bgl in order to accommodate the well setting.

Slotted (0.01 inch) rigid PVC well screen was placed at the bottom of the well and extended for 15 feet (34 to 49 feet) to ensure that the entire saturated zone was open to the well. Rigid Schedule 40 PVC with threads was utilized for the well casing. A 6-inch sand bed was placed at the bottom of the well bore. The 10/20 sand filter pack was installed to 2.25 feet over the top of the well screen. As the sand was installed in the well bore the ODEX casing was removed. Approximately 3.25 feet of bentonite was placed over the filter pack and hydrated. On April 9, 2009 an annular grout was pumped by tremie method to within two feet of the ground surface and allowed to cure for a minimum of 24 hours. On April 23, 2009 the surface pad and protective aluminum cover were installed. Soil cuttings were placed in open-top 55 gallon drums that were sealed when not in use.

AOC 24-5

On April 8, 2009 the drilling rig was set up on location AOC 24-5. Sample collection was accomplished using the HSA drilling method and split spoon samplers. The sampling terminated at 10 feet bgl. The borehole was grouted to the surface on April 9, 2009.

AOC 24-6

On April 8, 2009 the drilling rig was set up on location AOC 24-6. Sample collection was accomplished using the HSA drilling method and split spoon samplers. The sampling terminated at 10 feet bgl. The borehole was grouted to the surface on April 9, 2009.

AOC No. 25 - Auxiliary Warehouse and 90- Day Storage Area

In addition to the one soil boring installed at AOC No. 25 as described below, surface samples only were collected at one additional designated location (AOC 25-1). Details pertaining to surface sample collection are provided in Section 6 of this report.

AOC 25-2/MW-60

On April 5, 2009 the drilling rig was set up on location AOC 25-2 (Figure 16). Sample collection was initially accomplished using the HSA drilling method and split spoon samplers. After encountering gravelly sand at 38 feet bgl the rig was modified to drill using the ODEX drilling method. Sampling continued to a depth of 45.5 feet bgl. As shown on the well construction log for MW-60, the Nacimiento Formation was encountered at 43.5 feet bgl and consisted of dense, fine grain, damp, light yellowish brown weathered sandstone. The borehole was advanced to a depth of 45.5 feet bgl in order to accommodate the well setting.

Slotted (0.01 inch) rigid PVC well screen was placed at the bottom of the well and extended for 15 feet (28.75 to 43.75 feet) to ensure that the entire saturated zone was open to the well. Rigid Schedule 40 PVC with threads was utilized for the well casing. A 6-inch sand bed was placed at the bottom of the well bore. The 10/20 sand filter pack was installed to 2.25 feet over the top of the well screen. As the sand was installed in the well bore the ODEX casing was removed. Two feet of bentonite was placed over the filter pack and hydrated. On April 9, 2009 an annular grout was pumped by tremie method to within two feet of the ground surface and allowed to cure for a minimum of 24 hours. On April 23, 2009 the surface pad and protective aluminum cover were installed. Soil cuttings were placed in open-top 55 gallon drums that were sealed when not in use.

AOC No. 26 - Tank Area 44 and 45

In addition to the two soil borings installed at AOC No. 26 as described below, surface samples only were collected at seven additional designated sample locations (AOC 26-1 through AOC 26-7). Details pertaining to surface sample collection are provided in Section 6 of this report.

AOC 26-8/MW-65

On April 16, 2009 the drilling rig was set up on location AOC 26-8 (Figure 16). The boring had been hydroexcavated to 10 feet to clear utilities. Soil sampling with the rig began at 10 feet bgl and was accomplished using the HSA drilling method and split spoon samplers. The rig was modified to the ODEX drilling method after a gravelly sand was encountered at 32 feet bgl.

As shown on the well construction log for MW-65, the Nacimiento Formation was encountered at 41.75 feet bgl and consisted of fine grain, very stiff, damp, yellowish brown sandy clay/clayey sand. In order to accommodate the well setting the borehole was advanced to a depth of 44.25 feet bgl. During installation of the well the bentonite formed a “bridge” between the ODEX casing and the well casing. When the ODEX casing was being removed from the bore hole the well casing moved, which caused the proposed well settings to be adjusted. The ODEX casing and well casing were removed from the borehole and the field activities ceased for the day.

On April 17, 2009 the borehole for AOC 26-8/MW-65 was re-entered and reamed out to a depth of 44.25 feet bgl using the HSA drilling method. Slotted (0.01 inch) rigid PVC well screen was placed at the bottom of the well and extended for 15 feet (28 to 43 feet) to ensure that the entire saturated zone was open to the well. Rigid Schedule 40 PVC with threads was utilized for the well casing. A 6-inch sand bed was placed at the bottom of the well bore. The 10/20 sand filter pack was installed to two feet over the top of the well screen. As the sand was installed in the well bore the augers were removed. Approximately 2.5 feet of bentonite was placed over the filter pack and hydrated.

The rig was sent back to this location on April 20, 2009 to collect and screen the soils from 2 feet to 10 feet bgl. The borehole was grouted to the land surface.

On April 23, 2009 an annular grout was pumped by tremie method into well completion borehole to within two feet of the ground surface and allowed to cure for a minimum of 24 hours. On April 24, 2009 the surface completion and protective cover were installed. Soil cuttings were placed in open-top 55 gallon drums that were sealed when not in use.

AOC 26-9/MW-66

On April 20, 2009 the drilling rig was set up on location AOC 26-9. Soil sampling was initially conducted using the HSA drilling method and split spoon samplers. The rig was modified to the ODEX drilling method after reaching 36 feet bgl. As shown on the well construction log for MW-66, the Nacimiento Formation was encountered at 41 feet bgl and consisted of a sandy silty clay that was stiff to very stiff, dry and grayish green. In order to accommodate the well setting, the borehole was advanced to a depth of 43.25 feet bgl, and the field activities ceased for the day.

On April 21, 2009 MW-66 was installed. Slotted (0.01 inch) rigid PVC well screen was placed at the bottom of the well and extended for 15 feet (27 to 42 feet) to ensure that the entire saturated zone was open to the well. Rigid Schedule 40 PVC with threads was utilized for the well casing. A 6-inch sand bed was placed at the bottom of the well bore. The 10/20 sand filter pack was installed to 2.25 feet over the top of the well screen. As the sand was installed in the well bore the augers were removed. Approximately 2.25 feet of bentonite was placed over the filter pack and hydrated. On April 23, 2009 an annular grout was pumped by tremie method to within two feet of the ground surface and allowed to cure for a minimum of 24 hours. On April 24, 2009 the surface completion and protective cover were installed. Soil cuttings were placed in open-top 55 gallon drums that were sealed when not in use.

4.5 Monitor Well Development

Following monitoring well completion activities, each of the new monitoring wells were developed using a combination of mechanical surging and air-lift techniques. The following well development activities were conducted at each new monitoring well prior to ground water sampling activities.

Using a surge block attached to the end of the drill rod, ground water was forced to flow in and out of the well screen by the repeated upward and downward motion of the surge block along the entire length of the well screen. The repeated plunging motion drew filter pack fines and loosened sediment into the well casing, improving the water quality within the surrounding formation and filter pack.

Once the well was surged for a minimum of 20-minutes, the surge block was removed and the air-lift apparatus was used to remove the loosened sediment and fines from inside the well casing. Using an air compressor and dedicated 1-inch PVC eductor piping, compressed air was injected into the well. The air flow rate was manually adjusted to produce a continuous flow of water/sediment mixture out the top of the well casing via the 1-inch eductor piping. The groundwater/sediment mixture discharged directly into a 55-gallon drum. A glass jar was used to capture a sample of the purge water every 15 minutes to monitor the improving clarity of the purge water. Air lifting ceased once the purge water was relatively clear.

4.6 Ground Water Conditions

The uppermost aquifer is under water table conditions and occurs within the sand and gravel deposits of the Jackson Lake Formation. The Nacimiento Formation functions as an aquitard at the site and prevents site related contaminants from migrating to deeper aquifers. The potentiometric surface as measured in July/August 2009 is presented in Figure 5 and shows the ground water flowing to the northwest, toward the San Juan River. The potentiometric surface at the site is consistent with the regional gradient in that movement is toward to the San Juan River, which is a location of regional ground water discharge.

The depth to water in the area of the Group No. 3 SWMUs varies from approximately 34 feet near AOC No. 26 to 53 feet at AOC No. 23. Approximately 0.5 feet of separate phase hydrocarbon (SPH) was measured in one of the new wells (MW-61) installed during this investigation.

The saturated thickness in the water table aquifer varies from zero feet in the southern portion of the site to a maximum of approximately eight feet along the northern portion of the refinery. The areas with the greatest saturated thickness are found near and along the Hammond Ditch and on-site surface impoundments (i.e., the current and former Raw Water Ponds). The predominant source of recharge to the shallow aquifer beneath the refinery is recharge from man-made features (e.g., the Hammond Ditch and on-site surface impoundments).

4.7 Surface Water Conditions

The only local surface water body, excluding on-site surface impoundments and the Hammond Irrigation Ditch, is the San Juan River, which flows along the northern most property boundary. There were no accumulations of surface water observed during the site investigation or conditions likely to result in the future accumulation of surface water. Regionally, the surface topography slopes toward the floodplain of the San Juan River, and across most of the refinery and to the south of the refinery, the drainage is to the northwest. The active portion of the refinery property, where the process units and storage tanks are located, is generally of low relief with an overall northwest gradient of approximately 0.02 ft/ft. There is a steep bluff (approx. drop of 90 feet) at the northern boundary of the refinery where the San Juan River intersects the floodplain terrace, which marks the southern boundary of the floodplain.

There are two locally significant arroyos, one immediately east and another immediately west of the refinery, which collect most of the surface water flows in the area. A minor drainage feature is located on the eastern portion of the refinery, where the Landfill Pond (SWMU No. 9) was located, and there are several steep arroyos along the northern refinery boundary that primarily capture local surface water flows.

The average annual rainfall is only approximately 7.5 inches, thus the threat of surface water transport of contaminants as suspended load or dissolved phase is low. Further, the refinery implements a Stormwater Pollution Prevention Plan to ensure that surface waters of the State are not impacted by refinery operations.

Section 5
Regulatory Criteria

The applicable screening and cleanup levels are specified in Section VII of the Order issued by NMED on July 2, 2007. The soil cleanup levels are based on a target excess cancer risk of 10^{-5} for carcinogenic contaminants and a target hazard index of 1.0 for noncarcinogenic contaminants. The Order specifies a hierarchy of screening levels, with the screening levels based on NMED guidance taking precedence over EPA's Region VI Human Health Medium Specific Screening Levels with one exception for ground water that is discussed below. Based on direction received from NMED subsequent to issuance of the Order, EPA's Region VI Human Health Medium Specific Screening Levels have been replaced with EPA Regional Screening Levels dated April 2009. NMED guidance used to establish cleanup levels includes the *Technical Background Document for Development of Soil Screening Levels* (Revision 5.0 dated August 2009) and *Total Petroleum Hydrocarbon (TPH) Screening Guidelines* (dated October 2006).

For non-residential properties (e.g., the Bloomfield Refinery), the soil screening levels must be protective of commercial/industrial workers throughout the upper two feet of surface soils and construction workers throughout the upper ten feet based on NMED criteria. NMED residential soil screening levels are applied to the upper ten feet and soil screening levels for protection of ground water apply throughout the vadose zone. EPA soil screening levels for direct contact exposure apply to the upper two feet of the vadose zone. To achieve closure as "corrective action complete without controls", the affected media must meet residential screening levels, which are presented in Table 6. Table 7 provides a list of the available NMED and EPA soil screening levels for non-residential properties.

The 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.

The screening levels that are compared to individual sample results are presented in Tables 9, 10, and 11 for soils and Table 14 for ground water. Table 9 includes soil samples results for

SWMUs No. 4 and 5, and AOCs No. 23 and 25. The screening levels in Table 9 are based on residential land use. Since the investigation data for SWMU No. 4, SWMU No. 5, AOC No. 23, and AOC No. 25 indicate there is no threat to ground water in these areas, the applicable screening levels do not include the soil-to-ground water leachate pathway. Table 10 includes soil sample results for samples collected near the product loading rack portion of AOC No. 22 and AOC No. 26. The screening levels in Table 10 are based on non-residential land use and include the potential for constituents to migrate to ground water using a dilution attenuation factor (DAF) of 1.0. The soil analytical results for AOC No. 22 (crude receiving rack) and AOC No. 24 are presented in Table 11. The screening levels in Table 11 are based on non-residential land use. Based on investigation data discussed in Section 6, the constituents in Table 11 do not pose a threat to ground water, and thus these screening levels do not include the soil-to-ground water pathway.

The total petroleum hydrocarbon (TPH) screening levels are taken from NMED's October 2006 TPH Screening Guidelines. When no or insufficient information (e.g., site operational knowledge or laboratory chromatograms) is available to determine the type of petroleum product (e.g., diesel fuel, gasoline, or crude oil), the default product type of "unknown oil" is used to select a screening level for comparison to the gasoline range and diesel range organic analyses. Where information is available to identify particular product types, the screening level is selected accordingly from either Table 2a or 2b of NMED guidance. If two products have been handled in the same area (e.g., both diesel and gasoline at the product loading rack), then the most conservative (lowest) screening level of the two products is used. Screening values from Table 2b are used only in situations where impacts to shallow soils do not pose a threat to underlying ground water and there is limited potential for exposure to impacted soil (e.g., elevated concentrations occur mostly at depth and not at the land surface).

The motor oil range organic (MRO) results are compared to the "waste oil" screening levels, as waste oil is the only petroleum product category in the NMED guidance that includes similar carbon ranges as reported in the MRO analyses. The waste oil is assumed to be composed of 100% C19-C36 aliphatics and the MRO analyses include the C28 – C36 carbon range.

Some of the individual constituents reported by the laboratory did not have screening levels but were all non-detect in soil samples except 4-isopropyltoluene, n-butylbenzene, n-propylbenzene, and sec-butylbenzene. Similarly, there were detections of constituents in ground water samples that do not have screening levels. This includes the four constituents listed above for soil and magnesium, phenanthrene, bicarbonate, calcium, potassium and sodium. None of these constituents are classified as a carcinogen.

Section 6
Site Impacts

This section provides a description of sampling intervals and methods for detection of surface and subsurface impacts in soils and ground water. It explains the methods of sample collection, sample logging methods, screening sample selection methods, and field screening results. The analytical results are presented and compared to applicable screening levels, as described in Section 5.0.

6.1 Soil Sampling

Shallow soil sampling down to a maximum of 2 feet bgl was accomplished using a hand auger. These "surface" soil samples were collected from the auger bucket. The soil borings greater than 2 feet in depth were drilled using hollow-stem auguring (HSA) method or air rotary-ODEX method. Sample collection for analysis was completed with split-spoon samplers. The drilling equipment was decontaminated between each borehole using a high pressure potable water wash. The sampling equipment coming in direct contact with the samples (e.g., hand augers and split-spoon samplers) were decontaminated using a brush, as necessary, to remove larger particulate matter followed by a rinse with potable water, wash with nonphosphate detergent, rinse with potable water, and double rinse with deionized water. The field methods are also summarized in Appendix F.

All soil borings were drilled to a minimum depth of 10 feet with at least one boring at each of the individual potential source areas drilled to the top of saturation, with the exception of SWMU No. 5 where only shallow soil samples were collected. If there was any indication of impacts based on field screening results at 10 feet or evidence of waste materials or other signs of impacts, then the boring was drilled deeper until reaching a depth five feet below any indications of impacts or to the top of saturation, whichever was achieved first. If impacts were detected at the water table, then the boring was drilled five feet below the water table or to refusal, whichever occurred first.

Soil samples were collected continuously and logged by a qualified geologist. The soil sample descriptions were made in accordance with USCS nomenclature and recorded on the individual field boring logs. As shown on the boring logs (Appendix E) the data recorded included the lithologic interval, symbol, percent recovery and a sample description of the cuttings and core samples.

Known site features and/or site survey grid markers were used as references to locate each boring prior to surveying the location. The boring locations were measured to the nearest foot, and locations were placed on a scaled map. In addition, a hand held GPS receiver was used to record the coordinates of each soil boring. These coordinates were recorded on the boring logs. The soil boring locations were subsequently surveyed by a registered surveyor.

Samples obtained from the borings were screened in the field on 2 foot intervals for evidence of contaminants. Field screening results were recorded on the soil boring logs. Field screening results were used to aid in the selection of soil samples for laboratory analysis. The primary screening methods include: (1) visual examination, (2) olfactory examination, and (3) headspace vapor screening for volatile organic compounds.

Visual screening included examining the soil samples for evidence of staining caused by petroleum-related compounds or other substances that may have caused staining of natural soils such as elemental sulfur or cyanide compounds. Headspace vapor screening was conducted as described in Section 6.2.

The selected portion of the sample interval was placed in pre-cleaned, laboratory-prepared sample containers for laboratory chemical analysis. Two soil samples were collected for VOC analysis. An Encore® Sampler was used for collection of soil samples for low-level VOC analysis and the second sample was placed in a laboratory-prepared container with a methanol preservative.

6.1.1 SWMU No. 4 Transportation Terminal Sump

One soil boring was advanced in the area of SWMU No 4 (Figure 6) on April 6, 2009. This boring was subsequently converted to monitor well MW-59. The drilling and well installation is discussed in Section 4. The following text summarizes the soil sampling that was conducted at location SWMU 4-1.

As discussed in Section 4.4, soil was continuously logged at SWMU 4-1 to a depth of 43.5 feet bgl. Elevated PID readings were recorded in the interval from 4 to 12 feet bgl. The highest reading was at 6 to 8 feet bgl (214 ppm). A soft, black, sticky material mixed with clayey silt was encountered from 4 to 8 feet and soil discoloration and odor were observed down to 12 feet. None of the PID readings below 12 feet exceeded 10 ppm nor were there any visual or olfactory evidence of impacts below 12 feet.

Soil samples were collected at the following intervals from SWMU 4-1:

- 0 – 0.5 feet;
- 1.5 – 2 feet;
- 6 – 8 feet (interval with highest PID reading); and
- 36 – 38 feet (interval above saturation).

No constituents were detected at concentrations above the residential screening levels in either of the two surface soil samples (i.e., 0-0.5' and 1.5-2') or the deepest sample (36-38') collected just above the depth of saturation. TPH as DRO and MRO was detected at concentrations exceeding the residential screening levels (Table 9) in the sample with the highest PID reading in the 6-8' interval. The applicable screening levels used in Table 9 do not include the soil-to-ground water pathway because the impacted soil is vertically limited to the upper 12 feet and there is no indication that the relatively low concentrations of constituents are a threat to ground water that is already impacted by up-gradient sources.

Because only TPH was detected at concentrations above the screening levels, no cumulative risk evaluation was performed. The TPH screening levels were conservatively based on "unknown oil" for the DRO fraction and "waste oil" for the MRO fraction.

6.1.2 SWMU No. 5 - Heat Exchanger Bundle Cleaning Area

Soil samples were collected from six surface soil locations (SWMU 5-1, SWMU 5-2, SWMU 5-3, SWMU 5-4, SWMU 5-5, and SWMU 5-6) in the SWMU No. 5 area (Figure 7). On April 23, 2009 discrete soil samples, including one field duplicate sample (SWMU 5-5 (1.5-2.0')), were collected from all six surface soil locations at SWMU No. 5 for laboratory analyses from 0 to 0.5 feet bgl and 1.5 to 2 feet bgl. The samples were collected using a hand auger.

There were no indications of impacts based on the field screening results nor was there any visual or olfactory evidence of impacts in 0 to 2 foot interval in any of the six sample locations. No conditions that occurred during the field activities are considered to be capable of influencing the results of the field screening.

No organic constituents were detected at concentrations exceeding the residential screening levels; however, mercury and arsenic were detected in surface soil samples (0-0.5' interval) at concentrations above the residential screening levels. Mercury was exceeded at sample locations SWMU 5-1, SWMU 5-2, SWMU 5-3, SWMU 5-4, SWMU 5-5, and SWMU 5-6, while arsenic was exceeded only at SWMU 5-3. The applicable screening levels do not include the soil-to-ground water pathway because the impacted soil is vertically limited to surface soils and neither mercury nor arsenic was detected in ground water above the screening levels. The concentrations of mercury (as well as arsenic) attenuated very rapidly from the surface (0-0.5') samples to shallow subsurface (1.5-2.0') samples. The analytical results are summarized in Table 9.

6.1.3 AOC No. 22 - Product Loading Racks and Crude Receiving Loading Racks

Soil sampling was conducted at the following locations at AOC No. 22:

- Eleven surface soil sample locations - AOC 22-1 thru AOC 22-11;
- Two soil borings - AOC 22-13 and AOC22-14 (discussed in Section 4); and
- Three soil borings converted to monitor wells AOC 22-12/TW-01, AOC 22-15/MW-61 and AOC 22-16/MW-63 area (discussed in Section 4).

The following text summarizes the soil sampling that was conducted at AOC No. 22 in chronological order and the resulting analyses. The analytical results for AOC No. 22 are separated into two summary tables. The samples collected near the product loading rack are presented in Table 10 and the samples collected near the crude receiving rack are included in Table 11. The screening levels used in both tables are based on non-residential land use but Table 10 includes the soil-to-ground water pathway using a DAF of 1.0; whereas Table 11 screening levels do not include the soil-to-ground water pathway. A DAF of 1.0 is used in Table 10 due to the greater potential for constituents in soils to migrate to ground water and the soil-to-ground water pathway is eliminated for samples presented in Table 11 because the constituents in these areas do not indicate a threat to ground water.

The TPH screening criteria are also different for the areas near the crude rack vs. the product loading rack. The product type at the crude receiving rack is a weathered crude oil based on operations information and a review of chromatograms of samples collected in this area. Chromatograms for several soil samples characteristic of the crude receiving area are included in Appendix G. For comparison, chromatograms are also included for three fresh crude oils. No NMED screening level is provided for crude oil, weathered or otherwise, therefore "unknown oil" is utilized.

The TPH at the product loading racks is a mix of gasoline and diesel based on operations information. Since there is no NMED TPH screening level for gasoline, the screening level for diesel was utilized for evaluation of samples collected near the product loading rack.

AOC 22-14

Soil boring AOC 22-14 was extended to a depth of 10 feet on April 8, 2009. There were no indications of impacts based on the field screening results nor was there any visual or olfactory evidence of impacts from the surface to the termination depth. No conditions that occurred during the field activities are considered to be capable of influencing the results of the field screening. Soil samples were collected from AOC 22-14 at the following intervals:

- 0 – 0.5 feet; and
- 1.5 – 2 feet;

The analytical results for samples AOC 22-14 (0-0.5') and (1.5-2.0') are presented in Table 11. As shown, none of the concentrations exceed their respective screening levels.

AOC 22-13

Soil boring AOC 22-13 was drilled to a depth of 39 feet on April 8, 2009. Elevated PID readings were recorded from the surface to the termination depth. The readings ranged from 908 ppm (35 -37 feet) to 1,694 ppm (32 -33 feet). Soil discoloration was apparent from 20 to 39 feet bgl and the soil cores exhibited odor throughout the entire soil boring. Soil samples were collected from AOC 22-13 at the following intervals:

- 0 – 0.5 feet;
- 1.5 – 2 feet;
- 18 – 20 feet (high PID reading – 1660 ppm – silty sand);
- 32 – 34.5 feet (high PID reading – 1694 ppm – sand); and
- 37 – 39 feet (interval above saturation).

The analytical results, which are summarized in Table 10, indicate the presence of multiple volatile and semi-volatile organic constituents, cobalt, DRO, and GRO at concentrations above the respective screening levels protective of migration to ground water; however, detected concentrations of all SVOCs and cobalt were below the respective residential screening levels for direct contact.

AOC 22-12/TW-01

Soil boring AOC 22-12 was extended to a depth of 37.75 feet on April 13, 2009. Elevated PID readings were recorded from 28 to the termination depth. The readings ranged from 22.7 ppm (28 - 30 feet) to 220 ppm (36 – 37.75 feet). Soil discoloration and an odor were apparent in the soil cores from 26 to 37.75 feet bgl. The soil cores collected from the saturated portion of the boring also exhibited an odor. Soil samples were collected at AOC 22-12 from the following intervals:

- 0 – 0.5 feet – also duplicated;
- 1.5 – 2 feet;
- 32 – 35 feet (highest PID reading – 68 ppm); and
- 36 – 37.75 feet (interval above saturation).

As summarized in Table 10, cobalt was identified at concentrations above the non-residential screening level protective of migration to ground water; however the detected concentrations of cobalt were below the EPA Regional screening level for residential soils via direct contact. Concentrations of several organic constituents were detected in the 36-37.75 foot interval sample but are below the screening levels, with the exception of naphthalene that was detected at 6.22 µg/kg which exceed the respective screening level protective of ground water migration (4.19 µg/kg). However, the detected concentration of naphthalene was below the respective NMED residential soil screening level via direct contact.

AOC 22-16/MW-63

Soil boring AOC 22-16 drilled to a depth of 46 feet bgl on April 13 and 14, 2009. There were no indications of impacts based on the field screening results nor was there any visual or olfactory evidence of impacts from the surface to the termination depth. Soil samples were collected at AOC 22-16 from the following intervals:

- 0 – 0.5 feet;
- 1.5 – 2 feet; and
- 36-38 feet (interval above saturation).

All analytical results for the AOC 22-16 soil samples were below the screening levels (Table 11).

AOC 22-7 through AOC 22-9

On April 13, 2009 discrete soil samples were collected from three surface soil locations at AOC No. 22 (AOC 22-7, AOC 22-8, and AOC 22-9) for laboratory analyses from 0 to 0.5 feet bgl and

1.5 to 2 feet bgl. Soil samples collected include one field duplicate sample (AOC 22-8 (1.5-2.0')). The samples were collected using a hand auger. There were no indications of impacts based on the field screening results nor were there any visual or olfactory evidence of impacts in 0 to 2 foot interval in any of the three soil borings. The analytical results (Table 11) for samples collected at locations AOC 22-7 through AOC 22-9 did not indicate the presence of constituents above the respective non-residential screening levels listed in Table 11. In addition, all detected concentrations were below respective residential soil screening levels for direct contact.

AOC 22-10 and AOC 22-11

On April 14, 2009 discrete soil samples were collected from two surface soil locations at AOC No. 22 for laboratory analyses from 0 to 0.5 feet bgl and 1.5 to 2 feet bgl. There were no indications of impacts based on the field screening results nor were there any visual or olfactory evidence of impacts in the 0 to 2 foot interval in either of soil borings. The analytical results (Table 11) for soil samples collected at locations AOC 22-10 and AOC 22-11 do not indicate the presence of constituents above the screening levels.

AOC 22-15/MW-61

Soil boring AOC 22-15 was extended to a depth of 40.25 feet on April 15, 2009. Slightly elevated PID readings were observed from 1.5 feet to 32 feet. The highest readings were found between 1.5 to 4 feet (29.5 ppm and 23.4 ppm). There was no visual or olfactory evidence of impacts from the surface to a depth of 30 feet bgl. Two soil samples were collected from the upper most part of the boring at AOC 22-15:

- 1.0 – 1.5 feet; and
- 1.5 – 2 feet (duplicated).

In the interval from 30 to 32 feet, staining was observed, an odor was evident and the PID reading increased to 165 ppm. A PID reading of 510 ppm was collected from 34 to 36 feet. Soil samples were collected for laboratory analysis from both intervals (30-32' and 34-36').

Cobalt was detected above the screening level in all samples collected at AOC 22-15. Several organic constituents, including methylene chloride, MTBE, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene were detected at concentrations above the screening levels. The results are presented in Table 10.

AOC 22-1 through AOC 22-4

On April 15, 2009 discrete soil samples were collected from four surface soil locations at AOC No. 22 for laboratory analyses from 0 to 0.5 feet bgl and 1.5 to 2 feet bgl. The samples were collected using a hand auger.

No conditions that occurred during the field activities are considered to be capable of influencing the results of the field screening. There were no indications of impacts based on the field screening results nor were there any visual or olfactory evidence of impacts in 0 to 2 foot interval in soil borings AOC 22-1 or AOC 22-3.

At surface soil location AOC 22-2 the surface soil had a PID reading of 16.1 ppm. No staining or odor was apparent. In surface soil location AOC 22-4 the soil encountered in the 1.5 to 2 foot interval had a PID reading of 2429 ppm. No staining was apparent; however, the soil did exhibit an odor.

AOC 22-4 (1.5 – 2.0') was the only sample at locations AOC 22-1 through AOC 22-4 with multiple detections of organic constituents above the respective screening levels protective of migration to ground water, which is consistent with the field screening results. There were multiple volatile and semi-volatile organic constituents, DRO and cobalt with concentrations above the screening levels listed in Table 10; however the detected concentrations are below the NMED and/or EPA Regional screening levels for residential soil via direct contact. AOC 22-3 (1.5-2') contained methylene chloride at 11 µg/kg, which slightly exceeds the screening level of 10.7 µg/kg.

AOC 22-5 and AOC 22-6

On April 23, 2009 discrete soil samples were collected from two surface soil locations at AOC No. 22 for laboratory analyses from 0 to 0.5 feet bgl and 1.5 to 2 feet bgl. The samples were collected using a hand auger.

There were no indications of impacts based on the field screening results nor was there any visual or olfactory evidence of impacts in 0 to 2 foot interval at either location. No conditions that occurred during the field activities are considered to be capable of influencing the results of the field screening.

No constituents, with the exception of cobalt, were detected at concentrations above the respective screening level protective of ground water migration in any of the soil samples collected from locations AOC 22-5 or 22-6. However, the detected concentration of cobalt was below the EPA Regional soil screening level for residential soil via direct contact. The analytical results are summarized in Table 10.

AOC No. 22 Cumulative Risk Evaluation

As multiple constituents were detected at concentrations above the screening levels in soil samples collected at AOC No. 22, a cumulative risk evaluation was conducted. The constituents with concentrations above the screening level are listed below with a notation if they are considered to be carcinogenic or non-carcinogenic. For non-carcinogens, the target organ is listed.

Constituent	Carcinogenic vs. Non-Carcinogenic	Non-Carcinogenic Target Organ
Cobalt	Non-Carcinogenic	Lungs (National Toxicology Program, 2009)
1,2,4-Trimethylbenzene	Non-Carcinogenic	Eyes, skin, respiratory, central nervous system (NIOSH, 2004)
1,3,5-Trimethylbenzene	Non-Carcinogenic	Liver, neurotoxicity (NIOSH, 2002),
1-Methylnaphthalene	Carcinogenic	Not applicable
2-Methynaphthalene	Non-Carcinogenic	Lungs (IRIS, 2009a)
Benzene	Carcinogenic	Not applicable
Ethylbenzene	Carcinogenic	Not applicable
Methylene chloride	Carcinogenic	Not applicable
Naphthalene	Carcinogenic	Not applicable
Toluene	Non-Carcinogenic	Kidney (IRIS, 2009b)
Xylenes	Non-Carcinogenic	neurological effects (IRIS, 2009c)
DRO	Not specified in NMED guidance	NA
MRO	Not specified in NMED guidance	NA

Based on the aforementioned sources, two of the non-carcinogens could have similar target organs (i.e., lungs). Cobalt and 2-methylnaphthalene are both present at concentrations that exceed the soil-to-ground water screening level based on a DAF of 1 but are not present at concentrations that exceed the direct contact screening levels as provided in Table 7. Cumulative effects are not a concern for cobalt and 2-methylnaphthalene.

Five of the constituents are listed as potential carcinogens based on the NMED and EPA sources referenced in Section 5.0. This could result in a cumulative carcinogenic risk level of 5.0 E-5.

The screening level included in Table 10 for cobalt assumes a DAF of 1 for the soil-to-ground water pathway; however, cobalt is not detected in concentrations above the screening level in any of the ground water samples collected during this site investigation effort. Cobalt does not appear to present a threat to ground water and the soil-to-ground water pathway should not be considered to be complete at AOC No. 22.

6.1.4 AOC No. 23 - Southeast Holding Ponds

One soil boring was advanced in the area of AOC No. 23 (Figure 14) on April 13, 2009. This boring was subsequently converted to monitor well MW-62. The drilling, sampling and well installation is discussed in Section 4. The following text summarizes the soil sampling that was conducted at location AOC 23-1.

Soil boring AOC 23-1 extended to a depth of 58.25 feet bgl. There were no indications of impacts based on the field screening results nor was there any visual or olfactory evidence of impacts from the surface to the termination depth. Soil samples were collected from AOC 23-1 on April 21, 2009 from the following intervals:

- 0 – 0.5 feet (duplicate);
- 1.5 – 2 feet; and
- 52-53 feet (interval above saturation).

None of the analytical results for the soil samples collected at AOC 23 indicate concentrations of constituents above the residential screening levels and the results are summarized in Table 9. The residential screening levels do not include the soil-to-ground water pathway because there is no indication of the presence of site-related impacts to soil and all of the concentrations of constituents detected are low with only cobalt present above the soil-to-ground water screening level with a DAF of 20. Cobalt is present in all of the soil samples analyzed from the SWMU Group #3 areas at similar concentrations but does not appear in any of the ground water samples at concentrations above the ground water screening level. The soil-to-ground water exposure pathway is not considered to be complete at AOC No. 23.

6.1.5 AOC No. 24 - Tank Areas 41 and 43

The following field activities were conducted at AOC No. 24:

- Four surface soil samples - AOC 24-1 thru AOC 24-4;
- Two soil borings - AOC 24-5 and AOC 24-6 (discussed in Section 4); and
- One soil boring converted to a monitor well AOC 24-7/MW-64 (discussed in Section 4).

The following text summarizes the soil sampling that was conducted at location AOC No. 24 in chronological order. The chemical analyses are summarized in Table 11, where screening levels are based on non-residential land use without the soil-to-ground water pathway. The field screening data and chemical analyses indicate the few detections of constituents, which indicate site-related impacts, are limited to shallow soils and do not threaten to impact ground water, which occurs at nearly 40 feet beneath the land surface.

AOC 24-7/MW-64

Soil boring AOC 24-7 was extended a depth of 51 feet bgl on April 7, 2009. Drilling resumed the next day to a depth of 58.25'. There were no indications of impacts based on the field screening results nor was there any visual or olfactory evidence of impacts from the surface to the termination. Soil samples were collected from the following intervals:

- 0 – 0.5 feet;
- 1.5 – 2 feet; and
- 39 – 42 feet (interval above saturation).

There are no analytical results for the three samples collected at AOC 24-7 that exceed the screening levels. The analyses are summarized in Table 11.

AOC 24-5

Soil Boring AOC 24-5 extended to a depth of 10 feet bgl. There were no indications of impacts based on the field screening results nor was there any visual or olfactory evidence of impacts from the surface to the termination depth. The sampling terminated at 10 feet bgl. Soil samples were collected from AOC 24-5 on April 18, 2009 from the following intervals:

- 0 – 0.5 feet (duplicate); and
- 1.5 – 2 feet;

All of the analytical results for the samples collected at AOC 24-5 were less than the non-residential screening levels. All of the results are summarized in Table 11.

AOC 24-6

Soil boring AOC 24-6 extended to a depth of 10 feet bgl. There were no indications of impacts based on the field screening results nor was there any visual or olfactory evidence of impacts from the surface to the termination depth. Soil samples were collected on April 8, 2009 from the following intervals:

- 0 – 0.5 feet; and
- 1.5 – 2 feet;

All of the analytical results for the samples collected at AOC 24-6 were less than the non-residential screening levels with the exception of DRO in sample AOC 24-6 (1.5-2.0'). All of the results are summarized in Table 11.

AOC 24-1 through AOC 24-4

On April 23, 2009 discrete soil samples were collected from four surface soil locations at AOC No. 24 for laboratory analyses from 0 to 0.5 feet bgl and 1.5 to 2 feet bgl. The soil samples collected include one field duplicate sample (AOC 24-4 (1.5-2.0')). The samples were collected using a hand auger.

There were no indications of impacts based on the field screening results nor were there any visual or olfactory evidence of impacts in 0 to 2 foot interval in soil borings AOC 24-1 through AOC 24-4. No conditions that occurred during the field activities are considered to be capable of influencing the results of the field screening.

All of the analytical results for the samples collected at AOC 24-1 through 24-4 are less than the non-residential screening levels. The analytical results are summarized in Table 11.

6.1.6 AOC No. 25 - Auxiliary Warehouse and 90-Day Storage Area

The following field activities were conducted at AOC No. 25:

- One surface soil location - AOC 25-1; and
- One soil boring converted to a monitor well AOC 25-2/MW-60 (discussed in Section 4).

The following text summarizes the soil sampling that was conducted at location AOC No. 25 in chronological order. The analytical results are summarized in Table 9 and are compared to the residential screening levels that do not include the soil-to-ground water pathway. An initial review of the analytical results shows that only cobalt is present at concentrations above the soil-to-ground water screening levels using a DAF of 20. The cobalt concentrations are similar to all of the other analyses for cobalt performed at the site and do not indicate elevated concentrations near AOC No. 25. Cobalt is not detected in ground water above the screening level at MW-60 and the soil-to-ground water exposure pathway is not considered to be complete at AOC No. 25.

AOC 25-2/MW-60

Soil boring AOC 25-2 extended to a depth of 45.5 feet bgl. There were no indications of impacts based on the field screening results nor was there any visual or olfactory evidence of impacts from the surface to the termination depth. Soil samples were collected from AOC 25-2 on April 5, 2009 from the following intervals:

- 0 – 0.5 feet (duplicate);
- 1.5 – 2 feet; and
- 36– 38 feet (interval above saturation).

All of the analytical results for the samples collected at AOC 25-2 were less than the screening levels. All of the results are summarized in Table 9.

AOC 25-1

On April 23, 2009 two discrete soil samples were collected from AOC 25-1 for laboratory analyses from 0 to 0.5 feet bgl and 1.5 to 2 feet bgl. The samples were collected using a hand auger. There were no indications of impacts based on the field screening results nor were there any visual or olfactory evidence of impacts in 0 to 2 foot interval. No conditions that occurred during the field activities are considered to be capable of influencing the results of the field screening.

All of the analytical results for the samples collected at AOC 25-1 were less than the screening levels. The results are summarized in Table 9.

6.1.7 AOC No. 26 - Tank Area 44 and 45

The following field activities were conducted at AOC No. 26:

- Seven surface soil locations - AOC 26-1 thru AOC 26-7; and
- Two soil borings converted to monitor wells AOC 26-8/MW-65 and AOC 26-9/MW-66 (discussed in Section 4).

The following text summarizes the soil sampling that was conducted at location AOC No. 26 in chronological order. The analytical results are presented in Table 10, where they are compared to the non-residential screening levels. The soil-to-ground water screening level is based on a DAF of 1.0 based on documented ground water impacts in the area of chemicals that were historically stored in Tanks 44 and 45.

AOC 26-8/MW-65

Soil boring AOC 26-8 extended to a depth of 44.25 feet on April 16, 2009. A faint odor was initially detected at 28 feet bgl and became stronger with depth. Elevated PID readings were observed from 30 feet to 36 feet. The highest reading was 145 ppm in the core sample from 34 feet to 36 feet bgl. Surface soil samples were collected from AOC 26-8 from the following intervals:

- 0 to 1.0 feet (duplicate);
- 1.5-2 feet; and
- 32-36 feet.

Barium and cobalt are detected in the soil samples collected at AOC 26-8 at concentrations above the NMED DAF=1 screening level protective of groundwater, and the EPA protection of ground water risk-based screening level, respectively; however, detected concentrations of both analytes are below the respective NMED and EPA Regional screening level for residential soils via direct contact. All of the results are summarized in Table 10.

AOC 26-9/MW-66

On April 20, 2009, soil boring AOC 26-9 as drilled to a total depth of 43.25 feet. Elevated PID readings were observed from 34 feet to 38 feet. The highest reading was 3939 ppm in the core sample from 36 feet to 38 feet bgl. An odor was initially detected at 36 feet bgl and was also evident in the saturated soils.

Soil samples were collected from the following intervals:

- 0 to 0.5 feet;
- 1.5 to 2 feet; and
- 36-38 feet.

All of the analytical results for the surface soil samples (0-0.5' and 1.5-2.0') collected at AOC 26-9 are less than the screening levels with the exception of cobalt, which is detected at low concentrations above the EPA protection of groundwater risk-based screening level in all samples; however the detected cobalt concentrations were below the EPA Regional screening level for residential soils via direct contact. There are numerous organic constituents, including volatile and semi-volatile organics that have concentrations above the non-residential screening levels in soil sample AOC 26-9 (36-38'). The concentration detected in AOC 26-9 at 36-38' are believed to be associated with ground water impacts in the area and not a soil source in the immediate area. All of the soil analytical results are summarized in Table 10.

AOC 26-1 through AOC 26-7

On April 20, 2009 discrete soil samples were collected from seven surface soil locations at AOC No. 26 for laboratory analyses from 0 to 0.5 feet bgl and 1.5 to 2 feet bgl. Soil samples collected include one duplicate sample (AOC 26-3 (1.5-2.0')). The samples were collected using a hand auger.

All borings were advanced to a depth of 2 feet bgl. There were no indications of impacts based on the field screening results nor were there any visual or olfactory evidence of impacts in 0 to 2 foot interval in soil borings AOC 26-1 through AOC 26-7. No conditions that occurred during the field activities are considered to be capable of influencing the results of the field screening.

All of the analytical results for the soil samples collected at AOC 26-1 through 26-7 are less than the non-residential screening levels on Table 10 with the exception of Barium at 26-4 (0-0.5'), MTBE at 26-5 (1.5-2'), and cobalt; however the detected concentrations of barium, MTBE, and cobalt were below the respective NMED and/or EPA Regional soil screening levels for residential soil via direct contact..

An evaluation of the cumulative risk from the presence of multiple constituents is presented below. Each of the constituents with concentration exceeding the screening levels are listed, with the exception of the constituents detected in sample AOC 26-9 (36-38'), which are associated with ground water impacts and not a soil source.

Constituent	Carcinogenic vs. Non-Carcinogenic	Non-Carcinogenic Target Organ
Barium	Non-Carcinogenic	Kidney (IRIS, 2009d)
Cobalt	Non-Carcinogenic	Lungs (National Toxicology Program, 2009)
MTBE	Carcinogenic	Not applicable

The two non-carcinogens affect different target organs and thus the hazard index is 1. In addition, the concentrations of barium and cobalt are all less than the screening levels for direct contact exposures. There is only one carcinogenic constituents present above screening levels, thus the cumulative risk is 1E-05.

The screening level included in Table 10 for cobalt assumes a DAF of 1 for the soil-to-ground water pathway; however, cobalt is not detected in concentrations above the screening level in any of the ground water samples collected during this site investigation effort. Cobalt does not appear to present a threat to ground water and the soil-to-ground water pathway should not be considered to be complete at AOC No. 26.

6.2 Soil Sample Field Screening Results

Headspace vapor screening was conducted by placing a soil sample in a plastic sealable bag allowing space for ambient air. The bag was sealed, labeled and then shaken gently to expose the soil to the air trapped in the container. The sealed bag was then allowed to set for a minimum of 5 minutes while the vapors equilibrated. Vapors present within the sample bag's headspace were then measured by inserting the probe of a MiniRae 2000 volatile organic compound monitor (i.e., photoionization detector) in a small opening in the bag. The maximum value and the ambient air temperature were recorded on the field boring log for each sample. The MiniRae 2000 was calibrated to 100 ppm isoButylene each day to the manufacturer's standard for instrument operation. Field screening results and any conditions that were considered to be capable of influencing the results of the field screening were recorded on the field logs. A summary of the vapor screening results for surface soil samples is located in Table 12 and screening results for the soil samples collected from the soil borings are included in Table 13.

The screening results are discussed above in Section 6.1 for each individual soil boring/sample location.

6.3 Soil Sampling Chemical Analytical Results

Soil samples were sent to Hall Environmental Analysis Laboratory in Albuquerque, New Mexico for analysis using the following methods for organic constituents:

- SW-846 Method 8260 volatile organic compounds;
- SW-846 Method 8270 semi-volatile organic compounds; and
- SW-846 Method 8015B gasoline, diesel, and motor oil range petroleum hydrocarbons.

In addition, soil samples were analyzed for the following metals using the indicated analytical methods.

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.3/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

The soil analytical results are presented in Tables 9, 10, and 11. There were no conditions observed during the sample collection efforts that are thought to have had any impact on the analytical results. The site screening levels, as described in Section 5, are included in each table to facilitate a comparison between the reported concentrations and the applicable screening levels. Concentrations that exceed the applicable screening levels are bolded. Some of the samples have two analyses reported for VOCs. All data is reported to the lowest achievable limits expressed in units of ug/kg where possible. A second set of data has a higher reporting limit expressed in units of mg/kg due to higher concentrations being present in the samples.

The soils analyses were completed as provided in the site investigation work plan with only two exceptions. Soil sample AOC 22-12 (36-37.75') was inadvertently not analyzed for cyanide due to laboratory mis-communication; however analysis was completed for all other requested constituents for sample AOC 22-12 (36-37.75'). Due to limited sample recovery, sample AOC 22-13 (37-39') was not analyzed for metals and SVOCs; all other required analyses were completed. The data exceptions to the approved work plan are also discussed in the Data Validation Report in Appendix H. Also, additional analyses for ethanol were conducted for some soil samples at AOC No. 26, beyond those required in the NMED letter of February 18, 2009, which approved the investigation work plan.

Four metals (arsenic, barium, cobalt, and mercury) were detected at concentrations above the screening levels. Eleven organic constituents (1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 1-methylnaphthalene, 2-methylnaphthalene, benzene, ethylbenzene, methylene chloride, naphthalene, toluene, xylenes, and MTBE) and gasoline, diesel, and motor oil range hydrocarbons were also identified in concentrations exceeding the screening levels in soils. The constituents that exceed screening levels were identified in one or more samples collected from SWMU No. 4, SWMU No. 5, and AOCs No. 22. Maps showing the distribution of detected constituents with concentrations exceeding the applicable cleanup levels that are the most widespread or representative are included as Figures 6 - 16. For soil and ground water quality assurance/quality control sampling and analysis information is discussed in Appendix H and laboratory data reports are included Appendix C.

6.4 Ground Water Sampling

Ground water samples were collected from both temporary wells and all permanent monitoring wells as described below. Ground water samples were also collected from each of the eight permanent wells (MW 59 through MW-66) installed throughout the area south of County Road 4990 (Figure 17). The temporary wells were installed in soil borings AOC 22-12 and AOC 22-13, as discussed above in Section 4.4. Water samples were collected from the temporary and permanent wells using disposable bailers. The samples from temporary wells were collected within 24 hours of well installation.

The permanent wells installed for the Group No. 3 SWMUs include MW-59 (SWMU 4-1), MW-60 (AOC 25-2), MW-61 (AOC 22-15), MW-62 (AOC 23-1), MW-63 (AOC 22-16), MW-64 (AOC 24-7), MW-65 (AOC 26-8), and MW-66 (AOC 26-6). Two ground water sampling events were completed at the permanent monitoring wells. The first sampling event was conducted at the end of the initial well installation field effort on May 12 through May 14, 2009 and the second (confirmation) sampling event was completed on July 15, 16, and 29, 2009.

The fluid levels are presented in Table 15 and the depths to water are essentially the same as the collection depth because there is only a few feet or less of water in each well. The water samples were collected from each well for analysis as specified in the Investigation Work Plan.

6.5 General Ground Water Chemistry

The measurement of field purging parameters included measurements of pH, specific conductance, total dissolved solids, dissolved oxygen concentrations, oxidation-reduction potential, and temperature. The measurements were taken using an Ultrameter 6P manufactured by Myron L Company. The Ultrameter was calibrated daily (pH calibrated with 4.0, 7.0, and 10.0 solutions and conductivity calibrated with 1,413 uS/cm solution). A minimum of three well volumes were removed from each permanent monitoring well prior to sample collection. There were no conditions encountered during sample collection that affected field screening results. The measurements are included in Table 14.

6.6 Ground Water Chemical Analytical Results

The ground water samples were analyzed for organic constituents by the following methods:

- SW-846 Method 8260 volatile organic compounds;
- SW-846 Method 8270 semi-volatile organic compounds;
- SW-846 Method 8015B gasoline, diesel, and motor oil range organics; and
- SW-846 Method 8015 ethanol (for AOC 26 samples only).

Ground water samples were analyzed for the following metals using the indicated analytical methods.

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.3/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

In addition, ground water samples were analyzed for the following general chemistry parameters.

Analyte	Analytical Method
Bicarbonate/Carbonate/Alkalinity	SM-2320B
Chloride	EPA method 300.0
Sulfate	EPA method 300.0
Calcium	EPA method 6010B
Magnesium	EPA method 6010B
Sodium	EPA method 6010B
Potassium	EPA method 6010B
Manganese	SW-846 method 6010/6020
Nitrate/nitrite	EPA method 300.0
Ferric/ferrous Iron	EPA method 6010B
Fluoride	EPA method 300.0
Phosphorus	EPA method 300.0
Total Dissolved Solids	SM-2540C
Specific Conductance	EPA 120.1

The ground water analyses were completed as approved in the site investigation work plan with the exceptions noted in the following discussion. During the initial sampling event, separate analyses of nitrate and nitrite were completed for water samples collected from MW-61, MW-62, AOC 22-12/TW-01, and AOC 22-13, and total results for nitrate plus nitrite was reported for MW-59, MW-60, MW-63, MW-64, MW-65, and MW-66. For the second or confirmation sampling event, a separate analysis for nitrate and nitrite was reported for MW-63, MW-64, MW-66 and TW-01, and total results for nitrate plus nitrite was reported for MW-59, MW-61, MW-62, and MW-65. Samples must be analyzed within the 48-hour hold time to report nitrate and nitrite separately.

The work plan listed analyses for ferric/ferrous iron. The laboratory reported iron by method 6010B Total Recoverable Metals, which represents the sum of both ferric and ferrous iron. In addition, the analyses include iron by method 6010B dissolved metals, which represents ferrous iron. Ferric iron can be calculated by subtracting the dissolved analytical result from the total recoverable result.

There were no field conditions observed during sample collection that should have affected the analytical results. The analytical results and the applicable cleanup levels are presented in Table 16. The individual results that exceed the applicable cleanup levels are bolded. The results for the associated QA/QC samples are provided in Appendix H. Thirteen organic constituents (1,2,4-trimethylbenzene, 1,2-dichloroethane, 1,3,5-trimethylbenzene, 1-methylnaphthalene, 2-methylnaphthalene, benzene, bis(2-ethylhexyl)phthalate, ethylbenzene, MTBE, naphthalene, phenol, toluene, and xylenes) and gasoline and diesel range hydrocarbons were detected in concentrations exceeding the screening levels. Four metals (arsenic, iron, manganese, and lead) were detected at concentrations that exceed the screening levels. The distribution of manganese concentrations in ground water is presented in Figure 21.

6.7 Air and Subsurface Vapor Sampling/Field Screening Results

Subsurface vapor samples were screened during ground water sample collection activities for the presence of carbon dioxide, oxygen, and organic vapors. A total well vapor sample was screened in the field for percent carbon dioxide and oxygen. The vapor monitoring was completed by sealing the top of the well with a cap containing a sample port. Polyethylene tubing was inserted through the sample port and attached to a low-velocity pump and an Eagle Meter manufactured by RKI Instruments, Inc., which was calibrated to 15% CO_2, 12.0% O_2, and 100 ppm Isobutylene. The results are included in Table 14.

Section 7
Conclusions and Recommendations

An investigation of soil and ground water was conducted at the Group 3 SWMUs and AOCs to assess and evaluate the presence, nature, extent, fate, and transport of contaminants. To accomplish this objective, soil samples and/or ground water samples were collected at each of the SWMUs/AOCs and analyzed for potential site-related contaminants.

All soil borings were drilled to a minimum depth of 10 feet with at least one boring at each of the main potential source areas drilled to the top of saturation. Surface soil samples were also collected, with depths extending to two feet bgl. Ground water samples were collected at eight permanent and two temporary monitoring wells. Soil samples were collected continuously at all borings and logged by a qualified geologist in accordance with USCS nomenclature. A summary of the investigation results at each SWMU/AOC is provided below, along with conclusions and recommendations based on the investigation results.

SWMU No. 4 Transportation Terminal Sump

At SWMU No. 4, a black material was observed in soils at boring SWMU 4-1 from four to eight feet bgl. It appears that this boring may have penetrated the actual location of the former sump. Field screening results using a PID identified elevated readings from four feet to 10 feet bgl (with significantly lower PID readings below 10 feet) indicate that soil impacts related to the sump are limited in vertical extent. In addition, analytical results from the deeper sample (SWMU 4-1 (36-38')), which detected only one organic constituent (methylene chloride) at very low concentrations, indicate that the materials encountered at four to 10 feet do not pose a threat to ground water. The screening levels included in Table 9 are based on residential land use without inclusion of the cross-media soil-to-ground water screening level. Only the concentrations for motor oil and diesel range organics exceeds the NMED residential soil screening level.

Boring SWMU 4-1 was extended to the top of the Nacimiento and completed as MW-59. Ground water samples collected from the well indicate the presence of 1,2,4-trimethylbenzene, 1,2-dichloroethane, 1-methylnaphthalene, benzene, MTBE, naphthalene, gasoline range organics, diesel range organics, arsenic, and manganese in ground water at concentrations above the respective screening levels listed in Table 16. The presence of 1,2-dichloroethane and MTBE in ground water samples and not in the soil samples suggests that ground water is impacted from up-gradient source. Subsurface vapor samples did not indicate significant concentrations of organic constituents with PID readings ranging from 37.5 to 41.1 ppm. Measurements of oxygen and carbon dioxide in subsurface vapor samples did not indicate significant biological activity with oxygen levels at approximately 19% by volume and carbon dioxide measured at approximately 0.5 % (Table 14). Additional assessment is recommended to delineate the lateral extent of the impacts in soils near AOC 4-1.

SWMU No. 5 Heat Exchanger Bundle Cleaning Area

Surface soil samples were collected from depths of 0-0.5 feet and 1.5-2.0 feet at 6 locations (SWMU 5-1 through SWMU 5-6) around the northern, eastern, and southern sides of the bundle cleaning pad to locate any evidence of impacts from historical site operations. The western side of the cleaning area abuts the eastern wall of AOC No. 25 Auxiliary Warehouse and 90-Day Storage Area. The majority of the organic analyses are non-detect, with none of the results exceeding the residential screening levels. The metals are concentrated in the upper 6 inches, with the deeper samples (collected in the 1.5 – 2.0 foot interval) having significantly lower concentrations below applicable screening levels. The significant reduction in concentrations of metals over one foot of vertical interval indicates that metals are not migrating into deeper soils and do not pose a threat to the underlying ground water, which occurs at a depth of approximately 42 feet. The soil-to-ground water exposure pathway is not considered to be complete at SWMU No. 5. The soil analytical results for metals indicate that arsenic and mercury are present in surface soils (0-0.5') at concentrations above the residential screening level in the immediate vicinity of the pad (Figure 7). The analytical results are summarized in Table 9.

The bundle cleaning pad drains to a concrete sump located inside the eastern end of AOC No. 25 Auxiliary Warehouse and 90-Day Storage Area. To assess the potential for ground water impacts, a monitoring well (MW-60) was installed down-gradient of the sump, on the north side of AOC No. 25 (Figure 17). The analyses of the ground water samples collected from MW-60 did not indicate any impacts to ground water from activities at either SWMU No. 5 or AOC 25. Subsurface vapor samples collected from MW-60 did not indicate the presence of organic impacts (Table 14). All concentrations of reported constituents are below their respective screening levels with the single exception of manganese, which is barely over the screening level (Table 16).

Additional assessment may be necessary at SWMU No. 5 to delineate the lateral impact to surface soils based on the reported concentrations of mercury. The analytical data indicate that the impacts are limited to the surface soils and do not pose of threat to underlying ground water.

AOC No. 22 - Product Loading Racks and Crude Receiving Loading Racks

Samples were collected from 11 surface soil sample locations and five soil borings at the product loading and crude receiving racks. The sample locations were placed in areas most likely to be impacted from historical and current operations and included sumps, overflow areas and locations down-gradient of the racks, where surface spills could flow beyond the concrete covered surfaces.

The analytical results for soil samples collected at AOC No. 22 are presented in Tables 10 and 11. Figures 8 through 13 show the distribution of individual constituents within AOC No. 22. The analyses indicate that the primary area with impacted soils is near the sump located north of the product loading rack. Sample locations AOC 22-4 and AOC 22-13 both have soil samples with concentrations of multiple organic constituents (1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, benzene, ethylbenzene, toluene, xylenes, and diesel range organics) that exceed the applicable screening levels listed in Table 10.

Naphthalene was detected at a low concentration but above the screening level at a depth of 36 to 37.7 feet below ground surface at AOC 22-12. However, the concentration of naphthalene is lower and did not exceed the screening level in any of the shallower soil samples at this location. Naphthalene is present in ground water in this area and it is likely the detection of naphthalene in the sample collected at 36-37.7 feet is a capillary fringe impact from the underlying ground water rather than the result of an overlying soil source. There is a similar occurrence at AOC 22-15, where a few organic constituents (MTBE, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene) are detected at concentrations above the screening level in the deepest soil samples near the depth of saturation but are not present in concentrations above the screening level in shallower samples. Methylene chloride was detected at low concentrations that are slightly above the screening level at locations AOC 22-3, AOC 22-13, and AOC 22-15. All of these detections of methylene chloride are qualified due to potential laboratory impacts (see Appendix H).

The screening level included in Table 10 for cobalt assumes a DAF of 1 for the soil-to-ground water pathway; however, cobalt was not detected in concentrations above the screening level in any of the ground water samples collected during the investigation. Cobalt does not appear to present a threat to ground water and the soil-to-ground water pathway should not be considered to be complete at AOC No. 22.

Ground water samples were collected from four locations within AOC No. 22 (AOC 22-12/TW-01, AOC 22-13, AOC 22-15/MW-61, and AOC 22-16/MW-63). The sample results identified multiple constituents at concentrations exceeding the screening levels, including 1,2,4-trimethylbenzene, 1,2-dichloroethane, 1,3,5-trimethylbenzene, naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, benzene, ethylbenzene, toluene, xylenes, MTBE, bis(2-ethylhexyl)phthalate, phenol, gasoline range organics, diesel range organics, arsenic, iron, lead, and manganese. The arsenic and lead concentrations were only slightly above the screening level and one of the three detections in the first monitoring event was from a sample collected from a temporary monitoring well at soil boring AOC 22-13. The arsenic and lead detections may not be an indication of actual impacted ground water but rather possible sampling artifacts resulting from the use of a bailer to purge the wells and collect ground water samples. Many of the organics detected above screening levels were also detected in soils above screening levels and are most likely associated with historical site operations with the possible exception of bis(2-ethylhexyl) phthalate, which is a common laboratory contaminant (EPA, 1992). Laboratory quality control data is discussed in Appendix H.

Subsurface vapor samples collected from MW-61, MW-63, and TW-1 have reduced oxygen concentrations and elevated concentrations of carbon dioxide and elevated PID readings. The vapor results are consistent with the presence of organic constituents detected in both soil and ground water, and provide evidence of biological degradation of the organic constituents.

The analytical data indicate that impacts to ground water are elevated in the northern portion of AOC No. 22, which appear to be concentrated near the sump located north of the product loading rack. Figures 18 through 21 show the distribution of representative constituents that are detected in ground water.

Additional investigation is recommended for the impacted soils within AOC No. 22 for the area near borings AOC 22-4, and AOC 22-13. Some additional delineation of ground water impacts may also be useful and should be completed in consideration of any additional investigation to be completed at other nearby SWMUs/AOCs.

AOC No. 23 - Southeast Holding Ponds

To assess the potential for releases from the holding/evaporation ponds, a soil boring/monitoring well (AOC 23-1/MW-62) was installed down-gradient of the ponds. The analyses for the soil samples did not detect the presence of any constituents at concentrations above the residential screening levels and most of the organic results were non-detect, with the exception of a few constituents that were qualified bias due to laboratory contaminants (e.g., methylene chloride and acetone) (EPA, 1992). The soil analyses are summarized in Table 9 and the laboratory quality control information is discussed in Appendix H.

The ground water samples collected from MW-62 identified only manganese at concentrations above the screening levels (Table 16). The presence of only manganese above screening levels and no detections of petroleum constituents in water samples collected from MW-62 indicates that the manganese could be representative of background conditions rather than impacts from site operations; however, no background value has been established for manganese at this time. Subsurface vapor samples screened for oxygen and carbon dioxide did not indicate the presence of biological degradation of organic constituents (Table 14). Corrective Action Complete without Controls is recommended for AOC No. 23.

AOC No. 24 - Tank Areas 41 and 43

Soil samples were collected from four surface sample locations and three soil borings, one of which was completed as a permanent monitoring well (AOC 24-7/MW-64). All analytes were below the respective soil screening levels (Figure 15).

The analyses of the ground water samples collected from MW-64 identified low concentrations of arsenic and manganese. The analytical results for the first samples collected in May 2009 did not show concentrations of arsenic or manganese above the screening level; however, the results for the July 2009 samples identified low concentrations that exceeded the screening levels. The low concentrations may have been an artifact of sample collection using a bailer rather than a release at the site. Other inorganic constituents detected above screening levels include chloride, nitrate, and sulfate. Chloride and sulfate are naturally occurring constituents with wide-spread occurrence in ground water in the San Juan Basin (Stone, W. J. and others, 1983). The absence of any refinery-related constituents (i.e., petroleum hydrocarbons) in the ground water samples collect from MW-64 indicates that the inorganic constituents might not be related to site operations. The screening results of subsurface vapor samples for the presence of oxygen and carbon dioxide, as well as, organic vapors with a PID did not indicate the presence of organic constituents in the subsurface (Table 14).

An assessment to evaluate the risk posed by the limited occurrence of TPH at location AOC 24-6 is recommended instead of any additional assessment and/or remediation.

AOC No. 25 - Auxiliary Warehouse and 90-Day Storage Area

Samples were collected from one surface location and one soil boring, which was completed as a permanent monitoring well (AOC 25-2/MW-60) (Figure 7). There were no detections of any constituents at concentrations above the residential screening levels in the soil samples. There were also no constituents detected in the ground water samples above the screening levels, with the single exception of manganese, which was only slightly over the screening level. There was not a sufficient volume of ground water present in MW-60 to collect a ground water sample during the second sampling event conducted in July 2009. Corrective Action Complete without Controls is recommended for AOC No. 25.

AOC No. 26 - Tank Area 44 and 45

Soil samples were collected from seven surface sample locations and two soil borings, both of which were completed as permanent monitoring wells (Figure 16). Cobalt was detected at concentrations above the EPA risk-based screening level protective of soil-to-groundwater in all soil samples (Table 10); however all detected concentrations were below the EPA Regional screening level (23 mg/kg) for residential soils via direct contact.

Barium was detected in two soil samples (AOC 26-4 (0-0.5') and AOC 26-8 (0-0.1') above the NMED screening level protective of ground water (DAF=1); however both detected concentrations were below NMED residential soil screening level (15,600 mg/kg).

MTBE was detected in one soil sample (AOC 26-5 (1.5-2.0') above EPA risk-based soil screening level protective of soil-to-ground water; however the detected concentration is below EPA Regional screening level for residential soil (39 mg/kg)

Since cobalt and/or barium were not detected in ground water at concentrations above the screening level, the soil-to-ground water exposure pathway should not be complete for these two constituents. Detected concentration of barium, cobalt, and MTBE below residential screening levels indicates that the constituents do not cause an unacceptable risk of exposure.

Additional constituents were detected at concentrations above the screening level in a 36-38' soil sample collected from boring AOC 26-9. This sample was collected just above the depth of saturation, and the detected constituents are most likely the result of capillary fringe impacts from impacted ground water that has migrated to this location since there is no analytical or field screening evidence (i.e., PID readings of individual soil samples) of overlying soil sources in this area.

Two permanent monitoring wells (MW-65 and MW-66) were completed in the immediate area of AOC No. 26. Monitoring well MW-65 is located down-gradient of Tank 44 and MW-66 is located down-gradient of Tank 45 and the underground pipeline that connects Tank 45 to the product loading rack. The analyses of the ground water samples collected from these two wells indicate impacts from the storage and handling of petroleum products and additives (e.g., MTBE and 1,2-dichloroethane).

Subsurface vapor samples collected at MW-65 and MW-66 have reduced oxygen levels and elevated carbon dioxide levels. PID readings are also elevated in vapor samples collected from both wells (Table 14). This information is consistent with the presence of and biological degradation of organic constituents, which were detected in ground water and capillary fringe soil samples.

Although MTBE was not detected in surface soil samples collected at AOC 26-6 and AOC 26-7, nor was MTBE detected in shallow and deeper soil samples collected from the down-gradient soil boring AOC 26-9, additional soil sampling near AOC 26-5 may be considered to confirm the limited presence of MTBE that was detected in the 1.5-2.0' sample interval. Additional monitoring wells may be considered to better define the up-gradient extent of ground water impacts.

Ground Water General Chemistry

All of the nitrite results are non-detect and the concentrations of nitrate in samples where both species were reported are very low (Table 16). The data does not indicate potential reducing conditions but is not definitive. Most of the nitrate + nitrite concentrations are also low, with the highest concentrations identified in up-gradient wells (MW-63 and MW-64). Similarly, the highest concentrations of sulfate and total dissolved solids were identified at up-gradient wells MW-62, MW-63, and MW-64. The only chloride concentration above the screening level was identified at MW-64, which is an up-gradient well that did not show any indication of hydrocarbon impacts.

The analyses for iron were reported as dissolved metals and as total recoverable metals. The dissolved metals analyses represent ferrous iron concentrations and analyses of total recoverable metals include concentrations of both ferrous and ferric iron. The ferric iron concentrations can be derived by subtracting the dissolved iron concentrations from the total iron concentrations. In unaffected areas of the site where the aerobic ground water conditions should exist, iron is expected to be present as ferric (Fe^{+3}) iron. In impacted areas, as petroleum hydrocarbons in ground water are degraded, reducing conditions may develop with ferric iron being reduced to ferrous (Fe^{+2}) iron. The percentage of iron present in the ferrous state was elevated in ground water samples collected at AOC 22-13, MW-61, MW-65, and MW-66. Ground water samples collected from these same locations also demonstrates significant hydrocarbon impacts. Ground water samples collected from temporary wells TW-01 (AOC 22-12) and AOC 22-13, and MW-61, MW-65, and MW-66 contained concentrations of dissolved iron above the screening level.

Manganese was detected in ground water samples at concentrations above the screening level of 0.2 mg/l at all locations. The results at MW-60 were barely over the screening level and one of the two samples collected at MW-64 did not exceed the screening level. A review of the facility-wide ground water sampling information reveals that manganese is widespread across the refinery property (Figure 21). There is no direct evidence (e.g., a soil source area) to associate manganese's presence in shallow ground water beneath Group 3 SWMUs or AOCs with site operations or waste management activities. However, there does appear to be a correlation between the dissolved oxygen concentrations in ground water and the dissolved manganese concentrations. This relationship is discussed in detail in the Site Investigation Report for SWMU Group No. 2 (RPS JDC, 2009). Elevated dissolved manganese concentrations may be the result of natural degradation of petroleum hydrocarbons causing reducing conditions, which in turn could mobilize manganese that was previously adsorbed to the aquifer matrix (Western Refining Southwest, Inc., 2009).

Summary and Recommendations

Soils

Based on the results of the investigation of the Group 3 SWMUs/AOCs, additional assessment of impacted soils is to be considered for SWMU 4-1, SWMU No. 5, AOC 22-4, AOC 22-13, and AOC 26-5.

Ground Water

Ground water impacts documented during the assessment of SWMU No. 4 and AOCs No. 22 and 26 indicate that the primary constituents exceeding the screening levels across these areas are very similar and appear to be associated with operations at the product loading rack.

Additional ground water investigation at AOCs No. 22 and 26 is recommended to better define the distribution of constituents within these areas and to distinguish potential sources.

A separate investigation work plan will be prepared to detail proposed additional investigation activities for soil and ground water.

Section 8
References

EPA, 1992, Guidance for Data Useability in Risk Assessment (Part A) Final; United States Environmental Protection Agency Office of Emergency and Remedial Response, PB92-963356, p. 279.

Giant Industries, 2003, Solid Waste Management Unit Assessment Report, Giant Refining Company Bloomfield Refinery.

Groundwater Technology Inc., 1994, RCRA Facility Investigation/Corrective Measures Study Report Bloomfield Refining Company #50 County Road 4990 Bloomfield, New Mexico, p.51.

IRIS, 2009a, Integrated Risk Information System; 2-methylnaphthalene (CASRN 91-57-6): retrieved online 9/21/2009 http://www.epa.gov/ncea/1006.htm#reforal.

IRIS, 2009b, Integrated Risk Information System; Toluene (CASRN 108-88-3): retrieved online 9/21/2009 http://www.epa.gov/ncea/subst/0118.htm#studoral.

IRIS, 2009c, Integrated Risk Information System; Xylenes (CASRN 1330-20-7): retrieved online 9/21/2009 http://www.epa.gov/ncea/iris/subst/0270.htm#studoral.

IRIS, 2009d, Integrated Risk Information System; Barium (CASRN 7440-39-3): retrieved online 9/21/2009 http://www.epa.gov/ncea/iris/subst/0010.htm#studoral.

National Toxicology Program, 2009, TR-471 Cobalt Sulfate Heptahydrate, Target Organs and Levels of Evidence, retrieved online 9/21/2009 http://ntp.niehs.nih.gov/.

NIOSH (National Institute for Occupational Safety and Health). 2002. 1,3,5-Trimethylbenzene. International Chemical Safety Cards, ICSC 1155 retrieved online 9/21/2009. http://www.cdc.gov/niosh/ipcsneng/neng1155.html.

NIOSH (National Institute for Occupational Safety and Health). 2004. 1,2,4-Trimethylbenzene. NIOSH Pocket Guide 39 to Chemical Hazards. NIOSH, Cincinnati, OH. retrieved online 9/21/2009. http://www.cdc.gov/niosh/npg/npgd0638.html.

RPS JDC, 2009, Investigation Report Group 2; Bloomfield Refinery, Western Refining Southwest, Inc., Bloomfield New Mexico, p. 41.

Stone, W.J., Lyford, F.P., Frenzel, P.F., Mizell, N.H., and Padgett, E.T., 1983, Hydrogeology and water resources of San Juan Basin, New Mexico; New Mexico Bureau of Mines and Minerals Hydrologic Report 6, p. 70.

Western Refining Southwest, Inc., 2009, Facility-Wide Groundwater Monitoring Report, Bloomfield Refinery Bloomfield New Mexico, p.37.

Tables

Table 1
Historical Volatile Organic Ground Water Analytical Results Summary
Group 3 Investigation
Bloomfield Refinery - Bloomfield, New Mexico

		Parameters				
		Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylene (mg/L)	MTBE (mg/L)
Screening Level (mg/L):		0.005 (2)	0.75 (1)	0.7 (2)	0.62 (1)	0.012 (3)
Well ID:	**Date Sampled:**					
MW #3	4/5/2006	<0.001	<0.001	<0.001	<0.003	<0.0025
	8/5/2005	<0.001	<0.001	<0.001	<0.001	<0.001
	4/11/2005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0025
	8/21/2003	<0.001	<0.001	<0.001	<0.001	<0.001
MW-5	Dry	--	--	--	--	--
MW-6	Dry	--	--	--	--	--
MW #13	4/1/2007	<0.001	<0.001	<0.001	<0.002	0.0048
	8/15/2006	<0.001	<0.001	<0.001	<0.003	0.007
	4/5/2006	<0.001	<0.001	<0.001	<0.003	0.01
	8/5/2005	<0.001	<0.001	<0.001	<0.001	0.015
	4/11/2005	<0.0005	<0.0005	<0.0005	<0.0005	0.014
	8/23/2004	<0.0005	<0.0005	<0.0005	<0.0005	0.027
	3/3/2004	<0.0005	<0.0005	<0.0005	<0.0005	0.02
	8/21/2003	<0.001	<0.001	<0.001	<0.001	0.061
	3/3/2003	<0.0005	<0.0005	<0.0005	0.0012	0.049
MW #30	4/1/2007	5.7	3.3	5.4	21	<0.620
	4/5/2006	3.5	1.4	2.6	6.8	<0.620
	4/11/2005	5.7	3.7	4.4	12	<0.10
	8/23/2004	1.7	0.37	1.9	2.5	<0.10
MW #31	4/1/2007	4.3	<0.100	1.4	4.7	<0.250
	4/5/2006	6.1	1.5	0.94	4.5	<0.120
	4/11/2005	2.6	0.062	0.45	1.2	<0.250
	8/23/2004	3.7	0.4	0.32	1.2	<0.250
MW #44	4/1/2007	<0.001	0.0058	0.0026	0.034	<0.0025
	4/5/2006	<0.001	<0.001	<0.001	<0.003	0.0028
	4/11/2005	<0.0005	<0.0005	<0.0005	<0.0005	0.0041

Notes:

mg/L = milligram per liter
MW = monitoring well
MTBE = methyl tertiary butyl ether
MW-5 and MW-6 have been dry since at least 2003.
1 - WQCC 20 NMAC 6.2.3101 = New Mexico Standard for Ground Water of 10,000 ug/L TDS or less.
2 - EPA Maximum Contaminant Level
3 - EPA - Regional Screening Levels (April 2009)

Table 2
Historical Total Metals Ground Water Analytical Results Summary
Group 3 Investigation
Bloomfield Refinery - Bloomfield, New Mexico

		Parameters							
		Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Lead (mg/L)	Selenium (mg/L)	Silver (mg/L)	Mercury (mg/L)
Screening Level (mg/l)		**0.01 $^{(1)}$**	**2.0 $^{(1)}$**	**0.005 $^{(1)}$**	**NE $^{(2)}$**	**0.015 $^{(1)}$**	**0.05 $^{(1)}$**	**NE $^{(2)}$**	**0.002 $^{(1)}$**
Well ID:	**Date Sampled:**								
MW #3	8/5/2005	NA	NA	NA	0.016	<0.005	NA	NA	NA
	8/21/2003	NA	NA	NA	0.029	**0.022**	NA	NA	<0.0002
MW-5	Dry	--	--	--	--	--	--	--	--
MW-6	Dry	--	--	--	--	--	--	--	--
MW #13	8/15/2006	<0.02	0.025	<0.002	<0.006	0.0078	<0.05	<0.005	<0.0002
	8/5/2005	NA	NA	NA	0.012	<0.005	NA	NA	NA
	8/23/2004	<0.02	0.028	<0.002	0.085	<0.005	<0.05	<0.005	<0.0002
	8/21/2003	NA	NA	NA	0.45	<0.005	NA	NA	<0.0002
MW #30	8/23/2004	<0.02	0.24	<0.002	0.0073	0.011	<0.05	<0.005	0.00023
MW #31	8/23/2004	<0.02	0.35	<0.002	0.0088	<0.005	<0.05	<0.005	0.00022
MW #44	8/23/2004	<0.02	0.084	<0.002	0.1	0.036	<0.05	<0.005	0.00033

Notes:

mg/L = milligram per liter

MW = monitoring well

NA= not analyzed

MW-5 and MW-6 have been dry since at least 2003.

1- 40 CFR 141.62 MCL = National Primar Drinking Water Regulations: Maxiumum Contaminant Levels

2 - NE = No applicable screening level established for total analysis.

Table 3
Historical Dissolved Metals Ground Water Analytical Results Summary
Group 3 Investigation
Bloomfield Refinery- Bloomfield, New Mexico

		Parameters															
		Arsenic (mg/L)	Barium (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Chromium (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Selenium (mg/L)	Silver (mg/L)	Sodium (mg/L)	Uranium (mg/L)	Zinc (mg/L)
	Screening Level (mg/L):	**0.01 (1)**	**1 (2)**	**0.005 (1)**	**NE**	**0.05 (2)**	**1 (2)**	**1 (2)**	**0.015 (1)**	**NE**	**0.2 (2)**	**NE**	**0.05 (2)**	**0.05 (2)**	**NE**	**0.11 (2)**	**10 (2)**
Well ID:	**Date Sampled:**																
MW #3	8/5/2005	<0.02	0.018	<0.002	480	<0.006	<0.006	0.047	<0.005	130	0.43	7.6	<0.05	<0.005	1300	<0.1	0.018
	8/21/2003	<0.02	0.3	<0.002	490	<0.006	<0.006	0.27	<0.005	140	0.58	10	0.024	<0.005	1100	<0.1	0.094
MW-5	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-6	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW #13	8/15/2006	<0.02	0.025	<0.002	250	<0.006	0.0063	<0.02	0.0078	82	1.1	3.6	<0.05	<0.005	620	<0.10	0.061
	8/5/2005	<0.02	0.028	<0.002	240	<0.006	<0.006	<0.02	<0.005	85	1.1	3.8	<0.05	<0.005	570	<0.1	0.0088
	8/23/2004	<0.02	0.022	<0.002	210	<0.006	<0.006	0.046	<0.005	80	0.58	3.6	<0.05	<0.005	610	<0.1	0.021
	8/21/2003	<0.02	0.33	<0.002	270	<0.006	0.0096	0.04	<0.005	110	1.1	5.3	0.16	<0.005	680	<0.1	0.09
MW #30	8/23/2004	<0.02	0.13	<0.002	350	<0.006	0.0061	4.7	0.0051	88	2.1	<10.0	<0.05	<0.005	750	<0.1	0.046
MW #31	8/23/2004	<0.02	0.35	<0.002	220	<0.006	<0.006	0.46	<0.005	67	0.58	4.8	<0.05	<0.005	640	<0.1	0.019
MW #44	8/23/2004	<0.02	0.046	<0.002	520	0.034	0.027	76	0.015	87	1.7	44	<0.05	<0.005	970	<0.10	0.084

Notes:
mg/L = milligram per liter
MW = monitoring well
NE = not established
MW-5 and MW-6 have been dry since at least 2003.
1- 40 CFR 141.62 MCL = National Primar Drinking Water Regulations: Maxiumum Contaminant Levels
2 - WQCC 20 NMAC 6.2.3101 = New Mexico Standard for Ground Water of 10,000 ug/L or less

Table 4
Historical General Chemistry Ground Water Analytical Results Summary
Group 3 Investigation
Bloomfield Refinery - Bloomfield, New Mexico

		Parameters										
		Fluoride (mg/L)	Chloride (mg/L)	Bromide (mg/L)	Nitrite (mg/L)	Nitrogen (mg/L)	Phosphorus (mg/L)	Sulfate (mg/L)	TDS (mg/L)	E.C. (umhos/cm)	CO_2 (mg/L)	Alk (mg/L)
	Screening Level (mg/L):	1.6 (1)	250 (1)	NE	1 (2)	10 (1)	NE	600 (1)	1000 (1)	NE	NE	NE
Well ID:	**Date Sampled:**											
MW #3	8/5/2005	0.33	1200	4.5	<0.50	42	<0.50	2300	6200	8300	680	680
	8/21/2003	0.17	1400	22	NA	41	<0.50	1900	5700	8500	NA	NA
MW-5	Dry	--	--	--	--	--	--	--	--	--	--	--
MW-6	Dry	--	--	--	--	--	--	--	--	--	--	--
MW #13	8/15/2006	0.12	310	3.7	8.3	NA	<0.50	1100	3000	4300	910	960
	8/5/2005	0.15	320	4.6	0.23	6.1	<0.50	1000	3000	4600	1000	1000
	8/23/2004	0.2	330	4.3	1.6	6.6	<0.50	950	2800	3400	860	950
	8/21/2003	0.19	510	13	<0.10	12	<0.50	840	3100	5000	1000	917
MW #30	8/23/2004	0.18	360	5.6	<0.10	<0.10	<0.10	720	3100	3900	1200	1400
MW #31	8/23/2004	0.19	370	7.2	<0.10	0.14	<0.50	750	2800	3700	980	1100
MW #44	8/23/2004	0.3	210	0.79	<0.10	<0.10	<0.50	2800	4800	5200	400	450

Notes:
Alk = alkalinity, total
CO_2 = Carbon Dioxide
E.C. = electrical conductivity
TDS = total dissolved solids
umhos/cm = micro-mhos per centimeter
mg/L = milligram per liter
NE = not established
NA = not analyzed
MW = monitoring well
MW-5 and MW-6 have been dry since at least 2003.
1 - WQCC 20 NMAC 6.2.3101 = New Mexico Standard for Ground Water of 10,000 ug/L or less
2 - 40 CFR 141.62 MCL = National Primar Drinking Water Regulations: Maxiumum Contaminant Levels

Table 5
Historical Soil Analytical Results Summary
Group 3 Investigation
Bloomfield Refinery - Bloomfield, New Mexico

			Parameters																
			Acetone (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	m.p-Xylene (mg/kg)	o-Xylene (mg/kg)	Methylene chloride (mg/kg)	Semi-Volatile Organics	Total Petroleum Hydrocarbons	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Nickel (mg/kg)	Thallium (mg/kg)	Zinc (mg/kg)
SWMU 4 & AOC 22 (Crude Loading Rack) Soil Screening Levels (mg/kg):			263000 $^{(1)}$	471 $^{(2)}$	21100 $^{(1)}$	6630 $^{(2)}$	3130 $^{(1)}$	3130 $^{(1)}$	10600 $^{(2)}$	NA	NA	144 $^{(1)}$	309 $^{(1)}$	447,000 $^{(1)}$	12400 $^{(1)}$	800 $^{(1)}$	6190 $^{(1)}$	20.4 $^{(1)}$	92900 $^{(1)}$
Sample No.	**Sample Location**	**Date Sampled**																	
B-1 (2.5-4.5')	at SWMU No. 4	2/22/1994	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.66	4.5	9.7	12	ND	9.8	25	46
B-2 (10-12')	at SWMU No. 4	2/22/1994	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.53	3	8.5	8.9	ND	7	15	34
B-3 (6-8')	at AOC No. 22	2/22/1994	ND	ND	ND	ND	ND	ND	0.11	ND	ND	0.54	3.2	8	8.8	ND	7.4	15	35
AOC 22 (Product Loading Rack) Soil Screening Levels (mg/kg):			3.84 $^{(3)}$	0.00185 $^{(3)}$	1.38 $^{(3)}$	0.0146 $^{(3)}$	0.176 $^{(1)}$	0.176 $^{(1)}$	0.0107 $^{(3)}$	NA	NA	57.7 $^{(3)}$	1.37 $^{(3)}$	447,000 $^{(1)}$	12400 $^{(1)}$	800 $^{(1)}$	47.7 $^{(3)}$	0.172 $^{(3)}$	682 $^{(3)}$
B-4 (10-12')	at AOC No. 22	2/22/1994	ND	0.012	0.023	0.004J	0.031	0.022	ND	ND	ND	0.53	3.1	9.9	8.2	ND	7.2	19	32

Notes:
mg/kg = milligram per kilogram
ND - not detected, quantitation limit not provided in 1994 RFI Investigation Report
NA = not available
J = estimated concentration
NMED - Technical Background Document for Development of Soil Screening Levels - Revision 5.0 (August 2009)
(1) NMED - Construction Worker (0-10')
(2) NMED - Industrial (0-2') and Construction Worker (2-10')
(3) NMED DAF=1 SoilGW (All depths)

TABLE 6
Residential Soil Screening Levels
Bloomfield Refinery - Bloomfield, New Mexico

					Cross Media Soil-to-Ground Water			
	NMED		EPA		NMED	EPA		
Analyte	Residential Soil (mg/kg)	Endpoint	Residential Soil (mg/kg)	ResSoil key	DAF1 (mg/kg)	GW_Risk-based SSL (mgkg)	GW_MCL-based SSL (mg/kg)	Constituent Detected
Applicable depth interval	0-10'		0-2'		All depths			
Acenaphthene	3.44E+03	ns	3.40E+03	n	2.05E+01	2.70E+01	-	N
Acenaphthylene	-	-	-	-	-	-	-	N
Acetone	6.75E+04	n	6.10E+04	n	3.84E+00	4.40E+00	-	Y
Aniline	-	-	8.50E+01	c**	-	3.40E-03	-	N
Anthracene	1.72E+04	ns	1.70E+04	n	3.37E+02	4.50E+02	-	N
Antimony	3.13E+01	n	3.10E+01	n	6.61E-01	6.60E-01	2.70E-01	N
Arsenic	3.59E+00	c	3.90E-01	c*	1.31E-02	1.30E-03	2.90E-01	Y
Azobenzene	-	-	4.90E+00	c	-	5.10E-04	-	N
Barium	1.56E+04	n	1.50E+04	n	3.01E+02	3.00E+02	8.20E+01	Y
Benz(a)anthracene	4.81E+00	c	1.50E-01	c	3.20E-01	1.40E-02	-	N
Benzene	1.55E+01	c	1.10E+00	c*	1.85E-03	2.30E-04	2.80E-03	Y
Benzo(a)pyrene	4.81E-01	c	1.50E-02	c	1.09E-01	4.60E-03	3.10E-01	Y
Benzo(b)fluoranthene	4.81E+00	c	1.50E-01	c	1.11E+00	4.70E-02	-	N
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	N
Benzo(k)fluoranthene	4.81E+01	c	1.50E+00	c	1.09E+01	4.60E-01	-	N
Benzoic acid	-	-	2.40E+05	nm	-	3.30E+01	-	N
Benzyl alcohol	-	-	3.10E+04	n	-	4.20E+00	-	Y
Beryllium	1.56E+02	n	1.60E+02	n	5.77E+01	5.80E+01	3.20E+00	Y
Bis(2-chloroethoxy)methane	-	-	1.80E+02	n	-	2.30E-02	-	N
Bis(2-chloroethyl)ether	2.56E+00	c	1.90E-01	c	2.33E-05	2.70E-06	-	N
Bis(2-chloroisopropyl)ether	9.15E+01	c	-	-	2.56E-03	-	-	N
Bis(2-ethylhexyl)phthalate	2.80E+02	c	3.50E+01	c*	1.19E+01	1.60E+00	2.00E+00	N
Bromobenzene	-	-	9.40E+01	n	-	1.50E-02	-	N
Bromodichloromethane	5.25E+00	c	2.80E-01	c	2.76E-04	3.30E-05	-	N
Bromoform	-	-	6.10E+01	c*	-	2.30E-03	-	N
Bromomethane	2.23E+01	n	7.90E+00	n	1.94E-03	2.20E-03	-	N
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	N
2-Butanone (MEK)	3.96E+04	n	2.80E+04	ns	1.27E+00	1.50E+00	-	Y
Butyl benzyl phthalate	-	-	2.60E+02	c*	-	6.70E-01	-	N
Cadmium	7.79E+01	n	7.00E+01	n	1.37E+00	1.40E+00	3.80E-01	Y
Carbazole	-	-	-	-	-	-	-	N
Carbon disulfide	1.94E+03	ns	6.70E+02	ns	2.52E-01	2.70E-01	-	N
Carbon tetrachloride	4.38E+00	c	2.50E-01	c	7.39E-04	7.90E-05	2.00E-03	N
Chlorobenzene	5.08E+02	ns	3.10E+02	n	5.38E-02	6.80E-02	7.50E-02	N
Chloroethane	-	-	-	-	-	-	-	N
Chloroform	5.72E+00	c	3.00E-01	c	4.68E-04	5.50E-05	-	N
Chloromethane	3.56E+01	c	1.20E+02	n	4.18E-03	4.90E-02	-	N
4-Chloro-3-methylphenol	-	-	-	-	-	-	-	N
4-Chloroaniline	-	-	2.40E+00	c	-	1.20E-04	-	N
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	N
4-Chlorotoluene	-	-	5.50E+03	ns	-	2.80E+00	-	N
2-Chloronaphthalene	6.26E+03	ns	6.30E+03	ns	1.35E+01	1.80E+01	-	N
2-Chlorophenol	3.91E+02	n	3.90E+02	n	1.53E-01	2.00E-01	-	N
2-Chlorotoluene	1.56E+03	ns	1.60E+03	ns	6.24E-01	8.00E-01	-	N
Chromium	1.13E+05	nl	1.20E+05	nm	9.86E+07	9.90E+07	-	Y
Chrysene	4.81E+02	c	1.50E+01	c	3.26E+01	1.40E+00	-	N
cis-1,2-DCE	7.82E+02	n	7.80E+02	n	9.43E-02	1.10E-01	2.10E-02	N
cis-1,3-Dichloropropene	2.35E+01	c	1.70E+00	c*	1.35E-03	1.60E-04	-	N
Cobalt	-	-	2.30E+01	n	-	4.90E-01	-	Y
Cyanide	1.56E+03	n	1.60E+03	n	7.44E+00	7.40E+00	2.00E+00	N
1,1-Dichloroethane	6.29E+01	c	3.40E+00	c	6.09E-03	7.00E-04	-	N
1,1-Dichloroethene	6.18E+02	n	2.50E+02	n	1.19E-01	1.20E-01	2.60E-03	N

TABLE 6
Residential Soil Screening Levels
Bloomfield Refinery - Bloomfield, New Mexico

					Cross Media Soil-to-Ground Water			
	NMED		EPA		NMED	EPA		
Analyte	Residential Soil (mg/kg)	Endpoint	Residential Soil (mg/kg)	ResSoil key	DAF1 (mg/kg)	GW_Risk-based SSL (mgkg)	GW_MCL-based SSL (mg/kg)	Constituent Detected
Applicable depth interval	0-10'		0-2'		All depths			
1,1-Dichloropropene	-	-	-	-	-	-	-	**N**
1,2-Dibromo-3-chloropropane	1.94E-01	c	5.60E-03	c	2.97E-06	1.50E-07	9.20E-05	**N**
1,2-Dibromoethane (EDB)	5.74E-01	c	3.40E-02	c	1.58E-05	1.90E-06	1.50E-05	**N**
1,2-Dichlorobenzene	3.01E+03	ns	2.00E+03	ns	3.13E-01	4.00E-01	6.60E-01	**N**
3,3´-Dichlorobenzidine	8.71E+00	c	1.10E+00	c	1.70E-02	2.30E-03	-	**N**
1,2-Dichloroethane (EDC)	7.74E+00	c	4.50E-01	c	3.65E-04	4.40E-05	1.50E-03	**N**
1,2-Dichloropropane	1.47E+01	c	9.30E-01	c*	1.11E-03	1.30E-04	1.70E-03	**N**
1,3-Dichlorobenzene	-	-	-	-	-	-	-	**N**
1,3-Dichloropropane	-	-	1.60E+03	n	-	2.70E-01	-	**N**
1,4-Dichlorobenzene	3.21E+01	c	2.60E+00	c	3.57E-03	4.60E-04	8.10E-02	**N**
2,2-Dichloropropane	-	-	-	-	-	-	-	**N**
2,4-Dichlorophenol	1.83E+02	n	1.80E+02	n	1.37E-01	1.80E-01	-	**N**
2,4-Dimethylphenol	1.22E+03	n	1.20E+03	n	9.12E-01	1.20E+00	-	**N**
4,6-Dinitro-2-methylphenol	-	-	-	-	-	-	-	**N**
2,4-Dinitrophenol	1.22E+02	n	1.20E+02	n	5.25E-02	6.80E-02	-	**N**
2,4-Dinitrotoluene	1.26E+01	c	1.60E+00	c*	1.56E-03	2.00E-04	-	**N**
2,6-Dinitrotoluene	6.12E+01	n	6.10E+01	n	2.67E-02	3.40E-02	-	**N**
Dibenz(a,h)anthracene	4.81E-01	c	1.50E-02	c	3.62E-01	1.50E-02	-	**N**
Dibenzofuran	-	-	-	-	-	-	-	**N**
Dibromochloromethane	1.13E+01	c	7.00E-01	c	3.38E-04	4.00E-05	-	**N**
Dibromomethane	-	-	7.80E+02	n	-	9.10E-02	-	**N**
Dichlorodifluoromethane	4.81E+02	n	1.90E+02	n	7.23E-01	6.10E-01	-	**N**
Diethyl phthalate	4.89E+04	n	4.90E+04	n	1.06E+01	1.30E+01	-	**N**
Dimethyl phthalate	6.11E+05	nl	-	-	8.36E+01	-	-	**N**
Di-n-butyl phthalate	6.11E+03	n	-	-	8.63E+00	-	-	**N**
Di-n-octyl phthalate	-	-	-	-	-	-	-	**N**
Ethylbenzene	6.96E+01	c	5.70E+00	c	1.46E-02	1.90E-03	8.90E-01	Y
Fluoranthene	2.29E+03	n	2.30E+03	n	1.55E+02	2.10E+02	-	**N**
Fluorene	2.29E+03	ns	2.30E+03	n	2.50E+01	3.30E+01	-	**N**
Hexachlorobenzene	2.45E+00	c	3.00E-01	c	2.21E-03	2.90E-04	7.00E-03	**N**
Hexachlorobutadiene	-	-	6.20E+00	c**	-	1.90E-03	-	**N**
Hexachlorocyclopentadiene	3.67E+02	n	3.70E+02	n	6.13E-01	8.00E-01	1.80E-01	**N**
Hexachloroethane	6.11E+01	n	3.50E+01	c**	1.93E-02	3.20E-03	-	**N**
2-Hexanone	-	-	-	-	-	-	-	**N**
Indeno(1,2,3-cd)pyrene	4.81E+00	c	1.50E-01	c	3.70E+00	1.60E-01	-	**N**
Isophorone	4.13E+03	c	5.10E+02	c*	1.85E-01	2.20E-02	-	**N**
Isopropylbenzene (cumene)	3.21E+03	ns	2.20E+03	ns	9.86E-01	1.30E+00	-	Y
4-Isopropyltoluene	-	-	-	-	-	-	-	Y
Lead	4.00E+02	IEUBK	4.00E+02	nL	-	-	-	Y
Mercury	7.71E+00	ns	4.30E+00	ns	2.93E-02	3.00E-02	1.00E-01	Y
Methyl tert-butyl ether (MTBE)	8.62E+02	c	3.90E+01	c	2.29E-02	2.70E-03	-	Y
Methylene chloride	1.99E+02	c	1.10E+01	c	1.07E-02	1.20E-03	1.30E-03	Y
1-Methylnaphthalene	-	-	2.20E+01	c	-	1.50E-02	-	Y
2-Methylnaphthalene	-	-	3.10E+02	n	-	9.00E-01	-	Y
2-Methylphenol	-	-	3.10E+03	n	-	2.00E+00	-	**N**
3+4-Methylphenol	-	-	3.10E+02	n	-	1.90E-01	-	**N**
4-Methyl-2-pentanone	-	-	-	-	-	-	-	**N**
2-Nitroaniline	-	-	1.80E+02	n	-	3.30E-02	-	**N**
3-Nitroaniline	-	-	-	-	-	-	-	**N**
4-Nitroaniline	-	-	2.40E+01	c*	-	1.00E-03	-	**N**
2-Nitrophenol	-	-	-	-	-	-	-	**N**
4-Nitrophenol	-	-	-	-	-	-	-	**N**

TABLE 6
Residential Soil Screening Levels
Bloomfield Refinery - Bloomfield, New Mexico

					Cross Media Soil-to-Ground Water			
	NMED		EPA		NMED	EPA		
Analyte	Residential Soil (mg/kg)	Endpoint	Residential Soil (mg/kg)	ResSoil key	DAF1 (mg/kg)	GW_Risk-based SSL (mgkg)	GW_MCL-based SSL (mg/kg)	Constituent Detected
Applicable depth interval	0-10'		0-2'		All depths			
Naphthalene	4.50E+01	c	3.90E+00	c*	4.19E-03	5.50E-04	-	Y
n-Butylbenzene	-	-	-	-	-	-	-	Y
Nickel	1.56E+03	n	1.40E+04	c	4.77E+01	4.80E+01	-	Y
Nitrobenzene	4.94E+01	c	4.40E+00	c*	6.86E-03	7.10E-05	-	**N**
N-Nitrosodi-n-propylamine	-	-	6.90E-02	c	-	1.10E-05	-	**N**
N-Nitrosodiphenylamine	8.00E+02	c	9.90E+01	c	1.29E+00	1.70E-01	-	**N**
n-Propylbenzene	-	-	-	-	-	-	-	Y
Pentachlorophenol	2.07E+01	c	3.00E+00	c	2.94E-02	3.90E-03	7.00E-03	**N**
Phenanthrene	1.83E+03	ns	-	-	8.34E+01	-	-	Y
Phenol	1.83E+04	n	1.80E+04	n	6.30E+00	8.10E+00	-	**N**
Pyrene	1.72E+03	ns	1.70E+03	n	1.12E+02	1.50E+02	-	Y
Pyridine	-	-	7.80E+01	n	-	9.70E-03	-	**N**
sec-Butylbenzene	-	-	-	-	-	-	-	Y
Selenium	3.91E+02	n	3.90E+02	n	9.65E-01	9.50E-01	2.60E-01	**N**
Silver	3.91E+02	n	3.90E+02	n	1.57E+00	1.60E+00	-	**N**
Styrene	8.97E+03	ns	6.50E+03	ns	1.56E+00	2.00E+00	1.20E-01	**N**
1,2,3-Trichlorobenzene	-	-	-	-	-	-	-	**N**
1,1,1,2-Tetrachloroethane	2.92E+01	c	2.00E+00	c	1.73E-03	2.10E-04	-	**N**
1,1,1-Trichloroethane	2.18E+04	ns	9.00E+03	ns	2.98E+00	3.30E+00	7.20E-02	**N**
1,1,2,2-Tetrachloroethane	7.97E+00	c	5.90E-01	c	2.25E-04	2.80E-05	-	**N**
1,1,2-Trichloroethane	1.72E+01	c	1.10E+00	c	6.74E-04	8.20E-05	1.70E-03	**N**
2,4,5-Trichlorophenol	6.11E+03	n	6.10E+03	n	7.13E+00	9.40E+00	-	**N**
2,4,6-Trichlorophenol	6.11E+01	n	4.40E+01	c**	7.13E-02	1.60E-02	-	**N**
1,2,3-Trichloropropane	9.15E-01	c	9.10E-02	c	3.56E-05	4.40E-06	-	**N**
1,2,4-Trichlorobenzene	1.43E+02	ns	8.70E+01	n	1.02E-02	1.30E-02	1.10E-01	**N**
1,2,4-Trimethylbenzene	-	-	6.70E+01	n	-	2.40E-02	-	Y
1,3,5-Trimethylbenzene	-	-	4.70E+01	n	-	2.00E-02	-	Y
tert-Butylbenzene	-	-	-	-	-	-	-	**N**
Tetrachloroethene (PCE)	6.99E+00	c	5.70E-01	c	4.49E-04	5.20E-05	2.40E-03	**N**
Toluene	5.57E+03	ns	5.00E+03	ns	1.38E+00	1.70E+00	7.60E-01	Y
trans-1,2-DCE	2.73E+02	n	1.10E+02	n	3.01E-02	3.40E-02	3.20E-02	**N**
trans-1,3-Dichloropropene	2.35E+01	c	1.70E+00	c*	1.35E-03	1.60E-04	-	**N**
Trichloroethene (TCE)	4.57E+01	c	2.80E+00	c	5.30E-03	6.10E-04	1.90E-03	**N**
Trichlorofluoromethane	2.01E+03	ns	8.00E+02	n	9.01E-01	8.40E-01	-	**N**
Vanadium	3.91E+02	n	5.50E+02	n	1.83E+02	2.60E+02	-	Y
Vinyl chloride	8.65E-01	c	6.00E-02	c	2.88E-04	5.60E-06	7.00E-04	**N**
Xylenes, Total	1.09E+03	ns	6.00E+02	ns	1.76E-01	2.30E-01	1.10E+01	Y
Zinc	2.35E+04	n	2.30E+04	n	6.82E+02	6.80E+02	-	Y

c - carcinogen

n - noncarcinogen

cs - carcinogen, SSL may exceed saturation

ns - noncarcinogen, SSL may exceed saturation

nl - noncarcinogen, SSL may exceed ceiling limit

nls - noncarcinogen, SSL may exceed both saturation and ceiling limit

\- no screenig value currently available

NMED - Technical Background Document for Development of Soil Screening Levels - Revision 5.0 (August 2009)
EPA - Regional Screening Levels (April 2009)

TABLE 7
Non- Residential Soil Screening Levels
Bloomfield Refinery - Bloomfield, New Mexico

							Cross Media Soil-to-Ground Water			
	NMED				EPA		NMED	EPA		
Analyte	IndOccSoil (mg/kg)	IndOccSoil (Endpoint)	ConsWork (mg/kg)	ConsWork Soil (Endpoint)	Industrial (mg/kg)	IndSoil _key	DAF1 (mg/kg)	GW_Risk-based SSL (mg/kg)	GW_MCL-based SSL (mg/kg)	Constituent Detected
Applicable depth interval	0-2'		0-10'		0-2'		All depths			
Acenaphthene	3.67E+04	ns	1.86E+04	n	3.30E+04	n	2.05E+01	2.70E+01	-	N
Acenaphthylene	-	-	-	-	-	-	-	-	-	N
Acetone	8.51E+05	nls	2.63E+05	nls	6.10E+05	nms	3.84E+00	4.40E+00	-	Y
Aniline	-	-	-	-	3.00E+02	c*	-	3.40E-03	-	N
Anthracene	1.83E+05	nl	6.68E+04	ns	1.70E+05	nm	3.37E+02	4.50E+02	-	N
Antimony	4.54E+02	n	1.24E+02	n	4.10E+02	n	6.61E-01	6.60E-01	2.70E-01	N
Arsenic	1.77E+01	c	6.54E+01	n	1.60E+00	c	1.31E-02	1.30E-03	2.90E-01	Y
Azobenzene	-	-	-	-	2.20E+01	c	-	5.10E-04	-	N
Barium	2.24E+05	nl	4.35E+03	n	1.90E+05	nm	3.01E+02	3.00E+02	8.20E+01	Y
Beryllium	2.26E+03	n	1.44E+02	n	2.00E+03	n	5.77E+01	5.80E+01	3.20E+00	N
Benz(a)anthracene	2.34E+01	c	2.13E+02	c	2.10E+00	c	3.20E-01	1.40E-02	-	Y
Benzene	8.54E+01	c	4.71E+02	n	5.60E+00	c*	1.85E-03	2.30E-04	2.80E-03	Y
Benzo(a)pyrene	2.34E+00	c	2.13E+01	c	2.10E-01	c	1.09E-01	4.60E-03	3.10E-01	N
Benzo(b)fluoranthene	2.34E+01	c	2.13E+02	c	2.10E+00	c	1.11E+00	4.70E-02	-	N
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	-	N
Benzo(k)fluoranthene	2.34E+02	c	2.06E+03	c	2.10E+01	c	1.09E+01	4.60E-01	-	N
Benzoic acid	-	-	-	-	2.50E+06	nm	-	3.30E+01	-	Y
Benzyl alcohol	-	-	-	-	3.10E+05	nm	-	4.20E+00	-	Y
Bis(2-chloroethoxy)methane	-	-	-	-	1.80E+03	n	-	2.30E-02	-	N
Bis(2-chloroethyl)ether	1.36E+01	c	1.47E+02	c	9.00E-01	c	2.33E-05	2.70E-06	-	N
Bis(2-chloroisopropyl)ether	4.54E+02	c	3.10E+03	cs	-	-	2.56E-03	-	-	N
Bis(2-ethylhexyl)phthalate	1.37E+03	c	4.76E+03	n	1.20E+02	c	1.19E+01	1.60E+00	2.00E+00	N
Bromobenzene	-	-	-	-	4.10E+02	n	-	1.50E-02	-	N
Bromodichloromethane	2.92E+01	c	3.50E+03	cs	1.40E+00	c	2.76E-04	3.30E-05	-	N
Bromoform	-	-	-	-	2.20E+02	c*	-	2.30E-03	-	N
Bromomethane	8.36E+01	n	6.71E+01	n	3.50E+01	n	1.94E-03	2.20E-03	-	N
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	-	-	N
2-Butanone (MEK)	3.69E+05	nl	1.48E+05	nls	1.90E+05	nms	1.27E+00	1.50E+00	-	Y
Butyl benzyl phthalate	-	-	-	-	9.10E+02	c	-	6.70E-01	-	N
Cadmium	1.12E+03	n	3.09E+02	n	8.00E+02	n	1.37E+00	1.40E+00	3.80E-01	Y
Carbazole	-	-	-	-	-	-	-	-	-	N
Carbon disulfide	7.54E+03	ns	5.89E+03	ns	3.00E+03	ns	2.52E-01	2.70E-01	-	N
Carbon tetrachloride	2.43E+01	c	1.99E+02	n	1.30E+00	c	7.39E-04	7.90E-05	2.00E-03	N
Chlorobenzene	2.14E+03	n	1.58E+03	ns	1.50E+03	ns	5.38E-02	6.80E-02	7.50E-02	N
Chloroethane	-	-	-	-	-	-	-	-	-	N
Chloroform	3.19E+01	c	6.71E+02	c	1.50E+00	c	4.68E-04	5.50E-05	-	N
Chloromethane	1.98E+02	c	1.13E+03	n	5.10E+02	n	4.18E-03	4.90E-02	-	N
4-Chloro-3-methylphenol	-	-	-	-	-	-	-	-	-	N
4-Chloroaniline	-	-	-	-	8.60E+00	c	-	1.20E-04	-	N
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	-	-	N
4-Chlorotoluene	-	-	-	-	7.20E+04	ns	-	2.80E+00	-	N
2-Chloronaphthalene	9.08E+04	ns	2.48E+04	ns	8.20E+04	ns	1.35E+01	1.80E+01	-	N
2-Chlorophenol	5.68E+03	n	1.55E+03	n	5.10E+03	n	1.53E-01	2.00E-01	-	N
2-Chlorotoluene	2.27E+04	ns	6.19E+03	ns	2.00E+04	ns	6.24E-01	8.00E-01	-	N
Chromium	1.57E+06	nl	4.47E+05	nl	1.50E+06	nm	9.86E+07	9.90E+07	-	Y
Chrysene	2.34E+03	c	2.06E+04	c	2.10E+02	c	3.26E+01	1.40E+00	-	N
cis-1,2-DCE	1.14E+04	ns	3.10E+03	cs	1.00E+04	ns	9.43E-02	1.10E-01	2.10E-02	N
cis-1,3-Dichloropropene	1.26E+02	c	5.10E+02	n	8.40E+00	c*	1.35E-03	1.60E-04	-	N
Cobalt	-	-	-	-	3.00E+02	n	-	4.90E-01	-	Y
Cyanide	2.27E+04	n	6.19E+03	n	2.00E+04	n	7.44E+00	7.40E+00	2.00E+00	N
1,1-Dichloroethane	3.50E+02	c	6.88E+03	cs	1.70E+01	c	6.09E-03	7.00E-04	-	N
1,1-Dichloroethene	2.22E+03	ns	1.83E+03	ns	1.10E+03	n	1.19E-01	1.20E-01	2.60E-03	N
1,1-Dichloropropene	-	-	-	-	-	-	-	-	-	N
1,2-Dibromo-3-chloropropane	1.09E+00	c	2.30E+01	c	7.30E-02	c	2.97E-06	1.50E-07	9.20E-05	N
1,2-Dibromoethane (EDB)	3.14E+00	c	4.86E+01	c	1.70E-01	c	1.58E-05	1.90E-06	1.50E-05	N
1,2-Dichlorobenzene	1.43E+04	ns	9.71E+03	ns	1.00E+04	ns	3.13E-01	4.00E-01	6.60E-01	N
3,3´-Dichlorobenzidine	4.26E+01	c	3.71E+02	c	3.80E+00	c	1.70E-02	2.30E-03	-	N
1,2-Dichloroethane (EDC)	4.28E+01	c	7.51E+02	c	2.20E+00	c	3.65E-04	4.40E-05	1.50E-03	N
1,2-Dichloropropane	8.17E+01	c	1.17E+02	n	4.70E+00	c*	1.11E-03	1.30E-04	1.70E-03	N
1,3-Dichlorobenzene	-	-	-	-	-	-	-	-	-	N
1,3-Dichloropropane	-	-	-	-	2.00E+04	ns	-	2.70E-01	-	N
1,4-Dichlorobenzene	1.80E+02	c	3.78E+03	cs	1.30E+01	c	3.57E-03	4.60E-04	8.10E-02	N
2,2-Dichloropropane	-	-	-	-	-	-	-	-	-	N
2,4-Dichlorophenol	2.05E+03	n	7.15E+02	n	1.80E+03	n	1.37E-01	1.80E-01	-	N
2,4-Dimethylphenol	1.37E+04	n	4.76E+03	n	1.20E+04	n	9.12E-01	1.20E+00	-	N
4,6-Dinitro-2-methylphenol	-	-	-	-	-	-	-	-	-	N
2,4-Dinitrophenol	1.37E+03	n	4.76E+02	n	1.20E+03	n	5.25E-02	6.80E-02	-	N

TABLE 7
Non- Residential Soil Screening Levels
Bloomfield Refinery - Bloomfield, New Mexico

							Cross Media Soil-to-Ground Water			
	NMED				EPA		NMED	EPA		
Analyte	IndOccSoil (mg/kg)	IndOccSoil (Endpoint)	ConsWork (mg/kg)	ConsWork Soil (Endpoint)	Industrial (mg/kg)	IndSoil _key	DAF1 (mg/kg)	GW_Risk-based SSL (mg/kg)	GW_MCL-based SSL (mg/kg)	Constituent Detected
Applicable depth interval	0-2'		0-10'		0-2'		All depths			
2,4-Dinitrotoluene	1.03E+02	c	4.76E+02	n	5.50E+00	c	1.56E-03	2.00E-04	-	N
2,6-Dinitrotoluene	6.87E+02	n	2.39E+02	n	6.20E+02	n	2.67E-02	3.40E-02	-	N
Dibenz(a,h)anthracene	2.34E+00	c	2.13E+01	c	2.10E-01	c	3.62E-01	1.50E-02	-	N
Dibenzofuran	-	-	-	-	-	-	-	-	-	N
Dibromochloromethane	6.13E+01	c	1.99E+03	c	3.40E+00	c	3.38E-04	4.00E-05	-	N
Dibromomethane	-	-	-	-	1.00E+04	ns	-	9.10E-02	-	N
Dichlorodifluoromethane	1.55E+03	ns	1.37E+03	ns	7.80E+02	n	7.23E-01	6.10E-01	-	N
Diethyl phthalate	5.47E+05	nl	1.91E+05	nl	4.90E+05	nm	1.06E+01	1.30E+01	-	N
Dimethyl phthalate	6.84E+06	nl	2.38E+06	nl	-	-	8.36E+01	-	-	N
Di-n-butyl phthalate	6.84E+04	n	2.38E+04	n	-	-	8.63E+00	-	-	N
Di-n-octyl phthalate	-	-	-	-	-	-	-	-	-	N
Ethylbenzene	3.85E+02	c	6.63E+03	cs	2.90E+01	c	1.46E-02	1.90E-03	8.90E-01	Y
Fluoranthene	2.44E+04	n	8.91E+03	n	2.20E+04	n	1.55E+02	2.10E+02	-	N
Fluorene	2.44E+04	ns	8.91E+03	ns	2.20E+04	n	2.50E+01	3.30E+01	-	N
Hexachlorobenzene	1.20E+01	c	1.03E+02	c	1.10E+00	c	2.21E-03	2.90E-04	7.00E-03	N
Hexachlorobutadiene	-	-	-	-	2.20E+01	c*	-	1.90E-03	-	N
Hexachlorocyclopentadiene	4.10E+03	n	8.11E+02	n	3.70E+03	n	6.13E-01	8.00E-01	1.80E-01	N
Hexachloroethane	6.84E+02	n	2.38E+02	n	1.20E+02	c**	1.93E-02	3.20E-03	-	N
2-Hexanone	-	-	-	-	-	-	-	-	-	N
Indeno(1,2,3-cd)pyrene	2.34E+01	c	2.13E+02	c	2.10E+00	c	3.70E+00	1.60E-01	-	N
Isophorone	2.02E+04	c	4.75E+04	n	1.80E+03	c*	1.85E-01	2.20E-02	-	N
Isopropylbenzene (cumene)	1.49E+04	ns	1.03E+04	ns	1.10E+04	ns	9.86E-01	1.30E+00	-	Y
4-Isopropyltoluene	-	-	-	-	-	-	-	-	-	Y
Lead	8.00E+02	IEUBK	8.00E+02	IEUBK	8.00E+02	nL	-	-	-	Y
Mercury	4.99E+01	n	6.36E+01	ns	2.40E+01	ns	2.93E-02	3.00E-02	1.00E-01	Y
Methyl tert-butyl ether (MTBE)	4.69E+03	c	6.55E+04	cs	1.90E+02	c	2.29E-02	2.70E-03	-	Y
Methylene chloride	1.09E+03	c	1.06E+04	ns	5.40E+01	c	1.07E-02	1.20E-03	1.30E-03	Y
1-Methylnaphthalene	-	-	-	-	9.90E+01	c	-	1.50E-02	-	Y
2-Methylnaphthalene	-	-	-	-	4.10E+03	ns	-	9.00E-01	-	Y
2-Methylphenol	-	-	-	-	3.10E+04	n	-	2.00E+00	-	N
3+4-Methylphenol	-	-	-	-	3.10E+03	n	-	1.90E-01	-	N
4-Methyl-2-pentanone	-	-	-	-	-	-	-	-	-	N
2-Nitroaniline	-	-	-	-	1.80E+03	n	-	3.30E-02	-	N
3-Nitroaniline	-	-	-	-	-	-	-	-	-	N
4-Nitroaniline	-	-	-	-	8.60E+01	c*	-	1.00E-03	-	N
2-Nitrophenol	-	-	-	-	-	-	-	-	-	N
4-Nitrophenol	-	-	-	-	-	-	-	-	-	N
Naphthalene	2.52E+02	cs	7.02E+02	ns	2.00E+01	c*	4.19E-03	5.50E-04	-	Y
n-Butylbenzene	-	-	-	-	-	-	-	-	-	Y
Nickel	2.27E+04	n	6.19E+03	n	6.90E+04	c	4.77E+01	4.80E+01	-	Y
Nitrobenzene	2.77E+02	c	5.20E+02	n	2.20E+01	c*	6.86E-03	7.10E-05	-	N
N-Nitrosodi-n-propylamine	-	-	-	-	2.50E-01	c	-	1.10E-05	-	N
N-Nitrosodiphenylamine	3.91E+03	c	3.40E+04	c	3.50E+02	c	1.29E+00	1.70E-01	-	N
n-Propylbenzene	-	-	-	-	-	-	-	-	-	Y
Pentachlorophenol	1.00E+02	c	1.03E+03	c	9.00E+00	c	2.94E-02	3.90E-03	7.00E-03	N
Phenanthrene	2.05E+04	ns	7.15E+03	ns	-	-	8.34E+01	-	-	Y
Phenol	2.05E+05	nl	6.88E+04	n	1.80E+05	nm	6.30E+00	8.10E+00	-	N
Pyrene	1.83E+04	ns	6.68E+03	ns	1.70E+04	n	1.12E+02	1.50E+02	-	Y
Pyridine	-	-	-	-	1.00E+03	n	-	9.70E-03	-	N
sec-Butylbenzene	-	-	-	-	-	-	-	-	-	Y
Selenium	5.68E+03	n	1.55E+03	n	5.10E+03	n	9.65E-01	9.50E-01	2.60E-01	N
Silver	5.68E+03	n	1.55E+03	n	5.10E+03	n	1.57E+00	1.60E+00	-	N
Styrene	5.12E+04	ns	3.03E+04	ns	3.80E+04	ns	1.56E+00	2.00E+00	1.20E-01	N
1,2,3-Trichlorobenzene	-	-	-	-	-	-	-	-	-	N
1,1,1,2-Tetrachloroethane	1.61E+02	c	2.78E+03	cs	9.80E+00	c	1.73E-03	2.10E-04	-	N
1,1,1-Trichloroethane	7.71E+04	ns	6.43E+04	ns	3.90E+04	ns	2.98E+00	3.30E+00	7.20E-02	N
1,1,2,2-Tetrachloroethane	4.33E+01	c	5.99E+02	c	2.90E+00	c	2.25E-04	2.80E-05	-	N
1,1,2-Trichloroethane	9.43E+01	c	1.24E+03	ns	5.50E+00	c	6.74E-04	8.20E-05	1.70E-03	N
2,4,5-Trichlorophenol	6.84E+04	n	2.38E+04	n	6.20E+04	n	7.13E+00	9.40E+00	-	N
2,4,6-Trichlorophenol	6.84E+02	n	2.38E+02	n	1.60E+02	c**	7.13E-02	1.60E-02	-	N
1,2,3-Trichloropropane	4.54E+00	c	3.10E+01	c	4.10E-01	c	3.56E-05	4.40E-06	-	N
1,2,4-Trichlorobenzene	5.25E+02	ns	4.27E+02	ns	4.00E+02	ns	1.02E-02	1.30E-02	1.10E-01	N
1,2,4-Trimethylbenzene	-	-	-	-	2.80E+02	ns	-	2.40E-02	-	Y
1,3,5-Trimethylbenzene	-	-	-	-	2.00E+02	n	-	2.00E-02	-	Y
tert-Butylbenzene	-	-	-	-	-	-	-	-	-	N
Tetrachloroethene (PCE)	3.64E+01	c	3.38E+02	cs	2.70E+00	c	4.49E-04	5.20E-05	2.40E-03	N
Toluene	5.79E+04	ns	2.11E+04	ns	4.60E+04	ns	1.38E+00	1.70E+00	7.60E-01	Y

TABLE 7
Non- Residential Soil Screening Levels
Bloomfield Refinery - Bloomfield, New Mexico

							Cross Media Soil-to-Ground Water			
	NMED				EPA		NMED	EPA		
Analyte	IndOccSoil (mg/kg)	IndOccSoil (Endpoint)	ConsWork (mg/kg)	ConsWork Soil (Endpoint)	Industrial (mg/kg)	IndSoil _key	DAF1 (mg/kg)	GW_Risk-based SSL (mg/kg)	GW_MCL-based SSL (mg/kg)	Constituent Detected
Applicable depth interval	0-2'		0-10'		0-2'		All depths			
trans-1,2-DCE	9.95E+02	n	8.14E+02	n	5.00E+02	n	3.01E-02	3.40E-02	3.20E-02	**N**
trans-1,3-Dichloropropene	1.26E+02	c	5.10E+02	n	8.40E+00	c*	1.35E-03	1.60E-04	-	**N**
Trichloroethene (TCE)	2.53E+02	c	4.60E+03	cs	1.40E+01	c	5.30E-03	6.10E-04	1.90E-03	**N**
Trichlorofluoromethane	6.76E+03	ns	5.82E+03	ns	3.40E+03	ns	9.01E-01	8.40E-01	-	**N**
Vanadium	5.68E+03	n	1.55E+03	n	7.20E+03	n	1.83E+02	2.60E+02	-	Y
Vinyl chloride	2.59E+01	c	2.48E+02	c	1.70E+00	c	2.88E-04	5.60E-06	7.00E-04	**N**
Xylenes, Total	3.61E+03	ns	3.13E+03	ns	2.60E+03	ns	1.76E-01	2.30E-01	1.10E+01	Y
Zinc	3.41E+05	nl	9.29E+04	n	3.10E+05	nm	6.82E+02	6.80E+02	-	Y

c - carcinogen

n - noncarcinogen

cs - carcinogen, SSL may exceed saturation

ns - noncarcinogen, SSL may exceed saturation

\- no screenig value currently available

nl - noncarcinogen, SSL may exceed ceiling limit

nls - noncarcinogen, SSL may exceed both saturation and ceiling limit

NMED - Technical Background Document for Development of Soil Screening Levels - Revision 5.0 (August 2009)
EPA - Regional Screening Levels (April 2009)

TABLE 8
Ground Water Screening Levels
Bloomfield Refinery - Bloomfield, New Mexico

	NMED	EPA			
Analyte	New Mexico WQCC Standards (ug/L)	EPA Screening Levels.Tap Water (ug/L)	TapW_key	MCL (ug/L)	Constituent Detected
Acenaphthene	-	**2200**	n	-	Y
Acenaphthylene	-	-	-	-	**N**
Acetone	-	**22000**	n	-	Y
Aniline	-	**12**	c*	-	**N**
Anthracene	-	**11000**	n	-	**N**
Antimony	-	15	n	**6**	Y
Arsenic	100	0.045	c	**10**	Y
Azobenzene	-	**0.12**	c	-	**N**
Barium	**1000**	7300	n	2000	Y
Benz(a)anthracene	-	**0.029**	c	-	**N**
Benzene	10	0.41	c	**5**	Y
Benzo(a)pyrene	0.7	0.0029	c	**0.2**	**N**
Benzo(b)fluoranthene	-	**0.029**	c	-	**N**
Benzo(g,h,i)perylene	-	-	-	-	**N**
Benzo(k)fluoranthene	-	**0.29**	c	-	**N**
Benzoic acid	-	**150000**	n	-	**N**
Benzyl alcohol	-	**18000**	n	-	**N**
Beryllium	-	73	n	**4**	**N**
Bis(2-chloroethoxy)methane	-	**110**	n	-	**N**
Bis(2-chloroethyl)ether	-	**0.012**	c	-	**N**
Bis(2-chloroisopropyl)ether	-	-	-	-	**N**
Bis(2-ethylhexyl)phthalate	-	4.8	c	**6**	Y
Bromobenzene	-	**20**	n	-	**N**
Bromodichloromethane	-	**0.12**	c	-	**N**
Bromoform	-	**8.5**	c*	-	**N**
Bromomethane	-	**8.7**	n	-	**N**
4-Bromophenyl phenyl ether	-	-	-	-	**N**
Butyl benzyl phthalate	-	**35**	c	-	**N**
2-Butanone (MEK)	-	**7100**	n	-	**N**
Cadmium	10	18	n	**5**	**N**
Carbazole	-	-	-	-	**N**
Carbon disulfide	-	**1000**	n	-	**N**
Carbon tetrachloride	10	0.2	c	**5**	**N**
Chlorobenzene	-	91	n	**100**	**N**
Chloroethane	-	-	-	-	**N**
Chloroform	**100**	0.19	c	-	Y
Chloromethane	-	**190**	c	-	**N**
4-Chloro-3-methylphenol	-	-	-	-	**N**
4-Chloroaniline	-	**0.34**	c	-	**N**
4-Chlorophenyl phenyl ether	-	-	-	-	**N**
4-Chlorotoluene	-	**2600**	n	-	**N**
2-Chloronaphthalene	-	**2900**	n	-	**N**
2-Chlorophenol	-	**180**	n	-	**N**
2-Chlorotoluene	-	**730**	n	-	**N**
Chromium	**50**	55000	n	-	Y
Chrysene	-	**2.9**	c	-	**N**

TABLE 8
Ground Water Screening Levels
Bloomfield Refinery - Bloomfield, New Mexico

	NMED	EPA			
Analyte	New Mexico WQCC Standards (ug/L)	EPA Screening Levels.Tap Water (ug/L)	TapW_key	MCL (ug/L)	Constituent Detected
Cobalt	**50**	11	n	-	Y
Cyanide	**200**	730	n	200	Y
Dibenz(a,h)anthracene	-	**0.0029**	c	-	**N**
Dibenzofuran	-	-	-	-	**N**
Dibromochloromethane	-	**0.15**	c	-	**N**
cis-1,2-DCE	-	370	n	**70**	**N**
trans-1,2-DCE	-	110	n	**100**	**N**
cis-1,3-Dichloropropene	-	-	-	-	**N**
trans-1,3-Dichloropropene	-	**0.43**	c	-	**N**
Dibromomethane	-	**370**	n	-	**N**
1,2-Dibromo-3-chloropropane	-	0.00032	c	**0.2**	**N**
1,2-Dibromoethane (EDB)	0.1	0.0065	c	**0.05**	**N**
1,2-Dichlorobenzene	-	370	n	**600**	**N**
1,3-Dichlorobenzene	-	-	-	-	**N**
1,4-Dichlorobenzene	-	0.43	c	**75**	**N**
3,3´-Dichlorobenzidine	-	**0.15**	c	-	**N**
Dichlorodifluoromethane	-	**390**	n	-	**N**
1,1-Dichloroethane	**25**	2.4	c	-	**N**
1,2-Dichloroethane (EDC)	10	0.15	c	**5**	Y
1,1-Dichloroethene	**5**	340	n	7	**N**
2,4-Dichlorophenol	-	**110**	n	-	**N**
1,2-Dichloropropane	-	0.39	c*	**5**	**N**
2,2-Dichloropropane	-	-	-	-	**N**
1,3-Dichloropropane	-	**730**	n	-	**N**
1,1-Dichloropropene	-	-	-	-	**N**
Diethyl phthalate	-	**29000**	n	-	**N**
Dimethyl phthalate	-	-	-	-	**N**
2,4-Dimethylphenol	-	**730**	n	-	Y
4,6-Dinitro-2-methylphenol	-	-	-	-	**N**
2,4-Dinitrophenol	-	**73**	n	-	**N**
2,4-Dinitrotoluene	-	**0.22**	n	-	**N**
2,6-Dinitrotoluene	-	**37**	n	-	**N**
Di-n-butyl phthalate	-	-	-	-	**N**
Di-n-octyl phthalate	-	-	-	-	**N**
Ethylbenzene	750	1.5	c	700	Y
Fluoranthene	-	**1500**	n	-	**N**
Fluorene	-	**1500**	n	-	Y
Hexachlorobenzene	-	0.042	c	**1**	**N**
Hexachlorobutadiene	-	**0.86**	c*	-	**N**
Hexachlorocyclopentadiene	-	220	n	**50**	**N**
Hexachloroethane	-	**4.8**	c**	-	**N**
2-Hexanone	-	-	-	-	**N**
Indeno(1,2,3-cd)pyrene	-	**0.029**	c	-	**N**
Isophorone	-	**71**	c	-	**N**
Isopropylbenzene (Cumene)	-	**680**	n	-	Y
4-Isopropyltoluene	-	-	-	-	Y

TABLE 8
Ground Water Screening Levels
Bloomfield Refinery - Bloomfield, New Mexico

	NMED	EPA			
Analyte	New Mexico WQCC Standards (ug/L)	EPA Screening Levels.Tap Water (ug/L)	TapW_key	MCL (ug/L)	Constituent Detected
Lead	50	-	-	**15**	Y
Magnesium	-	-	-	-	Y
Manganese	**200**	880	n		Y
Mercury	**2**	0.57	n	2	Y
Methyl tert-butyl ether (MTBE)	-	**12**	c	-	Y
Methylene chloride	100	4.8	c	**5**	**N**
1-Methylnaphthalene	-	**2.3**	c	-	Y
2-Methylnaphthalene	-	**150**	n	-	Y
2-Methylphenol	-	**1800**	n	-	Y
3+4-Methylphenol	-	**180**	n	-	Y
4-Methyl-2-pentanone	-	-	-	-	**N**
Naphthalene	-	**0.14**	c*	-	Y
n-Butylbenzene	-	-	-	-	Y
Nickel	**200**	730	n	-	Y
2-Nitroaniline	-	**110**	n	-	**N**
3-Nitroaniline	-	-	-	-	**N**
4-Nitroaniline	-	**3.4**	c*	-	**N**
2-Nitrophenol	-	-	-	-	**N**
4-Nitrophenol	-	-	-	-	**N**
Nitrobenzene	-	**0.12**	c	-	**N**
N-Nitrosodimethylamine	-	**0.00042**	c		**N**
N-Nitrosodi-n-propylamine	-	**0.0096**	c	-	**N**
N-Nitrosodiphenylamine	-	**14**	c	-	**N**
n-Propylbenzene	-	-	-	-	Y
Pentachlorophenol	-	0.56	c	**1**	**N**
Phenanthrene	-	-	-	-	Y
Phenol	**5**	11000	n	-	Y
Pyrene	-	**1100**	n	-	Y
Pyridine	-	**37**	n	-	**N**
sec-Butylbenzene	-	-	-	-	Y
Selenium	**50**	180	n	50	Y
Silver	**50**	180	n	-	**N**
Styrene	-	1600	n	**100**	**N**
tert-Butylbenzene	-	-	-	-	**N**
Tetrachloroethene (PCE)	20	0.11	c	**5**	**N**
1,1,1,2-Tetrachloroethane	-	**0.52**	c	-	**N**
Toluene	**750**	2300	n	1000	Y
1,2,3-Trichlorobenzene	-	-	-	-	**N**
1,2,4-Trichlorobenzene	-	8.2	n	**70**	**N**
2,4,5-Trichlorophenol	-	**3700**	n	-	**N**
2,4,6-Trichlorophenol	-	**6.1**	c**	-	**N**
1,2,3-Trichloropropane	-	**0.0096**	c	-	**N**
1,2,4-Trichlorobenzene	-	8.2	n	**70**	**N**
1,2,4-Trimethylbenzene	-	**15**	n	-	Y
1,1,1-Trichloroethane	**60**	9100	n	200	**N**
1,1,2,2-Tetrachloroethane	**10**	0.067	c	-	**N**

TABLE 8
Ground Water Screening Levels
Bloomfield Refinery - Bloomfield, New Mexico

	NMED	EPA			
Analyte	New Mexico WQCC Standards (ug/L)	EPA Screening Levels.Tap Water (ug/L)	TapW_key	MCL (ug/L)	Constituent Detected
1,1,2-Trichloroethane	10	0.24	c	**5**	**N**
Trichloroethene (TCE)	100	1.7	c	**5**	**N**
Trichlorofluoromethane	-	**1300**	n	-	**N**
1,3,5-*Trimethylbenzene*	-	**12**	n	-	Y
Vanadium	-	**260**	n	-	**N**
Vinyl chloride	**1**	0.016	c	2	**N**
Xylenes, Total	**620**	200	n	10000	Y
Zinc	**10000**	11000	n	-	Y
General Chemistry					
Alkalinity	-	-	-	-	Y
Bicarbonate	-	-	-	-	Y
Carbonate	-	-	-	-	**N**
Calcium	-	-	-	-	Y
Chloride	**250000**				Y
Fluoride	**1600**				Y
Iron	**1000**	26000	n	-	Y
Nitrite	-	3700	n	**1000**	Y
Nitrate (NO3 as N)	10000	58000	n	**10000**	Y
Potassium	-	-	-	-	Y
Sodium	-	-	-	-	Y
Sulfate	**600000**	-	-	-	Y
Total Dissolved Solids	**1000000**				Y
Motor Oil Range Organics (MRO)	-	-	-	-	**N**
Diesel Range Organics (DRO)	-	-	-	-	Y
Gasoline Range Organics (GRO)	-	-	-	-	Y

c - cancer, * = where n SL < 100X c SL, ** = where n SL < 10X c SL

n - noncancer

620 - Bolded value is applicable screening level

- no screenig value currently available

EPA - Regional Screening Levels (April 2009)

NMED WQCC standards - Title 20 Chapter 6, Part 2, - 20.6.2.3101 Standards for Ground Water of 10,000 mg/l TDS Concentration or less

Table 9
Group 3 Soil Analytical Results Summary - AOC 23 and AOC 25
Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Residential Soil Screening Level	Source	Units	SWMU 4-1 (0-0.5')	SWMU 4-1 (1.5-2.0')	SWMU 4-1 (6-8')	SWMU 4-1 (36-38')	SWMU 5-1 (0-0.5')	SWMU 5-1 (1.5-2.0')	SWMU 5-2 (0-0.5')	SWMU 5-2 (1.5-2.0')	SWMU 5-3 (0-0.5')	SWMU 5-3 (1.5-2.0')	SWMU 5-4 (0-0.5')	SWMU 5-4 (1.5-2.0')	SWMU 5-5 (0-0.5')	SWMU 5-5 (1.5-2.0')	SWMU 5-5 (1.5-2.0') DUP	SWMU 5-6 (0-0.5')	SWMU 5-6 (1.5-2.0')	AOC 23-1 (0-0.5')
Sample Date				4/6/2009	4/6/2009	4/6/2009	4/6/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/21/2009
Metals (mg/kg)																					
Antimony	3.13E+01	(1)	mg/Kg	<2.5	<2.5	<13	<2.5	<2.5	<13	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<13	<2.5	<2.5	<2.5	<2.5
Arsenic	3.59E+00	(1)	mg/Kg	<2.5	<2.5	<13	<2.5	3.2	<13	<2.5	<2.5	**4.3**	<2.5	<2.5	<2.5	2.6	<2.5	<2.5	<2.5	<2.5	<2.5
Barium	1.56E+04	(1)	mg/Kg	120	160	270	140	300	110	220	100	210	100	200	140	210	160	140	200	140	120
Beryllium	1.56E+02	(1)	mg/Kg	0.3	0.31	<0.75	<0.15	0.23	<0.75	0.18	0.26	0.23	0.3	0.32	0.3	0.22	0.32	0.34	0.29	0.27	0.28
Cadmium	7.79E+01	(1)	mg/Kg	<0.10	<0.10	3.1	<0.10	0.18	<0.50	0.13	<0.10	0.26	<0.10	0.14	<0.10	0.12	<0.10	<0.10	0.14	<0.10	<0.10
Chromium	1.13E+05	(1)	mg/Kg	4.4	4.4	14	1.4	13	4.5	99	3.6	12	3.9	8.3	4.3	9.6	4.2	4.3	20	3.9	3.2
Cobalt	2.30E+01	(2)	mg/Kg	3	3	5.4	1.4	3.9	3.2	2.9	2.5	3.9	2.6	4.0	2.8	3.7	4.2	4.5	3.1	2.5	2.9
Cyanide	1.56E+03	(1)	mg/Kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Lead	4.00E+02	(1)	mg/Kg	3.4	3.6	57	1	9.8	5.6	8.8	3.4	14	3	12	4.3	8.1	3.9	3.2	11	3.9	4.7
Mercury	7.71E+00	(1)	mg/Kg	<0.033	<0.033	0.09	<0.033	**75**	0.04	**15**	0.057	**22**	<0.033	**12**	4.1	**55**	<0.033	0.27	**390**	0.07	<0.032
Nickel	1.56E+03	(1)	mg/Kg	4.2	4.4	10	1.3	26	5.5	10	3.8	11	4.4	6.4	6.2	30	6.5	4.8	11	4.3	4.6
Selenium	3.91E+02	(1)	mg/Kg	<2.5	<13	<13	<13	<13	<13	<13	<13	<13	<13	<13	<13	<13	<13	<13	<13	<13	<13
Silver	3.91E+02	(1)	mg/Kg	<0.25	<0.25	<1.3	<0.25	<0.25	<1.3	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Vanadium	3.91E+02	(1)	mg/Kg	12	11	19	7	11	14	12	9.3	13	9.8	12	12	14	14	14	13	11	9.4
Zinc	2.35E+04	(1)	mg/Kg	20	19	110	7.4	230	23	87	16	270	17	290	25	140	19	19	120	20	15
Volatile Organic Compounds - (EPA Method 8260B) mg/kg																					
1,1,1,2-Tetrachloroethane	2.92E+01	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
1,1,1-Trichloroethane	2.18E+04	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
1,1,2,2-Tetrachloroethane	7.97E+00	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
1,1,2-Trichloroethane	1.72E+01	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
1,1-Dichloroethane	6.29E+01	(1)	mg/Kg	<0.10	<0.10	<0.20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10
1,1-Dichloroethene	6.18E+02	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
1,1-Dichloropropene	--		mg/Kg	<0.10	<0.10	<0.20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10
1,2,3-Trichlorobenzene	--		mg/Kg	<0.10	<0.10	<0.20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10
1,2,3-Trichloropropane	9.15E-01	(1)	mg/Kg	<0.10	<0.10	<0.20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10
1,2,4-Trichlorobenzene	1.43E+02	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
1,2,4-Trimethylbenzene	6.70E+01	(2)	mg/Kg	<0.050	<0.050	8.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
1,2-Dibromo-3-chloropropane	1.94E-01	(1)	mg/Kg	<0.10	<0.10	<0.20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10
1,2-Dibromoethane (EDB)	5.74E-01	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
1,2-Dichlorobenzene	3.01E+03	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
1,2-Dichloroethane (EDC)	7.74E+00	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
1,2-Dichloropropane	1.47E+01	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
1,3,5-Trimethylbenzene	4.70E+01	(2)	mg/Kg	<0.050	<0.050	3.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
1,3-Dichlorobenzene	--		mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
1,3-Dichloropropane	1.60E+03	(2)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
1,4-Dichlorobenzene	3.21E+01	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
1-Methylnaphthalene	2.20E+02	(3)	mg/Kg	<0.20	<0.20	<20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.20
2,2-Dichloropropane	--		mg/Kg	<0.10	<0.10	<0.20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10
2-Butanone (MEK)	3.96E+04	(1)	mg/Kg	<0.50	<0.50	<1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.50
2-Chlorotoluene	1.56E+03	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
2-Hexanone	--		mg/Kg	<0.50	<0.50	<1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.50
2-Methylnaphthalene	3.10E+02	(2)	mg/Kg	<0.20	<0.20	29	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.20
4-Chlorotoluene	5.50E+03	(2)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
4-Isopropyltoluene	--		mg/Kg	<0.050	<0.050	0.82	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
4-Methyl-2-pentanone	--		mg/Kg	<0.50	<0.50	<1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.50
Acetone	6.75E+04	(1)	mg/Kg	<0.75	<0.75	<1.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.75
Benzene	1.55E+01	(1)	mg/Kg	<0.050	<0.050	0.27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050

Table 9
Group 3 Soil Analytical Results Summary - AOC 23 and AOC 25
Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Residential Soil Screening Level	Source	Units	SWMU 4-1 (0-0.5')	SWMU 4-1 (1.5-2.0')	SWMU 4-1 (6-8')	SWMU 4-1 (36-38')	SWMU 5-1 (0-0.5')	SWMU 5-1 (1.5-2.0')	SWMU 5-2 (0-0.5')	SWMU 5-2 (1.5-2.0')	SWMU 5-3 (0-0.5')	SWMU 5-3 (1.5-2.0')	SWMU 5-4 (0-0.5')	SWMU 5-4 (1.5-2.0')	SWMU 5-5 (0-0.5')	SWMU 5-5 (1.5-2.0')	SWMU 5-5 (1.5-2.0') DUP	SWMU 5-6 (0-0.5')	SWMU 5-6 (1.5-2.0')	AOC 23-1 (0-0.5')
Bromobenzene	9.40E+01	(2)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
Bromodichloromethane	5.25E+00	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
Bromoform	6.10E+02	(3)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
Bromomethane	2.23E+01	(1)	mg/Kg	<0.10	<0.10	<0.20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10
Carbon disulfide	1.94E+03	(1)	mg/Kg	<0.50	<0.50	<1.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.50
Carbon tetrachloride	4.38E+00	(1)	mg/Kg	<0.10	<0.10	<0.20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10
Chlorobenzene	5.08E+02	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
Chloroethane	--		mg/Kg	<0.10	<0.10	<0.20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10
Chloroform	5.72E+00	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
Chloromethane	3.56E+01	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
cis-1,2-DCE	7.82E+02	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
cis-1,3-Dichloropropene	2.35E+01	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
Dibromochloromethane	1.13E+01	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
Dibromomethane	7.80E+02	(2)	mg/Kg	<0.10	<0.10	<0.20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10
Dichlorodifluoromethane	4.81E+02	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
Ethylbenzene	6.96E+01	(1)	mg/Kg	<0.050	<0.050	5.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
Hexachlorobutadiene	6.20E+01	(3)	mg/Kg	<0.10	<0.10	<0.20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10
Isopropylbenzene	3.21E+03	(1)	mg/Kg	<0.050	<0.050	1.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
Methyl tert-butyl ether (MTBE)	8.62E+02	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
Methylene chloride	1.99E+02	(1)	mg/Kg	<0.15	<0.15	<0.30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.15
Naphthalene	4.50E+01	(1)	mg/Kg	<0.10	<0.10	17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10
n-Butylbenzene	--		mg/Kg	<0.050	<0.050	1.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
n-Propylbenzene	--		mg/Kg	<0.050	<0.050	3.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
sec-Butylbenzene	--		mg/Kg	<0.050	<0.050	1.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
Styrene	8.97E+03	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
tert-Butylbenzene	--		mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
Tetrachloroethene (PCE)	6.99E+00	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
Toluene	5.57E+03	(1)	mg/Kg	<0.050	<0.050	3.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
trans-1,2-DCE	2.73E+02	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
trans-1,3-Dichloropropene	2.35E+01	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
Trichloroethene (TCE)	4.57E+01	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
Trichlorofluoromethane	2.01E+03	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
Vinyl chloride	8.65E-01	(1)	mg/Kg	<0.050	<0.050	<0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.050
Xylenes, Total	1.09E+03	(1)	mg/Kg	<0.10	<0.10	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.10
Volatile Organic Compounds - (EPA Method 8260B) µg/Kg-dry																					
1,1,1,2-Tetrachloroethane	2.92E+04	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
1,1,1-Trichloroethane	2.18E+07	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
1,1,2,2-Tetrachloroethane	7.97E+03	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
1,1,2-Trichloroethane	1.72E+04	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
1,1-Dichloroethane	6.29E+04	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
1,1-Dichloroethene	6.18E+05	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
1,1-Dichloropropene	--		µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
1,2,3-Trichlorobenzene	--		µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
1,2,3-Trichloropropane	9.15E+02	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
1,2,4-Trichlorobenzene	1.43E+05	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
1,2,4-Trimethylbenzene	6.70E+04	(2)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
1,2-Dibromo-3-chloropropane	1.94E+02	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
1,2-Dibromoethane (EDB)	5.74E+02	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
1,2-Dichlorobenzene	3.01E+06	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978

Table 9
Group 3 Soil Analytical Results Summary - AOC 23 and AOC 25
Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Residential Soil Screening Level	Source	Units	SWMU 4-1 (0-0.5')	SWMU 4-1 (1.5-2.0')	SWMU 4-1 (6-8')	SWMU 4-1 (36-38')	SWMU 5-1 (0-0.5')	SWMU 5-1 (1.5-2.0')	SWMU 5-2 (0-0.5')	SWMU 5-2 (1.5-2.0')	SWMU 5-3 (0-0.5')	SWMU 5-3 (1.5-2.0')	SWMU 5-4 (0-0.5')	SWMU 5-4 (1.5-2.0')	SWMU 5-5 (0-0.5')	SWMU 5-5 (1.5-2.0')	SWMU 5-5 (1.5-2.0') DUP	SWMU 5-6 (0-0.5')	SWMU 5-6 (1.5-2.0')	AOC 23-1 (0-0.5')
1,2-Dichloroethane (EDC)	7.74E+03	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
1,2-Dichloropropane	1.47E+04	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
1,3,5-Trimethylbenzene	4.70E+04	(2)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
1,3-Dichlorobenzene	--		µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
1,3-Dichloropropane	1.60E+06	(2)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
1,4-Dichlorobenzene	3.21E+04	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
2,2-Dichloropropane	--		µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
2-Butanone	3.96E+07	(1)	µg/Kg-dry	<3.73	<3.96	--	<4.07	<3.72	<4.00	<3.85	<3.74	<3.57	<3.96	<3.66	<3.67	<3.57	<3.80	<3.87	<3.69	<3.49	<3.91
2-Chlorotoluene	1.56E+06	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
2-Hexanone	--		µg/Kg-dry	<3.73	<3.96	--	<4.07	<3.72	<4.00	<3.85	<3.74	<3.57	<3.96	<3.66	<3.67	<3.57	<3.80	<3.87	<3.69	<3.49	<3.91
4-Chlorotoluene	5.50E+06	(2)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
4-Isopropyltoluene	--		µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
4-Methyl-2-pentanone	-	(1)	µg/Kg-dry	<3.73	<3.96	--	<4.07	<3.72	<4.00	<3.85	<3.74	<3.57	<3.96	<3.66	<3.67	<3.57	<3.80	<3.87	<3.69	<3.49	<3.91
Acetone	6.75E+07	(1)	µg/Kg-dry	<3.73	<3.96	--	<4.07	8.35	5.74	7.89	6.05	8.43	7.89	11.1	19.6	20.7	<3.80	<3.87	<3.69	<3.49	13.6
Benzene	1.55E+04	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
Bromobenzene	9.40E+04	(2)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
Bromodichloromethane	5.25E+03	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
Bromoform	6.10E+05	(3)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
Bromomethane	2.23E+04	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
Carbon disulfide	1.94E+06	(1)	µg/Kg-dry	<3.73	<3.96	--	<4.07	<3.72	<4.00	<3.85	<3.74	<3.57	<3.96	<3.66	<3.67	<3.57	<3.80	<3.87	<3.69	<3.49	<3.91
Carbon tetrachloride	4.38E+03	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
Chlorobenzene	5.08E+05	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
Chloroethane	--		µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
Chloroform	5.72E+03	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
Chloromethane	3.56E+04	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
cis-1,2-DCE	7.82E+05	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
cis-1,3-Dichloropropene	2.35E+04	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
Dibromochloromethane	1.13E+04	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
Dibromomethane	7.80E+05	(2)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
Dichlorodifluoromethane	4.81E+05	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
Ethylbenzene	6.96E+04	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	1.42	<0.951	<0.966	1.12	<0.874	<0.978
Hexachlorobutadiene	6.20E+04	(3)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
Isopropylbenzene	3.21E+06	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
Methyl tert-butyl ether (MTBE)	8.62E+05	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
Methylene chloride	1.99E+05	(1)	µg/Kg-dry	<1.87	2.29	--	3.0	4.05	2.49	14.3	3.28	20.1	2.98	10.9	7.32	5.72	6.7	4.67	5.68	2.52	8.75
Naphthalene	4.50E+04	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
n-Butylbenzene	--		µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
n-Propylbenzene	--		µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
sec-Butylbenzene	--		µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
Styrene	8.97E+06	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
tert-Butylbenzene	--		µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
Tetrachloroethene (PCE)	6.99E+03	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
Toluene	5.57E+06	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	1.02	<0.999	<0.962	<0.935	<0.893	<0.989	2.75	<0.918	<0.892	1.94	1.1	1.84	<0.874	<0.978
trans-1,2-DCE	2.73E+05	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
trans-1,3-Dichloropropene	2.35E+04	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
Trichloroethene (TCE)	4.57E+04	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
Trichlorofluoromethane	2.01E+06	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
Vinyl chloride	8.65E+02	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	<0.930	<0.999	<0.962	<0.935	<0.893	<0.989	<0.914	<0.918	<0.892	<0.951	<0.966	<0.923	<0.874	<0.978
Xylenes, Total	1.09E+06	(1)	µg/Kg-dry	<0.933	<0.991	--	<1.02	6.94	<0.999	1.29	<0.935	1.99	<0.989	1.41	1.89	3.17	<0.951	<0.966	8.88	<0.874	<0.978

Table 9
Group 3 Soil Analytical Results Summary - AOC 23 and AOC 25
Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Residential Soil Screening Level	Source	Units	SWMU 4-1 (0-0.5')	SWMU 4-1 (1.5-2.0')	SWMU 4-1 (6-8')	SWMU 4-1 (36-38')	SWMU 5-1 (0-0.5')	SWMU 5-1 (1.5-2.0')	SWMU 5-2 (0-0.5')	SWMU 5-2 (1.5-2.0')	SWMU 5-3 (0-0.5')	SWMU 5-3 (1.5-2.0')	SWMU 5-4 (0-0.5')	SWMU 5-4 (1.5-2.0')	SWMU 5-5 (0-0.5')	SWMU 5-5 (1.5-2.0')	SWMU 5-5 (1.5-2.0') DUP	SWMU 5-6 (0-0.5')	SWMU 5-6 (1.5-2.0')	AOC 23-1 (0-0.5')
Semi Volatile Organics - (EPA Method 8270) mg/kg																					
1,2,4-Trichlorobenzene	1.43E+02	(1)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichlorobenzene	3.01E+03	(1)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,3-Dichlorobenzene	--		mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,4-Dichlorobenzene	3.21E+01	(1)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2,4,5-Trichlorophenol	6.11E+03	(1)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2,4,6-Trichlorophenol	6.11E+01	(1)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2,4-Dichlorophenol	1.83E+02	(1)	mg/Kg	<0.40	<0.40	<2.0	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2,4-Dimethylphenol	1.22E+03	(1)	mg/Kg	<0.30	<0.30	<1.5	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
2,4-Dinitrophenol	1.22E+02	(1)	mg/Kg	<0.40	<0.40	<2.0	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2,4-Dinitrotoluene	1.26E+01	(1)	mg/Kg	<0.50	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2,6-Dinitrotoluene	6.12E+01	(1)	mg/Kg	<0.50	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2-Chloronaphthalene	6.26E+03	(1)	mg/Kg	<0.25	<0.25	<1.3	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
2-Chlorophenol	3.91E+02	(1)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2-Methylnaphthalene	3.10E+02	(2)	mg/Kg	<0.25	<0.25	33	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
2-Methylphenol	3.10E+03	(2)	mg/Kg	<0.50	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2-Nitroaniline	1.80E+02	(2)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2-Nitrophenol	--		mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
3,3´-Dichlorobenzidine	8.71E+00	(1)	mg/Kg	<0.25	<0.25	<1.3	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
3+4-Methylphenol	3.10E+02	(2)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
3-Nitroaniline	--		mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
4,6-Dinitro-2-methylphenol	--		mg/Kg	<0.50	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
4-Bromophenyl phenyl ether	--		mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
4-Chloro-3-methylphenol	--		mg/Kg	<0.50	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
4-Chloroaniline	2.40E+01	(3)	mg/Kg	<0.50	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
4-Chlorophenyl phenyl ether	--		mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
4-Nitroaniline	2.40E+02	(3)	mg/Kg	<0.25	<0.25	<1.3	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
4-Nitrophenol	--		mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Acenaphthene	3.44E+03	(1)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Acenaphthylene	--		mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Aniline	8.50E+02	(3)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Anthracene	1.72E+04	(1)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Azobenzene	4.90E+01	(3)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benz(a)anthracene	4.81E+00	(1)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(a)pyrene	4.81E-01	(1)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	0.48	<0.20	<0.20	<0.20	0.22	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(b)fluoranthene	4.81E+00	(1)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(g,h,i)perylene	--		mg/Kg	<0.50	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Benzo(k)fluoranthene	4.81E+01	(1)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzoic acid	2.40E+05	(2)	mg/Kg	<0.50	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Benzyl alcohol	3.10E+04	(2)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	0.5	<0.20	0.86	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bis(2-chloroethoxy)methane	1.80E+02	(2)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bis(2-chloroethyl)ether	2.56E+00	(1)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bis(2-chloroisopropyl)ether	9.15E+01	(1)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bis(2-ethylhexyl)phthalate	2.80E+02	(1)	mg/Kg	<0.50	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Butyl benzyl phthalate	2.60E+03	(3)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Carbazole	--		mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chrysene	4.81E+02	(1)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dibenz(a,h)anthracene	4.81E-01	(1)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dibenzofuran	--		mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

Table 9
Group 3 Soil Analytical Results Summary - AOC 23 and AOC 25
Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Residential Soil Screening Level	Source	Units	SWMU 4-1 (0-0.5')	SWMU 4-1 (1.5-2.0')	SWMU 4-1 (6-8')	SWMU 4-1 (36-38')	SWMU 5-1 (0-0.5')	SWMU 5-1 (1.5-2.0')	SWMU 5-2 (0-0.5')	SWMU 5-2 (1.5-2.0')	SWMU 5-3 (0-0.5')	SWMU 5-3 (1.5-2.0')	SWMU 5-4 (0-0.5')	SWMU 5-4 (1.5-2.0')	SWMU 5-5 (0-0.5')	SWMU 5-5 (1.5-2.0')	SWMU 5-5 (1.5-2.0') DUP	SWMU 5-6 (0-0.5')	SWMU 5-6 (1.5-2.0')	AOC 23-1 (0-0.5')
Diethyl phthalate	4.89E+04	(1)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dimethyl phthalate	6.11E+05	(1)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Di-n-butyl phthalate	6.11E+03	(1)	mg/Kg	<0.50	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Di-n-octyl phthalate	--		mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Fluoranthene	2.29E+03	(1)	mg/Kg	<0.25	<0.25	<1.3	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Fluorene	2.29E+03	(1)	mg/Kg	<0.50	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Hexachlorobenzene	2.45E+00	(1)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Hexachlorobutadiene	6.20E+01	(3)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Hexachlorocyclopentadiene	3.67E+02	(1)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Hexachloroethane	6.11E+01	(1)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Indeno(1,2,3-cd)pyrene	4.81E+00	(1)	mg/Kg	<0.25	<0.25	<1.3	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Isophorone	4.13E+03	(1)	mg/Kg	<0.50	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Naphthalene	4.50E+01	(1)	mg/Kg	<0.20	<0.20	8.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Nitrobenzene	4.94E+01	(1)	mg/Kg	<0.50	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
N-Nitrosodi-n-propylamine	6.90E-01	(3)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
N-Nitrosodiphenylamine	8.00E+02	(1)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Pentachlorophenol	2.07E+01	(1)	mg/Kg	<0.40	<0.40	<2.0	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Phenanthrene	1.83E+03	(1)	mg/Kg	<0.20	<0.20	2.8	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Phenol	1.83E+04	(1)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Pyrene	1.72E+03	(1)	mg/Kg	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.24	<0.20	<0.20	<0.20	<0.20	<0.20
Pyridine	7.80E+01	(2)	mg/Kg	<0.50	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Total Petroleum Hydrocarbons - (EPA Method 8015B) mg/kg																					
Diesel Range Organics (DRO)	8.00E+02	(4)	mg/Kg	<10	<10	**7800**	<10	280	20	130	<10	370	<10	520	42	210	<10	<10	66	44	<10
Gasoline Range Organics (GRO)	8.00E+02	(4)	mg/Kg	<5.0	<5.0	110	<5.0	<5.0	<5.0	<5.0	6.2	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Motor Oil Range Organics (MRO)	2.50E+03	(5)	mg/Kg	<50	<50	**4000**	<50	640	<50	600	<50	1200	<50	530	130	610	<50	<50	200	88	<50

-- No screening level or analytical result available

(1) NMED - Technical Background Document for Development of Soil Screening Levels - Revision 5.0 (August 2009)

(2) EPA - Regional Screening Levels (April 2009)

(3) EPA - Regional Screening Levels (April 2009) multiplied by 10 pursuant to Provision VII.B. of the July 7, 2007 NMED Order because the constituent is listed as carcinogenic

(4) NMED Oct. 2006 TPH Screening Guidelines - Unknown oil for residential exposure via vapor migration and inhalation of ground water

(5) NMED Oct. 2006 TPH Screening Guidelines - Waste oil for vapor migration and inhalation of ground water

Table 9
Group 3 Soil Analytical Results Summary - AOC 23 and AOC 25
Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Residential Soil Screening Level	Source	Units	AOC 23-1 (0-0.5') DUP	AOC 23-1 (1.5-2.0')	AOC 23-1 (52-53')	AOC 25-1 (0-0.5')	AOC 25-1 (1.5-2.0')	AOC 25-2 (0-0.5')	AOC 25-2 (0-0.5')-DUP	AOC 25-2 (1.5-2.0')	AOC 25-2 (36-38')
Sample Date				4/21/2009	4/21/2009	4/22/2009	4/23/2009	4/23/2009	4/5/2009	4/5/2009	4/5/2009	4/5/2009
Metals (mg/kg)												
Antimony	3.13E+01	(1)	mg/Kg	<2.5	<2.5	<2.5	<2.5	<13	<12	<2.5	<2.5	<2.5
Arsenic	3.59E+00	(1)	mg/Kg	<2.5	<2.5	<2.5	<2.5	<13	<12	<2.5	<2.5	<2.5
Barium	1.56E+04	(1)	mg/Kg	140	130	6.9	120	160	130	150	120	88
Beryllium	1.56E+02	(1)	mg/Kg	0.28	0.3	0.27	0.2	<0.75	<0.75	0.26	0.23	<0.15
Cadmium	7.79E+01	(1)	mg/Kg	<0.10	<0.10	<0.10	0.41	<0.50	<0.50	<0.10	<0.10	<0.10
Chromium	1.13E+05	(1)	mg/Kg	3.4	3.7	2.2	4.4	5.1	4.9	3.1	2.9	1.0
Cobalt	2.30E+01	(2)	mg/Kg	3	2.6	2.4	2.4	4.5	4.0	2.6	2.2	4.6
Cyanide	1.56E+03	(1)	mg/Kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Lead	4.00E+02	(1)	mg/Kg	4.9	3.2	2.3	10	5.1	5.7	4.1	2.8	2.9
Mercury	7.71E+00	(1)	mg/Kg	<0.033	<0.033	<0.032	0.1	<0.033	<0.033	<0.033	<0.033	<0.033
Nickel	1.56E+03	(1)	mg/Kg	4.7	4.2	2.3	4.1	6.0	6.0	4.2	3.2	2.7
Selenium	3.91E+02	(1)	mg/Kg	<13	<13	<13	<13	<13	<12	<13	<13	<2.5
Silver	3.91E+02	(1)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<1.3	<1.2	<0.25	<0.25	<0.25
Vanadium	3.91E+02	(1)	mg/Kg	11	11	4.4	9.6	15	15	9.3	9.5	5.5
Zinc	2.35E+04	(1)	mg/Kg	17	17	12	61	25	28	20	14	9.5
Volatile Organic Compounds - (EPA Method 8260B) mg/kg												
1,1,1,2-Tetrachloroethane	2.92E+01	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
1,1,1-Trichloroethane	2.18E+04	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	7.97E+00	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
1,1,2-Trichloroethane	1.72E+01	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
1,1-Dichloroethane	6.29E+01	(1)	mg/Kg	<0.10	<0.10	--	--	--	--	--	--	--
1,1-Dichloroethene	6.18E+02	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
1,1-Dichloropropene	--		mg/Kg	<0.10	<0.10	--	--	--	--	--	--	--
1,2,3-Trichlorobenzene	--		mg/Kg	<0.10	<0.10	--	--	--	--	--	--	--
1,2,3-Trichloropropane	9.15E-01	(1)	mg/Kg	<0.10	<0.10	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	1.43E+02	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene	6.70E+01	(2)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane	1.94E-01	(1)	mg/Kg	<0.10	<0.10	--	--	--	--	--	--	--
1,2-Dibromoethane (EDB)	5.74E-01	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
1,2-Dichlorobenzene	3.01E+03	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
1,2-Dichloroethane (EDC)	7.74E+00	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
1,2-Dichloropropane	1.47E+01	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene	4.70E+01	(2)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
1,3-Dichlorobenzene	--		mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
1,3-Dichloropropane	1.60E+03	(2)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
1,4-Dichlorobenzene	3.21E+01	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
1-Methylnaphthalene	2.20E+02	(3)	mg/Kg	<0.20	<0.20	--	--	--	--	--	--	--
2,2-Dichloropropane	--		mg/Kg	<0.10	<0.10	--	--	--	--	--	--	--
2-Butanone (MEK)	3.96E+04	(1)	mg/Kg	<0.50	<0.50	--	--	--	--	--	--	--
2-Chlorotoluene	1.56E+03	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
2-Hexanone	--		mg/Kg	<0.50	<0.50	--	--	--	--	--	--	--
2-Methylnaphthalene	3.10E+02	(2)	mg/Kg	<0.20	<0.20	--	--	--	--	--	--	--
4-Chlorotoluene	5.50E+03	(2)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
4-Isopropyltoluene	--		mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
4-Methyl-2-pentanone	--		mg/Kg	<0.50	<0.50	--	--	--	--	--	--	--
Acetone	6.75E+04	(1)	mg/Kg	<0.75	<0.75	--	--	--	--	--	--	--
Benzene	1.55E+01	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--

Table 9
Group 3 Soil Analytical Results Summary - AOC 23 and AOC 25
Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Residential Soil Screening Level	Source	Units	AOC 23-1 (0-0.5') DUP	AOC 23-1 (1.5-2.0')	AOC 23-1 (52-53')	AOC 25-1 (0-0.5')	AOC 25-1 (1.5-2.0')	AOC 25-2 (0-0.5')	AOC 25-2 (0-0.5')-DUP	AOC 25-2 (1.5-2.0')	AOC 25-2 (36-38')
Bromobenzene	9.40E+01	(2)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
Bromodichloromethane	5.25E+00	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
Bromoform	6.10E+02	(3)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
Bromomethane	2.23E+01	(1)	mg/Kg	<0.10	<0.10	--	--	--	--	--	--	--
Carbon disulfide	1.94E+03	(1)	mg/Kg	<0.50	<0.50	--	--	--	--	--	--	--
Carbon tetrachloride	4.38E+00	(1)	mg/Kg	<0.10	<0.10	--	--	--	--	--	--	--
Chlorobenzene	5.08E+02	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
Chloroethane	--		mg/Kg	<0.10	<0.10	--	--	--	--	--	--	--
Chloroform	5.72E+00	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
Chloromethane	3.56E+01	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
cis-1,2-DCE	7.82E+02	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	2.35E+01	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
Dibromochloromethane	1.13E+01	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
Dibromomethane	7.80E+02	(2)	mg/Kg	<0.10	<0.10	--	--	--	--	--	--	--
Dichlorodifluoromethane	4.81E+02	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
Ethylbenzene	6.96E+01	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
Hexachlorobutadiene	6.20E+01	(3)	mg/Kg	<0.10	<0.10	--	--	--	--	--	--	--
Isopropylbenzene	3.21E+03	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
Methyl tert-butyl ether (MTBE)	8.62E+02	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
Methylene chloride	1.99E+02	(1)	mg/Kg	<0.15	<0.15	--	--	--	--	--	--	--
Naphthalene	4.50E+01	(1)	mg/Kg	<0.10	<0.10	--	--	--	--	--	--	--
n-Butylbenzene	--		mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
n-Propylbenzene	--		mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
sec-Butylbenzene	--		mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
Styrene	8.97E+03	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
tert-Butylbenzene	--		mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
Tetrachloroethene (PCE)	6.99E+00	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
Toluene	5.57E+03	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
trans-1,2-DCE	2.73E+02	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	2.35E+01	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
Trichloroethene (TCE)	4.57E+01	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
Trichlorofluoromethane	2.01E+03	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
Vinyl chloride	8.65E-01	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	--
Xylenes, Total	1.09E+03	(1)	mg/Kg	<0.10	<0.10	--	--	--	--	--	--	--
Volatile Organic Compounds - (EPA Method 8260B) µg/Kg-dry												
1,1,1,2-Tetrachloroethane	2.92E+04	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
1,1,1-Trichloroethane	2.18E+07	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
1,1,2,2-Tetrachloroethane	7.97E+03	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
1,1,2-Trichloroethane	1.72E+04	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
1,1-Dichloroethane	6.29E+04	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
1,1-Dichloroethene	6.18E+05	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
1,1-Dichloropropene	--		µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
1,2,3-Trichlorobenzene	--		µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
1,2,3-Trichloropropane	9.15E+02	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
1,2,4-Trichlorobenzene	1.43E+05	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
1,2,4-Trimethylbenzene	6.70E+04	(2)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
1,2-Dibromo-3-chloropropane	1.94E+02	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
1,2-Dibromoethane (EDB)	5.74E+02	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
1,2-Dichlorobenzene	3.01E+06	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02

Table 9
Group 3 Soil Analytical Results Summary - AOC 23 and AOC 25
Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Residential Soil Screening Level	Source	Units	AOC 23-1 (0-0.5') DUP	AOC 23-1 (1.5-2.0')	AOC 23-1 (52-53')	AOC 25-1 (0-0.5')	AOC 25-1 (1.5-2.0')	AOC 25-2 (0-0.5')	AOC 25-2 (0-0.5')-DUP	AOC 25-2 (1.5-2.0')	AOC 25-2 (36-38')
1,2-Dichloroethane (EDC)	7.74E+03	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
1,2-Dichloropropane	1.47E+04	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
1,3,5-Trimethylbenzene	4.70E+04	(2)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
1,3-Dichlorobenzene	--		µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
1,3-Dichloropropane	1.60E+06	(2)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
1,4-Dichlorobenzene	3.21E+04	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
2,2-Dichloropropane	--		µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
2-Butanone	3.96E+07	(1)	µg/Kg-dry	<3.96	<4.50	<4.38	<3.44	<3.61	<3.59	<3.61	<3.71	<4.08
2-Chlorotoluene	1.56E+06	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
2-Hexanone	--		µg/Kg-dry	<3.96	<4.50	<4.38	<3.44	<3.61	<3.59	<3.61	<3.71	<4.08
4-Chlorotoluene	5.50E+06	(2)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
4-Isopropyltoluene	--		µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
4-Methyl-2-pentanone	-	(1)	µg/Kg-dry	<3.96	<4.50	<4.38	<3.44	<3.61	<3.59	<3.61	<3.71	<4.08
Acetone	6.75E+07	(1)	µg/Kg-dry	25.4	26.2	16.2	176	33.9	<3.59	<3.61	<3.71	4.21
Benzene	1.55E+04	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
Bromobenzene	9.40E+04	(2)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
Bromodichloromethane	5.25E+03	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
Bromoform	6.10E+05	(3)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
Bromomethane	2.23E+04	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
Carbon disulfide	1.94E+06	(1)	µg/Kg-dry	<3.96	<4.50	<4.38	<3.44	<3.61	<3.59	<3.61	<3.71	<4.08
Carbon tetrachloride	4.38E+03	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
Chlorobenzene	5.08E+05	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
Chloroethane	--		µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
Chloroform	5.72E+03	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
Chloromethane	3.56E+04	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
cis-1,2-DCE	7.82E+05	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
cis-1,3-Dichloropropene	2.35E+04	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
Dibromochloromethane	1.13E+04	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
Dibromomethane	7.80E+05	(2)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
Dichlorodifluoromethane	4.81E+05	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
Ethylbenzene	6.96E+04	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
Hexachlorobutadiene	6.20E+04	(3)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
Isopropylbenzene	3.21E+06	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
Methyl tert-butyl ether (MTBE)	8.62E+05	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
Methylene chloride	1.99E+05	(1)	µg/Kg-dry	8.12	8.91	113	8.39	25.8	<1.80	<1.80	<1.85	<2.04
Naphthalene	4.50E+04	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
n-Butylbenzene	--		µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
n-Propylbenzene	--		µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
sec-Butylbenzene	--		µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
Styrene	8.97E+06	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
tert-Butylbenzene	--		µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
Tetrachloroethene (PCE)	6.99E+03	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
Toluene	5.57E+06	(1)	µg/Kg-dry	<0.991	1.41	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
trans-1,2-DCE	2.73E+05	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
trans-1,3-Dichloropropene	2.35E+04	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
Trichloroethene (TCE)	4.57E+04	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
Trichlorofluoromethane	2.01E+06	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
Vinyl chloride	8.65E+02	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	<0.861	<0.903	<0.898	<0.902	<0.926	<1.02
Xylenes, Total	1.09E+06	(1)	µg/Kg-dry	<0.991	<1.12	<1.10	1.2	<0.903	<0.898	<0.902	<0.926	<1.02

Table 9
Group 3 Soil Analytical Results Summary - AOC 23 and AOC 25
Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Residential Soil Screening Level	Source	Units	AOC 23-1 (0-0.5') DUP	AOC 23-1 (1.5-2.0')	AOC 23-1 (52-53')	AOC 25-1 (0-0.5')	AOC 25-1 (1.5-2.0')	AOC 25-2 (0-0.5')	AOC 25-2 (0-0.5')-DUP	AOC 25-2 (1.5-2.0')	AOC 25-2 (36-38')
Semi Volatile Organics - (EPA Method 8270) mg/kg												
1,2,4-Trichlorobenzene	1.43E+02	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichlorobenzene	3.01E+03	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,3-Dichlorobenzene	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,4-Dichlorobenzene	3.21E+01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2,4,5-Trichlorophenol	6.11E+03	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2,4,6-Trichlorophenol	6.11E+01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2,4-Dichlorophenol	1.83E+02	(1)	mg/Kg	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2,4-Dimethylphenol	1.22E+03	(1)	mg/Kg	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
2,4-Dinitrophenol	1.22E+02	(1)	mg/Kg	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2,4-Dinitrotoluene	1.26E+01	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2,6-Dinitrotoluene	6.12E+01	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2-Chloronaphthalene	6.26E+03	(1)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
2-Chlorophenol	3.91E+02	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2-Methylnaphthalene	3.10E+02	(2)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
2-Methylphenol	3.10E+03	(2)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2-Nitroaniline	1.80E+02	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2-Nitrophenol	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
3,3´-Dichlorobenzidine	8.71E+00	(1)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
3+4-Methylphenol	3.10E+02	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
3-Nitroaniline	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
4,6-Dinitro-2-methylphenol	--		mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
4-Bromophenyl phenyl ether	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
4-Chloro-3-methylphenol	--		mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
4-Chloroaniline	2.40E+01	(3)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
4-Chlorophenyl phenyl ether	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
4-Nitroaniline	2.40E+02	(3)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
4-Nitrophenol	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Acenaphthene	3.44E+03	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Acenaphthylene	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Aniline	8.50E+02	(3)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Anthracene	1.72E+04	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Azobenzene	4.90E+01	(3)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benz(a)anthracene	4.81E+00	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(a)pyrene	4.81E-01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(b)fluoranthene	4.81E+00	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(g,h,i)perylene	--		mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Benzo(k)fluoranthene	4.81E+01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzoic acid	2.40E+05	(2)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Benzyl alcohol	3.10E+04	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bis(2-chloroethoxy)methane	1.80E+02	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bis(2-chloroethyl)ether	2.56E+00	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bis(2-chloroisopropyl)ether	9.15E+01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bis(2-ethylhexyl)phthalate	2.80E+02	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Butyl benzyl phthalate	2.60E+03	(3)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Carbazole	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chrysene	4.81E+02	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dibenz(a,h)anthracene	4.81E-01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dibenzofuran	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

Table 9
Group 3 Soil Analytical Results Summary - AOC 23 and AOC 25
Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Residential Soil Screening Level	Source	Units	AOC 23-1 (0-0.5') DUP	AOC 23-1 (1.5-2.0')	AOC 23-1 (52-53')	AOC 25-1 (0-0.5')	AOC 25-1 (1.5-2.0')	AOC 25-2 (0-0.5')	AOC 25-2 (0-0.5')-DUP	AOC 25-2 (1.5-2.0')	AOC 25-2 (36-38')
Diethyl phthalate	4.89E+04	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dimethyl phthalate	6.11E+05	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Di-n-butyl phthalate	6.11E+03	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Di-n-octyl phthalate	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Fluoranthene	2.29E+03	(1)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Fluorene	2.29E+03	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Hexachlorobenzene	2.45E+00	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Hexachlorobutadiene	6.20E+01	(3)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Hexachlorocyclopentadiene	3.67E+02	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Hexachloroethane	6.11E+01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Indeno(1,2,3-cd)pyrene	4.81E+00	(1)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Isophorone	4.13E+03	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Naphthalene	4.50E+01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Nitrobenzene	4.94E+01	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
N-Nitrosodi-n-propylamine	6.90E-01	(3)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
N-Nitrosodiphenylamine	8.00E+02	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Pentachlorophenol	2.07E+01	(1)	mg/Kg	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Phenanthrene	1.83E+03	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Phenol	1.83E+04	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Pyrene	1.72E+03	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Pyridine	7.80E+01	(2)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Total Petroleum Hydrocarbons - (EPA Method 8015B) mg/kg												
Diesel Range Organics (DRO)	8.00E+02	(4)	mg/Kg	<10	<10	<10	50	<10	<10	<10	<10	<10
Gasoline Range Organics (GRO)	8.00E+02	(4)	mg/Kg	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Motor Oil Range Organics (MRO)	2.50E+03	(5)	mg/Kg	<50	<50	<50	140	<50	<50	<50	<50	<50

-- No screening level or analytical result available

(1) NMED - Technical Background Document for Development of Soil Screening Levels - Revision 5.0 (August 2009)

(2) EPA - Regional Screening Levels (April 2009)

(3) EPA - Regional Screening Levels (April 2009) multiplied by 10 pursuant to Provision VII.B. of the July 7, 2007 NMED Order because the constituent is listed as carcinogenic

(4) NMED Oct. 2006 TPH Screening Guidelines - Unknown oil for residential exposure via vapor migration and inhalation of ground water

(5) NMED Oct. 2006 TPH Screening Guidelines - Waste oil for vapor migration and inhalation of ground water

Table 10
Group 3 Soil Analytical Results Summary - AOC 22 (Product Loading Rack) and AOC 26
Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels (0-2' bgs)	Non-Residential Screening Levels (2-10' bgs)	Non-Residential Screening Levels (>10' bgs)	Source	Units	AOC 22-1 (0-0.5')	AOC 22-1 (1.5-2.0')	AOC 22-2 (0-0.5')	AOC 22-2 (1.5-2.0')	AOC 22-3 (0-0.5')	AOC 22-3 (1.5'-2.0')	AOC 22-4 (0-0.5')	AOC 22-4 (1.5-2.0)	AOC 22-5 (0-0.5')	AOC 22-5 1.5-2.0')	AOC 22-6 (0-0.5')	AOC 22-6 (1.5-2.0')	AOC 22-12 (0-0.5')	AOC 22-12 (0-0.5') DUP	AOC 22-12 (1.5-2.0')	AOC 22-12 (32-35')	AOC 22-12 (36-37.75')	AOC 22-13 (0-0.5')	AOC 22-13 (1.5-2.0')	AOC 22-13 (18-20')
Sample Date						4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/8/2009	4/8/2009	4/8/2009
Metals (mg/kg)																									
Antimony	6.61E-01	6.61E-01	6.61E-01	(1)	mg/Kg	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<13	<2.5	<13	<13	<2.5	<12	<2.5	<2.5	<2.5	<13	<2.5
Arsenic	1.31E-02	1.31E-02	1.31E-02	(1)	mg/Kg	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<13	<2.5	<13	<13	<13	<12	<2.5	<2.5	<2.5	<13	<2.5
Barium	3.01E+02	3.01E+02	3.01E+02	(1)	mg/Kg	170	210	190	160	210	230	190	180	210	180	230	220	230	220	180	130	110	180	180	37
Beryllium	5.77E+01	5.77E+01	5.77E+01	(1)	mg/Kg	0.3	0.37	0.34	0.36	0.36	0.34	0.33	0.34	0.16	<0.75	0.17	<0.75	<0.75	0.38	<0.75	<0.15	<0.15	0.33	<0.75	<0.15
Cadmium	1.37E+00	1.37E+00	1.37E+00	(1)	mg/Kg	0.11	0.19	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.50	<0.10	<0.50	<0.50	<0.10	<0.50	<0.10	<0.10	0.17	<0.50	<0.10
Chromium	4.47E+05	4.47E+05	9.86E+07	(2)	mg/Kg	5.4	5.7	6.7	18	5.1	4.7	4.7	4.6	5.3	5.3	8.8	7.7	6.7	6	10	4	20	5.8	6.4	1.7
Cobalt	4.90E-01	4.90E-01	4.90E-01	(3)	mg/Kg	**3.5**	**3.9**	**3.7**	**3.8**	**3.8**	**3.6**	**3.6**	**3.7**	**2.1**	**2.6**	**2.6**	**5.5**	**5**	**3.5**	**4.9**	**2.8**	**1.8**	**3.3**	**4.6**	**1.3**
Cyanide	7.44E+00	7.44E+00	7.44E+00	(1)	mg/Kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--*	<0.5	<0.5	<0.5
Lead	8.00E+02	8.00E+02	--	(5)	mg/Kg	7	6.8	4.7	4.9	4.5	3.8	4.2	4.1	4.2	3.8	2.9	5.4	6.5	5.5	7.8	2.7	1.7	6.7	7.2	5.8
Mercury	2.93E-02	2.93E-02	2.93E-02	(1)	mg/Kg	<0.032	<0.033	<0.033	<0.032	<0.032	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Nickel	4.77E+01	4.77E+01	4.77E+01	(1)	mg/Kg	5.7	5.6	5.3	5.5	5.6	5.4	5.3	5.5	2.5	3.4	3.3	9.1	6.9	5.5	7.7	2.5	2	4.9	7.2	2
Selenium	9.65E-01	9.65E-01	9.65E-01	(1)	mg/Kg	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<13	<13	<13	<13	<13	<13	<12	<12	<2.5	<13	<13	<2.5
Silver	1.57E+00	1.57E+00	1.57E+00	(1)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1.3	<0.25	<1.3	<1.3	<0.25	<1.2	<0.25	<0.25	<0.25	<1.3	<0.25
Vanadium	1.83E+02	1.83E+02	1.83E+02	(1)	mg/Kg	13	15	14	14	14	14	14	13	13	14	14	23	16	14	19	14	10	14	18	5.5
Zinc	6.82E+02	6.82E+02	6.82E+02	(1)	mg/Kg	27	27	30	30	26	25	25	24	14	16	20	34	32	26	36	13	10	28	32	9.1
Volatile Organic Compounds - (EPA Method 8260B) mg/kg																									
1,1,1,2-Tetrachloroethane	1.73E-03	1.73E-03	1.73E-03	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
1,1,1-Trichloroethane	2.98E+00	2.98E+00	2.98E+00	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
1,1,2,2-Tetrachloroethane	2.25E-04	2.25E-04	2.25E-04	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
1,1,2-Trichloroethane	6.74E-04	6.74E-04	6.74E-04	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
1,1-Dichloroethane	6.09E-03	6.09E-03	6.09E-03	(1)	mg/Kg	--	--	--	--	--	--	--	<1.0	--	--	--	--	--	--	--	--	--	--	<2.0	<1.0
1,1-Dichloroethene	1.19E-01	1.19E-01	1.19E-01	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
1,1-Dichloropropene	--	--	--		mg/Kg	--	--	--	--	--	--	--	<1.0	--	--	--	--	--	--	--	--	--	--	<2.0	<1.0
1,2,3-Trichlorobenzene	--	--	--		mg/Kg	--	--	--	--	--	--	--	<1.0	--	--	--	--	--	--	--	--	--	--	<2.0	<1.0
1,2,3-Trichloropropane	3.56E-05	3.56E-05	3.56E-05	(1)	mg/Kg	--	--	--	--	--	--	--	<1.0	--	--	--	--	--	--	--	--	--	--	<2.0	<1.0
1,2,4-Trichlorobenzene	1.02E-02	1.02E-02	1.02E-02	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
1,2,4-Trimethylbenzene	2.40E-02	2.40E-02	2.40E-02	(3)	mg/Kg	--	--	--	--	--	--	--	**270**	--	--	--	--	--	--	--	--	--	**28**	**200**	**73**
1,2-Dibromo-3-chloropropane	2.97E-06	2.97E-06	2.97E-06	(1)	mg/Kg	--	--	--	--	--	--	--	<1.0	--	--	--	--	--	--	--	--	--	--	<2.0	<1.0
1,2-Dibromoethane (EDB)	1.58E-05	1.58E-05	1.58E-05	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
1,2-Dichlorobenzene	3.13E-01	3.13E-01	3.13E-01	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
1,2-Dichloroethane (EDC)	3.65E-04	3.65E-04	3.65E-04	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
1,2-Dichloropropane	1.11E-03	1.11E-03	1.11E-03	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
1,3,5-Trimethylbenzene	2.00E-02	2.00E-02	2.00E-02	(3)	mg/Kg	--	--	--	--	--	--	--	**98**	--	--	--	--	--	--	--	--	--	**11**	**77**	**21**
1,3-Dichlorobenzene	--	--	--		mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
1,3-Dichloropropane	2.70E-01	2.70E-01	2.70E-01	(3)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
1,4-Dichlorobenzene	3.57E-03	3.57E-03	3.57E-03	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
1-Methylnaphthalene	1.50E-01	1.50E-01	1.50E-01	(4)	mg/Kg	--	--	--	--	--	--	--	**30**	--	--	--	--	--	--	--	--	--	**1.7**	**31**	**9.1**
2,2-Dichloropropane	--	--	--		mg/Kg	--	--	--	--	--	--	--	<1.0	--	--	--	--	--	--	--	--	--	--	<2.0	<1.0
2-Butanone (MEK)	1.27E+00	1.27E+00	1.27E+00	(1)	mg/Kg	--	--	--	--	--	--	--	<5.0	--	--	--	--	--	--	--	--	--	--	<10	<5.0
2-Chlorotoluene	6.24E-01	6.24E-01	6.24E-01	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
2-Hexanone	--	--	--		mg/Kg	--	--	--	--	--	--	--	<5.0	--	--	--	--	--	--	--	--	--	--	<10	<5.0
2-Methylnaphthalene	9.00E-01	9.00E-01	9.00E-01	(3)	mg/Kg	--	--	--	--	--	--	--	**60**	--	--	--	--	--	--	--	--	--	**3**	**47**	**17**
4-Chlorotoluene	2.80E+00	2.80E+00	2.80E+00	(3)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
4-Isopropyltoluene	--	--	--		mg/Kg	--	--	--	--	--	--	--	5.5	--	--	--	--	--	--	--	--	--	0.83	4.9	1.7
4-Methyl-2-pentanone	--	--	--		mg/Kg	--	--	--	--	--	--	--	<5.0	--	--	--	--	--	--	--	--	--	--	<10	<5.0
Acetone	3.84E+00	3.84E+00	3.84E+00	(1)	mg/Kg	--	--	--	--	--	--	--	<7.5	--	--	--	--	--	--	--	--	--	--	<15	<7.5
Benzene	1.85E-03	1.85E-03	1.85E-03	(1)	mg/Kg	--	--	--	--	--	--	--	**0.78**	--	--	--	--	--	--	--	--	--	--	**3.1**	**0.81**
Bromobenzene	1.50E-02	1.50E-02	1.50E-02	(3)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
Bromodichloromethane	2.76E-04	2.76E-04	2.76E-04	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
Bromoform	2.30E-02	2.30E-02	2.30E-02	(4)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
Bromomethane	1.94E-03	1.94E-03	1.94E-03	(1)	mg/Kg	--	--	--	--	--	--	--	<1.0	--	--	--	--	--	--	--	--	--	--	<2.0	<1.0
Carbon disulfide	2.52E-01	2.52E-01	2.52E-01	(1)	mg/Kg	--	--	--	--	--	--	--	<5.0	--	--	--	--	--	--	--	--	--	--	<10	<5.0
Carbon tetrachloride	7.39E-04	7.39E-04	7.39E-04	(1)	mg/Kg	--	--	--	--	--	--	--	<1.0	--	--	--	--	--	--	--	--	--	--	<2.0	<1.0
Chlorobenzene	5.38E-02	5.38E-02	5.38E-02	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50

Table 10
Group 3 Soil Analytical Results Summary - AOC 22 (Product Loading Rack) and AOC 26
Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels (0-2' bgs)	Non-Residential Screening Levels (2-10' bgs)	Non-Residential Screening Levels (>10' bgs)	Source	Units	AOC 22-1 (0-0.5')	AOC 22-1 (1.5-2.0')	AOC 22-2 (0-0.5')	AOC 22-2 (1.5-2.0')	AOC 22-3 (0-0.5')	AOC 22-3 (1.5'-2.0')	AOC 22-4 (0-0.5')	AOC 22-4 (1.5-2.0')	AOC 22-5 (0-0.5')	AOC 22-5 1.5-2.0')	AOC 22-6 (0-0.5')	AOC 22-6 (1.5-2.0')	AOC 22-12 (0-0.5')	AOC 22-12 (0-0.5') DUP	AOC 22-12 (1.5-2.0')	AOC 22-12 (32-35')	AOC 22-12 (36-37.75')	AOC 22-13 (0-0.5')	AOC 22-13 (1.5-2.0')	AOC 22-13 (18-20')
Sample Date						4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/8/2009	4/8/2009	4/8/2009
Chloroethane	--	--	--		mg/Kg	--	--	--	--	--	--	--	<1.0	--	--	--	--	--	--	--	--	--	--	<2.0	<1.0
Chloroform	4.68E-04	4.68E-04	4.68E-04	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
Chloromethane	4.18E-03	4.18E-03	4.18E-03	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
cis-1,2-DCE	9.43E-02	9.43E-02	9.43E-02	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
cis-1,3-Dichloropropene	1.35E-03	1.35E-03	1.35E-03	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
Dibromochloromethane	3.38E-04	3.38E-04	3.38E-04	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
Dibromomethane	9.10E-02	9.10E-02	9.10E-02	(3)	mg/Kg	--	--	--	--	--	--	--	<1.0	--	--	--	--	--	--	--	--	--	--	<2.0	<1.0
Dichlorodifluoromethane	7.23E-01	7.23E-01	7.23E-01	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
Ethylbenzene	1.46E-02	1.46E-02	1.46E-02	(1)	mg/Kg	--	--	--	--	--	--	--	**11**	--	--	--	--	--	--	--	--	--	**0.28**	**16**	**22**
Hexachlorobutadiene	2.20E+02	2.20E+02	1.90E-02	(4)	mg/Kg	--	--	--	--	--	--	--	<1.0	--	--	--	--	--	--	--	--	--	--	<2.0	<1.0
Isopropylbenzene	9.86E-01	9.86E-01	9.86E-01	(1)	mg/Kg	--	--	--	--	--	--	--	**3.6**	--	--	--	--	--	--	--	--	--	--	**2.5**	**3.7**
Methyl tert-butyl ether (MTBE)	2.29E-02	2.29E-02	2.29E-02	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
Methylene chloride	1.07E-02	1.07E-02	1.07E-02	(1)	mg/Kg	--	--	--	--	--	--	--	<1.5	--	--	--	--	--	--	--	--	--	--	<3.0	<1.5
Naphthalene	4.19E-03	4.19E-03	4.19E-03	(1)	mg/Kg	--	--	--	--	--	--	--	**45**	--	--	--	--	--	--	--	--	--	**2.6**	**32**	**12**
n-Butylbenzene	--	--	--		mg/Kg	--	--	--	--	--	--	--	14	--	--	--	--	--	--	--	--	--	2.8	4.4	7.9
n-Propylbenzene	--	--	--		mg/Kg	--	--	--	--	--	--	--	15	--	--	--	--	--	--	--	--	--	--	8.5	9.9
sec-Butylbenzene	--	--	--		mg/Kg	--	--	--	--	--	--	--	5.5	--	--	--	--	--	--	--	--	--	0.094	3	2.7
Styrene	1.56E+00	1.56E+00	1.56E+00	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
tert-Butylbenzene	--	--	--		mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
Tetrachloroethene (PCE)	4.49E-04	4.49E-04	4.49E-04	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
Toluene	1.38E+00	1.38E+00	1.38E+00	(1)	mg/Kg	--	--	--	--	--	--	--	**14**	--	--	--	--	--	--	--	--	--	0.78	**47**	**28**
trans-1,2-DCE	3.01E-02	3.01E-02	3.01E-02	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
trans-1,3-Dichloropropene	1.35E-03	1.35E-03	1.35E-03	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
Trichloroethene (TCE)	5.30E-03	5.30E-03	5.30E-03	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
Trichlorofluoromethane	9.01E-01	9.01E-01	9.01E-01	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
Vinyl chloride	2.88E-04	2.88E-04	2.88E-04	(1)	mg/Kg	--	--	--	--	--	--	--	<0.50	--	--	--	--	--	--	--	--	--	--	<1.0	<0.50
Xylenes, Total	1.76E-01	1.76E-01	1.76E-01	(1)	mg/Kg	--	--	--	--	--	--	--	**350**	--	--	--	--	--	--	--	--	--	**25**	**250**	**130**
Volatile Organic Compounds - (EPA Method 8260B) µg/Kg-dry																									
1,1,1,2-Tetrachloroethane	1.73E+00	1.73E+00	1.73E+00	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
1,1,1-Trichloroethane	2.98E+03	2.98E+03	2.98E+03	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
1,1,2,2-Tetrachloroethane	2.25E-01	2.25E-01	2.25E-01	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
1,1,2-Trichloroethane	6.74E-01	6.74E-01	6.74E-01	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
1,1-Dichloroethane	6.09E+00	6.09E+00	6.09E+00	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
1,1-Dichloroethene	1.19E+02	1.19E+02	1.19E+02	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
1,1-Dichloropropene	--	--	--		µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
1,2,3-Trichlorobenzene	--	--	--		µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
1,2,3-Trichloropropane	3.56E-02	3.56E-02	3.56E-02	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
1,2,4-Trichlorobenzene	1.02E+01	1.02E+01	1.02E+01	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
1,2,4-Trimethylbenzene	2.40E+01	2.40E+01	2.40E+01	(3)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	16.1	--	--	--
1,2-Dibromo-3-chloropropane	2.97E-03	2.97E-03	2.97E-03	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
1,2-Dibromoethane (EDB)	1.58E-02	1.58E-02	1.58E-02	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
1,2-Dichlorobenzene	3.13E+02	3.13E+02	3.13E+02	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
1,2-Dichloroethane (EDC)	3.65E-01	3.65E-01	3.65E-01	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
1,2-Dichloropropane	1.11E+00	1.11E+00	1.11E+00	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
1,3,5-Trimethylbenzene	2.00E+01	2.00E+01	2.00E+01	(3)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	5.42	--	--	--
1,3-Dichlorobenzene	--	--	--		µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
1,3-Dichloropropane	2.70E+02	2.70E+02	2.70E+02	(3)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
1,4-Dichlorobenzene	3.57E+00	3.57E+00	3.57E+00	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
2,2-Dichloropropane	--	--	--		µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
2-Butanone	1.27E+03	1.27E+03	1.27E+03	(1)	µg/Kg-dry	<3.59	<3.78	<3.83	<3.81	<3.84	<3.80	<3.94	--	<3.87	<3.64	<3.82	<3.99	<4.45	<4.04	<4.10	4.66	4.96	<4.42	--	--
2-Chlorotoluene	6.24E+02	6.24E+02	6.24E+02	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
2-Hexanone	--	--	--		µg/Kg-dry	<3.59	<3.78	<3.83	<3.81	<3.84	<3.80	<3.94	--	<3.87	<3.64	<3.82	<3.99	<4.45	<4.04	<4.10	<3.88	<3.76	<4.42	--	--
4-Chlorotoluene	2.80E+03	2.80E+03	2.80E+03	(3)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
4-Isopropyltoluene	--	--	--		µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	--	--	--
4-Methyl-2-pentanone	--	--	--		µg/Kg-dry	<3.59	<3.78	<3.83	<3.81	<3.84	<3.80	<3.94	--	<3.87	<3.64	<3.82	<3.99	<4.45	<4.04	<4.10	<3.88	<3.76	<4.42	--	--

Table 10
Group 3 Soil Analytical Results Summary - AOC 22 (Product Loading Rack) and AOC 26
Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels (0-2' bgs)	Non-Residential Screening Levels (2-10' bgs)	Non-Residential Screening Levels (>10' bgs)	Source	Units	AOC 22-1 (0-0.5')	AOC 22-1 (1.5-2.0')	AOC 22-2 (0-0.5')	AOC 22-2 (1.5-2.0')	AOC 22-3 (0-0.5')	AOC 22-3 (1.5'-2.0')	AOC 22-4 (0-0.5')	AOC 22-4 (1.5-2.0')	AOC 22-5 (0-0.5')	AOC 22-5 1.5-2.0')	AOC 22-6 (0-0.5')	AOC 22-6 (1.5-2.0')	AOC 22-12 (0-0.5')	AOC 22-12 (0-0.5') DUP	AOC 22-12 (1.5-2.0')	AOC 22-12 (32-35')	AOC 22-12 (36-37.75')	AOC 22-13 (0-0.5')	AOC 22-13 (1.5-2.0')	AOC 22-13 (18-20')
Sample Date						4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/8/2009	4/8/2009	4/8/2009
Acetone	3.84E+03	3.84E+03	3.84E+03	(1)	µg/Kg-dry	<3.59	<3.78	<3.83	<3.81	<3.84	<3.80	<3.94	--	10.5	<3.64	<3.82	9.25	<4.45	<4.04	<4.10	30.1	21	<4.42	--	--
Benzene	1.85E+00	1.85E+00	1.85E+00	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	**6.43**	--	--
Bromobenzene	1.50E+01	1.50E+01	1.50E+01	(3)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
Bromodichloromethane	2.76E-01	2.76E-01	2.76E-01	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
Bromoform	2.30E+01	2.30E+01	2.30E+01	(4)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
Bromomethane	1.94E+00	1.94E+00	1.94E+00	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
Carbon disulfide	2.52E+02	2.52E+02	2.52E+02	(1)	µg/Kg-dry	<3.59	<3.78	<3.83	<3.81	<3.84	<3.80	<3.94	--	<3.87	<3.64	<3.82	<3.99	<4.45	<4.04	<4.10	<3.88	<3.76	<4.42	--	--
Carbon tetrachloride	7.39E-01	7.39E-01	7.39E-01	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
Chlorobenzene	5.38E+01	5.38E+01	5.38E+01	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
Chloroethane	--	--	--		µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
Chloroform	4.68E-01	4.68E-01	4.68E-01	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
Chloromethane	4.18E+00	4.18E+00	4.18E+00	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
cis-1,2-DCE	9.43E+01	9.43E+01	9.43E+01	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
cis-1,3-Dichloropropene	1.35E+00	1.35E+00	1.35E+00	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
Dibromochloromethane	3.38E-01	3.38E-01	3.38E-01	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
Dibromomethane	9.10E+01	9.10E+01	9.10E+01	(3)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
Dichlorodifluoromethane	7.23E+02	7.23E+02	7.23E+02	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
Ethylbenzene	1.46E+01	1.46E+01	1.46E+01	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	1.28	--	--	--
Hexachlorobutadiene	2.20E+05	2.20E+05	1.90E+01	(4)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
Isopropylbenzene	9.86E+02	9.86E+02	9.86E+02	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	8.15	--	--
Methyl tert-butyl ether (MTBE)	2.29E+01	2.29E+01	2.29E+01	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	0.981	2.2	3.71	--	--
Methylene chloride	1.07E+01	1.07E+01	1.07E+01	(1)	µg/Kg-dry	8.24	10.3	7.26	9.35	8.3	**11**	8.26	--	2.02	2.22	<1.91	7.05	6.76	5.77	7.36	7.43	8.3	**14**	--	--
Naphthalene	4.19E+00	4.19E+00	4.19E+00	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	4.12	3.39	<0.954	<0.999	<1.11	<1.01	<1.03	1.4	**6.22**	--	--	--
n-Butylbenzene	--	--	--		µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	6.37	--	--	--
n-Propylbenzene	--	--	--		µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	1.88	11.9	--	--
sec-Butylbenzene	--	--	--		µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	1	--	--	--
Styrene	1560	1560	1.56E+03	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
tert-Butylbenzene	--	--	--		µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	8.23	--	--
Tetrachloroethene (PCE)	4.49E-01	4.49E-01	4.49E-01	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
Toluene	1.38E+03	1.38E+03	1.38E+03	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	--	--	--
trans-1,2-DCE	3.01E+01	3.01E+01	3.01E+01	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
trans-1,3-Dichloropropene	1.35E+00	1.35E+00	1.35E+00	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
Trichloroethene (TCE)	5.30E+00	5.30E+00	5.30E+00	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
Trichlorofluoromethane	9.01E+02	9.01E+02	9.01E+02	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
Vinyl chloride	2.88E-01	2.88E-01	2.88E-01	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	<0.939	<1.10	--	--
Xylenes, Total	1.76E+02	1.76E+02	1.76E+02	(1)	µg/Kg-dry	<0.898	<0.944	<0.957	<0.952	<0.960	<0.951	<0.984	--	<0.967	<0.911	<0.954	<0.999	<1.11	<1.01	<1.03	<0.971	7.62	--	--	--
Semi Volatile Organics - (EPA Method 8270) mg/kg																									
1,2,4-Trichlorobenzene	1.02E-02	1.02E-02	1.02E-02	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
1,2-Dichlorobenzene	3.13E-01	3.13E-01	3.13E-01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
1,3-Dichlorobenzene	--	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
1,4-Dichlorobenzene	3.57E-03	3.57E-03	3.57E-03	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
2,4,5-Trichlorophenol	7.13E+00	7.13E+00	7.13E+00	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
2,4,6-Trichlorophenol	7.13E-02	7.13E-02	7.13E-02	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
2,4-Dichlorophenol	1.37E-01	1.37E-01	1.37E-01	(1)	mg/Kg	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<4.0	<2.0	<0.40	<2.0	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<2.0	<4.0	<0.40
2,4-Dimethylphenol	9.12E-01	9.12E-01	9.12E-01	(1)	mg/Kg	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<3.0	<1.5	<0.30	<1.5	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<1.5	<3.0	<0.30
2,4-Dinitrophenol	5.25E-02	5.25E-02	5.25E-02	(1)	mg/Kg	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<4.0	<2.0	<0.40	<2.0	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<2.0	<4.0	<0.40
2,4-Dinitrotoluene	1.56E-03	1.56E-03	1.56E-03	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<2.5	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<5.0	<0.50
2,6-Dinitrotoluene	2.67E-02	2.67E-02	2.67E-02	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<2.5	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<5.0	<0.50
2-Chloronaphthalene	1.35E+01	1.35E+01	1.35E+01	(1)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<2.5	<1.3	<0.25	<1.3	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1.3	<2.5	<0.25
2-Chlorophenol	1.53E-01	1.53E-01	1.53E-01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
2-Methylnaphthalene	9.00E-01	9.00E-01	9.00E-01	(3)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	**53**	<1.3	<0.25	<1.3	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	**9.5**	**32**	**11**
2-Methylphenol	2.00E+00	2.00E+00	2.00E+00	(3)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<2.5	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<5.0	<0.50
2-Nitroaniline	3.30E-02	3.30E-02	3.30E-02	(3)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
2-Nitrophenol	--	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
3,3'-Dichlorobenzidine	1.70E-02	1.70E-02	1.70E-02	(1)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<2.5	<1.3	<0.25	<1.3	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1.3	<2.5	<0.25

Table 10
Group 3 Soil Analytical Results Summary - AOC 22 (Product Loading Rack) and AOC 26
Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Non-*Residential* Screening Levels (0-2' bgs)	Non-*Residential* Screening Levels (2-10' bgs)	Non-*Residential* Screening Levels (>10' bgs)	Source	Units	AOC 22-1 (0-0.5')	AOC 22-1 (1.5-2.0')	AOC 22-2 (0-0.5')	AOC 22-2 (1.5-2.0')	AOC 22-3 (0-0.5')	AOC 22-3 (1.5'-2.0')	AOC 22-4 (0-0.5')	AOC 22-4 (1.5-2.0)	AOC 22-5 (0-0.5')	AOC 22-5 1.5-2.0'	AOC 22-6 (0-0.5')	AOC 22-6 (1.5-2.0')	AOC 22-12 (0-0.5')	AOC 22-12 (0-0.5') DUP	AOC 22-12 (1.5-2.0')	AOC 22-12 (32-35')	AOC 22-12 (36-37.75')	AOC 22-13 (0-0.5')	AOC 22-13 (1.5-2.0')	AOC 22-13 (18-20')
Sample Date						4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/8/2009	4/8/2009	4/8/2009
3+4-Methylphenol	1.90E-01	1.90E-01	1.90E-01	(3)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
3-Nitroaniline	--	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
4,6-Dinitro-2-methylphenol	--	--	--		mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<2.5	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<5.0	<0.50
4-Bromophenyl phenyl ether	--	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
4-Chloro-3-methylphenol	--	--	--		mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<2.5	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<5.0	<0.50
4-Chloroaniline	1.20E-03	1.20E-03	1.20E-03	(4)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<2.5	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<5.0	<0.50
4-Chlorophenyl phenyl ether	--	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
4-Nitroaniline	1.00E-02	1.00E-02	1.00E-02	(4)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<2.5	<1.3	<0.25	<1.3	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1.3	<2.5	<0.25
4-Nitrophenol	--	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Acenaphthene	2.05E+01	2.05E+01	2.05E+01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Acenaphthylene	--	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Aniline	3.40E-02	3.40E-02	3.40E-02	(4)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Anthracene	3.37E+02	3.37E+02	3.37E+02	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Azobenzene	5.10E-03	5.10E-03	5.10E-03	(4)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Benz(a)anthracene	3.20E-01	3.20E-01	3.20E-01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Benzo(a)pyrene	1.09E-01	1.09E-01	1.09E-01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Benzo(b)fluoranthene	1.11E+00	1.11E+00	1.11E+00	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Benzo(g,h,i)perylene	--	--	--		mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<2.5	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<5.0	<0.50
Benzo(k)fluoranthene	1.09E+01	1.09E+01	1.09E+01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Benzoic acid	3.30E+01	3.30E+01	3.30E+01	(3)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<2.5	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<5.0	<0.50
Benzyl alcohol	4.20E+00	4.20E+00	4.20E+00	(3)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Bis(2-chloroethoxy)methane	2.30E-02	2.30E-02	2.30E-02	(3)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Bis(2-chloroethyl)ether	2.33E-05	2.33E-05	2.33E-05	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Bis(2-chloroisopropyl)ether	2.56E-03	2.56E-03	2.56E-03	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Bis(2-ethylhexyl)phthalate	1.19E+01	1.19E+01	1.19E+01	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<2.5	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<5.0	<0.50
Butyl benzyl phthalate	6.70E+00	6.70E+00	6.70E+00	(4)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Carbazole	--	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Chrysene	3.26E+01	3.26E+01	3.26E+01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Dibenz(a,h)anthracene	3.62E-01	3.62E-01	3.62E-01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Dibenzofuran	--	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Diethyl phthalate	1.06E+01	1.06E+01	1.06E+01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Dimethyl phthalate	8.36E+01	8.36E+01	8.36E+01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Di-n-butyl phthalate	8.63E+00	8.63E+00	8.63E+00	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<2.5	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<5.0	<0.50
Di-n-octyl phthalate	--	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Fluoranthene	1.55E+02	1.55E+02	1.55E+02	(1)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<2.5	<1.3	<0.25	<1.3	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1.3	<2.5	<0.25
Fluorene	2.50E+01	2.50E+01	2.50E+01	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<2.5	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<5.0	<0.50
Hexachlorobenzene	2.21E-03	2.21E-03	2.21E-03	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Hexachlorobutadiene	1.90E-02	1.90E-02	1.90E-02	(4)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Hexachlorocyclopentadiene	6.13E-01	6.13E-01	6.13E-01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Hexachloroethane	1.93E-02	1.93E-02	1.93E-02	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Indeno(1,2,3-cd)pyrene	3.70E+00	3.70E+00	3.70E+00	(1)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<2.5	<1.3	<0.25	<1.3	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1.3	<2.5	<0.25
Isophorone	1.85E-01	1.85E-01	1.85E-01	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<2.5	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<5.0	<0.50
Naphthalene	4.19E-03	4.19E-03	4.19E-03	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	**28**	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	**3.5**	**17**	**5.3**
Nitrobenzene	6.86E-03	6.86E-03	6.86E-03	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<2.5	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<5.0	<0.50
N-Nitrosodi-n-propylamine	1.10E-04	1.10E-04	1.10E-04	(4)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
N-Nitrosodiphenylamine	1.29E+00	1.29E+00	1.29E+00	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Pentachlorophenol	2.94E-02	2.94E-02	2.94E-02	(1)	mg/Kg	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<4.0	<2.0	<0.40	<2.0	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<2.0	<4.0	<0.40
Phenanthrene	8.34E+01	8.34E+01	8.34E+01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	5.6	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	1.5	3.1	0.67
Phenol	6.30E+00	6.30E+00	6.30E+00	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Pyrene	1.12E+02	1.12E+02	1.12E+02	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<1.0	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<2.0	<0.20
Pyridine	9.70E-03	9.70E-03	9.70E-03	(3)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<2.5	<0.50	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<5.0	<0.50
Total Petroleum Hydrocarbons - (EPA Method 8015B) mg/kg																									
Diesel Range Organics (DRO)	1120	1120	1120	(6)	mg/Kg	75	23	<10	130	<10	<10	22	**7700**	56	73	130	<10	56	63	74	10	46	**4400**	**8600**	**1400**
Gasoline Range Organics (GRO)	1120	1120	1120	(6)	mg/Kg	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	**2200**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	180	**1900**	**1300**
Motor Oil Range Organics (MRO)	5000	5000	5000	(7)	mg/Kg	75	86	<50	140	<50	<50	<50	<1000	270	320	770	64	62	67	87	<50	<50	1000	540	<500

Table 10
Group 3 Soil Analytical Results Summary - AOC 22 (Product Loading Rack) and AOC 26
Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels (0-2' bgs)	Non-Residential Screening Levels (2-10' bgs)	Non-Residential Screening Levels (>10' bgs)	Source	Units	AOC 22-1 (0-0.5')	AOC 22-1 (1.5-2.0')	AOC 22-2 (0-0.5')	AOC 22-2 (1.5-2.0')	AOC 22-3 (0-0.5')	AOC 22-3 (1.5'-2.0')	AOC 22-4 (0-0.5')	AOC 22-4 (1.5-2.0)	AOC 22-5 (0-0.5')	AOC 22-5 1.5-2.0')	AOC 22-6 (0-0.5')	AOC 22-6 (1.5-2.0')	AOC 22-12 (0-0.5')	AOC 22-12 (0-0.5') DUP	AOC 22-12 (1.5-2.0')	AOC 22-12 (32-35')	AOC 22-12 (36-37.75')	AOC 22-13 (0-0.5')	AOC 22-13 (1.5-2.0')	AOC 22-13 (18-20')
Sample Date						4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/8/2009	4/8/2009	4/8/2009
Ethanol	--	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

--* Laboratory inadvertently did not analyze for Cyanide for AOC (22-12 (36-37.75')

-- No screening level or analytical result available

NMED - Technical Background Document for Development of Soil Screening Levels - Revision 5.0 (August 2009)

EPA - Regional Screening Levels (April 2009)

(1) NMED DAF=1 SoilGW (All depths)

(2) NMED ConstWork (0-10'), NMED Soil-to-ground water DAF=1 (>10')

(3) EPA Protection of Ground Water Risk-based SSL (All depths)

(4) EPA - Regional Screening Levels (April 2009) multiplied by 10 pursuant to Provision VII.B. of the July 7, 2007 NMED Order because the constituent is listed as carcinogenic & EPA screening level based on 10-6 risk-based SSL

(5) NMED ConsWork Soil (0-10')

(6) NMED Oct. 2006 TPH Screening Guidelines - diesel fuel for industrial exposure via direct contact

(7) NMED Oct. 2006 TPH Screening Guidelines - waste oil for industrial exposure via direct contact

Table 10
Group 3 Soil Analytical Results Summary - AOC 22 (Product Loading Rack) and AOC 26
Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels (0-2' bgs)	Non-Residential Screening Levels (2-10' bgs)	Non-Residential Screening Levels (>10' bgs)	Source	Units	AOC 22-13 (32-34.5')	AOC 22-13 (37-39')	AOC 22-15 (1.0-1.5')	AOC 22-15 (1.5-2.0')	AOC 22-15 (1.5-2.0') DUP	AOC 22-15 (30-32')	AOC 22-15 (34-36')	AOC 26-1 (0-0.5')	AOC 26-1 (1.5-2.0')	AOC 26-2 (0.0.5')	AOC 26-2 (1.5-2.0')	AOC 26-3 (0-0.5')	AOC 26-3 (1.5-2.0')	AOC 26-3 (1.5-2.0') DUP	AOC 26-4 (0-0.5')	AOC 26-4 (1.5-2.0')	AOC 26-5 (0-0.5')	AOC 26-5 (1.5-2.0')	AOC 26-6 (0-0.5')	AOC 26-6 (1.5-2.0')
Sample Date						4/8/2009	4/8/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009
Metals (mg/kg)																									
Antimony	6.61E-01	6.61E-01	6.61E-01	(1)	mg/Kg	<2.5	--	<2.5	<2.5	<2.5	<2.5	<2.5	<12	<13	<13	<12	<12	<12	<13	<12	<13	<12	<13	<12	<12
Arsenic	1.31E-02	1.31E-02	1.31E-02	(1)	mg/Kg	<2.5	--	<13	<2.5	<2.5	<2.5	<2.5	<12	<13	<13	<12	<12	<12	<13	<12	<13	<12	<13	<12	<12
Barium	3.01E+02	3.01E+02	3.01E+02	(1)	mg/Kg	130	--	160	160	180	190	230	150	200	190	210	190	190	180	**330**	230	260	170	200	180
Beryllium	5.77E+01	5.77E+01	5.77E+01	(1)	mg/Kg	<0.15	--	0.26	0.39	0.37	0.18	<0.15	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75
Cadmium	1.37E+00	1.37E+00	1.37E+00	(1)	mg/Kg	<0.10	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium	4.47E+05	4.47E+05	9.86E+07	(2)	mg/Kg	8.5	--	4.4	4.8	4.9	4.7	2.2	8	7.7	7.6	7.2	10	13	9	8.4	7.2	7.2	6.4	6.6	6.4
Cobalt	4.90E-01	4.90E-01	4.90E-01	(3)	mg/Kg	**2**	--	**3.5**	**3.8**	**3.7**	**2.9**	**2.2**	**5.3**	**6.5**	**6.7**	**6**	**4.6**	**4.9**	**4.7**	**6.3**	**6.2**	**5.7**	**5.8**	**5.7**	**5.8**
Cyanide	7.44E+00	7.44E+00	7.44E+00	(1)	mg/Kg	<0.5	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Lead	8.00E+02	8.00E+02	--	(5)	mg/Kg	6.2	--	5.3	4.3	4.4	3.9	2.1	7.2	6	8.5	6	6	25	4.6	6.4	6.2	6.1	5.3	10	5.4
Mercury	2.93E-02	2.93E-02	2.93E-02	(1)	mg/Kg	<0.033	--	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.032	<0.033	<0.032
Nickel	4.77E+01	4.77E+01	4.77E+01	(1)	mg/Kg	2.2	--	5	5.7	5.6	3.8	1.7	6.8	8.8	8.5	7.9	6.4	6.4	6.2	10	8.5	7.8	7.1	7.3	6.7
Selenium	9.65E-01	9.65E-01	9.65E-01	(1)	mg/Kg	<2.5	--	<13	<13	<13	<2.5	<2.5	<12	<13	<13	<12	<12	<12	<13	<12	<13	<12	<13	<12	<12
Silver	1.57E+00	1.57E+00	1.57E+00	(1)	mg/Kg	<0.25	--	<0.25	<0.25	<0.25	<0.25	<0.25	<1.2	<1.3	<1.3	<1.2	<1.2	<1.2	<1.3	<1.2	<1.3	<1.2	<1.3	<1.2	<1.2
Vanadium	1.83E+02	1.83E+02	1.83E+02	(1)	mg/Kg	9.8	--	12	15	14	15	11	17	23	21	20	17	19	20	20	22	21	21	19	23
Zinc	6.82E+02	6.82E+02	6.82E+02	(1)	mg/Kg	14	--	18	24	23	21	12	54	41	62	38	36	47	34	41	40	48	33	83	36
Volatile Organic Compounds - (EPA Method 8260B) mg/kg																									
1,1,1,2-Tetrachloroethane	1.73E-03	1.73E-03	1.73E-03	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
1,1,1-Trichloroethane	2.98E+00	2.98E+00	2.98E+00	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
1,1,2,2-Tetrachloroethane	2.25E-04	2.25E-04	2.25E-04	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
1,1,2-Trichloroethane	6.74E-04	6.74E-04	6.74E-04	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
1,1-Dichloroethane	6.09E-03	6.09E-03	6.09E-03	(1)	mg/Kg	<0.10	<10	--	--	--	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	--	<0.10	<0.10
1,1-Dichloroethene	1.19E-01	1.19E-01	1.19E-01	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
1,1-Dichloropropene	--	--	--		mg/Kg	<0.10	<10	--	--	--	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	--	<0.10	<0.10
1,2,3-Trichlorobenzene	--	--	--		mg/Kg	<0.10	<10	--	--	--	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	--	<0.10	<0.10
1,2,3-Trichloropropane	3.56E-05	3.56E-05	3.56E-05	(1)	mg/Kg	<0.10	<10	--	--	--	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	--	<0.10	<0.10
1,2,4-Trichlorobenzene	1.02E-02	1.02E-02	1.02E-02	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
1,2,4-Trimethylbenzene	2.40E-02	2.40E-02	2.40E-02	(3)	mg/Kg	**13**	**400**	--	--	--	--	**0.69**	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
1,2-Dibromo-3-chloropropane	2.97E-06	2.97E-06	2.97E-06	(1)	mg/Kg	<0.10	<10	--	--	--	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	--	<0.10	<0.10
1,2-Dibromoethane (EDB)	1.58E-05	1.58E-05	1.58E-05	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
1,2-Dichlorobenzene	3.13E-01	3.13E-01	3.13E-01	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
1,2-Dichloroethane (EDC)	3.65E-04	3.65E-04	3.65E-04	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
1,2-Dichloropropane	1.11E-03	1.11E-03	1.11E-03	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
1,3,5-Trimethylbenzene	2.00E-02	2.00E-02	2.00E-02	(3)	mg/Kg	**4.4**	**140**	--	--	--	--	**0.26**	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
1,3-Dichlorobenzene	--	--	--		mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
1,3-Dichloropropane	2.70E-01	2.70E-01	2.70E-01	(3)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
1,4-Dichlorobenzene	3.57E-03	3.57E-03	3.57E-03	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
1-Methylnaphthalene	1.50E-01	1.50E-01	1.50E-01	(4)	mg/Kg	**1.9**	**45**	--	--	--	--	--	--	--	--	--	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	--	<0.20	<0.20
2,2-Dichloropropane	--	--	--		mg/Kg	<0.10	<10	--	--	--	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	--	<0.10	<0.10
2-Butanone (MEK)	1.27E+00	1.27E+00	1.27E+00	(1)	mg/Kg	<0.50	<50	--	--	--	--	--	--	--	--	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50
2-Chlorotoluene	6.24E-01	6.24E-01	6.24E-01	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
2-Hexanone	--	--	--		mg/Kg	<0.50	<50	--	--	--	--	--	--	--	--	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50
2-Methylnaphthalene	9.00E-01	9.00E-01	9.00E-01	(3)	mg/Kg	**3.4**	**72**	--	--	--	--	--	--	--	--	--	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	--	<0.20	<0.20
4-Chlorotoluene	2.80E+00	2.80E+00	2.80E+00	(3)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
4-Isopropyltoluene	--	--	--		mg/Kg	0.46	6	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
4-Methyl-2-pentanone	--	--	--		mg/Kg	<0.50	<50	--	--	--	--	--	--	--	--	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50
Acetone	3.84E+00	3.84E+00	3.84E+00	(1)	mg/Kg	<0.75	<75	--	--	--	--	--	--	--	--	--	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	--	<0.75	<0.75
Benzene	1.85E-03	1.85E-03	1.85E-03	(1)	mg/Kg	**0.066**	**7.7**	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
Bromobenzene	1.50E-02	1.50E-02	1.50E-02	(3)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
Bromodichloromethane	2.76E-04	2.76E-04	2.76E-04	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
Bromoform	2.30E-02	2.30E-02	2.30E-02	(4)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
Bromomethane	1.94E-03	1.94E-03	1.94E-03	(1)	mg/Kg	<0.10	<10	--	--	--	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	--	<0.10	<0.10
Carbon disulfide	2.52E-01	2.52E-01	2.52E-01	(1)	mg/Kg	<0.50	<50	--	--	--	--	--	--	--	--	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	--	<0.50	<0.50
Carbon tetrachloride	7.39E-04	7.39E-04	7.39E-04	(1)	mg/Kg	<0.10	<10	--	--	--	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	--	<0.10	<0.10
Chlorobenzene	5.38E-02	5.38E-02	5.38E-02	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050

Table 10
Group 3 Soil Analytical Results Summary - AOC 22 (Product Loading Rack) and AOC 26
Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels (0-2' bgs)	Non-Residential Screening Levels (2-10' bgs)	Non-Residential Screening Levels (>10' bgs)	Source	Units	AOC 22-13 (32-34.5')	AOC 22-13 (37-39')	AOC 22-15 (1.0-1.5')	AOC 22-15 (1.5-2.0')	AOC 22-15 (1.5-2.0') DUP	AOC 22-15 (30-32')	AOC 22-15 (34-36')	AOC 26-1 (0-0.5')	AOC 26-1 (1.5-2.0')	AOC 26-2 (0.0.5')	AOC 26-2 (1.5-2.0')	AOC 26-3 (0-0.5')	AOC 26-3 (1.5-2.0')	AOC 26-3 (1.5-2.0') DUP	AOC 26-4 (0-0.5')	AOC 26-4 (1.5-2.0')	AOC 26-5 (0-0.5')	AOC 26-5 (1.5-2.0')	AOC 26-6 (0-0.5')	AOC 26-6 (1.5-2.0')
Sample Date						4/8/2009	4/8/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009
Chloroethane	--	--	--		mg/Kg	<0.10	<10	--	--	--	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	--	<0.10	<0.10
Chloroform	4.68E-04	4.68E-04	4.68E-04	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
Chloromethane	4.18E-03	4.18E-03	4.18E-03	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
cis-1,2-DCE	9.43E-02	9.43E-02	9.43E-02	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
cis-1,3-Dichloropropene	1.35E-03	1.35E-03	1.35E-03	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
Dibromochloromethane	3.38E-04	3.38E-04	3.38E-04	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
Dibromomethane	9.10E-02	9.10E-02	9.10E-02	(3)	mg/Kg	<0.10	<10	--	--	--	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	--	<0.10	<0.10
Dichlorodifluoromethane	7.23E-01	7.23E-01	7.23E-01	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
Ethylbenzene	1.46E-02	1.46E-02	1.46E-02	(1)	mg/Kg	**2.2**	**120**	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
Hexachlorobutadiene	2.20E+02	2.20E+02	1.90E-02	(4)	mg/Kg	<0.10	<10	--	--	--	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	--	<0.10	<0.10
Isopropylbenzene	9.86E-01	9.86E-01	9.86E-01	(1)	mg/Kg	0.55	**12**	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
Methyl tert-butyl ether (MTBE)	2.29E-02	2.29E-02	2.29E-02	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**0.22**	<0.050	<0.050
Methylene chloride	1.07E-02	1.07E-02	1.07E-02	(1)	mg/Kg	<0.15	<15	--	--	--	--	--	--	--	--	--	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	--	<0.15	<0.15
Naphthalene	4.19E-03	4.19E-03	4.19E-03	(1)	mg/Kg	**2.5**	**49**	--	--	--	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	--	<0.10	<0.10
n-Butylbenzene	--	--	--		mg/Kg	2.3	36	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
n-Propylbenzene	--	--	--		mg/Kg	1.6	57	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
sec-Butylbenzene	--	--	--		mg/Kg	0.67	10	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
Styrene	1.56E+00	1.56E+00	1.56E+00	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
tert-Butylbenzene	--	--	--		mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
Tetrachloroethene (PCE)	4.49E-04	4.49E-04	4.49E-04	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
Toluene	1.38E+00	1.38E+00	1.38E+00	(1)	mg/Kg	**1.6**	**68**	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
trans-1,2-DCE	3.01E-02	3.01E-02	3.01E-02	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
trans-1,3-Dichloropropene	1.35E-03	1.35E-03	1.35E-03	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
Trichloroethene (TCE)	5.30E-03	5.30E-03	5.30E-03	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
Trichlorofluoromethane	9.01E-01	9.01E-01	9.01E-01	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
Vinyl chloride	2.88E-04	2.88E-04	2.88E-04	(1)	mg/Kg	<0.050	<5.0	--	--	--	--	--	--	--	--	--	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	--	<0.050	<0.050
Xylenes, Total	1.76E-01	1.76E-01	1.76E-01	(1)	mg/Kg	**14**	**760**	--	--	--	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	--	<0.10	<0.10
Volatile Organic Compounds - (EPA Method 8260B) µg/Kg-dry																									
1,1,1,2-Tetrachloroethane	1.73E+00	1.73E+00	1.73E+00	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
1,1,1-Trichloroethane	2.98E+03	2.98E+03	2.98E+03	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
1,1,2,2-Tetrachloroethane	2.25E-01	2.25E-01	2.25E-01	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
1,1,2-Trichloroethane	6.74E-01	6.74E-01	6.74E-01	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
1,1-Dichloroethane	6.09E+00	6.09E+00	6.09E+00	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
1,1-Dichloroethene	1.19E+02	1.19E+02	1.19E+02	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
1,1-Dichloropropene	--	--	--		µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
1,2,3-Trichlorobenzene	--	--	--		µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
1,2,3-Trichloropropane	3.56E-02	3.56E-02	3.56E-02	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
1,2,4-Trichlorobenzene	1.02E+01	1.02E+01	1.02E+01	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
1,2,4-Trimethylbenzene	2.40E+01	2.40E+01	2.40E+01	(3)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	--	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
1,2-Dibromo-3-chloropropane	2.97E-03	2.97E-03	2.97E-03	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
1,2-Dibromoethane (EDB)	1.58E-02	1.58E-02	1.58E-02	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
1,2-Dichlorobenzene	3.13E+02	3.13E+02	3.13E+02	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
1,2-Dichloroethane (EDC)	3.65E-01	3.65E-01	3.65E-01	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
1,2-Dichloropropane	1.11E+00	1.11E+00	1.11E+00	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
1,3,5-Trimethylbenzene	2.00E+01	2.00E+01	2.00E+01	(3)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	--	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
1,3-Dichlorobenzene	--	--	--		µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
1,3-Dichloropropane	2.70E+02	2.70E+02	2.70E+02	(3)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
1,4-Dichlorobenzene	3.57E+00	3.57E+00	3.57E+00	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
2,2-Dichloropropane	--	--	--		µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
2-Butanone	1.27E+03	1.27E+03	1.27E+03	(1)	µg/Kg-dry	--	--	<3.70	<4.01	<3.67	<3.90	<4.03	<4.53	<4.00	<3.63	<3.85	<3.81	<4.05	<3.85	<3.67	<4.06	<4.33	<4.05	<3.60	<3.97
2-Chlorotoluene	6.24E+02	6.24E+02	6.24E+02	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
2-Hexanone	--	--	--		µg/Kg-dry	--	--	<3.70	<4.01	<3.67	<3.90	<4.03	<4.53	<4.00	<3.63	<3.85	<3.81	<4.05	<3.85	<3.67	<4.06	<4.33	<4.05	<3.60	<3.97
4-Chlorotoluene	2.80E+03	2.80E+03	2.80E+03	(3)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
4-Isopropyltoluene	--	--	--		µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	--	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
4-Methyl-2-pentanone	--	--	--		µg/Kg-dry	--	--	<3.70	<4.01	<3.67	<3.90	<4.03	<4.53	<4.00	<3.63	<3.85	<3.81	<4.05	<3.85	<3.67	<4.06	<4.33	<4.05	<3.60	<3.97

Table 10
Group 3 Soil Analytical Results Summary - AOC 22 (Product Loading Rack) and AOC 26
Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels (0-2' bgs)	Non-Residential Screening Levels (2-10' bgs)	Non-Residential Screening Levels (>10' bgs)	Source	Units	AOC 22-13 (32-34.5')	AOC 22-13 (37-39')	AOC 22-15 (1.0-1.5')	AOC 22-15 (1.5-2.0')	AOC 22-15 (1.5-2.0') DUP	AOC 22-15 (30-32')	AOC 22-15 (34-36')	AOC 26-1 (0-0.5')	AOC 26-1 (1.5-2.0')	AOC 26-2 (0-0.5')	AOC 26-2 (1.5-2.0')	AOC 26-3 (0-0.5')	AOC 26-3 (1.5-2.0')	AOC 26-3 (1.5-2.0') DUP	AOC 26-4 (0-0.5')	AOC 26-4 (1.5-2.0')	AOC 26-5 (0-0.5')	AOC 26-5 (1.5-2.0')	AOC 26-6 (0-0.5')	AOC 26-6 (1.5-2.0')
Sample Date						4/8/2009	4/8/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009
Acetone	3.84E+03	3.84E+03	3.84E+03	(1)	µg/Kg-dry	--	--	9.84	6.14	4.35	15	205	15.9	9.75	15.3	10.6	<3.81	<4.05	<3.85	<3.67	5.06	44.8	7.14	49.8	6.34
Benzene	1.85E+00	1.85E+00	1.85E+00	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
Bromobenzene	1.50E+01	1.50E+01	1.50E+01	(3)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
Bromodichloromethane	2.76E-01	2.76E-01	2.76E-01	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
Bromoform	2.30E+01	2.30E+01	2.30E+01	(4)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
Bromomethane	1.94E+00	1.94E+00	1.94E+00	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
Carbon disulfide	2.52E+02	2.52E+02	2.52E+02	(1)	µg/Kg-dry	--	--	<3.70	<4.01	<3.67	<3.90	<4.03	<4.53	<4.00	<3.63	<3.85	<3.81	<4.05	<3.85	<3.67	<4.06	<4.33	<4.05	<3.60	<3.97
Carbon tetrachloride	7.39E-01	7.39E-01	7.39E-01	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
Chlorobenzene	5.38E+01	5.38E+01	5.38E+01	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
Chloroethane	--	--	--		µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
Chloroform	4.68E-01	4.68E-01	4.68E-01	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
Chloromethane	4.18E+00	4.18E+00	4.18E+00	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
cis-1,2-DCE	9.43E+01	9.43E+01	9.43E+01	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
cis-1,3-Dichloropropene	1.35E+00	1.35E+00	1.35E+00	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
Dibromochloromethane	3.38E-01	3.38E-01	3.38E-01	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
Dibromomethane	9.10E+01	9.10E+01	9.10E+01	(3)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
Dichlorodifluoromethane	7.23E+02	7.23E+02	7.23E+02	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
Ethylbenzene	1.46E+01	1.46E+01	1.46E+01	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<0.05	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
Hexachlorobutadiene	2.20E+05	2.20E+05	1.90E+01	(4)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
Isopropylbenzene	9.86E+02	9.86E+02	9.86E+02	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<0.05	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
Methyl tert-butyl ether (MTBE)	2.29E+01	2.29E+01	2.29E+01	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	**28.1**	7.07	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	20.7	--	<0.899	<0.991
Methylene chloride	1.07E+01	1.07E+01	1.07E+01	(1)	µg/Kg-dry	--	--	**16.3**	**11**	9.09	**12.1**	**15.6**	7.64	5.85	5.81	6.43	8.97	9.83	**10.8**	7.78	7.58	6.28	7.83	4.63	7.82
Naphthalene	4.19E+00	4.19E+00	4.19E+00	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	0.1	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
n-Butylbenzene	--	--	--		µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	0.15	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
n-Propylbenzene	--	--	--		µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	0.084	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
sec-Butylbenzene	--	--	--		µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<0.05	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
Styrene	1560	1560	1.56E+03	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
tert-Butylbenzene	--	--	--		µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
Tetrachloroethene (PCE)	4.49E-01	4.49E-01	4.49E-01	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
Toluene	1.38E+03	1.38E+03	1.38E+03	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	1.59	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	3.02	<0.991
trans-1,2-DCE	3.01E+01	3.01E+01	3.01E+01	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
trans-1,3-Dichloropropene	1.35E+00	1.35E+00	1.35E+00	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
Trichloroethene (TCE)	5.30E+00	5.30E+00	5.30E+00	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
Trichlorofluoromethane	9.01E+02	9.01E+02	9.01E+02	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
Vinyl chloride	2.88E-01	2.88E-01	2.88E-01	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	<1.01	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
Xylenes, Total	1.76E+02	1.76E+02	1.76E+02	(1)	µg/Kg-dry	--	--	<0.924	<1.00	<0.918	<0.976	0.22	<1.13	<0.999	<0.908	<0.964	<0.952	<1.01	<0.962	<0.917	<1.02	<1.08	<1.01	<0.899	<0.991
Semi Volatile Organics - (EPA Method 8270) mg/kg																									
1,2,4-Trichlorobenzene	1.02E-02	1.02E-02	1.02E-02	(1)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichlorobenzene	3.13E-01	3.13E-01	3.13E-01	(1)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,3-Dichlorobenzene	--	--	--		mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,4-Dichlorobenzene	3.57E-03	3.57E-03	3.57E-03	(1)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2,4,5-Trichlorophenol	7.13E+00	7.13E+00	7.13E+00	(1)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2,4,6-Trichlorophenol	7.13E-02	7.13E-02	7.13E-02	(1)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2,4-Dichlorophenol	1.37E-01	1.37E-01	1.37E-01	(1)	mg/Kg	<0.40	--	<2.0	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2,4-Dimethylphenol	9.12E-01	9.12E-01	9.12E-01	(1)	mg/Kg	<0.30	--	<1.5	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
2,4-Dinitrophenol	5.25E-02	5.25E-02	5.25E-02	(1)	mg/Kg	<0.40	--	<2.0	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2,4-Dinitrotoluene	1.56E-03	1.56E-03	1.56E-03	(1)	mg/Kg	<0.50	--	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2,6-Dinitrotoluene	2.67E-02	2.67E-02	2.67E-02	(1)	mg/Kg	<0.50	--	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2-Chloronaphthalene	1.35E+01	1.35E+01	1.35E+01	(1)	mg/Kg	<0.25	--	<1.3	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
2-Chlorophenol	1.53E-01	1.53E-01	1.53E-01	(1)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2-Methylnaphthalene	9.00E-01	9.00E-01	9.00E-01	(3)	mg/Kg	**3.8**	--	<1.3	<0.25	<0.25	<0.25	0.63	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
2-Methylphenol	2.00E+00	2.00E+00	2.00E+00	(3)	mg/Kg	<0.50	--	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2-Nitroaniline	3.30E-02	3.30E-02	3.30E-02	(3)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2-Nitrophenol	--	--	--		mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
3,3´-Dichlorobenzidine	1.70E-02	1.70E-02	1.70E-02	(1)	mg/Kg	<0.25	--	<1.3	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25

Table 10
Group 3 Soil Analytical Results Summary - AOC 22 (Product Loading Rack) and AOC 26
Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels (0-2' bgs)	Non-Residential Screening Levels (2-10' bgs)	Non-Residential Screening Levels (>10' bgs)	Source	Units	AOC 22-13 (32-34.5')	AOC 22-13 (37-39')	AOC 22-15 (1.0-1.5')	AOC 22-15 (1.5-2.0')	AOC 22-15 (1.5-2.0') DUP	AOC 22-15 (30-32')	AOC 22-15 (34-36')	AOC 26-1 (0-0.5')	AOC 26-1 (1.5-2.0')	AOC 26-2 (0.0.5')	AOC 26-2 (1.5-2.0')	AOC 26-3 (0-0.5')	AOC 26-3 (1.5-2.0')	AOC 26-3 (1.5-2.0') DUP	AOC 26-4 (0-0.5')	AOC 26-4 (1.5-2.0')	AOC 26-5 (0-0.5')	AOC 26-5 (1.5-2.0')	AOC 26-6 (0-0.5')	AOC 26-6 (1.5-2.0')
Sample Date						4/8/2009	4/8/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009
3+4-Methylphenol	1.90E-01	1.90E-01	1.90E-01	(3)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
3-Nitroaniline	--	--	--		mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
4,6-Dinitro-2-methylphenol	--	--	--		mg/Kg	<0.50	--	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
4-Bromophenyl phenyl ether	--	--	--		mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
4-Chloro-3-methylphenol	--	--	--		mg/Kg	<0.50	--	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
4-Chloroaniline	1.20E-03	1.20E-03	1.20E-03	(4)	mg/Kg	<0.50	--	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
4-Chlorophenyl phenyl ether	--	--	--		mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
4-Nitroaniline	1.00E-02	1.00E-02	1.00E-02	(4)	mg/Kg	<0.25	--	<1.3	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
4-Nitrophenol	--	--	--		mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Acenaphthene	2.05E+01	2.05E+01	2.05E+01	(1)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Acenaphthylene	--	--	--		mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Aniline	3.40E-02	3.40E-02	3.40E-02	(4)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Anthracene	3.37E+02	3.37E+02	3.37E+02	(1)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Azobenzene	5.10E-03	5.10E-03	5.10E-03	(4)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benz(a)anthracene	3.20E-01	3.20E-01	3.20E-01	(1)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(a)pyrene	1.09E-01	1.09E-01	1.09E-01	(1)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(b)fluoranthene	1.11E+00	1.11E+00	1.11E+00	(1)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(g,h,i)perylene	--	--	--		mg/Kg	<0.50	--	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Benzo(k)fluoranthene	1.09E+01	1.09E+01	1.09E+01	(1)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzoic acid	3.30E+01	3.30E+01	3.30E+01	(3)	mg/Kg	<0.50	--	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Benzyl alcohol	4.20E+00	4.20E+00	4.20E+00	(3)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bis(2-chloroethoxy)methane	2.30E-02	2.30E-02	2.30E-02	(3)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bis(2-chloroethyl)ether	2.33E-05	2.33E-05	2.33E-05	(1)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bis(2-chloroisopropyl)ether	2.56E-03	2.56E-03	2.56E-03	(1)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bis(2-ethylhexyl)phthalate	1.19E+01	1.19E+01	1.19E+01	(1)	mg/Kg	<0.50	--	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Butyl benzyl phthalate	6.70E+00	6.70E+00	6.70E+00	(4)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Carbazole	--	--	--		mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chrysene	3.26E+01	3.26E+01	3.26E+01	(1)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dibenz(a,h)anthracene	3.62E-01	3.62E-01	3.62E-01	(1)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dibenzofuran	--	--	--		mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Diethyl phthalate	1.06E+01	1.06E+01	1.06E+01	(1)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dimethyl phthalate	8.36E+01	8.36E+01	8.36E+01	(1)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Di-n-butyl phthalate	8.63E+00	8.63E+00	8.63E+00	(1)	mg/Kg	<0.50	--	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Di-n-octyl phthalate	--	--	--		mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Fluoranthene	1.55E+02	1.55E+02	1.55E+02	(1)	mg/Kg	<0.25	--	<1.3	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Fluorene	2.50E+01	2.50E+01	2.50E+01	(1)	mg/Kg	<0.50	--	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Hexachlorobenzene	2.21E-03	2.21E-03	2.21E-03	(1)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Hexachlorobutadiene	1.90E-02	1.90E-02	1.90E-02	(4)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Hexachlorocyclopentadiene	6.13E-01	6.13E-01	6.13E-01	(1)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Hexachloroethane	1.93E-02	1.93E-02	1.93E-02	(1)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Indeno(1,2,3-cd)pyrene	3.70E+00	3.70E+00	3.70E+00	(1)	mg/Kg	<0.25	--	<1.3	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Isophorone	1.85E-01	1.85E-01	1.85E-01	(1)	mg/Kg	<0.50	--	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Naphthalene	4.19E-03	4.19E-03	4.19E-03	(1)	mg/Kg	**1.8**	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Nitrobenzene	6.86E-03	6.86E-03	6.86E-03	(1)	mg/Kg	<0.50	--	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
N-Nitrosodi-n-propylamine	1.10E-04	1.10E-04	1.10E-04	(4)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
N-Nitrosodiphenylamine	1.29E+00	1.29E+00	1.29E+00	(1)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Pentachlorophenol	2.94E-02	2.94E-02	2.94E-02	(1)	mg/Kg	<0.40	--	<2.0	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Phenanthrene	8.34E+01	8.34E+01	8.34E+01	(1)	mg/Kg	0.41	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Phenol	6.30E+00	6.30E+00	6.30E+00	(1)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Pyrene	1.12E+02	1.12E+02	1.12E+02	(1)	mg/Kg	<0.20	--	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Pyridine	9.70E-03	9.70E-03	9.70E-03	(3)	mg/Kg	<0.50	--	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Total Petroleum Hydrocarbons - (EPA Method 8015B) mg/kg																									
Diesel Range Organics (DRO)	1120	1120	1120	(6)	mg/Kg	**1300**	**7800**	19	<10	<10	<10	100	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Gasoline Range Organics (GRO)	1120	1120	1120	(6)	mg/Kg	<250	**5500**	<5.0	<5.0	<5.0	<5.0	15	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Motor Oil Range Organics (MRO)	5000	5000	5000	(7)	mg/Kg	<500	<1000	71	<50	<50	<50	<50	<50	<50	<50	<50	70	56	67	<50	<50	<50	<50	<50	<50

Table 10
Group 3 Soil Analytical Results Summary - AOC 22 (Product Loading Rack) and AOC 26
Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels (0-2' bgs)	Non-Residential Screening Levels (2-10' bgs)	Non-Residential Screening Levels (>10' bgs)	Source	Units	AOC 22-13 (32-34.5')	AOC 22-13 (37-39')	AOC 22-15 (1.0-1.5')	AOC 22-15 (1.5-2.0')	AOC 22-15 (1.5-2.0') DUP	AOC 22-15 (30-32')	AOC 22-15 (34-36')	AOC 26-1 (0-0.5')	AOC 26-1 (1.5-2.0')	AOC 26-2 (0.0.5')	AOC 26-2 (1.5-2.0')	AOC 26-3 (0-0.5')	AOC 26-3 (1.5-2.0')	AOC 26-3 (1.5-2.0') DUP	AOC 26-4 (0-0.5')	AOC 26-4 (1.5-2.0')	AOC 26-5 (0-0.5')	AOC 26-5 (1.5-2.0')	AOC 26-6 (0-0.5')	AOC 26-6 (1.5-2.0')
Sample Date						4/8/2009	4/8/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/15/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009	4/20/2009
Ethanol	--	--	--		mg/Kg	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0

--* Laboratory inadvertently did not analyze for Cyanide for AOC (22-12 (36-37.75')

-- No screening level or analytical result available

NMED - Technical Background Document for Development of Soil Screening Levels - Revision 5.0 (August 2009)

EPA - Regional Screening Levels (April 2009)

(1) NMED DAF=1 SoilGW (All depths)

(2) NMED ConstWork (0-10'), NMED Soil-to-ground water DAF=1 (>10')

(3) EPA Protection of Ground Water Risk-based SSL (All depths)

(4) EPA - Regional Screening Levels (April 2009) multiplied by 10 pursuant to Provision VII.B. of the July 7, 2007 NMED Order because the constituent is listed as carcinogenic & EPA screening level based on 10-6 risk-based SSL

(5) NMED ConsWork Soil (0-10')

(6) NMED Oct. 2006 TPH Screening Guidelines - diesel fuel for industrial exposure via direct contact

(7) NMED Oct. 2006 TPH Screening Guidelines - waste oil for industrial exposure via direct contact

Table 10
Group 3 Soil Analytical Results Summary - AOC 22 (Product Loading Rack) and AOC 26
Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels (0-2' bgs)	Non-Residential Screening Levels (2-10' bgs)	Non-Residential Screening Levels (>10' bgs)	Source	Units	AOC 26-7 (0-0.5')	AOC 26-7 (1.5-2.0')	AOC 26-8 (0-1.0')	AOC 26-8 (0-1.0') DUP	AOC 26-8 (1.5-2.0')	AOC 26-8 (32-36')	AOC 26-9 (0-0.5')	AOC 26-9 (1.5-2.0')	AOC 26-9 (36-38')
Sample Date						4/20/2009	4/20/2009	4/16/2009	4/16/2009	4/16/2009	4/16/2009	4/20/2009	4/20/2009	4/20/2009
Metals (mg/kg)														
Antimony	6.61E-01	6.61E-01	6.61E-01	(1)	mg/Kg	<13	<13	<13	<12	<2.5	<2.5	<13	<12	<2.5
Arsenic	1.31E-02	1.31E-02	1.31E-02	(1)	mg/Kg	<13	<13	<13	<12	<2.5	<2.5	<13	<12	<2.5
Barium	3.01E+02	3.01E+02	3.01E+02	(1)	mg/Kg	220	150	**380**	240	280	230	150	130	180
Beryllium	5.77E+01	5.77E+01	5.77E+01	(1)	mg/Kg	<0.75	<0.75	<0.75	<0.75	0.29	<0.15	<0.75	<0.75	<0.15
Cadmium	1.37E+00	1.37E+00	1.37E+00	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.10	<0.10	<0.50	<0.50	<0.10
Chromium	4.47E+05	4.47E+05	9.86E+07	(2)	mg/Kg	6.8	5.2	2.4	2.1	4.2	2.5	14	6.8	3.9
Cobalt	4.90E-01	4.90E-01	4.90E-01	(3)	mg/Kg	**6.4**	**4.5**	**3.1**	**3.1**	**3.5**	**2.3**	**4.2**	**5.6**	**2.3**
Cyanide	7.44E+00	7.44E+00	7.44E+00	(1)	mg/Kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.5
Lead	8.00E+02	8.00E+02	--	(5)	mg/Kg	16	6	2.8	2.8	3.2	3.1	4.3	5.5	1.4
Mercury	2.93E-02	2.93E-02	2.93E-02	(1)	mg/Kg	<0.032	<0.032	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.032
Nickel	4.77E+01	4.77E+01	4.77E+01	(1)	mg/Kg	7.6	6.8	3	2.8	4.8	1.8	5.8	7.6	1.8
Selenium	9.65E-01	9.65E-01	9.65E-01	(1)	mg/Kg	<13	<13	<13	<12	<12	<12	<13	<12	<13
Silver	1.57E+00	1.57E+00	1.57E+00	(1)	mg/Kg	<1.3	<1.3	<1.3	<1.2	<0.25	<0.25	<1.3	<1.2	<0.25
Vanadium	1.83E+02	1.83E+02	1.83E+02	(1)	mg/Kg	19	17	<13	<12	13	10	14	19	11
Zinc	6.82E+02	6.82E+02	6.82E+02	(1)	mg/Kg	160	30	22	20	24	14	39	32	11
Volatile Organic Compounds - (EPA Method 8260B) mg/kg														
1,1,1,2-Tetrachloroethane	1.73E-03	1.73E-03	1.73E-03	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
1,1,1-Trichloroethane	2.98E+00	2.98E+00	2.98E+00	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
1,1,2,2-Tetrachloroethane	2.25E-04	2.25E-04	2.25E-04	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
1,1,2-Trichloroethane	6.74E-04	6.74E-04	6.74E-04	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
1,1-Dichloroethane	6.09E-03	6.09E-03	6.09E-03	(1)	mg/Kg	<0.10	<0.10	--	--	--	--	--	--	<1.0
1,1-Dichloroethene	1.19E-01	1.19E-01	1.19E-01	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
1,1-Dichloropropene	--	--	--		mg/Kg	<0.10	<0.10	--	--	--	--	--	--	<1.0
1,2,3-Trichlorobenzene	--	--	--		mg/Kg	<0.10	<0.10	--	--	--	--	--	--	<1.0
1,2,3-Trichloropropane	3.56E-05	3.56E-05	3.56E-05	(1)	mg/Kg	<0.10	<0.10	--	--	--	--	--	--	<1.0
1,2,4-Trichlorobenzene	1.02E-02	1.02E-02	1.02E-02	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
1,2,4-Trimethylbenzene	2.40E-02	2.40E-02	2.40E-02	(3)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	**71**
1,2-Dibromo-3-chloropropane	2.97E-06	2.97E-06	2.97E-06	(1)	mg/Kg	<0.10	<0.10	--	--	--	--	--	--	<1.0
1,2-Dibromoethane (EDB)	1.58E-05	1.58E-05	1.58E-05	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
1,2-Dichlorobenzene	3.13E-01	3.13E-01	3.13E-01	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
1,2-Dichloroethane (EDC)	3.65E-04	3.65E-04	3.65E-04	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
1,2-Dichloropropane	1.11E-03	1.11E-03	1.11E-03	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
1,3,5-Trimethylbenzene	2.00E-02	2.00E-02	2.00E-02	(3)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	**25**
1,3-Dichlorobenzene	--	--	--		mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
1,3-Dichloropropane	2.70E-01	2.70E-01	2.70E-01	(3)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
1,4-Dichlorobenzene	3.57E-03	3.57E-03	3.57E-03	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
1-Methylnaphthalene	1.50E-01	1.50E-01	1.50E-01	(4)	mg/Kg	<0.20	<0.20	--	--	--	--	--	--	**8.8**
2,2-Dichloropropane	--	--	--		mg/Kg	<0.10	<0.10	--	--	--	--	--	--	<1.0
2-Butanone (MEK)	1.27E+00	1.27E+00	1.27E+00	(1)	mg/Kg	<0.50	<0.50	--	--	--	--	--	--	<5.0
2-Chlorotoluene	6.24E-01	6.24E-01	6.24E-01	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
2-Hexanone	--	--	--		mg/Kg	<0.50	<0.50	--	--	--	--	--	--	<5.0
2-Methylnaphthalene	9.00E-01	9.00E-01	9.00E-01	(3)	mg/Kg	<0.20	<0.20	--	--	--	--	--	--	**16**
4-Chlorotoluene	2.80E+00	2.80E+00	2.80E+00	(3)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
4-Isopropyltoluene	--	--	--		mg/Kg	<0.050	<0.050	--	--	--	--	--	--	1.2
4-Methyl-2-pentanone	--	--	--		mg/Kg	<0.50	<0.50	--	--	--	--	--	--	<5.0
Acetone	3.84E+00	3.84E+00	3.84E+00	(1)	mg/Kg	<0.75	<0.75	--	--	--	--	--	--	<7.5
Benzene	1.85E-03	1.85E-03	1.85E-03	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	**1.8**
Bromobenzene	1.50E-02	1.50E-02	1.50E-02	(3)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
Bromodichloromethane	2.76E-04	2.76E-04	2.76E-04	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
Bromoform	2.30E-02	2.30E-02	2.30E-02	(4)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
Bromomethane	1.94E-03	1.94E-03	1.94E-03	(1)	mg/Kg	<0.10	<0.10	--	--	--	--	--	--	<1.0
Carbon disulfide	2.52E-01	2.52E-01	2.52E-01	(1)	mg/Kg	<0.50	<0.50	--	--	--	--	--	--	<5.0
Carbon tetrachloride	7.39E-04	7.39E-04	7.39E-04	(1)	mg/Kg	<0.10	<0.10	--	--	--	--	--	--	<1.0
Chlorobenzene	5.38E-02	5.38E-02	5.38E-02	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50

Table 10
Group 3 Soil Analytical Results Summary - AOC 22 (Product Loading Rack) and AOC 26
Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels (0-2' bgs)	Non-Residential Screening Levels (2-10' bgs)	Non-Residential Screening Levels (>10' bgs)	Source	Units	AOC 26-7 (0-0.5')	AOC 26-7 (1.5-2.0')	AOC 26-8 (0-1.0')	AOC 26-8 (0-1.0') DUP	AOC 26-8 (1.5-2.0')	AOC 26-8 (32-36')	AOC 26-9 (0-0.5')	AOC 26-9 (1.5-2.0')	AOC 26-9 (36-38')
Sample Date						4/20/2009	4/20/2009	4/16/2009	4/16/2009	4/16/2009	4/16/2009	4/20/2009	4/20/2009	4/20/2009
Chloroethane	--	--	--		mg/Kg	<0.10	<0.10	--	--	--	--	--	--	<1.0
Chloroform	4.68E-04	4.68E-04	4.68E-04	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
Chloromethane	4.18E-03	4.18E-03	4.18E-03	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
cis-1,2-DCE	9.43E-02	9.43E-02	9.43E-02	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
cis-1,3-Dichloropropene	1.35E-03	1.35E-03	1.35E-03	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
Dibromochloromethane	3.38E-04	3.38E-04	3.38E-04	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
Dibromomethane	9.10E-02	9.10E-02	9.10E-02	(3)	mg/Kg	<0.10	<0.10	--	--	--	--	--	--	<1.0
Dichlorodifluoromethane	7.23E-01	7.23E-01	7.23E-01	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
Ethylbenzene	1.46E-02	1.46E-02	1.46E-02	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	**22**
Hexachlorobutadiene	2.20E+02	2.20E+02	1.90E-02	(4)	mg/Kg	<0.10	<0.10	--	--	--	--	--	--	<1.0
Isopropylbenzene	9.86E-01	9.86E-01	9.86E-01	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	**2.6**
Methyl tert-butyl ether (MTBE)	2.29E-02	2.29E-02	2.29E-02	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
Methylene chloride	1.07E-02	1.07E-02	1.07E-02	(1)	mg/Kg	<0.15	<0.15	--	--	--	--	--	--	<1.5
Naphthalene	4.19E-03	4.19E-03	4.19E-03	(1)	mg/Kg	<0.10	<0.10	--	--	--	--	--	--	**11**
n-Butylbenzene	--	--	--		mg/Kg	<0.050	<0.050	--	--	--	--	--	--	5
n-Propylbenzene	--	--	--		mg/Kg	<0.050	<0.050	--	--	--	--	--	--	12
sec-Butylbenzene	--	--	--		mg/Kg	<0.050	<0.050	--	--	--	--	--	--	2.1
Styrene	1.56E+00	1.56E+00	1.56E+00	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
tert-Butylbenzene	--	--	--		mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
Tetrachloroethene (PCE)	4.49E-04	4.49E-04	4.49E-04	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
Toluene	1.38E+00	1.38E+00	1.38E+00	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	**23**
trans-1,2-DCE	3.01E-02	3.01E-02	3.01E-02	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
trans-1,3-Dichloropropene	1.35E-03	1.35E-03	1.35E-03	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
Trichloroethene (TCE)	5.30E-03	5.30E-03	5.30E-03	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
Trichlorofluoromethane	9.01E-01	9.01E-01	9.01E-01	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
Vinyl chloride	2.88E-04	2.88E-04	2.88E-04	(1)	mg/Kg	<0.050	<0.050	--	--	--	--	--	--	<0.50
Xylenes, Total	1.76E-01	1.76E-01	1.76E-01	(1)	mg/Kg	<0.10	<0.10	--	--	--	--	--	--	**130**
Volatile Organic Compounds - (EPA Method 8260B) µg/Kg-dry														
1,1,1,2-Tetrachloroethane	1.73E+00	1.73E+00	1.73E+00	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
1,1,1-Trichloroethane	2.98E+03	2.98E+03	2.98E+03	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
1,1,2,2-Tetrachloroethane	2.25E-01	2.25E-01	2.25E-01	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
1,1,2-Trichloroethane	6.74E-01	6.74E-01	6.74E-01	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
1,1-Dichloroethane	6.09E+00	6.09E+00	6.09E+00	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
1,1-Dichloroethene	1.19E+02	1.19E+02	1.19E+02	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
1,1-Dichloropropene	--	--	--		µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
1,2,3-Trichlorobenzene	--	--	--		µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
1,2,3-Trichloropropane	3.56E-02	3.56E-02	3.56E-02	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
1,2,4-Trichlorobenzene	1.02E+01	1.02E+01	1.02E+01	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
1,2,4-Trimethylbenzene	2.40E+01	2.40E+01	2.40E+01	(3)	µg/Kg-dry	<0.919	<0.984	4.33	1.6	<1.09	3.2	<0.896	<0.960	--
1,2-Dibromo-3-chloropropane	2.97E-03	2.97E-03	2.97E-03	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
1,2-Dibromoethane (EDB)	1.58E-02	1.58E-02	1.58E-02	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
1,2-Dichlorobenzene	3.13E+02	3.13E+02	3.13E+02	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
1,2-Dichloroethane (EDC)	3.65E-01	3.65E-01	3.65E-01	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
1,2-Dichloropropane	1.11E+00	1.11E+00	1.11E+00	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
1,3,5-Trimethylbenzene	2.00E+01	2.00E+01	2.00E+01	(3)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
1,3-Dichlorobenzene	--	--	--		µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
1,3-Dichloropropane	2.70E+02	2.70E+02	2.70E+02	(3)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
1,4-Dichlorobenzene	3.57E+00	3.57E+00	3.57E+00	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
2,2-Dichloropropane	--	--	--		µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
2-Butanone	1.27E+03	1.27E+03	1.27E+03	(1)	µg/Kg-dry	<3.67	<3.94	<3.71	<3.97	<4.36	9.58	<3.58	<3.84	--
2-Chlorotoluene	6.24E+02	6.24E+02	6.24E+02	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
2-Hexanone	--	--	--		µg/Kg-dry	<3.67	<3.94	<3.71	<3.97	<4.36	<3.65	<3.58	<3.84	--
4-Chlorotoluene	2.80E+03	2.80E+03	2.80E+03	(3)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
4-Isopropyltoluene	--	--	--		µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
4-Methyl-2-pentanone	--	--	--		µg/Kg-dry	<3.67	<3.94	<3.71	<3.97	<4.36	<3.65	<3.58	<3.84	--

Table 10
Group 3 Soil Analytical Results Summary - AOC 22 (Product Loading Rack) and AOC 26
Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels (0-2' bgs)	Non-Residential Screening Levels (2-10' bgs)	Non-Residential Screening Levels (>10' bgs)	Source	Units	AOC 26-7 (0-0.5')	AOC 26-7 (1.5-2.0')	AOC 26-8 (0-1.0')	AOC 26-8 (0-1.0') DUP	AOC 26-8 (1.5-2.0')	AOC 26-8 (32-36')	AOC 26-9 (0-0.5')	AOC 26-9 (1.5-2.0')	AOC 26-9 (36-38')
Sample Date						4/20/2009	4/20/2009	4/16/2009	4/16/2009	4/16/2009	4/16/2009	4/20/2009	4/20/2009	4/20/2009
Acetone	3.84E+03	3.84E+03	3.84E+03	(1)	µg/Kg-dry	78	25.8	<3.71	<3.97	<4.36	42.4	7.73	6.71	--
Benzene	1.85E+00	1.85E+00	1.85E+00	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	0.966	<0.896	<0.960	--
Bromobenzene	1.50E+01	1.50E+01	1.50E+01	(3)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
Bromodichloromethane	2.76E-01	2.76E-01	2.76E-01	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
Bromoform	2.30E+01	2.30E+01	2.30E+01	(4)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
Bromomethane	1.94E+00	1.94E+00	1.94E+00	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
Carbon disulfide	2.52E+02	2.52E+02	2.52E+02	(1)	µg/Kg-dry	<3.67	<3.94	<3.71	<3.97	<4.36	<3.65	<3.58	<3.84	--
Carbon tetrachloride	7.39E-01	7.39E-01	7.39E-01	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
Chlorobenzene	5.38E+01	5.38E+01	5.38E+01	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
Chloroethane	--	--	--		µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
Chloroform	4.68E-01	4.68E-01	4.68E-01	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
Chloromethane	4.18E+00	4.18E+00	4.18E+00	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
cis-1,2-DCE	9.43E+01	9.43E+01	9.43E+01	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
cis-1,3-Dichloropropene	1.35E+00	1.35E+00	1.35E+00	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
Dibromochloromethane	3.38E-01	3.38E-01	3.38E-01	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
Dibromomethane	9.10E+01	9.10E+01	9.10E+01	(3)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
Dichlorodifluoromethane	7.23E+02	7.23E+02	7.23E+02	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
Ethylbenzene	1.46E+01	1.46E+01	1.46E+01	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
Hexachlorobutadiene	2.20E+05	2.20E+05	1.90E+01	(4)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
Isopropylbenzene	9.86E+02	9.86E+02	9.86E+02	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
Methyl tert-butyl ether (MTBE)	2.29E+01	2.29E+01	2.29E+01	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
Methylene chloride	1.07E+01	1.07E+01	1.07E+01	(1)	µg/Kg-dry	5.14	6.38	8.24	10.5	9.76	8.38	5.73	6.57	--
Naphthalene	4.19E+00	4.19E+00	4.19E+00	(1)	µg/Kg-dry	<0.919	<0.984	1.82	<0.991	<1.09	2.34	<0.896	<0.960	--
n-Butylbenzene	--	--	--		µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
n-Propylbenzene	--	--	--		µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
sec-Butylbenzene	--	--	--		µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
Styrene	1560	1560	1.56E+03	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
tert-Butylbenzene	--	--	--		µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
Tetrachloroethene (PCE)	4.49E-01	4.49E-01	4.49E-01	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
Toluene	1.38E+03	1.38E+03	1.38E+03	(1)	µg/Kg-dry	6.58	<0.984	3.92	3.55	<1.09	<0.912	<0.896	<0.960	--
trans-1,2-DCE	3.01E+01	3.01E+01	3.01E+01	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
trans-1,3-Dichloropropene	1.35E+00	1.35E+00	1.35E+00	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
Trichloroethene (TCE)	5.30E+00	5.30E+00	5.30E+00	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
Trichlorofluoromethane	9.01E+02	9.01E+02	9.01E+02	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
Vinyl chloride	2.88E-01	2.88E-01	2.88E-01	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	<0.912	<0.896	<0.960	--
Xylenes, Total	1.76E+02	1.76E+02	1.76E+02	(1)	µg/Kg-dry	<0.919	<0.984	<0.928	<0.991	<1.09	2.54	<0.896	<0.960	--
Semi Volatile Organics - (EPA Method 8270) mg/kg														
1,2,4-Trichlorobenzene	1.02E-02	1.02E-02	1.02E-02	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichlorobenzene	3.13E-01	3.13E-01	3.13E-01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,3-Dichlorobenzene	--	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,4-Dichlorobenzene	3.57E-03	3.57E-03	3.57E-03	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2,4,5-Trichlorophenol	7.13E+00	7.13E+00	7.13E+00	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2,4,6-Trichlorophenol	7.13E-02	7.13E-02	7.13E-02	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2,4-Dichlorophenol	1.37E-01	1.37E-01	1.37E-01	(1)	mg/Kg	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2,4-Dimethylphenol	9.12E-01	9.12E-01	9.12E-01	(1)	mg/Kg	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
2,4-Dinitrophenol	5.25E-02	5.25E-02	5.25E-02	(1)	mg/Kg	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2,4-Dinitrotoluene	1.56E-03	1.56E-03	1.56E-03	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2,6-Dinitrotoluene	2.67E-02	2.67E-02	2.67E-02	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2-Chloronaphthalene	1.35E+01	1.35E+01	1.35E+01	(1)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
2-Chlorophenol	1.53E-01	1.53E-01	1.53E-01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2-Methylnaphthalene	9.00E-01	9.00E-01	9.00E-01	(3)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	**6**
2-Methylphenol	2.00E+00	2.00E+00	2.00E+00	(3)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2-Nitroaniline	3.30E-02	3.30E-02	3.30E-02	(3)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2-Nitrophenol	--	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
3,3'-Dichlorobenzidine	1.70E-02	1.70E-02	1.70E-02	(1)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25

Table 10
Group 3 Soil Analytical Results Summary - AOC 22 (Product Loading Rack) and AOC 26
Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels (0-2' bgs)	Non-Residential Screening Levels (2-10' bgs)	Non-Residential Screening Levels (>10' bgs)	Source	Units	AOC 26-7 (0-0.5')	AOC 26-7 (1.5-2.0')	AOC 26-8 (0-1.0')	AOC 26-8 (0-1.0') DUP	AOC 26-8 (1.5-2.0')	AOC 26-8 (32-36')	AOC 26-9 (0-0.5')	AOC 26-9 (1.5-2.0')	AOC 26-9 (36-38')
Sample Date						4/20/2009	4/20/2009	4/16/2009	4/16/2009	4/16/2009	4/16/2009	4/20/2009	4/20/2009	4/20/2009
3+4-Methylphenol	1.90E-01	1.90E-01	1.90E-01	(3)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
3-Nitroaniline	--	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
4,6-Dinitro-2-methylphenol	--	--	--		mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
4-Bromophenyl phenyl ether	--	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
4-Chloro-3-methylphenol	--	--	--		mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
4-Chloroaniline	1.20E-03	1.20E-03	1.20E-03	(4)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
4-Chlorophenyl phenyl ether	--	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
4-Nitroaniline	1.00E-02	1.00E-02	1.00E-02	(4)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
4-Nitrophenol	--	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Acenaphthene	2.05E+01	2.05E+01	2.05E+01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Acenaphthylene	--	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Aniline	3.40E-02	3.40E-02	3.40E-02	(4)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Anthracene	3.37E+02	3.37E+02	3.37E+02	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Azobenzene	5.10E-03	5.10E-03	5.10E-03	(4)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benz(a)anthracene	3.20E-01	3.20E-01	3.20E-01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(a)pyrene	1.09E-01	1.09E-01	1.09E-01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(b)fluoranthene	1.11E+00	1.11E+00	1.11E+00	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo(g,h,i)perylene	--	--	--		mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Benzo(k)fluoranthene	1.09E+01	1.09E+01	1.09E+01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzoic acid	3.30E+01	3.30E+01	3.30E+01	(3)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Benzyl alcohol	4.20E+00	4.20E+00	4.20E+00	(3)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bis(2-chloroethoxy)methane	2.30E-02	2.30E-02	2.30E-02	(3)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bis(2-chloroethyl)ether	2.33E-05	2.33E-05	2.33E-05	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bis(2-chloroisopropyl)ether	2.56E-03	2.56E-03	2.56E-03	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bis(2-ethylhexyl)phthalate	1.19E+01	1.19E+01	1.19E+01	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Butyl benzyl phthalate	6.70E+00	6.70E+00	6.70E+00	(4)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Carbazole	--	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chrysene	3.26E+01	3.26E+01	3.26E+01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dibenz(a,h)anthracene	3.62E-01	3.62E-01	3.62E-01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dibenzofuran	--	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Diethyl phthalate	1.06E+01	1.06E+01	1.06E+01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dimethyl phthalate	8.36E+01	8.36E+01	8.36E+01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Di-n-butyl phthalate	8.63E+00	8.63E+00	8.63E+00	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Di-n-octyl phthalate	--	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Fluoranthene	1.55E+02	1.55E+02	1.55E+02	(1)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Fluorene	2.50E+01	2.50E+01	2.50E+01	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Hexachlorobenzene	2.21E-03	2.21E-03	2.21E-03	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Hexachlorobutadiene	1.90E-02	1.90E-02	1.90E-02	(4)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Hexachlorocyclopentadiene	6.13E-01	6.13E-01	6.13E-01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Hexachloroethane	1.93E-02	1.93E-02	1.93E-02	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Indeno(1,2,3-cd)pyrene	3.70E+00	3.70E+00	3.70E+00	(1)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Isophorone	1.85E-01	1.85E-01	1.85E-01	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Naphthalene	4.19E-03	4.19E-03	4.19E-03	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	**2.8**
Nitrobenzene	6.86E-03	6.86E-03	6.86E-03	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
N-Nitrosodi-n-propylamine	1.10E-04	1.10E-04	1.10E-04	(4)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
N-Nitrosodiphenylamine	1.29E+00	1.29E+00	1.29E+00	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Pentachlorophenol	2.94E-02	2.94E-02	2.94E-02	(1)	mg/Kg	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Phenanthrene	8.34E+01	8.34E+01	8.34E+01	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.56
Phenol	6.30E+00	6.30E+00	6.30E+00	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Pyrene	1.12E+02	1.12E+02	1.12E+02	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Pyridine	9.70E-03	9.70E-03	9.70E-03	(3)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Total Petroleum Hydrocarbons - (EPA Method 8015B) mg/kg														
Diesel Range Organics (DRO)	1120	1120	1120	(6)	mg/Kg	<10	<10	11	<10	<10	<10	120	<10	840
Gasoline Range Organics (GRO)	1120	1120	1120	(6)	mg/Kg	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	930
Motor Oil Range Organics (MRO)	5000	5000	5000	(7)	mg/Kg	<50	<50	160	79	64	<50	160	<50	<50

Table 10

Group 3 Soil Analytical Results Summary - AOC 22 (Product Loading Rack) and AOC 26

Bloomfield Refinery, Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels (0-2' bgs)	Non-Residential Screening Levels (2-10' bgs)	Non-Residential Screening Levels (>10' bgs)	Source	Units	AOC 26-7 (0-0.5')	AOC 26-7 (1.5-2.0')	AOC 26-8 (0-1.0')	AOC 26-8 (0-1.0') DUP	AOC 26-8 (1.5-2.0')	AOC 26-8 (32-36')	AOC 26-9 (0-0.5')	AOC 26-9 (1.5-2.0')	AOC 26-9 (36-38')
Sample Date						4/20/2009	4/20/2009	4/16/2009	4/16/2009	4/16/2009	4/16/2009	4/20/2009	4/20/2009	4/20/2009
Ethanol	--	--	--		mg/Kg	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	--

--* Laboratory inadvertently did not analyze for Cyanide for AOC (22-12 (36-37.75')

-- No screening level or analytical result available

NMED - Technical Background Document for Development of Soil Screening Levels - Revision 5.0 (August 2009)

EPA - Regional Screening Levels (April 2009)

(1) NMED DAF=1 SoilGW (All depths)

(2) NMED ConstWork (0-10'), NMED Soil-to-ground water DAF=1 (>10')

(3) EPA Protection of Ground Water Risk-based SSL (All depths)

(4) EPA - Regional Screening Levels (April 2009) multiplied by 10 pursuant to Provision VII.B. of the July 7, 2007 NMED Order because the constituent is listed as carcinogenic & EPA screening level based on 10-6 risk-based SSL

(5) NMED ConsWork Soil (0-10')

(6) NMED Oct. 2006 TPH Screening Guidelines - diesel fuel for industrial exposure via direct contact

(7) NMED Oct. 2006 TPH Screening Guidelines - waste oil for industrial exposure via direct contact

Table 11
Group 3 Soil Analytical Results Summary - SWMUs No. 4 and 5, AOC 22 (Crude Receiving Rack) and AOC 24
Bloomfield Refinery - Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels 0-2'	Non-Residential Screening Levels 2-10'	Source	Units	AOC 22-7 (0-0.5')	AOC 22-7 (1.5-2.0)	AOC 22-8 (0-0.5')	AOC 22-8 (1.5-2.0)	AOC 22-8 (1.5-2.0) DUP	AOC 22-9 (0-0.5)	AOC 22-9 (1.5-2.0')	AOC 22-10 (0-0.5')	AOC 22-10 (1.5'-2.0')	AOC 22-11 (0-0.5')	AOC 22-11 (1.5'-2.0')	AOC 22-14 (0-0.5')	AOC 22-14 (1.5-2.0')	AOC 22-16 (0-0.5')	AOC 22-16 (1.5-2.0')
Sample Date					4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/14/2009	4/14/2009	4/14/2009	4/14/2009	4/8/2009	4/8/2009	4/13/2009	4/13/2009
Metals (mg/kg)																			
Antimony	1.24E+02	1.24E+02	(1)	mg/Kg	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<13	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Arsenic	1.77E+01	6.54E+01	(2)	mg/Kg	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<13	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Barium	4.35E+03	4.35E+03	(1)	mg/Kg	130	180	150	110	150	170	190	180	160	130	170	160	160	230	130
Beryllium	1.44E+02	1.44E+02	(1)	mg/Kg	0.27	0.39	0.34	0.26	0.3	0.37	0.38	<0.75	0.33	0.28	0.33	0.34	0.35	0.35	0.32
Cadmium	3.09E+02	3.09E+02	(1)	mg/Kg	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.50	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chromium	4.47E+05	4.47E+05	(1)	mg/Kg	9.4	4.8	10	11	11	8	8.1	4.2	9.3	32	27	11	13	16	82
Cobalt	3.00E+02	--	(3)	mg/Kg	2.6	3.7	3.4	3.1	3.5	3.2	3.4	2.2	3.2	2.8	3.3	3	3.3	3.2	2.8
Cyanide	6.19E+03	6.19E+03	(1)	mg/Kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Lead	8.00E+02	--	(3)	mg/Kg	3.5	4.4	4.3	3.9	7.3	3.9	4.1	3.8	4.1	3.4	4	4.5	4.5	4.4	3.6
Mercury	4.99E+01	6.36E+01	(2)	mg/Kg	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	0.042
Nickel	6.19E+03	6.19E+03	(1)	mg/Kg	4	5.7	5	3.8	4.3	5.2	5.5	2.7	4.9	4.1	5.1	4.8	5.1	5.1	5.2
Selenium	1.55E+03	1.55E+03	(1)	mg/Kg	<13	<13	<2.5	<13	<12	<12	<13	<13	<13	<13	<13	<13	<12	<13	<13
Silver	1.55E+03	1.55E+03	(1)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1.3	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Vanadium	1.55E+03	1.55E+03	(1)	mg/Kg	11	16	12	10	12	15	14	<13	13	11	13	12	13	14	13
Zinc	9.29E+04	9.29E+04	(1)	mg/Kg	21	25	25	23	24	24	24	22	24	33	35	24	27	34	75
Volatile Organic Compounds - (EPA Method 8260B) mg/kg																			
1,1,1,2-Tetrachloroethane	1.61E+02	2.78E+03	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	6.43E+04	6.43E+04	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	4.33E+01	5.99E+02	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	9.43E+01	1.24E+03	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	3.50E+02	6.88E+03	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethene	1.83E+03	1.83E+03	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloropropene	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-Trichlorobenzene	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	4.54E+00	3.10E+01	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	4.27E+02	4.27E+02	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene	2.80E+02	--	(3)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane	1.09E+00	2.30E+01	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane (EDB)	3.14E+00	4.86E+01	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	9.71E+03	9.71E+03	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane (EDC)	4.28E+01	7.51E+02	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	8.17E+01	1.17E+02	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene	2.00E+02	--	(3)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichloropropane	2.00E+04	--	(3)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	1.80E+02	3.78E+03	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1-Methylnaphthalene	9.90E+02	--	(4)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,2-Dichloropropane	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Butanone	1.48E+05	1.48E+05	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Chlorotoluene	6.19E+03	6.19E+03	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Hexanone	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	4.10E+03	--	(3)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Chlorotoluene	7.20E+04	--	(3)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Isopropyltoluene	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Acetone	2.63E+05	263000	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	8.54E+01	4.71E+02	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bromobenzene	4.10E+02	--	(3)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	2.92E+01	3.50E+03	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 11
Group 3 Soil Analytical Results Summary - SWMUs No. 4 and 5, AOC 22 (Crude Receiving Rack) and AOC 24
Bloomfield Refinery - Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels 0-2'	Non-Residential Screening Levels 2-10'	Source	Units	AOC 22-7 (0-0.5')	AOC 22-7 (1.5-2.0')	AOC 22-8 (0.0.5')	AOC 22-8 (1.5-2.0)	AOC 22-8 (1.5-2.0) DUP	AOC 22-9 (0-0.5)	AOC 22-9 (1.5-2.0')	AOC 22-10 (0-0.5')	AOC 22-10 (1.5'-2.0')	AOC 22-11 (0-0.5')	AOC 22-11 (1.5'-2.0')	AOC 22-14 (0-0.5')	AOC 22-14 (1.5-2.0')	AOC 22-16 (0-0.5')	AOC 22-16 (1.5-2.0')
Sample Date					4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/14/2009	4/14/2009	4/14/2009	4/14/2009	4/8/2009	4/8/2009	4/13/2009	4/13/2009
Bromoform	2.20E+03	--	(3)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	6.71E+01	6.71E+01	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carbon disulfide	5.89E+03	5.89E+03	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carbon tetrachloride	2.43E+01	1.99E+02	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	1.58E+03	1.58E+03	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chloroethane	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chloroform	3.19E+01	6.71E+02	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chloromethane	1.98E+02	1.13E+03	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-DCE	3.10E+03	3.10E+03	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	1.26E+02	5.10E+02	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	6.13E+01	1.99E+03	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dibromomethane	1.00E+04	--	(3)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane	1.37E+03	1.37E+03	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	3.85E+02	6.63E+03	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hexachlorobutadiene	2.20E+02	--	(3)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Isopropylbenzene	1.03E+04	1.03E+04	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Methyl tert-butyl ether (MTBE)	4.69E+03	6.55E+04	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Methylene chloride	1.09E+03	1.06E+04	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	2.52E+02	7.02E+02	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
n-Butylbenzene	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
n-Propylbenzene	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
sec-Butylbenzene	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Styrene	3.03E+04	30300	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
tert-Butylbenzene	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethene (PCE)	3.64E+01	3.38E+02	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Toluene	2.11E+04	2.11E+04	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
trans-1,2-DCE	8.14E+02	8.14E+02	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	1.26E+02	5.10E+02	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene (TCE)	2.53E+02	4.60E+03	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trichlorofluoromethane	5.82E+03	5.82E+03	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vinyl chloride	2.59E+01	2.48E+02	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Xylenes, Total	3.13E+03	3.13E+03	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Volatile Organic Compounds - (EPA Method 8260B) µg/Kg-dry																			
1,1,1,2-Tetrachloroethane	1.61E+05	2.78E+06	(2)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
1,1,1-Trichloroethane	6.43E+07	6.43E+07	(1)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
1,1,2,2-Tetrachloroethane	4.33E+04	4.33E+04	(2)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
1,1,2-Trichloroethane	9.43E+04	9.43E+04	(2)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
1,1-Dichloroethane	3.50E+05	3.50E+05	(2)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
1,1-Dichloroethene	1.83E+06	1.83E+06	(1)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
1,1-Dichloropropene	--	--		µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
1,2,3-Trichlorobenzene	--	--		µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
1,2,3-Trichloropropane	4.54E+03	3.10E+04	(2)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
1,2,4-Trichlorobenzene	4.27E+05	4.27E+05	(1)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
1,2,4-Trimethylbenzene	2.80E+05	--	(3)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
1,2-Dibromo-3-chloropropane	1.09E+03	2.30E+04	(2)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
1,2-Dibromoethane (EDB)	3.14E+03	4.86E+04	(2)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
1,2-Dichlorobenzene	9.71E+06	9.71E+06	(1)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
1,2-Dichloroethane (EDC)	4.28E+04	7.51E+05	(2)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
1,2-Dichloropropane	8.17E+04	1.17E+05	(2)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
1,3,5-Trimethylbenzene	2.00E+05	--	(3)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24

Table 11
Group 3 Soil Analytical Results Summary - SWMUs No. 4 and 5, AOC 22 (Crude Receiving Rack) and AOC 24
Bloomfield Refinery - Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels 0-2'	Non-Residential Screening Levels 2-10'	Source	Units	AOC 22-7 (0-0.5')	AOC 22-7 (1.5-2.0)	AOC 22-8 (0.0.5')	AOC 22-8 (1.5-2.0)	AOC 22-8 (1.5-2.0) DUP	AOC 22-9 (0-0.5)	AOC 22-9 (1.5-2.0')	AOC 22-10 (0-0.5')	AOC 22-10 (1.5'-2.0')	AOC 22-11 (0-0.5')	AOC 22-11 (1.5'-2.0')	AOC 22-14 (0-0.5')	AOC 22-14 (1.5-2.0')	AOC 22-16 (0-0.5')	AOC 22-16 (1.5-2.0')
Sample Date					4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/14/2009	4/14/2009	4/14/2009	4/14/2009	4/8/2009	4/8/2009	4/13/2009	4/13/2009
1,3-Dichlorobenzene	--	--		µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
1,3-Dichloropropane	2.00E+07	--	(3)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
1,4-Dichlorobenzene	1.80E+05	3.78E+06	(2)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
2,2-Dichloropropane	--	--		µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
2-Butanone	1.48E+08	1.48E+08	(1)	µg/Kg-dry	<4.32	<4.13	<4.01	<4.10	<3.50	<3.71	<3.83	<3.91	<3.58	<4.05	<3.84	<4.92	<3.83	<4.03	<4.94
2-Chlorotoluene	6.19E+06	6.19E+06	(1)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
2-Hexanone	--	--		µg/Kg-dry	<4.32	<4.13	<4.01	<4.10	<3.50	<3.71	<3.83	<3.91	<3.58	<4.05	<3.84	<4.92	<3.83	<4.03	<4.94
4-Chlorotoluene	7.20E+07	--	(3)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
4-Isopropyltoluene	--	--		µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
4-Methyl-2-pentanone	--	--		µg/Kg-dry	<4.32	<4.13	<4.01	<4.10	<3.50	<3.71	<3.83	<3.91	<3.58	<4.05	<3.84	<4.92	<3.83	<4.03	<4.94
Acetone	2.63E+08	2.63E+08	(1)	µg/Kg-dry	<4.32	<4.13	<4.01	<4.10	<3.50	<3.71	<3.83	<3.91	<3.58	<4.05	<3.84	<4.92	<3.83	<4.03	<4.94
Benzene	8.54E+04	4.71E+05	(2)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Bromobenzene	4.10E+05	--	(3)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Bromodichloromethane	2.92E+04	3.50E+06	(1)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Bromoform	2.20E+06	--	(3)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Bromomethane	6.71E+04	6.71E+04	(1)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Carbon disulfide	5.89E+06	5.89E+06	(1)	µg/Kg-dry	<4.32	<4.13	<4.01	<4.10	<3.50	<3.71	<3.83	<3.91	<3.58	<4.05	<3.84	<4.92	<3.83	<4.03	<4.94
Carbon tetrachloride	2.43E+04	1.99E+05	(2)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Chlorobenzene	1.58E+06	1.58E+06	(1)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Chloroethane	--	--		µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Chloroform	3.19E+04	6.71E+05	(2)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Chloromethane	1.98E+05	1.13E+06	(2)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
cis-1,2-DCE	3.10E+06	3.10E+06	(1)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
cis-1,3-Dichloropropene	1.26E+05	5.10E+05	(2)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Dibromochloromethane	6.13E+04	1.99E+06	(2)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Dibromomethane	1.00E+07	--	(3)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Dichlorodifluoromethane	1.37E+06	1.37E+06	(1)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Ethylbenzene	3.85E+05	6.63E+06	(2)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Hexachlorobutadiene	2.20E+05	--	(3)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Isopropylbenzene	1.03E+07	1.03E+07	(1)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Methyl tert-butyl ether (MTBE)	4.69E+06	6.55E+07	(2)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Methylene chloride	1.09E+06	1.06E+07	(2)	µg/Kg-dry	9.29	12.3	3.29	9.01	8.71	8.83	11.1	10.6	9.42	9.64	11.4	<2.46	2.02	8.85	7.26
Naphthalene	2.52E+05	7.02E+05	(2)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
n-Butylbenzene	--	--		µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
n-Propylbenzene	--	--		µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
sec-Butylbenzene	--	--		µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Styrene	3.03E+07	3.03E+07	(1)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
tert-Butylbenzene	--	--		µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Tetrachloroethene (PCE)	3.64E+04	3.38E+05	(2)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Toluene	2.11E+07	2.11E+07	(1)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
trans-1,2-DCE	8.14E+05	8.14E+05	(1)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
trans-1,3-Dichloropropene	1.26E+05	5.10E+05	(2)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Trichloroethene (TCE)	2.53E+05	4.60E+06	(2)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Trichlorofluoromethane	5.82E+06	5.82E+06	(1)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Vinyl chloride	2.59E+04	2.48E+05	(2)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Xylenes, Total	3.13E+06	3.13E+06	(1)	µg/Kg-dry	<1.08	<1.03	<1.00	<1.03	<0.875	<0.929	<0.957	<0.977	<0.896	<1.01	<0.959	<1.23	<0.959	<1.01	<1.24
Semi Volatile Organics - (EPA Method 8270) mg/kg																			
1,2,4-Trichlorobenzene	4.27E+02	4.27E+02	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
1,2-Dichlorobenzene	9.71E+03	9.71E+03	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
1,3-Dichlorobenzene	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20

Table 11
Group 3 Soil Analytical Results Summary - SWMUs No. 4 and 5, AOC 22 (Crude Receiving Rack) and AOC 24
Bloomfield Refinery - Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels 0-2'	Non-Residential Screening Levels 2-10'	Source	Units	AOC 22-7 (0-0.5')	AOC 22-7 (1.5-2.0)	AOC 22-8 (0.0.5')	AOC 22-8 (1.5-2.0)	AOC 22-8 (1.5-2.0) DUP	AOC 22-9 (0-0.5)	AOC 22-9 (1.5-2.0')	AOC 22-10 (0-0.5')	AOC 22-10 (1.5'-2.0')	AOC 22-11 (0-0.5')	AOC 22-11 (1.5'-2.0')	AOC 22-14 (0-0.5')	AOC 22-14 (1.5-2.0')	AOC 22-16 (0-0.5')	AOC 22-16 (1.5-2.0')
Sample Date					4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/14/2009	4/14/2009	4/14/2009	4/14/2009	4/8/2009	4/8/2009	4/13/2009	4/13/2009
1,4-Dichlorobenzene	1.80E+02	3.78E+03	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
2,4,5-Trichlorophenol	2.38E+04	2.38E+04	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
2,4,6-Trichlorophenol	2.38E+02	2.38E+02	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
2,4-Dichlorophenol	7.15E+02	7.15E+02	(1)	mg/Kg	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<2.0	<2.0	<2.0	<2.0	<2.0	<0.40	<0.40
2,4-Dimethylphenol	4.76E+03	4.76E+03	(1)	mg/Kg	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<1.5	<1.5	<1.5	<1.5	<1.5	<0.30	<0.30
2,4-Dinitrophenol	4.76E+02	4.76E+02	(1)	mg/Kg	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<2.0	<2.0	<2.0	<2.0	<2.0	<0.40	<0.40
2,4-Dinitrotoluene	1.03E+02	4.76E+02	(2)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<2.5	<2.5	<2.5	<2.5	<0.50	<0.50
2,6-Dinitrotoluene	2.39E+02	2.39E+02	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<2.5	<2.5	<2.5	<2.5	<0.50	<0.50
2-Chloronaphthalene	2.48E+04	2.48E+04	(1)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1.3	<1.3	<1.3	<1.3	<1.3	<0.25	<0.25
2-Chlorophenol	1.55E+03	1.55E+03	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
2-Methylnaphthalene	4.10E+03	--	(3)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1.3	<1.3	<1.3	<1.3	<1.3	<0.25	<0.25
2-Methylphenol	3.10E+04	--	(3)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<2.5	<2.5	<2.5	<2.5	<0.50	<0.50
2-Nitroaniline	1.80E+03	--	(3)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
2-Nitrophenol	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
3,3'-Dichlorobenzidine	4.26E+01	3.71E+02	(2)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1.3	<1.3	<1.3	<1.3	<1.3	<0.25	<0.25
3+4-Methylphenol	3.10E+03	--	(3)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
3-Nitroaniline	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
4,6-Dinitro-2-methylphenol	--	--		mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<2.5	<2.5	<2.5	<2.5	<0.50	<0.50
4-Bromophenyl phenyl ether	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
4-Chloro-3-methylphenol	--	--		mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<2.5	<2.5	<2.5	<2.5	<0.50	<0.50
4-Chloroaniline	8.60E+01	--	(4)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<2.5	<2.5	<2.5	<2.5	<0.50	<0.50
4-Chlorophenyl phenyl ether	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
4-Nitroaniline	8.60E+02	--	(4)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1.3	<1.3	<1.3	<1.3	<1.3	<0.25	<0.25
4-Nitrophenol	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Acenaphthene	1.86E+04	1.86E+04	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Acenaphthylene	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Aniline	3.00E+03	--	(4)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Anthracene	6.68E+04	6.68E+04	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Azobenzene	2.20E+02	--	(4)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Benz(a)anthracene	2.34E+01	2.13E+02	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Benzo(a)pyrene	2.34E+00	2.13E+01	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Benzo(b)fluoranthene	2.34E+01	2.13E+02	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Benzo(g,h,i)perylene	--	--		mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<2.5	<2.5	<2.5	<2.5	<0.50	<0.50
Benzo(k)fluoranthene	2.34E+02	2.06E+03	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Benzoic acid	2.50E+06	--	(3)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<2.5	<2.5	<2.5	<2.5	<0.50	<0.50
Benzyl alcohol	3.10E+05	--	(3)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Bis(2-chloroethoxy)methane	1.80E+03	--	(3)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Bis(2-chloroethyl)ether	1.36E+01	1.47E+02	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Bis(2-chloroisopropyl)ether	4.54E+02	3.10E+03	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Bis(2-ethylhexyl)phthalate	1.37E+03	4.76E+03	(2)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<2.5	<2.5	<2.5	<2.5	<0.50	<0.50
Butyl benzyl phthalate	9.10E+03	--	(4)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Carbazole	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Chrysene	2.34E+03	2.06E+04	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Dibenz(a,h)anthracene	2.34E+00	2.13E+01	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Dibenzofuran	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Diethyl phthalate	1.91E+05	1.91E+05	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Dimethyl phthalate	2.38E+06	2.38E+06	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Di-n-butyl phthalate	2.38E+04	2.38E+04	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<2.5	<2.5	<2.5	<2.5	<0.50	<0.50
Di-n-octyl phthalate	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Fluoranthene	8.91E+03	8.91E+03	(1)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1.3	<1.3	<1.3	<1.3	<1.3	<0.25	<0.25

Table 11

Group 3 Soil Analytical Results Summary - SWMUs No. 4 and 5, AOC 22 (Crude Receiving Rack) and AOC 24

Bloomfield Refinery - Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels 0-2'	Non-Residential Screening Levels 2-10'	Source	Units	AOC 22-7 (0-0.5')	AOC 22-7 (1.5-2.0)	AOC 22-8 (0.0.5')	AOC 22-8 (1.5-2.0)	AOC 22-8 (1.5-2.0) DUP	AOC 22-9 (0-0.5)	AOC 22-9 (1.5-2.0')	AOC 22-10 (0-0.5')	AOC 22-10 (1.5'-2.0')	AOC 22-11 (0-0.5')	AOC 22-11 (1.5'-2.0')	AOC 22-14 (0-0.5')	AOC 22-14 (1.5-2.0')	AOC 22-16 (0-0.5')	AOC 22-16 (1.5-2.0')
Sample Date					4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/13/2009	4/14/2009	4/14/2009	4/14/2009	4/14/2009	4/8/2009	4/8/2009	4/13/2009	4/13/2009
Fluorene	8.91E+03	8.91E+03	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<2.5	<2.5	<2.5	<2.5	<0.50	<0.50
Hexachlorobenzene	1.20E+01	1.03E+02	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Hexachlorobutadiene	2.20E+02	--	(4)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Hexachlorocyclopentadiene	8.11E+02	8.11E+02	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Hexachloroethane	2.38E+02	2.38E+02	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Indeno(1,2,3-cd)pyrene	2.34E+01	2.13E+02	(2)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1.3	<1.3	<1.3	<1.3	<1.3	<0.25	<0.25
Isophorone	2.02E+04	4.75E+04	(2)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<2.5	<2.5	<2.5	<2.5	<0.50	<0.50
Naphthalene	2.52E+02	7.02E+02	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Nitrobenzene	2.77E+02	5.20E+02	(2)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<2.5	<2.5	<2.5	<2.5	<0.50	<0.50
N-Nitrosodi-n-propylamine	2.50E+00	--	(4)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
N-Nitrosodiphenylamine	3.91E+03	3.40E+04	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Pentachlorophenol	1.00E+02	1.03E+03	(2)	mg/Kg	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<2.0	<2.0	<2.0	<2.0	<2.0	<0.40	<0.40
Phenanthrene	7.15E+03	7.15E+03	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Phenol	6.88E+04	6.88E+04	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Pyrene	6.68E+03	6.68E+03	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20
Pyridine	1.00E+03	--	(3)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5	<2.5	<2.5	<2.5	<2.5	<0.50	<0.50
Total Petroleum Hydrocarbons - (EPA Method 8015B) mg/kg																			
Diesel Range Organics (DRO)	2000	2000	(5)	mg/Kg	<10	<10	120	180	190	46	53	<10	190	34	410	71	670	24	1000
Gasoline Range Organics (GRO)	2000	2000	(5)	mg/Kg	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Motor Oil Range Organics (MRO)	5000	5000	(6)	mg/Kg	<50	<50	220	510	580	110	120	<50	620	74	1100	350	1800	67	1200

-- No screening level or analytical result available

NMED - Technical Background Document for Development of Soil Screening Levels - Revision 5.0 (August 2009) - Residential Soil

EPA - Regional Screening Levels (April 2009)

(1) NMED - Construction Worker (0-10')

(2) NMED - Industrial (0-2') and Construction Worker (2-10')

(3) EPA - Industrial Soil (0-2')

(4) EPA - Regional Screening Levels (April 2009) Industrial Soil multiplied by 10 pursuant to Provision VII.B. of the July 7, 2007 NMED Order because the constituent is listed as carcinogenic & EPA screening level based on 10-6 risk-based SSL

(5) NMED Oct. 2006 TPH Screening Guidelines - Unknown oil for industrial exposure via vapor migration and inhalation of ground water

(6) NMED Oct. 2006 TPH Screening Guidelines - Waste oil for industrial exposure via vapor migration and inhalation of ground water

Table 11
Group 3 Soil Analytical Results Summary - SWMUs No. 4 and 5, AOC 22 (Crude Receiving Rack) and AOC 24
Bloomfield Refinery - Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels 0-2'	Non-Residential Screening Levels 2-10'	Source	Units	AOC 22-16 (36-38')[1]	AOC 24-1 (0-0.5')	AOC 24-1 (1.5-2.0')	AOC 24-2 (0.0.5')	AOC 24-2 (1.5-2.0')	AOC 24-3 (0-0.5')	AOC 24-3 (1.5-2.0')	AOC 24-4 (0-0.5')	AOC 24-4 (1.5-2.0')	AOC 24-4 (1.5-2.0') DUP	AOC 24-5 (0-0.5')	AOC 24-5 (0-0.5') DUP	AOC 24-5 (1.5-2.0')	AOC 24-6 (0.0.5')	AOC 24-6 (1.5-2.0')
Sample Date					4/14/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/8/2009	4/8/2009	4/8/2009	4/8/2009	4/8/2009
Metals (mg/kg)																			
Antimony	1.24E+02	1.24E+02	(1)	mg/Kg	<2.5	<13	<13	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<13	<13	<2.5	<13	<13	<13
Arsenic	1.77E+01	6.54E+01	(2)	mg/Kg	<2.5	<13	<13	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<13	<13	<2.5	<2.5	<13	<13
Barium	4.35E+03	4.35E+03	(1)	mg/Kg	220	230	180	220	160	170	130	230	200	190	160	170	140	180	160
Beryllium	1.44E+02	1.44E+02	(1)	mg/Kg	<0.15	<0.75	<0.75	0.28	0.3	0.18	0.16	0.27	0.31	<0.75	<0.75	0.28	<0.75	<0.75	<0.75
Cadmium	3.09E+02	3.09E+02	(1)	mg/Kg	<0.10	<0.50	<0.50	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.50	<0.50	<0.10	<0.50	<0.50	<0.50
Chromium	4.47E+05	4.47E+05	(1)	mg/Kg	2.7	6.6	6.3	4.7	3.8	2.8	3.1	11	4.1	6.4	11	9.4	6.2	12	23
Cobalt	3.00E+02	--	(3)	mg/Kg	2	3.8	4.7	2.9	2.8	2.4	2.1	2.9	3.2	4.8	4.7	4.4	4.2	5	4.8
Cyanide	6.19E+03	6.19E+03	(1)	mg/Kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Lead	8.00E+02	--	(3)	mg/Kg	1.8	4.8	6	3.1	3.5	1.6	1.4	3.3	3.3	4.9	5.8	4.7	5.1	6.1	6
Mercury	4.99E+01	6.36E+01	(2)	mg/Kg	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Nickel	6.19E+03	6.19E+03	(1)	mg/Kg	1.7	5.9	7.4	3.9	4.6	2.5	2.1	3.6	4.5	6.2	5.3	4.4	6.2	7.2	7
Selenium	1.55E+03	1.55E+03	(1)	mg/Kg	<2.5	<13	<13	<13	<13	<13	<13	<13	<13	<13	<13	<2.5	<13	<13	<13
Silver	1.55E+03	1.55E+03	(1)	mg/Kg	<0.25	<1.3	<1.3	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1.3	<1.3	<0.25	<1.3	<1.3	<1.3
Vanadium	1.55E+03	1.55E+03	(1)	mg/Kg	12	18	24	15	12	13	14	15	12	17	15	13	15	18	16
Zinc	9.29E+04	9.29E+04	(1)	mg/Kg	12	29	33	20	18	14	12	24	18	27	40	36	28	35	40
Volatile Organic Compounds - (EPA Method 8260B) mg/kg																			
1,1,1,2-Tetrachloroethane	1.61E+02	2.78E+03	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	6.43E+04	6.43E+04	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	4.33E+01	5.99E+02	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	9.43E+01	1.24E+03	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	3.50E+02	6.88E+03	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethene	1.83E+03	1.83E+03	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloropropene	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-Trichlorobenzene	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	4.54E+00	3.10E+01	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	4.27E+02	4.27E+02	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene	2.80E+02	--	(3)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane	1.09E+00	2.30E+01	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane (EDB)	3.14E+00	4.86E+01	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	9.71E+03	9.71E+03	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane (EDC)	4.28E+01	7.51E+02	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	8.17E+01	1.17E+02	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene	2.00E+02	--	(3)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichloropropane	2.00E+04	--	(3)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	1.80E+02	3.78E+03	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1-Methylnaphthalene	9.90E+02	--	(4)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,2-Dichloropropane	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Butanone	1.48E+05	1.48E+05	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Chlorotoluene	6.19E+03	6.19E+03	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Hexanone	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	4.10E+03	--	(3)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Chlorotoluene	7.20E+04	--	(3)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Isopropyltoluene	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Acetone	2.63E+05	263000	(1)	mg/Kg	<0.75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	8.54E+01	4.71E+02	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bromobenzene	4.10E+02	--	(3)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	2.92E+01	3.50E+03	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 11
Group 3 Soil Analytical Results Summary - SWMUs No. 4 and 5, AOC 22 (Crude Receiving Rack) and AOC 24
Bloomfield Refinery - Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels 0-2'	Non-Residential Screening Levels 2-10'	Source	Units	AOC 22-16 (36-38') [1]	AOC 24-1 (0-0.5')	AOC 24-1 (1.5-2.0')	AOC 24-2 (0.0.5')	AOC 24-2 (1.5-2.0')	AOC 24-3 (0-0.5')	AOC 24-3 (1.5-2.0')	AOC 24-4 (0-0.5')	AOC 24-4 (1.5-2.0')	AOC 24-4 (1.5-2.0') DUP	AOC 24-5 (0-0.5')	AOC 24-5 (0-0.5') DUP	AOC 24-5 (1.5-2.0')	AOC 24-6 (0.0.5')	AOC 24-6 (1.5-2.0')
Sample Date					4/14/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/8/2009	4/8/2009	4/8/2009	4/8/2009	4/8/2009
Bromoform	2.20E+03	--	(3)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	6.71E+01	6.71E+01	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carbon disulfide	5.89E+03	5.89E+03	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carbon tetrachloride	2.43E+01	1.99E+02	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	1.58E+03	1.58E+03	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chloroethane	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chloroform	3.19E+01	6.71E+02	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chloromethane	1.98E+02	1.13E+03	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-DCE	3.10E+03	3.10E+03	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	1.26E+02	5.10E+02	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	6.13E+01	1.99E+03	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dibromomethane	1.00E+04	--	(3)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane	1.37E+03	1.37E+03	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	3.85E+02	6.63E+03	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hexachlorobutadiene	2.20E+02	--	(3)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Isopropylbenzene	1.03E+04	1.03E+04	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Methyl tert-butyl ether (MTBE)	4.69E+03	6.55E+04	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Methylene chloride	1.09E+03	1.06E+04	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	2.52E+02	7.02E+02	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
n-Butylbenzene	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
n-Propylbenzene	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
sec-Butylbenzene	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Styrene	3.03E+04	30300	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
tert-Butylbenzene	--	--		mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethene (PCE)	3.64E+01	3.38E+02	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Toluene	2.11E+04	2.11E+04	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
trans-1,2-DCE	8.14E+02	8.14E+02	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	1.26E+02	5.10E+02	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene (TCE)	2.53E+02	4.60E+03	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trichlorofluoromethane	5.82E+03	5.82E+03	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vinyl chloride	2.59E+01	2.48E+02	(2)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Xylenes, Total	3.13E+03	3.13E+03	(1)	mg/Kg	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Volatile Organic Compounds - (EPA Method 8260B) µg/Kg-dry																			
1,1,1,2-Tetrachloroethane	1.61E+05	2.78E+06	(2)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
1,1,1-Trichloroethane	6.43E+07	6.43E+07	(1)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
1,1,2,2-Tetrachloroethane	4.33E+04	4.33E+04	(2)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
1,1,2-Trichloroethane	9.43E+04	9.43E+04	(2)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
1,1-Dichloroethane	3.50E+05	3.50E+05	(2)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
1,1-Dichloroethene	1.83E+06	1.83E+06	(1)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
1,1-Dichloropropene	--	--		µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
1,2,3-Trichlorobenzene	--	--		µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
1,2,3-Trichloropropane	4.54E+03	3.10E+04	(2)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
1,2,4-Trichlorobenzene	4.27E+05	4.27E+05	(1)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
1,2,4-Trimethylbenzene	2.80E+05	--	(3)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
1,2-Dibromo-3-chloropropane	1.09E+03	2.30E+04	(2)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
1,2-Dibromoethane (EDB)	3.14E+03	4.86E+04	(2)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
1,2-Dichlorobenzene	9.71E+06	9.71E+06	(1)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
1,2-Dichloroethane (EDC)	4.28E+04	7.51E+05	(2)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
1,2-Dichloropropane	8.17E+04	1.17E+05	(2)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
1,3,5-Trimethylbenzene	2.00E+05	--	(3)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923

Table 11
Group 3 Soil Analytical Results Summary - SWMUs No. 4 and 5, AOC 22 (Crude Receiving Rack) and AOC 24
Bloomfield Refinery - Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels 0-2'	Non-Residential Screening Levels 2-10'	Source	Units	AOC 22-16 (36-38')¹	AOC 24-1 (0-0.5')	AOC 24-1 (1.5-2.0')	AOC 24-2 (0-0.5')	AOC 24-2 (1.5-2.0')	AOC 24-3 (0-0.5')	AOC 24-3 (1.5-2.0')	AOC 24-4 (0-0.5')	AOC 24-4 (1.5-2.0')	AOC 24-4 (1.5-2.0') DUP	AOC 24-5 (0-0.5')	AOC 24-5 (0-0.5') DUP	AOC 24-5 (1.5-2.0')	AOC 24-6 (0.0.5')	AOC 24-6 (1.5-2.0')
Sample Date					4/14/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/8/2009	4/8/2009	4/8/2009	4/8/2009	4/8/2009
1,3-Dichlorobenzene	--	--		µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
1,3-Dichloropropane	2.00E+07	--	(3)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
1,4-Dichlorobenzene	1.80E+05	3.78E+06	(2)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
2,2-Dichloropropane	--	--		µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
2-Butanone	1.48E+08	1.48E+08	(1)	µg/Kg-dry	<3.86	<3.96	<3.95	<3.89	<4.03	<3.91	<3.81	<3.76	<3.78	<3.84	<3.59	<4.17	<4.36	<4.11	<3.69
2-Chlorotoluene	6.19E+06	6.19E+06	(1)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
2-Hexanone	--	--		µg/Kg-dry	<3.86	<3.96	<3.95	<3.89	<4.03	<3.91	<3.81	<3.76	<3.78	<3.84	<3.59	<4.17	<4.36	<4.11	<3.69
4-Chlorotoluene	7.20E+07	--	(3)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
4-Isopropyltoluene	--	--		µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
4-Methyl-2-pentanone	--	--		µg/Kg-dry	<3.86	<3.96	<3.95	<3.89	<4.03	<3.91	<3.81	<3.76	<3.78	<3.84	<3.59	<4.17	<4.36	<4.11	<3.69
Acetone	2.63E+08	2.63E+08	(1)	µg/Kg-dry	--	4.94	<3.95	5.76	4.65	4.57	4.81	4.92	5.19	6.95	<3.59	<4.17	<4.36	<4.11	<3.69
Benzene	8.54E+04	4.71E+05	(2)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Bromobenzene	4.10E+05	--	(3)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Bromodichloromethane	2.92E+04	3.50E+06	(1)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Bromoform	2.20E+06	--	(3)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Bromomethane	6.71E+04	6.71E+04	(1)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Carbon disulfide	5.89E+06	5.89E+06	(1)	µg/Kg-dry	<3.86	<3.96	<3.95	<3.89	<4.03	<3.91	<3.81	<3.76	<3.78	<3.84	<3.59	<4.17	<4.36	<4.11	<3.69
Carbon tetrachloride	2.43E+04	1.99E+05	(2)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Chlorobenzene	1.58E+06	1.58E+06	(1)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Chloroethane	--	--		µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Chloroform	3.19E+04	6.71E+05	(2)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Chloromethane	1.98E+05	1.13E+06	(2)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
cis-1,2-DCE	3.10E+06	3.10E+06	(1)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
cis-1,3-Dichloropropene	1.26E+05	5.10E+05	(2)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Dibromochloromethane	6.13E+04	1.99E+06	(2)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Dibromomethane	1.00E+07	--	(3)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Dichlorodifluoromethane	1.37E+06	1.37E+06	(1)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Ethylbenzene	3.85E+05	6.63E+06	(2)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Hexachlorobutadiene	2.20E+05	--	(3)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Isopropylbenzene	1.03E+07	1.03E+07	(1)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Methyl tert-butyl ether (MTBE)	4.69E+06	6.55E+07	(2)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Methylene chloride	1.09E+06	1.06E+07	(2)	µg/Kg-dry	13.2	2.59	2.77	3.11	4.46	2.13	<1.90	3.48	5.49	3.85	2.42	<2.09	2.18	<2.05	<1.85
Naphthalene	2.52E+05	7.02E+05	(2)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
n-Butylbenzene	--	--		µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
n-Propylbenzene	--	--		µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
sec-Butylbenzene	--	--		µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Styrene	3.03E+07	3.03E+07	(1)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
tert-Butylbenzene	--	--		µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Tetrachloroethene (PCE)	3.64E+04	3.38E+05	(2)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Toluene	2.11E+07	2.11E+07	(1)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
trans-1,2-DCE	8.14E+05	8.14E+05	(1)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
trans-1,3-Dichloropropene	1.26E+05	5.10E+05	(2)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Trichloroethene (TCE)	2.53E+05	4.60E+06	(2)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Trichlorofluoromethane	5.82E+06	5.82E+06	(1)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Vinyl chloride	2.59E+04	2.48E+05	(2)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Xylenes, Total	3.13E+06	3.13E+06	(1)	µg/Kg-dry	<0.965	<0.989	<0.987	<0.973	<1.01	<0.977	<0.951	<0.941	<0.946	<0.961	<0.898	<1.04	<1.09	<1.03	<0.923
Semi Volatile Organics - (EPA Method 8270) mg/kg																			
1,2,4-Trichlorobenzene	4.27E+02	4.27E+02	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
1,2-Dichlorobenzene	9.71E+03	9.71E+03	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
1,3-Dichlorobenzene	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0

Table 11
Group 3 Soil Analytical Results Summary - SWMUs No. 4 and 5, AOC 22 (Crude Receiving Rack) and AOC 24
Bloomfield Refinery - Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels 0-2'	Non-Residential Screening Levels 2-10'	Source	Units	AOC 22-16 (36-38') [1]	AOC 24-1 (0-0.5')	AOC 24-1 (1.5-2.0')	AOC 24-2 (0.0.5')	AOC 24-2 (1.5-2.0')	AOC 24-3 (0-0.5')	AOC 24-3 (1.5-2.0')	AOC 24-4 (0-0.5')	AOC 24-4 (1.5-2.0')	AOC 24-4 (1.5-2.0') DUF	AOC 24-5 (0-0.5')	AOC 24-5 (0-0.5') DUP	AOC 24-5 (1.5-2.0')	AOC 24-6 (0.0.5')	AOC 24-6 (1.5-2.0')
Sample Date					4/14/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/8/2009	4/8/2009	4/8/2009	4/8/2009	4/8/2009
1,4-Dichlorobenzene	1.80E+02	3.78E+03	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
2,4,5-Trichlorophenol	2.38E+04	2.38E+04	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
2,4,6-Trichlorophenol	2.38E+02	2.38E+02	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
2,4-Dichlorophenol	7.15E+02	7.15E+02	(1)	mg/Kg	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<2.0
2,4-Dimethylphenol	4.76E+03	4.76E+03	(1)	mg/Kg	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<1.5
2,4-Dinitrophenol	4.76E+02	4.76E+02	(1)	mg/Kg	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<2.0
2,4-Dinitrotoluene	1.03E+02	4.76E+02	(2)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5
2,6-Dinitrotoluene	2.39E+02	2.39E+02	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5
2-Chloronaphthalene	2.48E+04	2.48E+04	(1)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1.3
2-Chlorophenol	1.55E+03	1.55E+03	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
2-Methylnaphthalene	4.10E+03	--	(3)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1.3
2-Methylphenol	3.10E+04	--	(3)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5
2-Nitroaniline	1.80E+03	--	(3)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
2-Nitrophenol	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
3,3´-Dichlorobenzidine	4.26E+01	3.71E+02	(2)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1.3
3+4-Methylphenol	3.10E+03	--	(3)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
3-Nitroaniline	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
4,6-Dinitro-2-methylphenol	--	--		mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5
4-Bromophenyl phenyl ether	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
4-Chloro-3-methylphenol	--	--		mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5
4-Chloroaniline	8.60E+01	--	(4)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5
4-Chlorophenyl phenyl ether	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
4-Nitroaniline	8.60E+02	--	(4)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1.3
4-Nitrophenol	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Acenaphthene	1.86E+04	1.86E+04	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Acenaphthylene	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Aniline	3.00E+03	--	(4)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Anthracene	6.68E+04	6.68E+04	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Azobenzene	2.20E+02	--	(4)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Benz(a)anthracene	2.34E+01	2.13E+02	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Benzo(a)pyrene	2.34E+00	2.13E+01	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Benzo(b)fluoranthene	2.34E+01	2.13E+02	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Benzo(g,h,i)perylene	--	--		mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5
Benzo(k)fluoranthene	2.34E+02	2.06E+03	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Benzoic acid	2.50E+06	--	(3)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5
Benzyl alcohol	3.10E+05	--	(3)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Bis(2-chloroethoxy)methane	1.80E+03	--	(3)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Bis(2-chloroethyl)ether	1.36E+01	1.47E+02	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Bis(2-chloroisopropyl)ether	4.54E+02	3.10E+03	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Bis(2-ethylhexyl)phthalate	1.37E+03	4.76E+03	(2)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5
Butyl benzyl phthalate	9.10E+03	--	(4)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Carbazole	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Chrysene	2.34E+03	2.06E+04	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Dibenz(a,h)anthracene	2.34E+00	2.13E+01	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Dibenzofuran	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Diethyl phthalate	1.91E+05	1.91E+05	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Dimethyl phthalate	2.38E+06	2.38E+06	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Di-n-butyl phthalate	2.38E+04	2.38E+04	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5
Di-n-octyl phthalate	--	--		mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Fluoranthene	8.91E+03	8.91E+03	(1)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1.3

Table 11
Group 3 Soil Analytical Results Summary - SWMUs No. 4 and 5, AOC 22 (Crude Receiving Rack) and AOC 24
Bloomfield Refinery - Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels 0-2'	Non-Residential Screening Levels 2-10'	Source	Units	AOC 22-16 (36-38')^1	AOC 24-1 (0-0.5')	AOC 24-1 (1.5-2.0')	AOC 24-2 (0.0.5')	AOC 24-2 (1.5-2.0')	AOC 24-3 (0-0.5')	AOC 24-3 (1.5-2.0')	AOC 24-4 (0-0.5')	AOC 24-4 (1.5-2.0')	AOC 24-4 (1.5-2.0') DUP	AOC 24-5 (0-0.5')	AOC 24-5 (0-0.5') DUP	AOC 24-5 (1.5-2.0')	AOC 24-6 (0.0.5')	AOC 24-6 (1.5-2.0')
Sample Date					4/14/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/23/2009	4/8/2009	4/8/2009	4/8/2009	4/8/2009	4/8/2009
Fluorene	8.91E+03	8.91E+03	(1)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5
Hexachlorobenzene	1.20E+01	1.03E+02	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Hexachlorobutadiene	2.20E+02	--	(4)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Hexachlorocyclopentadiene	8.11E+02	8.11E+02	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Hexachloroethane	2.38E+02	2.38E+02	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Indeno(1,2,3-cd)pyrene	2.34E+01	2.13E+02	(2)	mg/Kg	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<1.3
Isophorone	2.02E+04	4.75E+04	(2)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5
Naphthalene	2.52E+02	7.02E+02	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Nitrobenzene	2.77E+02	5.20E+02	(2)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5
N-Nitrosodi-n-propylamine	2.50E+00	--	(4)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
N-Nitrosodiphenylamine	3.91E+03	3.40E+04	(2)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Pentachlorophenol	1.00E+02	1.03E+03	(2)	mg/Kg	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<2.0
Phenanthrene	7.15E+03	7.15E+03	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Phenol	6.88E+04	6.88E+04	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Pyrene	6.68E+03	6.68E+03	(1)	mg/Kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<1.0
Pyridine	1.00E+03	--	(3)	mg/Kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<2.5
Total Petroleum Hydrocarbons - (EPA Method 8015B) mg/kg																			
Diesel Range Organics (DRO)	2000	2000	(5)	mg/Kg	18	28	<10	22	<10	<10	<10	130	<10	<10	360	330	12	20	1400
Gasoline Range Organics (GRO)	2000	2000	(5)	mg/Kg	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Motor Oil Range Organics (MRO)	5000	5000	(6)	mg/Kg	59	140	<50	76	<50	<50	<50	240	<50	<50	670	610	99	72	2200

-- No screening level or analytical result available

NMED - Technical Background Document for Development of Soil Screening Levels - Revision 5.0 (August 2009) - Residential Soil

EPA - Regional Screening Levels (April 2009)

(1) NMED - Construction Worker (0-10')

(2) NMED - Industrial (0-2') and Construction Worker (2-10')

(3) EPA - Industrial Soil (0-2')

(4) EPA - Regional Screening Levels (April 2009) Industrial Soil multiplied by 10 pursuant to Provision VII.B. of the July 7, 2007 NMED Order because the constituent is listed as carcinogenic & EPA screening level based on 10-6 risk-based SSL

(5) NMED Oct. 2006 TPH Screening Guidelines - Unknown oil for industrial exposure via vapor migration and inhalation of ground water

(6) NMED Oct. 2006 TPH Screening Guidelines - Waste oil for industrial exposure via vapor migration and inhalation of ground water

Table 11
Group 3 Soil Analytical Results Summary - SWMUs No. 4 and 5, AOC 22 (Crude Receiving Rack) and AOC 24
Bloomfield Refinery - Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels 0-2'	Non-Residential Screening Levels 2-10'	Source	Units	AOC 24-7 (0-0.5')	AOC 24-7 (1.5-2.0')	AOC 24-7 (39-42')
Sample Date					4/7/2009	4/7/2009	4/7/2009
Metals (mg/kg)							
Antimony	1.24E+02	1.24E+02	(1)	mg/Kg	<13	<13	<2.5
Arsenic	1.77E+01	6.54E+01	(2)	mg/Kg	<13	<13	<2.5
Barium	4.35E+03	4.35E+03	(1)	mg/Kg	210	150	530
Beryllium	1.44E+02	1.44E+02	(1)	mg/Kg	<0.75	<0.75	<0.15
Cadmium	3.09E+02	3.09E+02	(1)	mg/Kg	<0.50	<0.50	<0.10
Chromium	4.47E+05	4.47E+05	(1)	mg/Kg	38	54	4
Cobalt	3.00E+02	--	(3)	mg/Kg	4.9	4.4	2.4
Cyanide	6.19E+03	6.19E+03	(1)	mg/Kg	<0.5	<0.5	<0.5
Lead	8.00E+02	--	(3)	mg/Kg	7.2	5.1	0.84
Mercury	4.99E+01	6.36E+01	(2)	mg/Kg	<0.033	<0.033	<0.032
Nickel	6.19E+03	6.19E+03	(1)	mg/Kg	6.8	5.8	1.6
Selenium	1.55E+03	1.55E+03	(1)	mg/Kg	<13	<13	<2.5
Silver	1.55E+03	1.55E+03	(1)	mg/Kg	<1.3	<1.3	<0.25
Vanadium	1.55E+03	1.55E+03	(1)	mg/Kg	17	15	11
Zinc	9.29E+04	9.29E+04	(1)	mg/Kg	52	48	15
Volatile Organic Compounds - (EPA Method 8260B) mg/kg							
1,1,1,2-Tetrachloroethane	1.61E+02	2.78E+03	(2)	mg/Kg	--	--	--
1,1,1-Trichloroethane	6.43E+04	6.43E+04	(1)	mg/Kg	--	--	--
1,1,2,2-Tetrachloroethane	4.33E+01	5.99E+02	(2)	mg/Kg	--	--	--
1,1,2-Trichloroethane	9.43E+01	1.24E+03	(2)	mg/Kg	--	--	--
1,1-Dichloroethane	3.50E+02	6.88E+03	(2)	mg/Kg	--	--	--
1,1-Dichloroethene	1.83E+03	1.83E+03	(1)	mg/Kg	--	--	--
1,1-Dichloropropene	--	--		mg/Kg	--	--	--
1,2,3-Trichlorobenzene	--	--		mg/Kg	--	--	--
1,2,3-Trichloropropane	4.54E+00	3.10E+01	(2)	mg/Kg	--	--	--
1,2,4-Trichlorobenzene	4.27E+02	4.27E+02	(1)	mg/Kg	--	--	--
1,2,4-Trimethylbenzene	2.80E+02	--	(3)	mg/Kg	--	--	--
1,2-Dibromo-3-chloropropane	1.09E+00	2.30E+01	(2)	mg/Kg	--	--	--
1,2-Dibromoethane (EDB)	3.14E+00	4.86E+01	(2)	mg/Kg	--	--	--
1,2-Dichlorobenzene	9.71E+03	9.71E+03	(1)	mg/Kg	--	--	--
1,2-Dichloroethane (EDC)	4.28E+01	7.51E+02	(2)	mg/Kg	--	--	--
1,2-Dichloropropane	8.17E+01	1.17E+02	(2)	mg/Kg	--	--	--
1,3,5-Trimethylbenzene	2.00E+02	--	(3)	mg/Kg	--	--	--
1,3-Dichlorobenzene	--	--		mg/Kg	--	--	--
1,3-Dichloropropane	2.00E+04	--	(3)	mg/Kg	--	--	--
1,4-Dichlorobenzene	1.80E+02	3.78E+03	(2)	mg/Kg	--	--	--
1-Methylnaphthalene	9.90E+02	--	(4)	mg/Kg	--	--	--
2,2-Dichloropropane	--	--		mg/Kg	--	--	--
2-Butanone	1.48E+05	1.48E+05	(1)	mg/Kg	--	--	--
2-Chlorotoluene	6.19E+03	6.19E+03	(1)	mg/Kg	--	--	--
2-Hexanone	--	--		mg/Kg	--	--	--
2-Methylnaphthalene	4.10E+03	--	(3)	mg/Kg	--	--	--
4-Chlorotoluene	7.20E+04	--	(3)	mg/Kg	--	--	--
4-Isopropyltoluene	--	--		mg/Kg	--	--	--
4-Methyl-2-pentanone	--	--		mg/Kg	--	--	--
Acetone	2.63E+05	263000	(1)	mg/Kg	--	--	--
Benzene	8.54E+01	4.71E+02	(2)	mg/Kg	--	--	--
Bromobenzene	4.10E+02	--	(3)	mg/Kg	--	--	--
Bromodichloromethane	2.92E+01	3.50E+03	(2)	mg/Kg	--	--	--

Table 11

Group 3 Soil Analytical Results Summary - SWMUs No. 4 and 5, AOC 22 (Crude Receiving Rack) and AOC 24

Bloomfield Refinery - Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels 0-2'	Non-Residential Screening Levels 2-10'	Source	Units	AOC 24-7 (0-0.5')	AOC 24-7 (1.5-2.0')	AOC 24-7 (39-42')
Sample Date					4/7/2009	4/7/2009	4/7/2009
Bromoform	2.20E+03	--	(3)	mg/Kg	--	--	--
Bromomethane	6.71E+01	6.71E+01	(1)	mg/Kg	--	--	--
Carbon disulfide	5.89E+03	5.89E+03	(1)	mg/Kg	--	--	--
Carbon tetrachloride	2.43E+01	1.99E+02	(2)	mg/Kg	--	--	--
Chlorobenzene	1.58E+03	1.58E+03	(1)	mg/Kg	--	--	--
Chloroethane	--	--		mg/Kg	--	--	--
Chloroform	3.19E+01	6.71E+02	(2)	mg/Kg	--	--	--
Chloromethane	1.98E+02	1.13E+03	(2)	mg/Kg	--	--	--
cis-1,2-DCE	3.10E+03	3.10E+03	(1)	mg/Kg	--	--	--
cis-1,3-Dichloropropene	1.26E+02	5.10E+02	(2)	mg/Kg	--	--	--
Dibromochloromethane	6.13E+01	1.99E+03	(2)	mg/Kg	--	--	--
Dibromomethane	1.00E+04	--	(3)	mg/Kg	--	--	--
Dichlorodifluoromethane	1.37E+03	1.37E+03	(1)	mg/Kg	--	--	--
Ethylbenzene	3.85E+02	6.63E+03	(2)	mg/Kg	--	--	--
Hexachlorobutadiene	2.20E+02	--	(3)	mg/Kg	--	--	--
Isopropylbenzene	1.03E+04	1.03E+04	(1)	mg/Kg	--	--	--
Methyl tert-butyl ether (MTBE)	4.69E+03	6.55E+04	(2)	mg/Kg	--	--	--
Methylene chloride	1.09E+03	1.06E+04	(2)	mg/Kg	--	--	--
Naphthalene	2.52E+02	7.02E+02	(2)	mg/Kg	--	--	--
n-Butylbenzene	--	--		mg/Kg	--	--	--
n-Propylbenzene	--	--		mg/Kg	--	--	--
sec-Butylbenzene	--	--		mg/Kg	--	--	--
Styrene	3.03E+04	30300	(1)	mg/Kg	--	--	--
tert-Butylbenzene	--	--		mg/Kg	--	--	--
Tetrachloroethene (PCE)	3.64E+01	3.38E+02	(2)	mg/Kg	--	--	--
Toluene	2.11E+04	2.11E+04	(1)	mg/Kg	--	--	--
trans-1,2-DCE	8.14E+02	8.14E+02	(1)	mg/Kg	--	--	--
trans-1,3-Dichloropropene	1.26E+02	5.10E+02	(2)	mg/Kg	--	--	--
Trichloroethene (TCE)	2.53E+02	4.60E+03	(2)	mg/Kg	--	--	--
Trichlorofluoromethane	5.82E+03	5.82E+03	(1)	mg/Kg	--	--	--
Vinyl chloride	2.59E+01	2.48E+02	(2)	mg/Kg	--	--	--
Xylenes, Total	3.13E+03	3.13E+03	(1)	mg/Kg	--	--	--
Volatile Organic Compounds - (EPA Method 8260B) µg/Kg-dry							
1,1,1,2-Tetrachloroethane	1.61E+05	2.78E+06	(2)	µg/Kg-dry	<1.04	<1.01	<1.07
1,1,1-Trichloroethane	6.43E+07	6.43E+07	(1)	µg/Kg-dry	<1.04	<1.01	<1.07
1,1,2,2-Tetrachloroethane	4.33E+04	4.33E+04	(2)	µg/Kg-dry	<1.04	<1.01	<1.07
1,1,2-Trichloroethane	9.43E+04	9.43E+04	(2)	µg/Kg-dry	<1.04	<1.01	<1.07
1,1-Dichloroethane	3.50E+05	3.50E+05	(2)	µg/Kg-dry	<1.04	<1.01	<1.07
1,1-Dichloroethene	1.83E+06	1.83E+06	(1)	µg/Kg-dry	<1.04	<1.01	<1.07
1,1-Dichloropropene	--	--		µg/Kg-dry	<1.04	<1.01	<1.07
1,2,3-Trichlorobenzene	--	--		µg/Kg-dry	<1.04	<1.01	<1.07
1,2,3-Trichloropropane	4.54E+03	3.10E+04	(2)	µg/Kg-dry	<1.04	<1.01	<1.07
1,2,4-Trichlorobenzene	4.27E+05	4.27E+05	(1)	µg/Kg-dry	<1.04	<1.01	<1.07
1,2,4-Trimethylbenzene	2.80E+05	--	(3)	µg/Kg-dry	<1.04	<1.01	<1.07
1,2-Dibromo-3-chloropropane	1.09E+03	2.30E+04	(2)	µg/Kg-dry	<1.04	<1.01	<1.07
1,2-Dibromoethane (EDB)	3.14E+03	4.86E+04	(2)	µg/Kg-dry	<1.04	<1.01	<1.07
1,2-Dichlorobenzene	9.71E+06	9.71E+06	(1)	µg/Kg-dry	<1.04	<1.01	<1.07
1,2-Dichloroethane (EDC)	4.28E+04	7.51E+05	(2)	µg/Kg-dry	<1.04	<1.01	<1.07
1,2-Dichloropropane	8.17E+04	1.17E+05	(2)	µg/Kg-dry	<1.04	<1.01	<1.07
1,3,5-Trimethylbenzene	2.00E+05	--	(3)	µg/Kg-dry	<1.04	<1.01	<1.07

Table 11
Group 3 Soil Analytical Results Summary - SWMUs No. 4 and 5, AOC 22 (Crude Receiving Rack) and AOC 24
Bloomfield Refinery - Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels 0-2'	Non-Residential Screening Levels 2-10'	Source	Units	AOC 24-7 (0-0.5')	AOC 24-7 (1.5-2.0')	AOC 24-7 (39-42')
Sample Date					4/7/2009	4/7/2009	4/7/2009
1,3-Dichlorobenzene	--	--		µg/Kg-dry	<1.04	<1.01	<1.07
1,3-Dichloropropane	2.00E+07	--	(3)	µg/Kg-dry	<1.04	<1.01	<1.07
1,4-Dichlorobenzene	1.80E+05	3.78E+06	(2)	µg/Kg-dry	<1.04	<1.01	<1.07
2,2-Dichloropropane	--	--		µg/Kg-dry	<1.04	<1.01	<1.07
2-Butanone	1.48E+08	1.48E+08	(1)	µg/Kg-dry	<4.16	<4.06	<4.29
2-Chlorotoluene	6.19E+06	6.19E+06	(1)	µg/Kg-dry	<1.04	<1.01	<1.07
2-Hexanone	--	--		µg/Kg-dry	<4.16	<4.06	<4.29
4-Chlorotoluene	7.20E+07	--	(3)	µg/Kg-dry	<1.04	<1.01	<1.07
4-Isopropyltoluene	--	--		µg/Kg-dry	<1.04	<1.01	<1.07
4-Methyl-2-pentanone	--	--		µg/Kg-dry	<4.16	<4.06	<4.29
Acetone	2.63E+08	2.63E+08	(1)	µg/Kg-dry	<4.16	<4.06	7.8
Benzene	8.54E+04	4.71E+05	(2)	µg/Kg-dry	<1.04	<1.01	<1.07
Bromobenzene	4.10E+05	--	(3)	µg/Kg-dry	<1.04	<1.01	<1.07
Bromodichloromethane	2.92E+04	3.50E+06	(1)	µg/Kg-dry	<1.04	<1.01	<1.07
Bromoform	2.20E+06	--	(3)	µg/Kg-dry	<1.04	<1.01	<1.07
Bromomethane	6.71E+04	6.71E+04	(1)	µg/Kg-dry	<1.04	<1.01	<1.07
Carbon disulfide	5.89E+06	5.89E+06	(1)	µg/Kg-dry	<4.16	<4.06	<4.29
Carbon tetrachloride	2.43E+04	1.99E+05	(2)	µg/Kg-dry	<1.04	<1.01	<1.07
Chlorobenzene	1.58E+06	1.58E+06	(1)	µg/Kg-dry	<1.04	<1.01	<1.07
Chloroethane	--	--		µg/Kg-dry	<1.04	<1.01	<1.07
Chloroform	3.19E+04	6.71E+05	(2)	µg/Kg-dry	<1.04	<1.01	<1.07
Chloromethane	1.98E+05	1.13E+06	(2)	µg/Kg-dry	<1.04	<1.01	<1.07
cis-1,2-DCE	3.10E+06	3.10E+06	(1)	µg/Kg-dry	<1.04	<1.01	<1.07
cis-1,3-Dichloropropene	1.26E+05	5.10E+05	(2)	µg/Kg-dry	<1.04	<1.01	<1.07
Dibromochloromethane	6.13E+04	1.99E+06	(2)	µg/Kg-dry	<1.04	<1.01	<1.07
Dibromomethane	1.00E+07	--	(3)	µg/Kg-dry	<1.04	<1.01	<1.07
Dichlorodifluoromethane	1.37E+06	1.37E+06	(1)	µg/Kg-dry	<1.04	<1.01	<1.07
Ethylbenzene	3.85E+05	6.63E+06	(2)	µg/Kg-dry	<1.04	<1.01	<1.07
Hexachlorobutadiene	2.20E+05	--	(3)	µg/Kg-dry	<1.04	<1.01	<1.07
Isopropylbenzene	1.03E+07	1.03E+07	(1)	µg/Kg-dry	<1.04	<1.01	<1.07
Methyl tert-butyl ether (MTBE)	4.69E+06	6.55E+07	(2)	µg/Kg-dry	<1.04	<1.01	<1.07
Methylene chloride	1.09E+06	1.06E+07	(2)	µg/Kg-dry	2.37	2.39	2.71
Naphthalene	2.52E+05	7.02E+05	(2)	µg/Kg-dry	<1.04	<1.01	<1.07
n-Butylbenzene	--	--		µg/Kg-dry	<1.04	<1.01	<1.07
n-Propylbenzene	--	--		µg/Kg-dry	<1.04	<1.01	<1.07
sec-Butylbenzene	--	--		µg/Kg-dry	<1.04	<1.01	<1.07
Styrene	3.03E+07	3.03E+07	(1)	µg/Kg-dry	<1.04	<1.01	<1.07
tert-Butylbenzene	--	--		µg/Kg-dry	<1.04	<1.01	<1.07
Tetrachloroethene (PCE)	3.64E+04	3.38E+05	(2)	µg/Kg-dry	<1.04	<1.01	<1.07
Toluene	2.11E+07	2.11E+07	(1)	µg/Kg-dry	<1.04	<1.01	<1.07
trans-1,2-DCE	8.14E+05	8.14E+05	(1)	µg/Kg-dry	<1.04	<1.01	<1.07
trans-1,3-Dichloropropene	1.26E+05	5.10E+05	(2)	µg/Kg-dry	<1.04	<1.01	<1.07
Trichloroethene (TCE)	2.53E+05	4.60E+06	(2)	µg/Kg-dry	<1.04	<1.01	<1.07
Trichlorofluoromethane	5.82E+06	5.82E+06	(1)	µg/Kg-dry	<1.04	<1.01	<1.07
Vinyl chloride	2.59E+04	2.48E+05	(2)	µg/Kg-dry	<1.04	<1.01	<1.07
Xylenes, Total	3.13E+06	3.13E+06	(1)	µg/Kg-dry	<1.04	<1.01	<1.07
Semi Volatile Organics - (EPA Method 8270) mg/kg							
1,2,4-Trichlorobenzene	4.27E+02	4.27E+02	(1)	mg/Kg	<1.0	<0.20	<0.20
1,2-Dichlorobenzene	9.71E+03	9.71E+03	(1)	mg/Kg	<1.0	<0.20	<0.20
1,3-Dichlorobenzene	--	--		mg/Kg	<1.0	<0.20	<0.20

Table 11
Group 3 Soil Analytical Results Summary - SWMUs No. 4 and 5, AOC 22 (Crude Receiving Rack) and AOC 24
Bloomfield Refinery - Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels 0-2'	Non-Residential Screening Levels 2-10'	Source	Units	AOC 24-7 (0-0.5')	AOC 24-7 (1.5-2.0')	AOC 24-7 (39-42')
Sample Date					4/7/2009	4/7/2009	4/7/2009
1,4-Dichlorobenzene	1.80E+02	3.78E+03	(2)	mg/Kg	<1.0	<0.20	<0.20
2,4,5-Trichlorophenol	2.38E+04	2.38E+04	(1)	mg/Kg	<1.0	<0.20	<0.20
2,4,6-Trichlorophenol	2.38E+02	2.38E+02	(1)	mg/Kg	<1.0	<0.20	<0.20
2,4-Dichlorophenol	7.15E+02	7.15E+02	(1)	mg/Kg	<2.0	<0.40	<0.40
2,4-Dimethylphenol	4.76E+03	4.76E+03	(1)	mg/Kg	<1.5	<0.30	<0.30
2,4-Dinitrophenol	4.76E+02	4.76E+02	(1)	mg/Kg	<2.0	<0.40	<0.40
2,4-Dinitrotoluene	1.03E+02	4.76E+02	(2)	mg/Kg	<2.5	<0.50	<0.50
2,6-Dinitrotoluene	2.39E+02	2.39E+02	(1)	mg/Kg	<2.5	<0.50	<0.50
2-Chloronaphthalene	2.48E+04	2.48E+04	(1)	mg/Kg	<1.3	<0.25	<0.25
2-Chlorophenol	1.55E+03	1.55E+03	(1)	mg/Kg	<1.0	<0.20	<0.20
2-Methylnaphthalene	4.10E+03	--	(3)	mg/Kg	<1.3	<0.25	<0.25
2-Methylphenol	3.10E+04	--	(3)	mg/Kg	<2.5	<0.50	<0.50
2-Nitroaniline	1.80E+03	--	(3)	mg/Kg	<1.0	<0.20	<0.20
2-Nitrophenol	--	--		mg/Kg	<1.0	<0.20	<0.20
3,3´-Dichlorobenzidine	4.26E+01	3.71E+02	(2)	mg/Kg	<1.3	<0.25	<0.25
3+4-Methylphenol	3.10E+03	--	(3)	mg/Kg	<1.0	<0.20	<0.20
3-Nitroaniline	--	--		mg/Kg	<1.0	<0.20	<0.20
4,6-Dinitro-2-methylphenol	--	--		mg/Kg	<2.5	<0.50	<0.50
4-Bromophenyl phenyl ether	--	--		mg/Kg	<1.0	<0.20	<0.20
4-Chloro-3-methylphenol	--	--		mg/Kg	<2.5	<0.50	<0.50
4-Chloroaniline	8.60E+01	--	(4)	mg/Kg	<2.5	<0.50	<0.50
4-Chlorophenyl phenyl ether	--	--		mg/Kg	<1.0	<0.20	<0.20
4-Nitroaniline	8.60E+02	--	(4)	mg/Kg	<1.3	<0.25	<0.25
4-Nitrophenol	--	--		mg/Kg	<1.0	<0.20	<0.20
Acenaphthene	1.86E+04	1.86E+04	(1)	mg/Kg	<1.0	<0.20	<0.20
Acenaphthylene	--	--		mg/Kg	<1.0	<0.20	<0.20
Aniline	3.00E+03	--	(4)	mg/Kg	<1.0	<0.20	<0.20
Anthracene	6.68E+04	6.68E+04	(1)	mg/Kg	<1.0	<0.20	<0.20
Azobenzene	2.20E+02	--	(4)	mg/Kg	<1.0	<0.20	<0.20
Benz(a)anthracene	2.34E+01	2.13E+02	(2)	mg/Kg	<1.0	<0.20	<0.20
Benzo(a)pyrene	2.34E+00	2.13E+01	(2)	mg/Kg	<1.0	<0.20	<0.20
Benzo(b)fluoranthene	2.34E+01	2.13E+02	(2)	mg/Kg	<1.0	<0.20	<0.20
Benzo(g,h,i)perylene	--	--		mg/Kg	<2.5	<0.50	<0.50
Benzo(k)fluoranthene	2.34E+02	2.06E+03	(2)	mg/Kg	<1.0	<0.20	<0.20
Benzoic acid	2.50E+06	--	(3)	mg/Kg	<2.5	<0.50	<0.50
Benzyl alcohol	3.10E+05	--	(3)	mg/Kg	<1.0	<0.20	<0.20
Bis(2-chloroethoxy)methane	1.80E+03	--	(3)	mg/Kg	<1.0	<0.20	<0.20
Bis(2-chloroethyl)ether	1.36E+01	1.47E+02	(2)	mg/Kg	<1.0	<0.20	<0.20
Bis(2-chloroisopropyl)ether	4.54E+02	3.10E+03	(2)	mg/Kg	<1.0	<0.20	<0.20
Bis(2-ethylhexyl)phthalate	1.37E+03	4.76E+03	(2)	mg/Kg	<2.5	<0.50	<0.50
Butyl benzyl phthalate	9.10E+03	--	(4)	mg/Kg	<1.0	<0.20	<0.20
Carbazole	--	--		mg/Kg	<1.0	<0.20	<0.20
Chrysene	2.34E+03	2.06E+04	(2)	mg/Kg	<1.0	<0.20	<0.20
Dibenz(a,h)anthracene	2.34E+00	2.13E+01	(2)	mg/Kg	<1.0	<0.20	<0.20
Dibenzofuran	--	--		mg/Kg	<1.0	<0.20	<0.20
Diethyl phthalate	1.91E+05	1.91E+05	(1)	mg/Kg	<1.0	<0.20	<0.20
Dimethyl phthalate	2.38E+06	2.38E+06	(1)	mg/Kg	<1.0	<0.20	<0.20
Di-n-butyl phthalate	2.38E+04	2.38E+04	(1)	mg/Kg	<2.5	<0.50	<0.50
Di-n-octyl phthalate	--	--		mg/Kg	<1.0	<0.20	<0.20
Fluoranthene	8.91E+03	8.91E+03	(1)	mg/Kg	<1.3	<0.25	<0.25

Table 11

Group 3 Soil Analytical Results Summary - SWMUs No. 4 and 5, AOC 22 (Crude Receiving Rack) and AOC 24

Bloomfield Refinery - Bloomfield, New Mexico

Analytes	Non-Residential Screening Levels 0-2'	Non-Residential Screening Levels 2-10'	Source	Units	AOC 24-7 (0-0.5')	AOC 24-7 (1.5-2.0')	AOC 24-7 (39-42')
Sample Date					4/7/2009	4/7/2009	4/7/2009
Fluorene	8.91E+03	8.91E+03	(1)	mg/Kg	<2.5	<0.50	<0.50
Hexachlorobenzene	1.20E+01	1.03E+02	(2)	mg/Kg	<1.0	<0.20	<0.20
Hexachlorobutadiene	2.20E+02	--	(4)	mg/Kg	<1.0	<0.20	<0.20
Hexachlorocyclopentadiene	8.11E+02	8.11E+02	(1)	mg/Kg	<1.0	<0.20	<0.20
Hexachloroethane	2.38E+02	2.38E+02	(1)	mg/Kg	<1.0	<0.20	<0.20
Indeno(1,2,3-cd)pyrene	2.34E+01	2.13E+02	(2)	mg/Kg	<1.3	<0.25	<0.25
Isophorone	2.02E+04	4.75E+04	(2)	mg/Kg	<2.5	<0.50	<0.50
Naphthalene	2.52E+02	7.02E+02	(2)	mg/Kg	<1.0	<0.20	<0.20
Nitrobenzene	2.77E+02	5.20E+02	(2)	mg/Kg	<2.5	<0.50	<0.50
N-Nitrosodi-n-propylamine	2.50E+00	--	(4)	mg/Kg	<1.0	<0.20	<0.20
N-Nitrosodiphenylamine	3.91E+03	3.40E+04	(2)	mg/Kg	<1.0	<0.20	<0.20
Pentachlorophenol	1.00E+02	1.03E+03	(2)	mg/Kg	<2.0	<0.40	<0.40
Phenanthrene	7.15E+03	7.15E+03	(1)	mg/Kg	<1.0	<0.20	<0.20
Phenol	6.88E+04	6.88E+04	(1)	mg/Kg	<1.0	<0.20	<0.20
Pyrene	6.68E+03	6.68E+03	(1)	mg/Kg	<1.0	<0.20	<0.20
Pyridine	1.00E+03	--	(3)	mg/Kg	<2.5	<0.50	<0.50
Total Petroleum Hydrocarbons - (EPA Method 8015B) mg/kg							
Diesel Range Organics (DRO)	2000	2000	(5)	mg/Kg	120	34	<10
Gasoline Range Organics (GRO)	2000	2000	(5)	mg/Kg	<5.0	<5.0	<5.0
Motor Oil Range Organics (MRO)	5000	5000	(6)	mg/Kg	280	140	<50

-- No screening level or analytical result available

NMED - Technical Background Document for Development of Soil Screening Levels - Revision 5.0 (August 2009) - Residential Soil

EPA - Regional Screening Levels (April 2009)

(1) NMED - Construction Worker (0-10')

(2) NMED - Industrial (0-2') and Construction Worker (2-10')

(3) EPA - Industrial Soil (0-2')

(4) EPA - Regional Screening Levels (April 2009) Industrial Soil multiplied by 10 pursuant to Provision VII.B. of the July 7, 2007 NMED Order because the constituent is listed as carcinogenic & EPA screening level based on 10-6 risk-based SSL

(5) NMED Oct. 2006 TPH Screening Guidelines - Unknown oil for industrial exposure via vapor migration and inhalation of ground water

(6) NMED Oct. 2006 TPH Screening Guidelines - Waste oil for industrial exposure via vapor migration and inhalation of ground water

TABLE 12
Surface Soil Samples - Vapor Screening Results
Bloomfield Refinery - Bloomfield, New Mexico

Sample Interval Depth	SWMU 5-1	SWMU 5-2	SWMU 5-3	SWMU 5-4	SWMU 5-5
0 – 0.5’	9.8	7.7	12.2	13.7	12.0
1.5 – 2’	9.4	9.3	15.9	14.3	17.8

Sample Interval Depth	SWMU 5-6	AOC 22-1	AOC 22-2	AOC 22-3	AOC 22-4
0 – 0.5’	16.0	4.5	16.1	5.1	3.4
1.5 – 2’	12.5	3.5	2.1	3.7	2429

Sample Interval Depth	AOC 22-5	AOC 22-6	AOC 22-7	AOC 22-8	AOC 22-9
0 – 0.5’	1.6	1.5	1.3	1.4	0.6
1.5 – 2’	1.4	4.1	2.6	1.2	1.1

Sample Interval Depth	AOC 22-10	AOC 22-11	AOC 24-1	AOC 24-2	AOC 24-3
0 – 0.5’	7.9	5.9	3.3	2.7	1.7
1.5 – 2’	3.8	4.3	3.9	4.1	7.7

Sample Interval Depth	AOC 24-4	AOC 25-1	AOC 26-1	AOC 26-2	AOC 26-3
0 – 0.5’	3.9	5.5	5.6	4.6	4.3
1.5 – 2’	6.4	5.5	3.5	3.9	7.2

Sample Interval Depth	AOC 26-4	AOC 26-5	AOC 26-6	AOC 26-7
0 – 0.5’	4.5	9.2	9.3	5.7
1.5 – 2’	4.1	15.2	6.6	6.1

Units - ppm

TABLE 13
Soil Boring Samples - Vapor Screening Results
Bloomfield Refinery - Bloomfield, New Mexico

Sample Interval Depth	SWMU 4-1 (MW-59)	AOC 22-12	AOC 22-13	AOC 22-14	AOC 22-15 (MW-61)	AOC 22-16 (MW-63)	AOC 23-1 (MW-62)	AOC 24-5	AOC 24-6	AOC 24-7 (MW-64)	AOC 25-2 (MW-60)	AOC 26-8 (MW-65)	AOC 26-9 (MW-66)
0 – 2’	0.2	0.9/3.4	1427	2.1	2.8/29.5	1.6/0.9	3.1/3.3	1.2/6.0	0.3/5.0	0.4	0.1	1.8/1.0	8.6
2 – 4’	2.9	4.9	1186	3.1	23.4	4.5	14.5	5.4	4.8	0.4	0.1	2.3	10.5
4 – 6’	50.8	5.6	1373	6.3	5.5	5.8	14.4	6.4	4.9	0.2	--	2.0	10.5
6 – 8’	214	5.2	1349	5.1	13.1	5.8	14.8	7.8	2.0	0.3	0.1	1.2	9.0
8 –10’	41	4.9	1302	4.6	18.1	7.3	12.3	5.9	5.3	0.4	0.0	1.0	10.0
10 – 12’	9.5	4.2	1302	3.8	16.6	3.2	--			0.3	0.0	1.9	8.3
12 – 14’	9.7	6.3	1345		11.2	3.8	7.1			0.4	0.1	2.5	8.2
14 – 16’	8.0	6.0	1277		6.5	6.2	17.6			0.4	0.0	2.1	9.6
16 – 18’	8.1	5.2	1250		13.2	5.8	8.7			0.1	0.2	2.1	9.5
18 – 20’	7.3	5.1	1660		13.2	5.7	2.2			0.5	0.4	1.8	8.8
20 – 22’	6.4	4.4	1611		21.5	5.8	3.9			0.3	0.1	1.2	10.9
22 – 24’	6.6	4.3	1336		12.9	6.8	2.4			0.1	0.3	1.1	10.4
24 – 26’	5.5	5.7	1131		16.0	4.9	1.6			0.1	0.4	1.3	10.0
26 – 28’	6.3	5.2	1131		17.1	7.5	4.0			0.1	0.3	2.4	9.5
28 – 30’	4.2	22.7	1184		22.0	7.9	3.6			0.3	0.2	11.0	7.9
30 – 32’	3.9	35.0	1268		165	6.0	5.4			0.2	0.1	20.8	5.6
32 – 34’	2.8	25.0	1694		510	6.5	3.2			0.4	3.6	58.7	6.3
34 – 36’	3.1	68.0	1596			10.9	3.3			0.9	2.5	145	25.3
36 – 38’	3.8	220	908			12.2	4.4			3.4	4.2		3939
38 – 40’			1228				5.3			4.4			
40 – 42’							3.3			1.2			
42 – 44’							--			3.1			
44 – 46’							3.3			3.1			
46 – 48’							--			3.6			
48 – 50’							2.3						
50 – 52’							3.8						
52 – 54’							4.4						

Units - ppm

TABLE 14
Field Screening Results - Ground Water & Subsurface Vapors
Bloomfield Refinery - Bloomfield, New Mexico

		Ground Water Data							Vapor Data		
Well	Date	Well Volume	Temp (degrees F)	Specific Conductivity	Dissolved Oxygen (mg/L)	pH	ORP	TDS (ppm)	O_2 (%)	CO_2 (%)	PID (ppm)
MW-59	5/14/2009	0	61.00	1.644	7.65	7.07	269	1295	19.0	0.5	41.1
		1	60.30	1.499	4.31	6.96	260	1151			
		2	61.20	1.468	4.52	6.79	261	1205			
		3	60.90	1.472	4.61	6.80	263	1241			
	7/16/2009	0	63.90	1.822	9.90	6.77	272	1336	18.7	0.3	37.5
		1	63.50	1.774	4.91	6.76	268	1297			
		2	63.10	1.748	4.50	6.77	263	1278			
		3	63.20	1.751	4.63	6.77	264	1281			
MW-60	5/14/2009	0	67.30	1.335	5.91	7.18	227	1031	18.1	0.1	21
		1	69.30	1.329	6.15	7.16	211	1027			
		2	68.30	1.341	4.91	7.20	215	1053			
		3	67.40	1.379	5.12	7.19	220	1068			
	7/16/2009	DRY	DRY	DRY	DRY	DRY	DRY	DRY	18.4	0.2	18
MW-61	5/13/2009	0	63.20	1.170	8.76	7.02	258	900.9	0	4.8	1245
		1	65.50	1.212	4.79	7.02	262	933.5			
		2	65.70	1.143	4.91	6.96	255	788.5			
		3	65.30	1.163	4.83	6.98	259	771			
	7/16/2009	0	75.30	0.460	9.61	6.91	122	329	0	3.9	1305
		1	74.40	1.262	3.61	6.89	152	894			
		2	71.90	1.293	5.22	6.87	156	918			
		3	72.10	1.291	4.05	6.86	157	899			
MW-62	5/13/2009	0	62.30	6.330	5.51	6.92	269	5671	11.2	0	79.1
		1	62.20	6.369	5.62	6.90	237	5709			
		2	62.50	6.392	5.43	6.95	200	5732			
		3	62.40	6.385	5.70	6.91	225	5721			
	7/16/2009	0	66.10	6.821	5.80	6.86	231	5644	10.9	0	65
		1	63.90	6.740	8.07	6.84	227	5584			
		2	63.60	6.765	5.80	6.83	223	5596			
		3	63.50	6.769	5.76	6.84	225	5589			
MW-63	5/13/2009	0	69.10	4.137	21.76	6.99	291	3491	3.6	7	79
		1	68.90	3.855	13.02	7.08	277	3285			
		2	68.30	3.902	12.79	7.06	239	3339			
		3	67.40	3.911	13.14	7.05	221	3340			
	7/15/2009	0	76.30	4.445	30.55	6.91	255	3506	3.8	6.4	101
		1	68.90	4.309	15.05	6.90	215	3493			
		2	68.10	4.270	11.25	6.88	198	3371			
		3	68.40	4.373	12.73	6.85	201	3357			
MW-64	5/13/2009	0	68.4	5.539	nm	7.06	228	4858	18.1	0.8	17
		1	65	5.554	nm	7.03	231	4885			
		2	69	5.789	nm	7.02	225	4174			
		3	67.1	5.494	nm	7.04	227	4861			
	7/15/2009	0	69.7	5.650	30.42	6.93	220	4733	18	0.5	10
		1	66.5	5.705	12.65	6.92	213	4770			
		2	66.3	5.827	11.83	6.90	211	4732			
		3	65.1	5.833	11.41	6.89	203	4751			

TABLE 14

Field Screening Results - Ground Water & Subsurface Vapors

Bloomfield Refinery - Bloomfield, New Mexico

		Ground Water Data							Vapor Data		
Well	**Date**	**Well Volume**	**Temp (degrees F)**	**Specific Conductivity**	**Dissolved Oxygen (mg/L)**	**pH**	**ORP**	**TDS (ppm)**	**O_2 (%)**	**CO_2 (%)**	**PID (ppm)**
MW-65	5/12/2009	0	69.9	3.006	7.59	6.84	247	2490	0	4.9	1820
		1	67.8	2.988	4.15	6.92	201	2459			
		2	66.1	3.023	3.78	6.85	180	2483			
		3	66.5	3.059	3.65	6.83	195	2465			
	7/16/2009	0	73.9	3.022	10.14	6.94	236	2303	0.1	3.9	1530
		1	70.3	3.150	3.65	6.93	216	2415			
		2	69.1	3.229	2.50	6.87	193	2490			
		3	69.7	3.308	2.60	6.86	180	2552			
MW-66	5/12/2009	0	74.4	2.923	11.51	6.97	188	2432	0.4	6.8	1880
		1	67.7	3.120	9.85	6.95	168	2605			
		2	66.2	3.205	7.67	6.94	191	2654			
		3	68.7	3.125	8.15	6.93	187	2605			
	7/15/2009	0	72.0	3.277	37.40	6.97	239	2529	0.3	7.2	2180
		1	71.9	3.162	22.90	6.95	192	2436			
		2	70.6	3.479	9.72	6.94	182	2689			
		3	71.9	3.455	7.97	6.98	169	2653			
AOC (22-12) /TW-1	4/14/2009	NA	58.9	2.585	1.81	7.77	-102.5	nm	nm	nm	nm
	7/29/2009	0	69.1	2.561	18.79	6.99	261	nm	5.3	2.19	450
		1	66.9	2.540	10.12	6.97	258	nm			
		2	65.3	2.547	9.51	6.96	233	nm			
		3	65.9	2.550	10.13	6.97	245	nm			

nm - not measured

TABLE 15
Water Level Measurements
Bloomfield Refinery - Bloomfield, New Mexico

Well	Date	Top of Casing (ft-msl)	Depth to Bottom (ft)	Depth to Product (ft)	Depth to Water (ft)	Groundwater Elevation (ft-msl)	Product Thickness (ft)
MW-59	5/14/2009	5545.2	46.95	NPP	43.33	5501.87	0
	7/16/2009	5545.2	46.95	NPP	43.38	5501.82	0
MW-60	5/14/2009	5543.71	43.39	NPP	42.4	5501.31	0
	7/16/2009	5543.71	43.40	NPP	42.84	5500.87	0
MW-61	5/13/2009	5539.41	40.86	36.63	36.85	5502.74	0.22
	7/16/2009	5539.41	40.58	36.63	37.05	5502.7	0.42
MW-62	5/13/2009	5561.32	61.28	NPP	56.00	5505.32	0
	7/16/2009	5561.32	61.33	NPP	56.24	5505.08	0
MW-63	5/13/2009	5547.26	47.84	NPP	44.88	5502.38	0
	7/15/2009	5547.26	47.85	NPP	44.93	5502.33	0
MW-64	5/13/2009	5552.29	52.40	NPP	50.12	5502.17	0
	7/15/2009	5552.29	52.43	NPP	50.18	5502.11	0
MW-65	5/12/2009	5539.52	44.37	NPP	37.00	5502.52	0
	7/16/2009	5539.52	44.25	NPP	37.02	5502.5	0
MW-66	5/12/2009	5544.63	45.58	41.84	41.85	5502.79	0.01
	7/15/2009	5544.63	45.57	41.82	42.02	5502.77	0.2
TW-1	7/29/2009	5543.61	45.56	NPP	40.99	5502.62	0

NPP - no product present

Table 16
Ground Water Analytical Results Summary
Bloomfield Refinery - Bloomfield, New Mexico

Analytes	Screening Levels	Source	Units	AOC 22-12 (GW)	AOC 22-12/TW-01	AOC 22-13 (GW)	MW-59	MW-59	MW-60	MW-61	MW-61	MW-62	MW-62	MW-63	MW-63	MW-63 (DUP)	MW-64	MW-64	MW-65	MW-65 (DUP)	MW-65	MW-66	MW-66
Sample Date				4/14/2009	7/29/2009	4/9/2009	5/14/2009	7/16/2009	5/14/2009	5/13/2009	7/16/2009	5/13/2009	7/16/2009	5/13/2009	7/15/2009	7/15/2009	5/13/2009	7/15/2009	5/12/2009	5/12/2009	7/16/2009	5/12/2009	7/15/2009
Metals																							
Antimony	0.006	(2)	mg/L	<0.001	<0.005	<0.001	<0.001	<0.005	<0.001	0.002	<0.005	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.005	0.002	0.004
Arsenic	0.01	(2)	mg/L	**0.013**	**0.031**	**0.017**	**0.014**	**0.016**	0.003	**0.041**	**0.024**	0.001	<0.001	0.007	0.005	0.004	0.006	**0.017**	**0.021**	**0.015**	**0.024**	**0.024**	**0.033**
Barium	1	(3)	mg/L	0.88	0.44	0.73	0.087	0.1	0.065	0.29	0.28	0.1	0.023	0.15	0.027	0.026	0.18	0.036	0.15	0.13	0.074	0.13	0.088
Beryllium	0.004	(2)	mg/L	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Cadmium	0.005	(2)	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Calcium *	-		mg/L	--	210	--	--	120	--	--	120	--	430	--	420	410	--	480	--	--	240	--	240
Calcium, Dissolved	-		mg/L	140	150	180	110	120	87	110	120	420	460	390	410	420	470	500	230	230	260	220	250
Chromium	0.05	(3)	mg/L	<0.0060	<0.0060	0.013	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.0063	<0.0060	<0.0060	0.0075	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
Cobalt	0.05	(3)	mg/L	0.0083	0.0084	0.024	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.0078	0.0079	0.013	<0.0060	<0.0060	0.01	0.0067	<0.0060	<0.0060	<0.0060	0.012	0.0074
Cyanide, Total	0.2	(3)	mg/L	<0.005	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	0.072	0.011	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Iron, Dissolved	1	(3)	mg/L	**2.2**	**5.9**	**24**	0.11	0.26	<0.020	0.14	**1.6**	<0.020	0.51	0.35	0.028	0.044	0.051	0.1	0.98	**1.1**	**4**	**3.4**	**5**
Iron, Total	-	(3)	mg/L	10	17	61	3.6	2.4	4.6	1.2	2.8	2.9	0.26	21	1.5	1.3	19	5.3	3.5	3.6	5.3	18	8.9
Lead	0.015	(2)	mg/L	<0.0050	**0.018**	**0.038**	0.0097	0.007	0.0063	**0.025**	**0.042**	<0.0050	<0.0050	0.0097	<0.0050	0.0051	0.014	0.011	<0.0050	0.006	<0.0050	**0.019**	**0.026**
Magnesium	-		mg/L	--	78	--	--	27	--	--	44	--	39	--	130	120	--	73	--	--	82	--	69
Magnesium, Dissolved	-		mg/L	61	70	81	31	29	29	37	45	36	40	110	120	120	75	73	79	79	84	64	68
Manganese	0.2	(3)	mg/L	--	**5.4**	--	--	**2.7**	--	3.2	4.3	2.7	**3.0**	--	**4.6**	**4.5**	--	**0.53**	**2.7**	**2.8**	**3.8**	--	**6.3**
Manganese, Dissolved	-	(3)	mg/L	3.4	3.7	3.9	2.6	2.7	0.22	--	4.4	--	2.9	3	4.4	4.5	0.13	0.032	--	--	3.9	5.1	6.5
Mercury	0.002	(3)	mg/L	<0.00020	<0.00020	0.00045	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Nickel	0.2	(3)	mg/L	0.011	0.013	0.034	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.021	0.012	0.012	0.02	0.012	<0.010	<0.010	<0.010	0.012	<0.010
Potassium *	-		mg/L	--	3.6	--	--	2.4	--	--	1.9	--	10	--	4.6	4.6	--	5	--	--	3.4	--	4.7
Potassium, Dissolved	-		mg/L	3.8	5.1	3.7	2.4	2.3	4.2	1.7	2.1	8.8	11	4.7	4.1	4.3	5.5	5.7	3.8	3.7	3.9	4.7	4.4
Selenium	0.05	(3)	mg/L	<0.050	<0.005	<0.050	<0.25	<0.001	<0.25	<0.25	<0.001	<0.25	<0.001	<0.25	0.026	0.023	<0.25	0.024	<0.050	<0.050	<0.001	<0.050	0.005
Silver	0.05	(3)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Sodium *	-		mg/L	--	410	--	--	280	--	--	110	--	1400	--	540	530	--	850	--	--	520	--	550
Sodium, Dissolved	-		mg/L	380	400	360	270	280	190	130	110	1400	1400	510	510	520	820	850	480	480	520	540	560
Vanadium	0.26	(1)	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Zinc	10	(3)	mg/L	0.027	0.054	0.051	0.025	<0.020	0.067	<0.020	<0.020	<0.020	<0.020	0.074	<0.020	<0.020	0.085	0.035	<0.020	<0.020	<0.020	0.055	<0.020
Volatile Organic Compounds - (EPA Method 8260W)																							
1,1,1,2-Tetrachloroethane	0.52	(1)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
1,1,1-Trichloroethane	60	(3)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
1,1,2,2-Tetrachloroethane	10	(3)	µg/L	<100	<200	<200	<2.0	<2.0	<2.0	<40	<20	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<40	<40	<20	<200	<100
1,1,2-Trichloroethane	5	(2)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
1,1-Dichloroethane	25	(3)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
1,1-Dichloroethene	-	(3)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
1,1-Dichloropropene	-		µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
1,2,3-Trichlorobenzene	-		µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
1,2,3-Trichloropropane	0.0096	(1)	µg/L	<100	<200	<200	<2.0	<2.0	<2.0	<40	<20	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<40	<40	<20	<200	<100
1,2,4-Trichlorobenzene	70	(2)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
1,2,4-Trimethylbenzene	15	(1)	µg/L	**1500**	**1300**	**4800**	**19**	**18**	<1.0	**2400**	**2900**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1400**	**1500**	**1300**	**2000**	**2800**
1,2-Dibromo-3-chloropropane	0.2	(2)	µg/L	<100	<200	<200	<2.0	<2.0	<2.0	<40	<20	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<40	<40	<20	<200	<100
1,2-Dibromoethane (EDB)	0.05	(2)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
1,2-Dichlorobenzene	600	(2)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
1,2-Dichloroethane (EDC)	5	(2)	µg/L	**61**	<100	**220**	**7.2**	**5.4**	<1.0	<20	<10	<1.0	<1.0	1.9	1.4	1.6	<1.0	<1.0	**220**	**250**	**270**	**120**	**88**
1,2-Dichloropropane	5	(2)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
1,3,5-Trimethylbenzene	12	(1)	µg/L	**240**	<100	**1300**	4.4	<1.0	<1.0	**820**	**550**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**500**	**510**	**490**	**700**	**810**
1,3-Dichlorobenzene	-		µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
1,3-Dichloropropane	730	(1)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
1,4-Dichlorobenzene	75	(2)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
1-Methylnaphthalene	2.3	(1)	µg/L	<200	<400	<400	**54**	**36**	<4.0	**270**	**150**	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	**150**	**170**	**130**	<400	**280**
2,2-Dichloropropane	-		µg/L	<100	<200	<200	<2.0	<2.0	<2.0	<40	<20	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<40	<40	<20	<200	<100
2-Butanone	7100	(1)	µg/L	<500	<1000	<1000	<10	<10	<10	<200	<100	<10	<10	<10	<10	<10	<10	<10	<200	<200	<100	<1000	<500
2-Chlorotoluene	730	(1)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
2-Hexanone	-		µg/L	<500	<1000	<1000	<10	<10	<10	<200	<100	<10	<10	<10	<10	<10	<10	<10	<200	<200	<100	<1000	<500
2-Methylnaphthalene	150	(1)	µg/L	<200	<400	**710**	14	5	<4.0	**450**	**260**	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	**220**	**230**	**210**	<400	**500**
4-Chlorotoluene	2600	(1)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
4-Isopropyltoluene	-		µg/L	<50	<100	<100	2.4	1.4	<1.0	22	13	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
4-Methyl-2-pentanone	-		µg/L	<500	<1000	<1000	<10	<10	<10	<200	<100	<10	<10	<10	<10	<10	<10	<10	<200	<200	<100	<1000	<500
Acetone	22000	(1)	µg/L	<500	<1000	<1000	<10	<10	<10	1100	3000	<10	<10	<10	<10	<10	<10	<10	<200	<200	110	1300	1100
Benzene	5	(2)	µg/L	**8600**	**8200**	**13000**	**210**	**140**	<1.0	**49**	**48**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**6800**	**7100**	**5400**	**4600**	**3500**
Bromobenzene	20	(1)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
Bromodichloromethane	0.12	(1)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
Bromoform	8.5	(1)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
Bromomethane	8.7	(1)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
Carbon disulfide	1000	(1)	µg/L	<500	<1000	<1000	<10	<10	<10	<200	<100	<10	<10	<10	<10	<10	<10	<10	<200	<200	<100	<1000	<500

Table 16
Ground Water Analytical Results Summary
Bloomfield Refinery - Bloomfield, New Mexico

Analytes	Screening Levels	Source	Units	AOC 22-12 (GW)	AOC 22-12/TW-01	AOC 22-13 (GW)	MW-59	MW-59	MW-60	MW-61	MW-61	MW-62	MW-62	MW-63	MW-63	MW-63 (DUP)	MW-64	MW-64	MW-65	MW-65 (DUP)	MW-65	MW-66	MW-66
Carbon Tetrachloride	5	(2)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
Chlorobenzene	100	(2)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
Chloroethane	-		µg/L	<100	<200	<200	<2.0	<2.0	<2.0	<40	<20	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<40	<40	<20	<200	<100
Chloroform	100	(3)	µg/L	<50	<100	<100	<1.0	<1.0	1.2	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
Chloromethane	190	(1)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
cis-1,2-DCE	70	(2)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
cis-1,3-Dichloropropene	-		µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
Dibromochloromethane	0.15	(1)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
Dibromomethane	370	(1)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
Dichlorodifluoromethane	390	(1)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
Ethylbenzene	700	(2)	µg/L	**2100**	**2200**	**4300**	380	410	<1.0	**1400**	**1500**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1800**	**2000**	**1400**	**1600**	**1500**
Hexachlorobutadiene	0.86	(1)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
Isopropylbenzene (Cumene)	680	(1)	µg/L	69	190	240	38	30	<1.0	100	70	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	84	92	81	140	85
Methyl tert-butyl ether (MTBE)	12	(1)	µg/L	**20000**	**23000**	**14000**	**16**	**13**	<1.0	**380**	**410**	<1.0	<1.0	**48**	**54**	**61**	<1.0	<1.0	**1700**	**1800**	**1700**	**780**	**650**
Methylene Chloride	5	(2)	µg/L	<150	<300	<300	<3.0	<3.0	<3.0	<60	<30	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<60	<60	<30	<300	<150
Naphthalene	0.14	(1)	µg/L	**380**	**480**	**800**	**210**	**180**	<2.0	**690**	**500**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	**480**	**520**	**450**	**560**	**880**
n-Butylbenzene	-		µg/L	<50	<100	420	10	11	<1.0	110	97	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	49	50	85	<100	51
n-Propylbenzene	-		µg/L	200	180	700	48	43	<1.0	310	240	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	230	240	260	290	310
sec-Butylbenzene	-		µg/L	<50	<100	110	7.4	6.6	<1.0	<20	15	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	14	<100	<50
Styrene	100	(2)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
tert-Butylbenzene	-		µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
Tetrachloroethene (PCE)	5	(2)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
Toluene	750	(3)	µg/L	**870**	380	**16000**	2.7	1.8	<1.0	<20	11	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**2500**	**2800**	150	**2000**	**2500**
trans-1,2-DCE	100	(2)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
trans-1,3-Dichloropropene	0.43	(1)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
Trichloroethene (TCE)	5	(2)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
Trichlorofluoromethane	1300	(1)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
Vinyl chloride	1	(3)	µg/L	<50	<100	<100	<1.0	<1.0	<1.0	<20	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<20	<20	<10	<100	<50
Xylenes, Total	620	(3)	µg/L	**6100**	**5000**	**23000**	<1.5	3.6	<1.5	**7300**	**6800**	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	**8500**	**9200**	**6400**	**6200**	**7900**
Semi Volatile Organics - (EPA Method 8270W)																							
1,2,4-Trichlorobenzene	70	(2)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
1,2-Dichlorobenzene	600	(2)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
1,3-Dichlorobenzene	-		µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
1,4-Dichlorobenzene	75	(2)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
2,4,5-Trichlorophenol	3700	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
2,4,6-Trichlorophenol	6.1	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
2,4-Dichlorophenol	110	(1)	µg/L	<20	<100	<20	<20	<100	<20	<100	<100	<20	<20	<20	<20	<20	<20	<20	<20	<20	<100	<20	<100
2,4-Dimethylphenol	730	(1)	µg/L	30	<50	<10	<10	<50	<10	<50	130	<10	<10	<10	<10	<10	<10	<10	24	22	<50	59	<50
2,4-Dinitrophenol	73	(1)	µg/L	<20	<100	<20	<20	<100	<20	<100	<100	<20	<20	<20	<20	<20	<20	<20	<20	<20	<100	<20	<100
2,4-Dinitrotoluene	0.22	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
2,6-Dinitrotoluene	37	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
2-Chloronaphthalene	2900	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
2-Chlorophenol	180	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
2-Methylnaphthalene	150	(1)	µg/L	81	71	100	<10	<50	<10	**17000**	**1200**	<10	<10	<10	<10	<10	<10	<10	**160**	150	130	150	**19000**
2-Methylphenol	1800	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	32	<50
2-Nitroaniline	110	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
2-Nitrophenol	-		µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
3,3´-Dichlorobenzidine	0.15	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
3+4-Methylphenol	180	(1)	µg/L	16	<50	10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	16	<50
3-Nitroaniline	-		µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
4,6-Dinitro-2-methylphenol	-		µg/L	<20	<100	<20	<20	<100	<20	<100	<100	<20	<20	<20	<20	<20	<20	<20	<20	<20	<100	<20	<100
4-Bromophenyl phenyl ether	-		µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
4-Chloro-3-methylphenol	-		µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
4-Chloroaniline	0.34	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
4-Chlorophenyl phenyl ether	-		µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
4-Nitroaniline	3.4	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
4-Nitrophenol	-		µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Acenaphthene	2200	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	250
Acenaphthylene	-		µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Aniline	12	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Anthracene	11000	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Azobenzene	0.12	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Benz(a)anthracene	0.029	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Benzo(a)pyrene	0.2	(2)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Benzo(b)fluoranthene	0.029	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Benzo(g,h,i)perylene	-		µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50

Table 16
Ground Water Analytical Results Summary
Bloomfield Refinery - Bloomfield, New Mexico

Analytes	Screening Levels	Source	Units	AOC 22-12 (GW)	AOC 22-12/TW-01	AOC 22-13 (GW)	MW-59	MW-59	MW-60	MW-61	MW-61	MW-62	MW-62	MW-63	MW-63	MW-63 (DUP)	MW-64	MW-64	MW-65	MW-65 (DUP)	MW-65	MW-66	MW-66
Benzo(k)fluoranthene	0.29	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Benzoic acid	150000	(1)	µg/L	<20	<100	<20	<20	<100	<20	<100	<100	<20	<20	<20	<20	<20	<20	<20	<20	<20	<100	<20	<100
Benzyl alcohol	18000	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Bis(2-chloroethoxy)methane	110	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Bis(2-chloroethyl)ether	0.012	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Bis(2-chloroisopropyl)ether	-		µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Bis(2-ethylhexyl)phthalate	6	(2)	µg/L	<10	<50	<10	<10	<50	<10	**140**	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Butyl benzyl phthalate	35	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Carbazole	-		µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Chrysene	2.9	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Dibenz(a,h)anthracene	0.0029	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Dibenzofuran	-		µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Diethyl phthalate	29000	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Dimethyl phthalate	-		µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Di-n-butyl phthalate	-		µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Di-n-octyl phthalate	-		µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Fluoranthene	1500	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Fluorene	1500	(1)	µg/L	<10	<50	<10	<10	<50	<10	300	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	250
Hexachlorobenzene	1	(2)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Hexachlorobutadiene	0.86	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Hexachlorocyclopentadiene	50	(2)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Hexachloroethane	4.8	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Indeno(1,2,3-cd)pyrene	0.029	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Isophorone	71	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Naphthalene	0.14	(1)	µg/L	**250**	**220**	**110**	**100**	**120**	<10	**7500**	**690**	<10	<10	<10	<10	<10	<10	<10	**370**	**350**	**290**	**330**	**9700**
Nitrobenzene	0.12	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
N-Nitrosodimethylamine	0.00042	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
N-Nitrosodi-n-propylamine	0.0096	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
N-Nitrosodiphenylamine	14	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Pentachlorophenol	1	(2)	µg/L	<20	<100	<20	<20	<100	<20	<100	<100	<20	<20	<20	<20	<20	<20	<20	<20	<20	<100	<20	<100
Phenanthrene	-		µg/L	<10	<50	<10	<10	<50	<10	1500	130	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	1600
Phenol	5	(3)	µg/L	**30**	<50	**19**	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	**49**	**49**	<50	**25**	<50
Pyrene	1100	(1)	µg/L	<10	<50	<10	<10	<50	<10	58	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	62
Pyridine	37	(1)	µg/L	<10	<50	<10	<10	<50	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<50	<10	<50
Alkalinity, Total (As CaCO3)	-		mg/L CaCO3	1100	1200	1200	850	820	420	590	520	640	620	640	630	640	300	300	1000	1000	990	1000	1100
Bicarbonate	-		mg/L CaCO3	1100	1200	1200	850	820	420	590	520	640	620	640	630	640	300	300	1000	1000	990	1000	1100
Bromide	-		mg/L	--																			
Carbonate	-		mg/L CaCO3	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Chloride	250	(3)	mg/L	140	170	210	58	57	48	67	70	15	15	210	240	240	**1100**	**1100**	140	130	160	99	94
Fluoride	1.6	(3)	mg/L	--	0.28	--	0.35	0.34	0.21	0.38	0.39	0.14	0.16	0.19	0.17	0.14	0.21	0.19	0.21	0.22	0.24	0.22	0.19
Nitrate (As N)+Nitrite (As N)			mg/L	--	--	--	<2.0	<1.0	15	--	<1.0	--	<1.0	72	--	--	44	--	<1.0	<1.0	<1.0	3.1	--
Nitrogen, Nitrate (As N)	10	(2)	mg/L	0.12	0.19	0.15	--	--	--	<1.0	--	0.17	--	--	**74**	**75**	--	**48**	--	--	--	--	0.7
Nitrogen, Nitrite (As N)	1	(2)	mg/L	<1.0	<2.0	<1.0	--	--	--	<1.0	--	<0.10	--	--	<2.0	--	--	<2.0	--	--	--	--	<2.0
Sulfate	600	(3)	mg/L	56	39	110	92	70	240	65	110	**3900**	**3900**	**1600**	**1500**	**1500**	**1800**	**1700**	**790**	**750**	**950**	**1100**	**1100**
Phosphorus, Orthophosphate (As P)	-		mg/L	--	<0.50	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Total Dissolved Solids	1000	(3)	mg/L	**2500**	**1720**	**1700**	**1100**	**1070**	990	820	872	**6000**	**5410**	**3500**	**3710**	**3700**	**4500**	**4580**	**2300**	**2400**	**2420**	**2600**	**2820**
Diesel Range Organics (DRO)	1.34	(4)	mg/L	**9.4**	**5.7**	**65**	**3.4**	**2.3**	<1.0	**550**	**59**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**14**	**14**	**11**	**12**	**31**
Gasoline Range Organics (GRO)	1.34	(4)	mg/L	**84**	**54**	**190**	**2.6**	**3.1**	0.15	**24**	**30**	<0.050	<0.050	0.055	0.077	0.073	<0.050	<0.050	**42**	**44**	**43**	**34**	**46**
Motor Oil Range Organics (MRO)	-		mg/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ethanol	-		mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1.0	<1.0	<1.0	<1.0	<1.0

-- No screening level or analytical result available

450 - bolded value exceeds screening level

(1) EPA - Regional Screening Levels (April 2009) - EPA Screening Levels.Tap Water

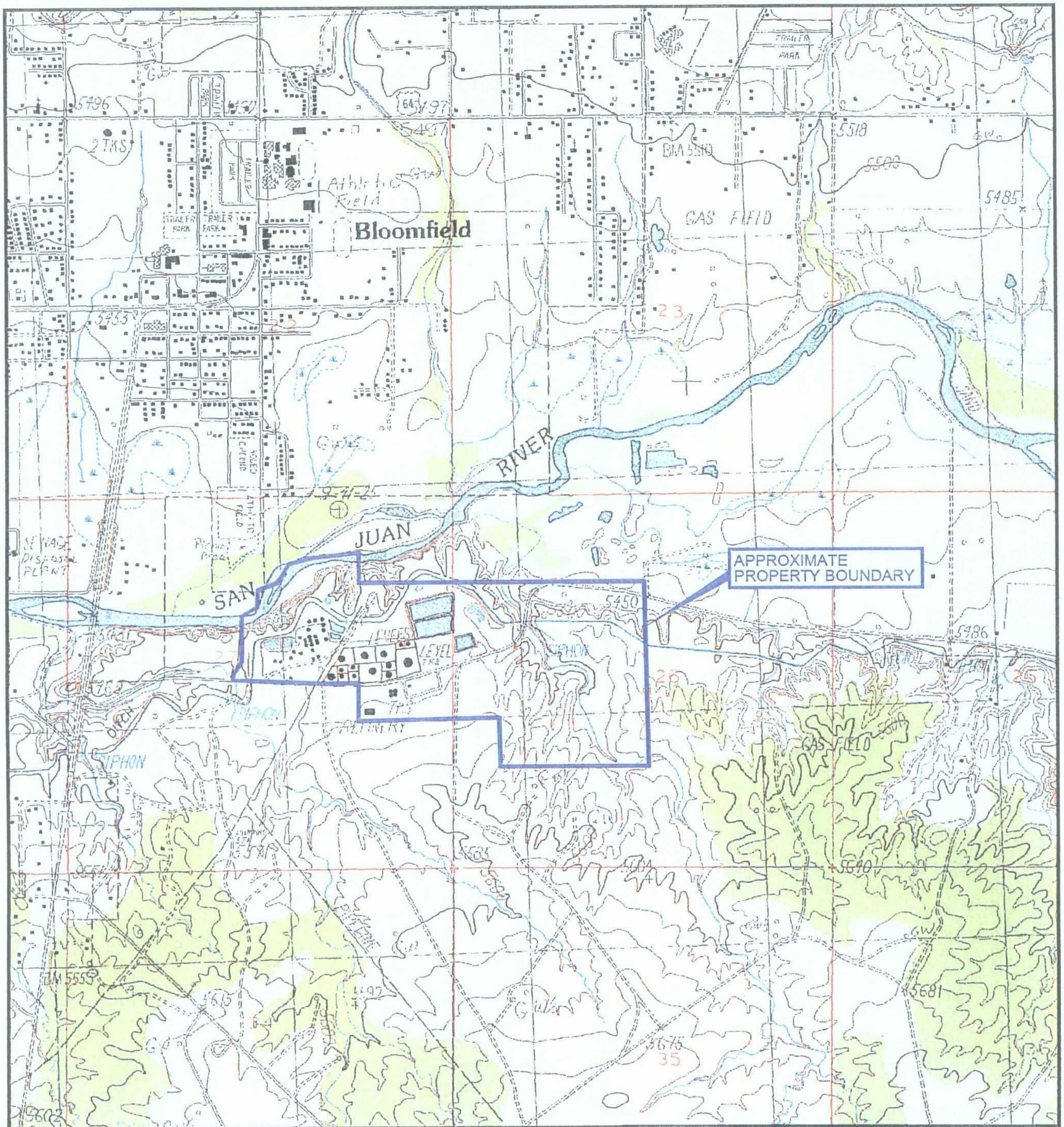
(2) EPA - Regional Screening Levels (April 2009) - MCL

(3) NMED WQCC standards - Title 20 Chapter 6, Part 2, - 20.6.2.3101 Standards for Ground Water of 10,000 mg/l TDS Concentration or less

(4) NMED TPH Screening Guidelines Oct. 2006 - #3 and #6 fuel oil

* = General Chemistry analytes not required by Work Plan.

Figures



Map Source: USGS 7.5 Min. Quad Sheet BLOOMFIELD, NM., 1985.

0 2000
SCALE IN FEET

QUADRANGLE LOCATION

Western Refining

WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining	DATE: 6/19/08	FILE: WestRef-A25

FIGURE 1
SITE LOCATION MAP
BLOOMFIELD REFINERY

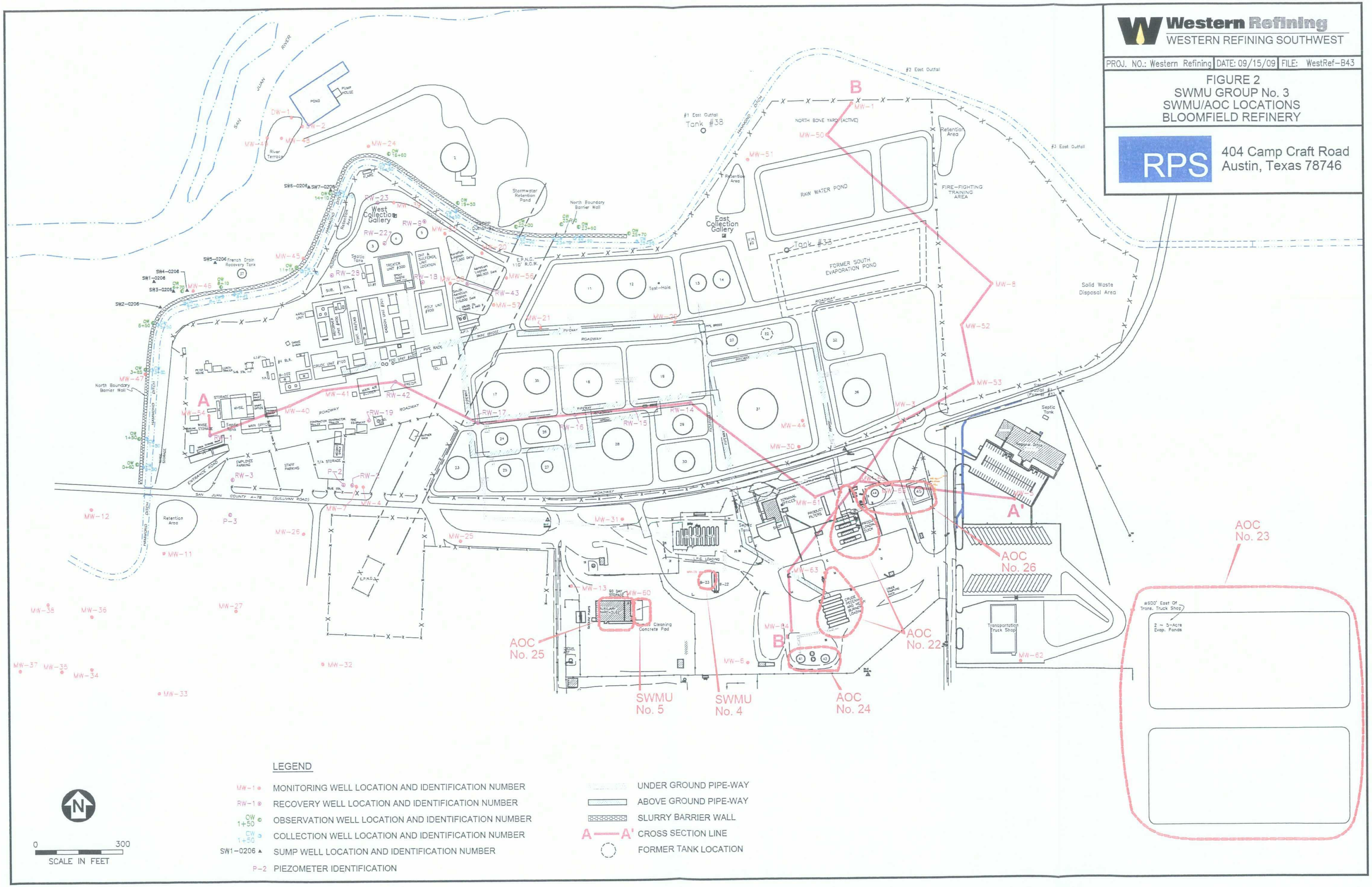
RPS JDC
404 Camp Craft Road
Austin, Texas 78746

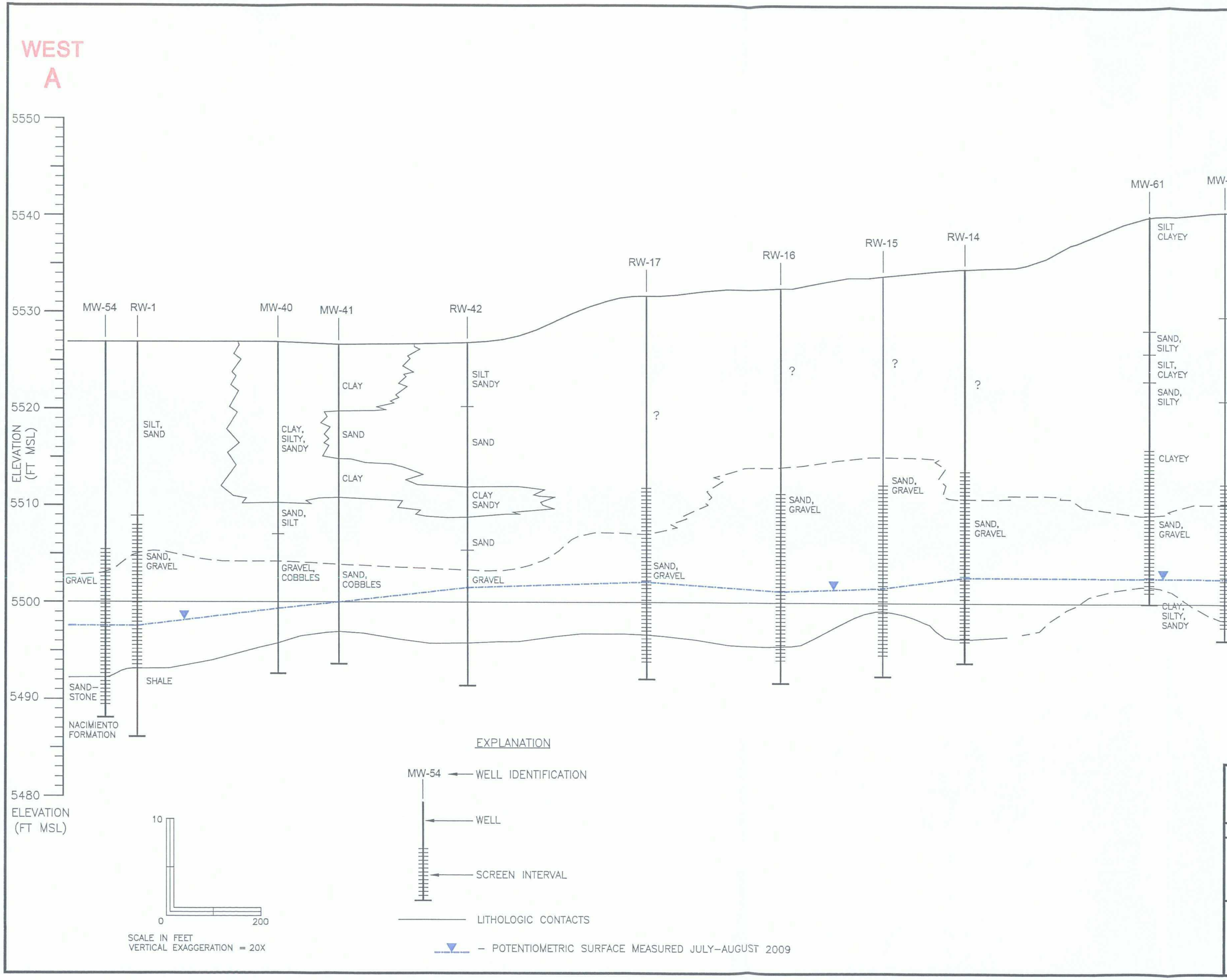
Western Refining
WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining | DATE: 09/15/09 | FILE: WestRef-B43

FIGURE 2
SWMU GROUP No. 3
SWMU/AOC LOCATIONS
BLOOMFIELD REFINERY

RPS
404 Camp Craft Road
Austin, Texas 78746



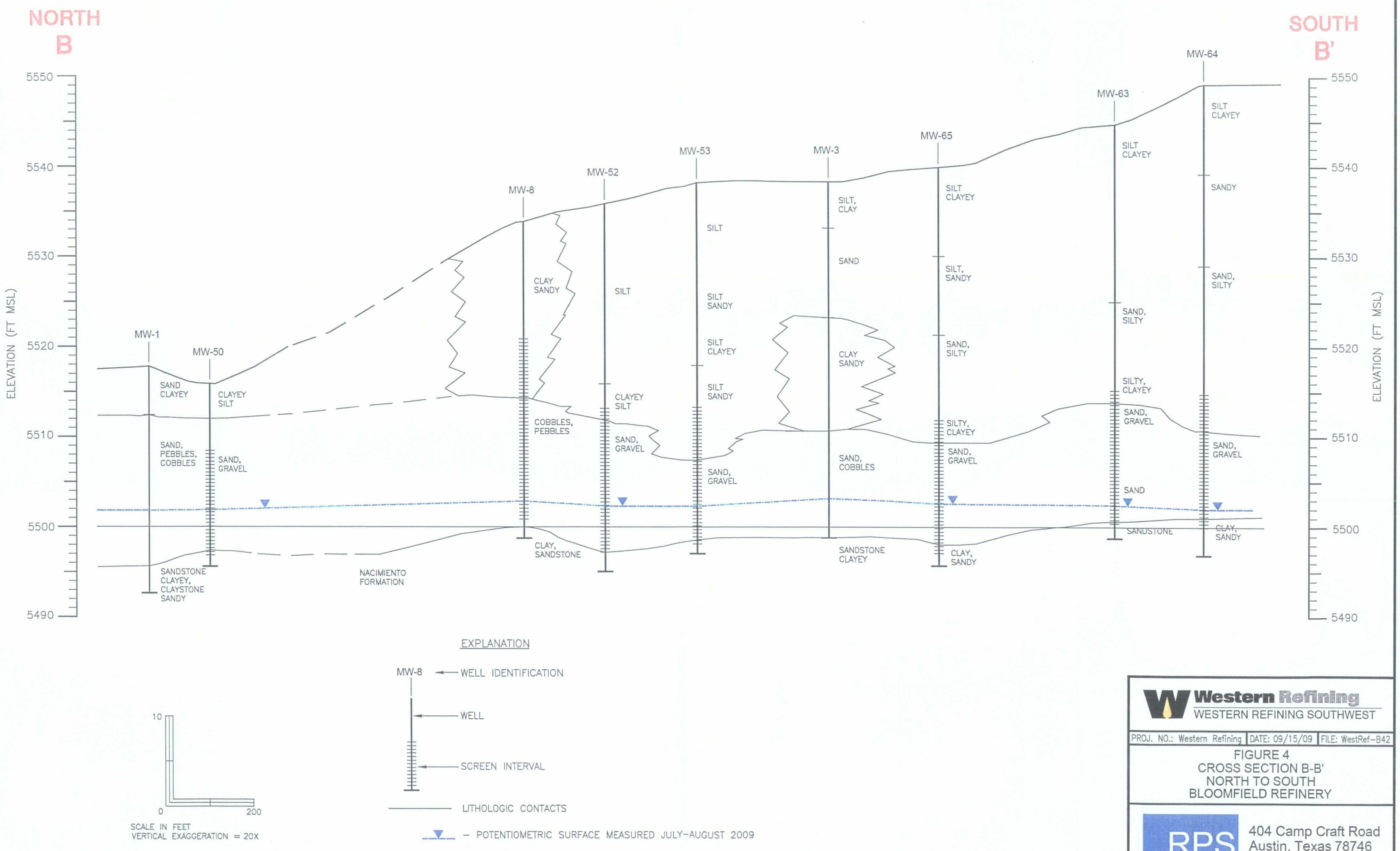


Western Refining
WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining	DATE: 09/15/09	FILE: WestRef-B41

FIGURE 3
CROSS SECTION A-A'
WEST TO EAST
BLOOMFIELD REFINERY

RPS
404 Camp Craft Road
Austin, Texas 78746



Western Refining
WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining | DATE: 09/15/09 | FILE: WestRef–B42

FIGURE 4
CROSS SECTION B-B'
NORTH TO SOUTH
BLOOMFIELD REFINERY

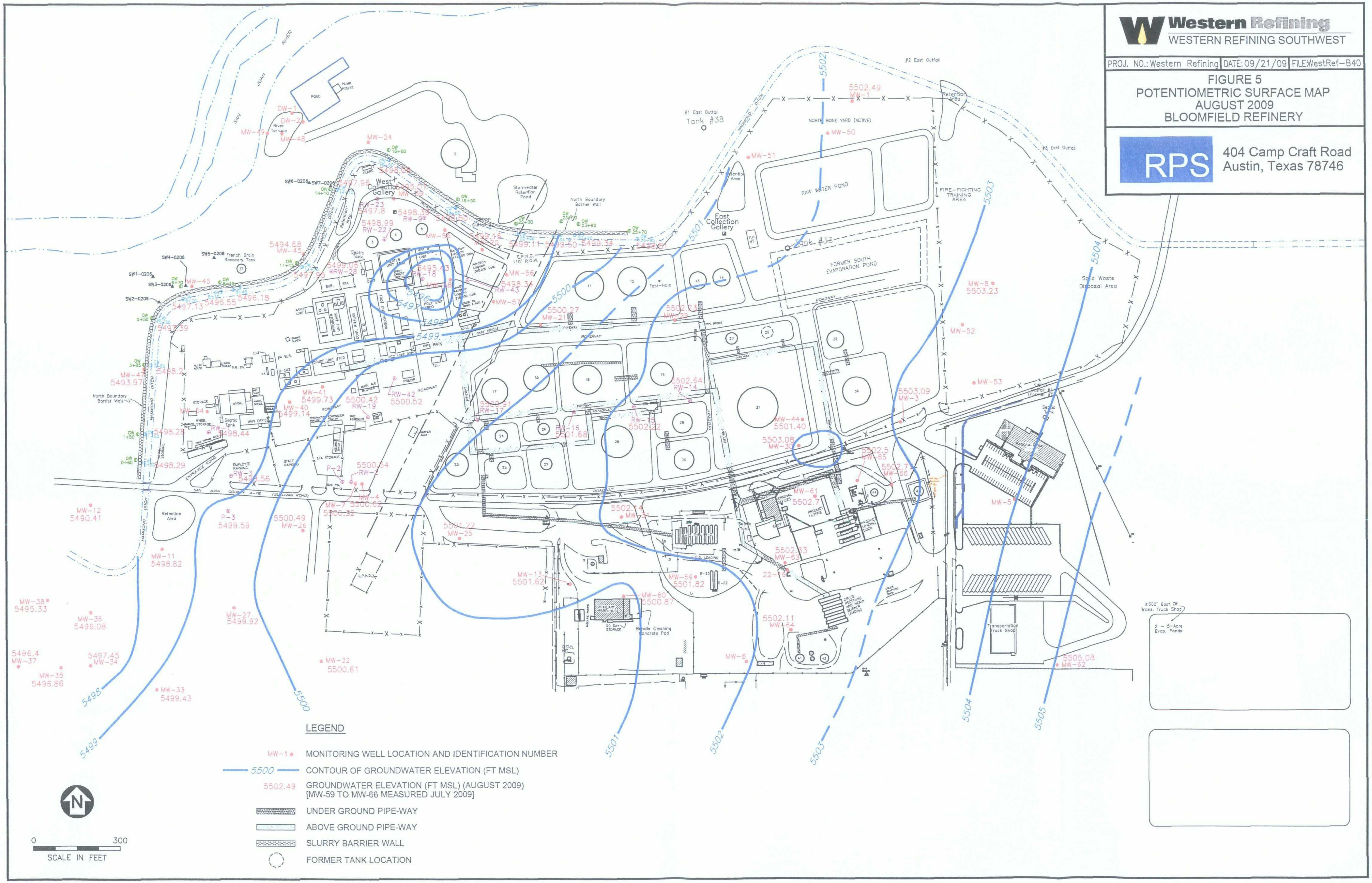
RPS
404 Camp Craft Road
Austin, Texas 78746

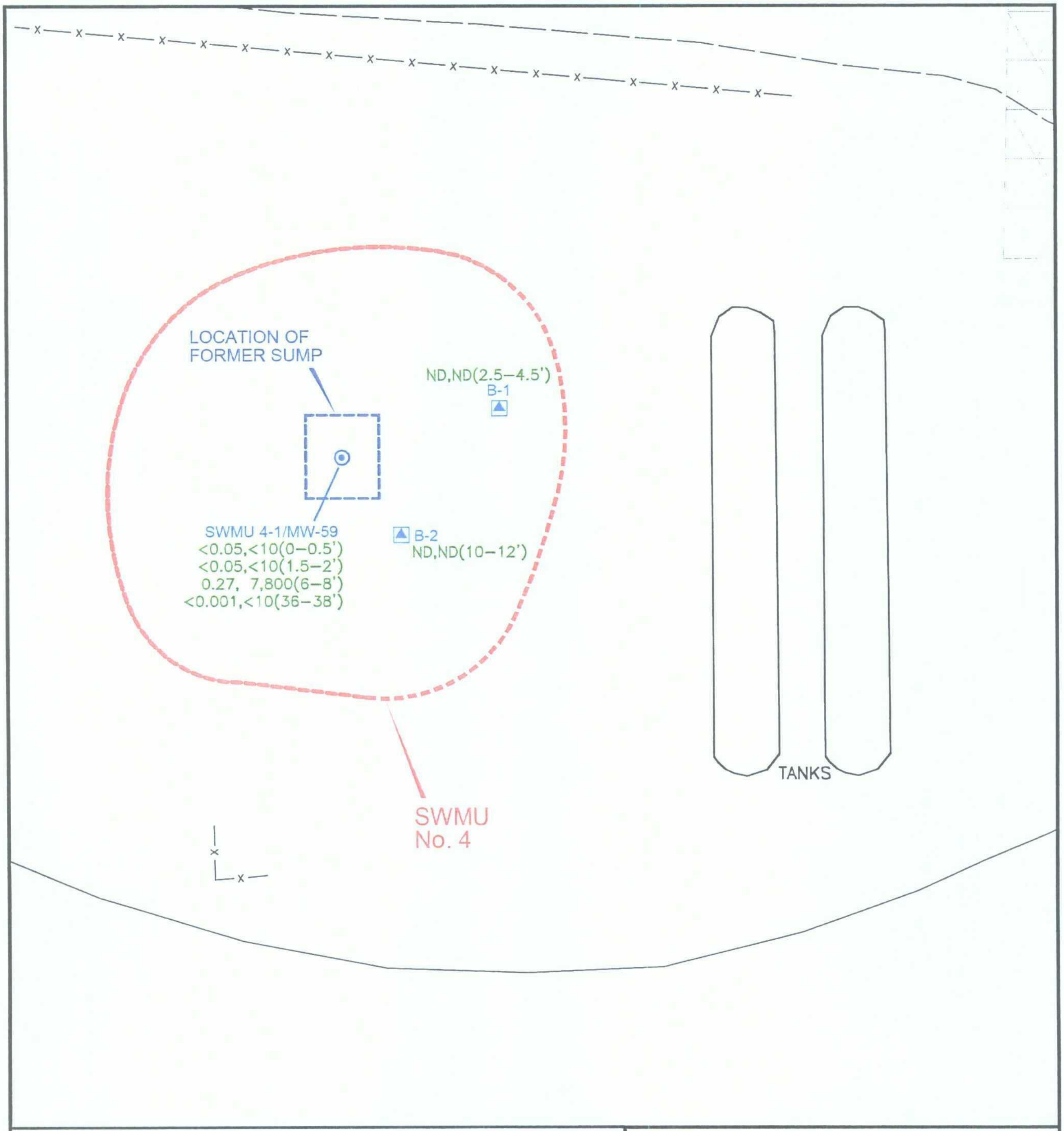
Western Refining
WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining | DATE: 09/21/09 | FILE: WestRef-B40

FIGURE 5
POTENTIOMETRIC SURFACE MAP
AUGUST 2009
BLOOMFIELD REFINERY

RPS
404 Camp Craft Road
Austin, Texas 78746





LEGEND

<0.05,<10(0–0.5') BENZENE,DRO CONCENTRATION mg/kg, (SAMPLE DEPTH, FT.)

APPROXIMATE SWMU No. 4 BOUNDARY

SWMU 4-1/MW-59 ◎ MONITORING WELL COMPLETION

B-1 ▲ 1994 RFI SOIL BORING

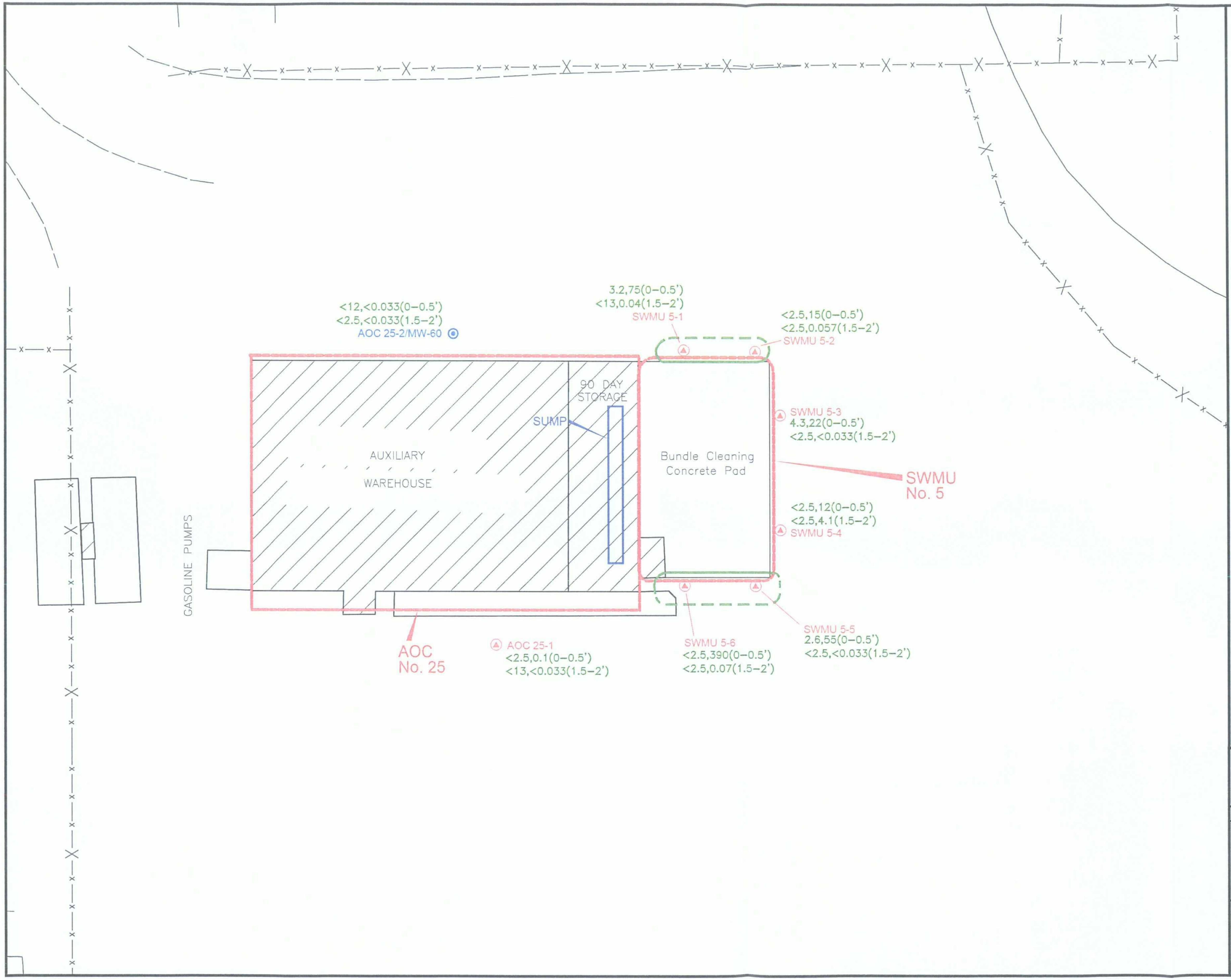
0 20
SCALE IN FEET

Western Refining
WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining	DATE: 08/17/09	FILE:WestRef–A34

FIGURE 6
SWMU No. 4
SAMPLE LOCATIONS MAP
BLOOMFIELD REFINERY

RPS
404 Camp Craft Road
Austin, Texas 78746



N

0 30
SCALE IN FEET

LEGEND

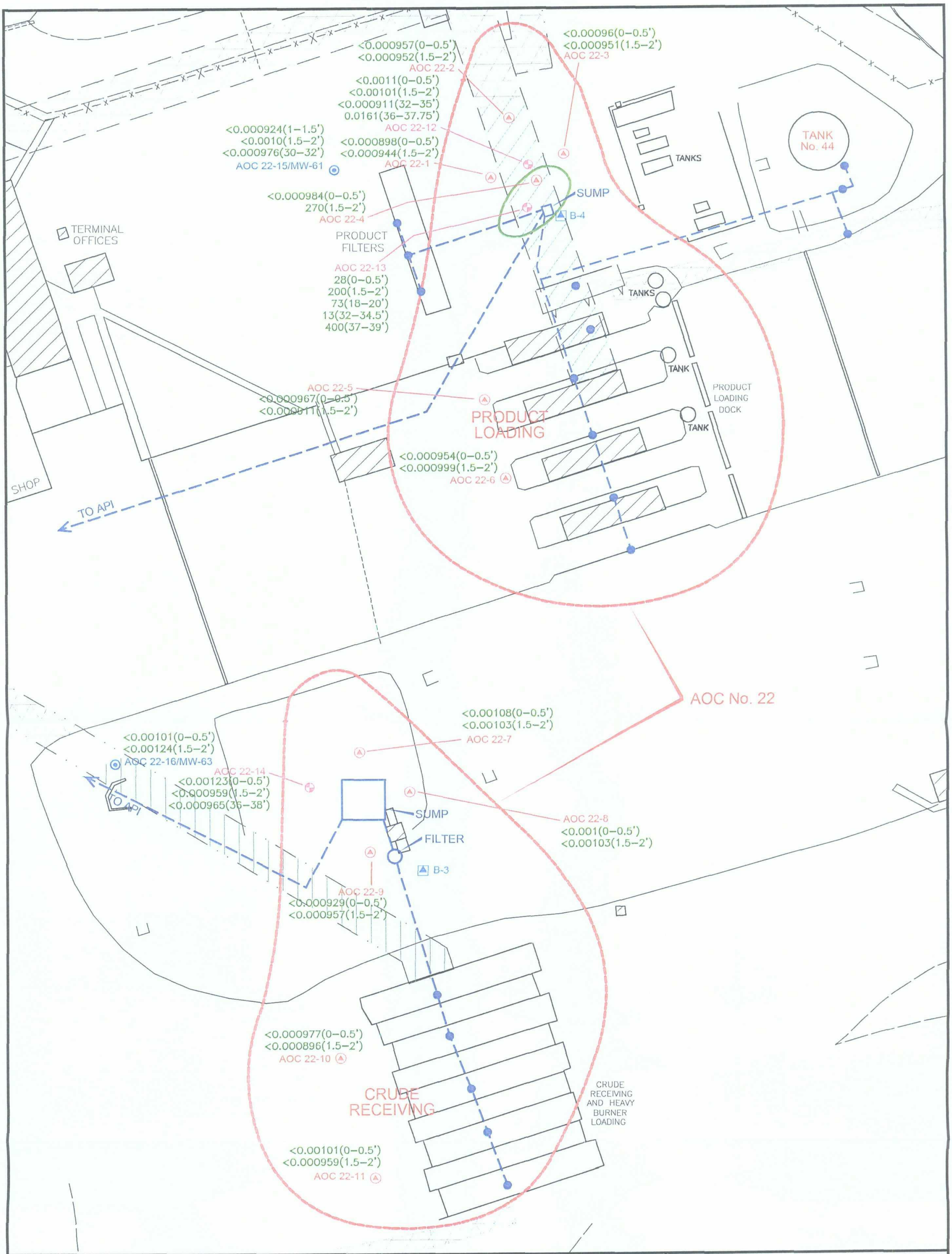
<2.5,12(0–0.5')	ARSENIC,MERCURY CONCENTRATION mg/kg, (SAMPLE DEPTH, FT.)
—	AFFECTED AREA
⬭	APPROXIMATE SWMU No. 5 AND AOC No. 25 BOUNDARY
AOC 25-2/MW-60 ⦿	MONITORING WELL COMPLETION
SWMU 5-1 ▲	SURFACE SOIL SAMPLE

Western Refining
WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining | DATE: 08/17/09 | FILE: WestRefB37

FIGURE 7
SWMU No. 5 AND AOC No. 25
SAMPLE LOCATIONS MAP
BLOOMFIELD REFINERY

RPS
404 Camp Craft Road
Austin, Texas 78746



LEGEND

<0.000924(0–0.5')	1,2,4-TRIMETHYLBENZENE CONCENTRATION mg/kg, (SAMPLE DEPTH, FT.)
🟩	AFFECTED AREA
○	APPROXIMATE AOC No. 22 BOUNDARY
AOC 22-12	SOIL BORING LOCATION
AOC 22-15/MW-61 ⦿	MONITORING WELL COMPLETION
AOC 22-1 Ⓐ	SURFACE SOIL SAMPLE
B-3 ▲	1994 RFI SOIL BORING
●	DRAIN
– – –	UNDERGROUND PIPING (APPROX. LOCATION)

N

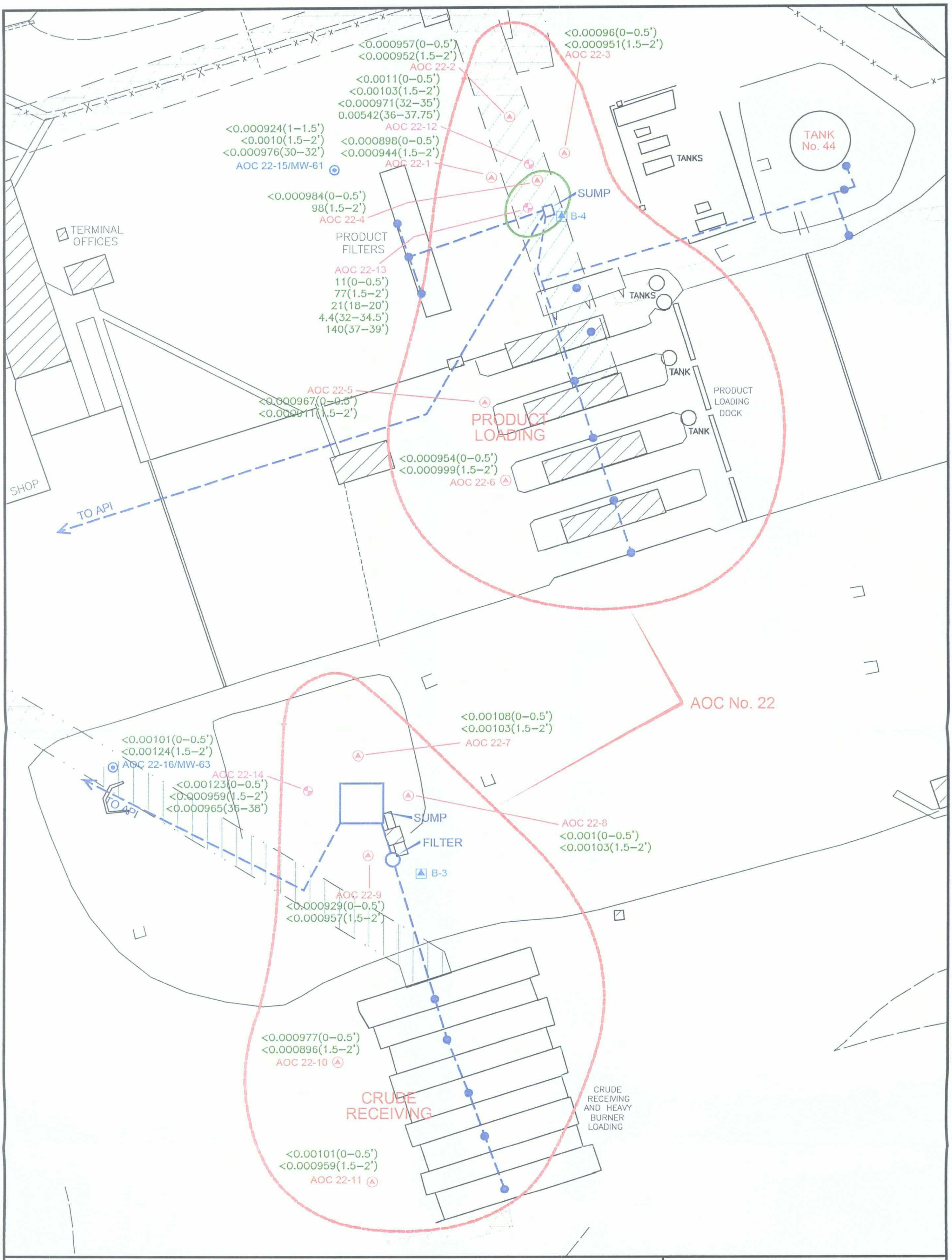
0 40
SCALE IN FEET

Western Refining
WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining | DATE: 08/17/09 | FILE: WestRefB37

FIGURE 8
AOC No. 22
1,2,4-TRIMETHYLBENZENE SOIL MAP
BLOOMFIELD REFINERY

RPS
404 Camp Craft Road
Austin, Texas 78746



LEGEND

<0.000929(0–0.5')	1,3,5-TRIMETHYLBENZENE CONCENTRATION mg/kg, (SAMPLE DEPTH, FT.)
━	AFFECTED AREA
⬭	APPROXIMATE AOC No. 22 BOUNDARY
AOC 22-12 ⊕	SOIL BORING LOCATION
AOC 22-15/MW-61 ◉	MONITORING WELL COMPLETION
AOC 22-1 Ⓐ	SURFACE SOIL SAMPLE
B-3 ▲	1994 RFI SOIL BORING
●	DRAIN
– – –	UNDERGROUND PIPING (APPROX. LOCATION)

N

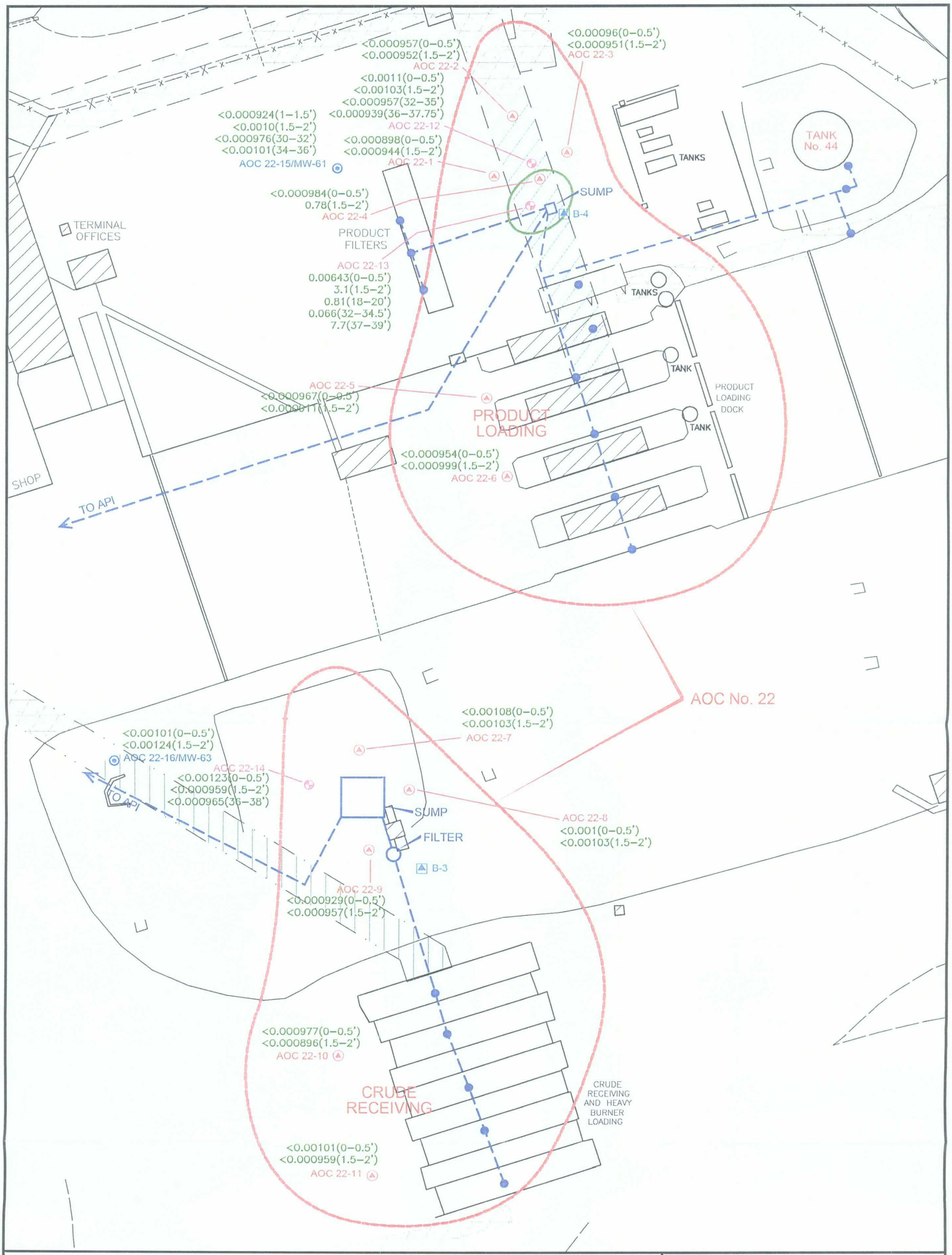
0 40
SCALE IN FEET

Western Refining
WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining | DATE: 08/22/09 | FILE: WestRefB37

FIGURE 9
AOC No. 22
1,3,5-TRIMETHYLBENZENE SOIL MAP
BLOOMFIELD REFINERY

RPS
404 Camp Craft Road
Austin, Texas 78746



LEGEND

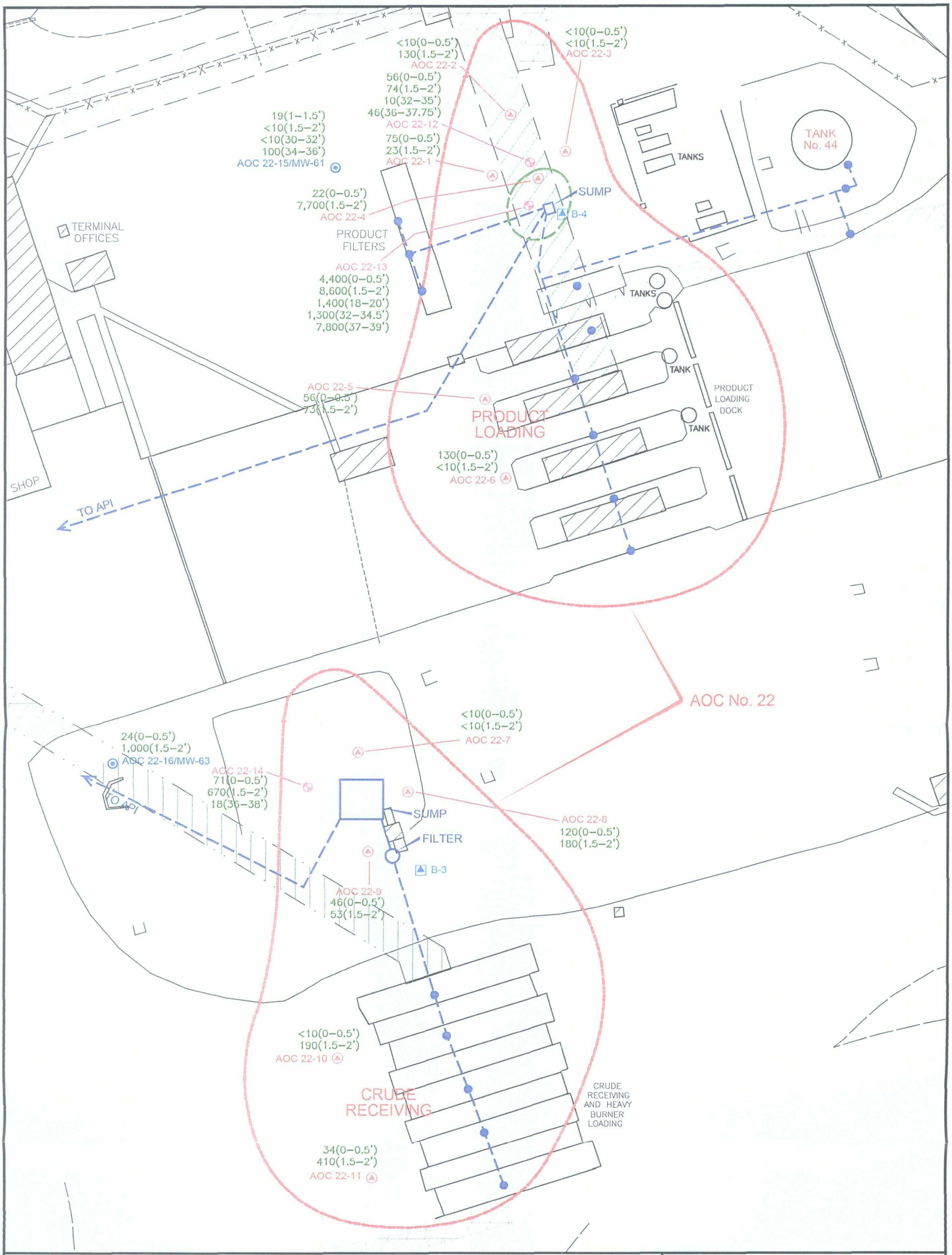
<0.000929(0–0.5')	BENZENE CONCENTRATION mg/kg, (SAMPLE DEPTH, FT.)
▬	AFFECTED AREA
⬭	APPROXIMATE AOC No. 22 BOUNDARY
AOC 22-12 ◍	SOIL BORING LOCATION
AOC 22-15/MW-61 ⊙	MONITORING WELL COMPLETION
AOC 22-1 Ⓐ	SURFACE SOIL SAMPLE
B-3 ▲	1994 RFI SOIL BORING
●	DRAIN
— — —	UNDERGROUND PIPING (APPROX. LOCATION)

Western Refining
WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining | DATE: 08/22/09 | FILE: WestRefB37

FIGURE 10
AOC No. 22
BENZENE SOIL MAP
BLOOMFIELD REFINERY

RPS
404 Camp Craft Road
Austin, Texas 78746



LEGEND

120(0–0.5') DIESEL RANGE ORGANICS (DRO) CONCENTRATION mg/kg, (SAMPLE DEPTH, FT.)

AFFECTED AREA

APPROXIMATE AOC No. 22 BOUNDARY

AOC 22-12 SOIL BORING LOCATION

AOC 22-15/MW-61 ⦿ MONITORING WELL COMPLETION

AOC 22-1 SURFACE SOIL SAMPLE

B-3 ▲ 1994 RFI SOIL BORING

● DRAIN

– – – UNDERGROUND PIPING (APPROX. LOCATION)

N

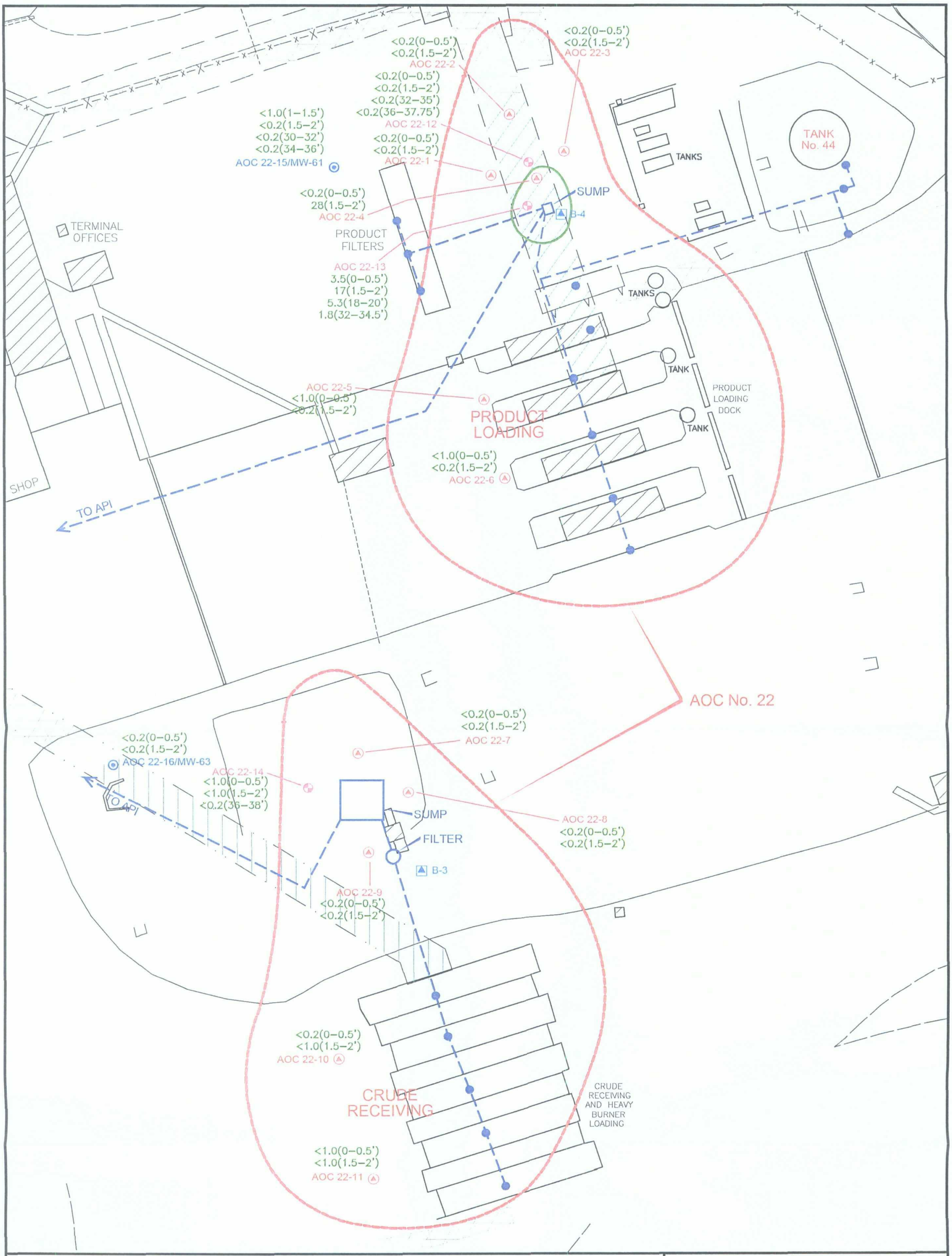
0 40
SCALE IN FEET

Western Refining
WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining	DATE: 08/22/09	FILE: WestRefB37

FIGURE 11
AOC No. 22
DIESEL RANGE ORGANICS SOIL MAP
BLOOMFIELD REFINERY

RPS
404 Camp Craft Road
Austin, Texas 78746



LEGEND

<0.2(0–0.5')	NAPHTHALENE CONCENTRATION mg/kg, (SAMPLE DEPTH, FT.)
▬	AFFECTED AREA
⬭	APPROXIMATE AOC No. 22 BOUNDARY
AOC 22-12 ⊕	SOIL BORING LOCATION
AOC 22-15/MW-61 ⊙	MONITORING WELL COMPLETION
AOC 22-1 Ⓐ	SURFACE SOIL SAMPLE
B-3 ▲	1994 RFI SOIL BORING
●	DRAIN
– – –	UNDERGROUND PIPING (APPROX. LOCATION)

N

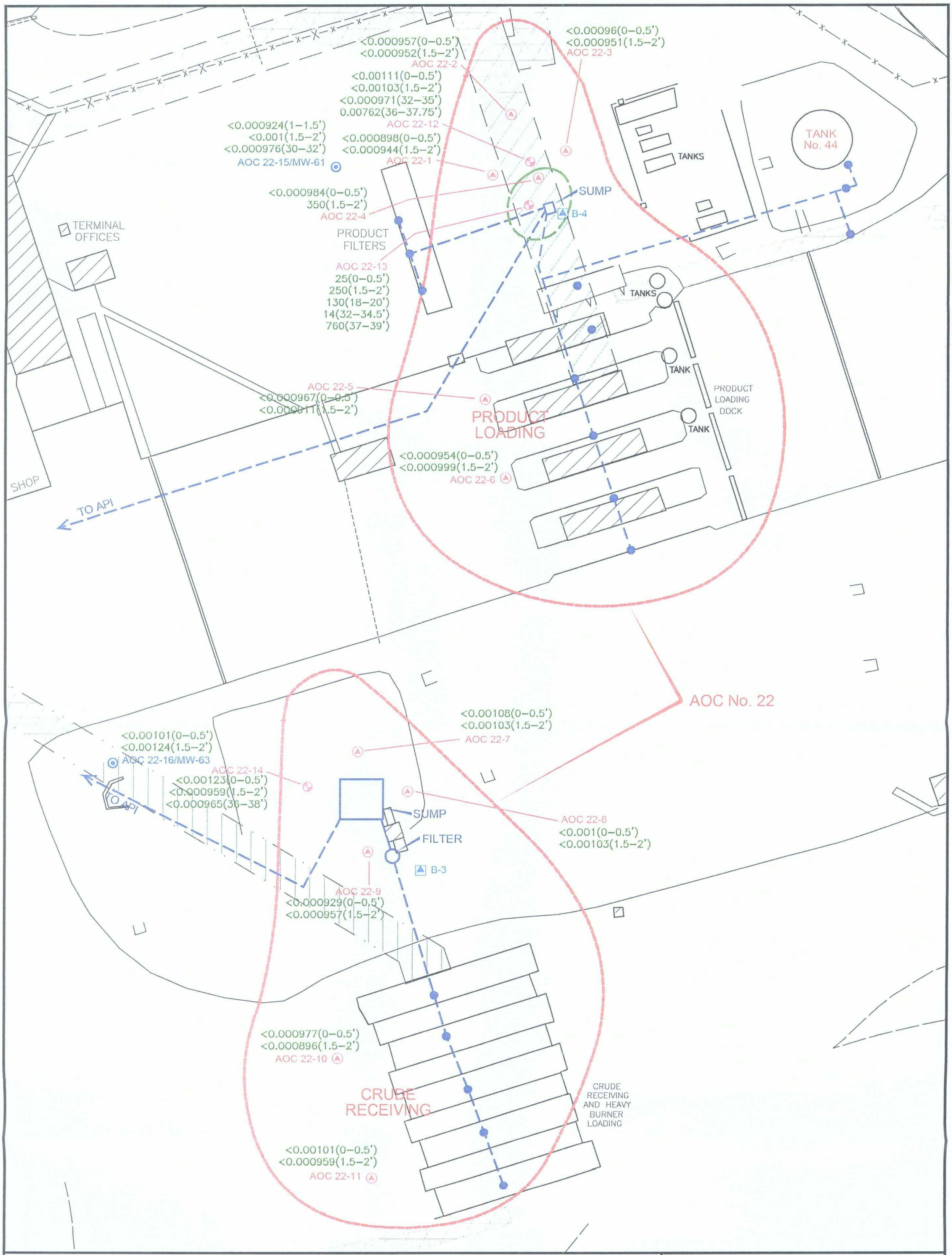
0 40
SCALE IN FEET

Western Refining
WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining	DATE: 08/22/09	FILE: WestRefB37

FIGURE 12
AOC No. 22
NAPHTHALENE SOIL MAP
BLOOMFIELD REFINERY

RPS
404 Camp Craft Road
Austin, Texas 78746



LEGEND

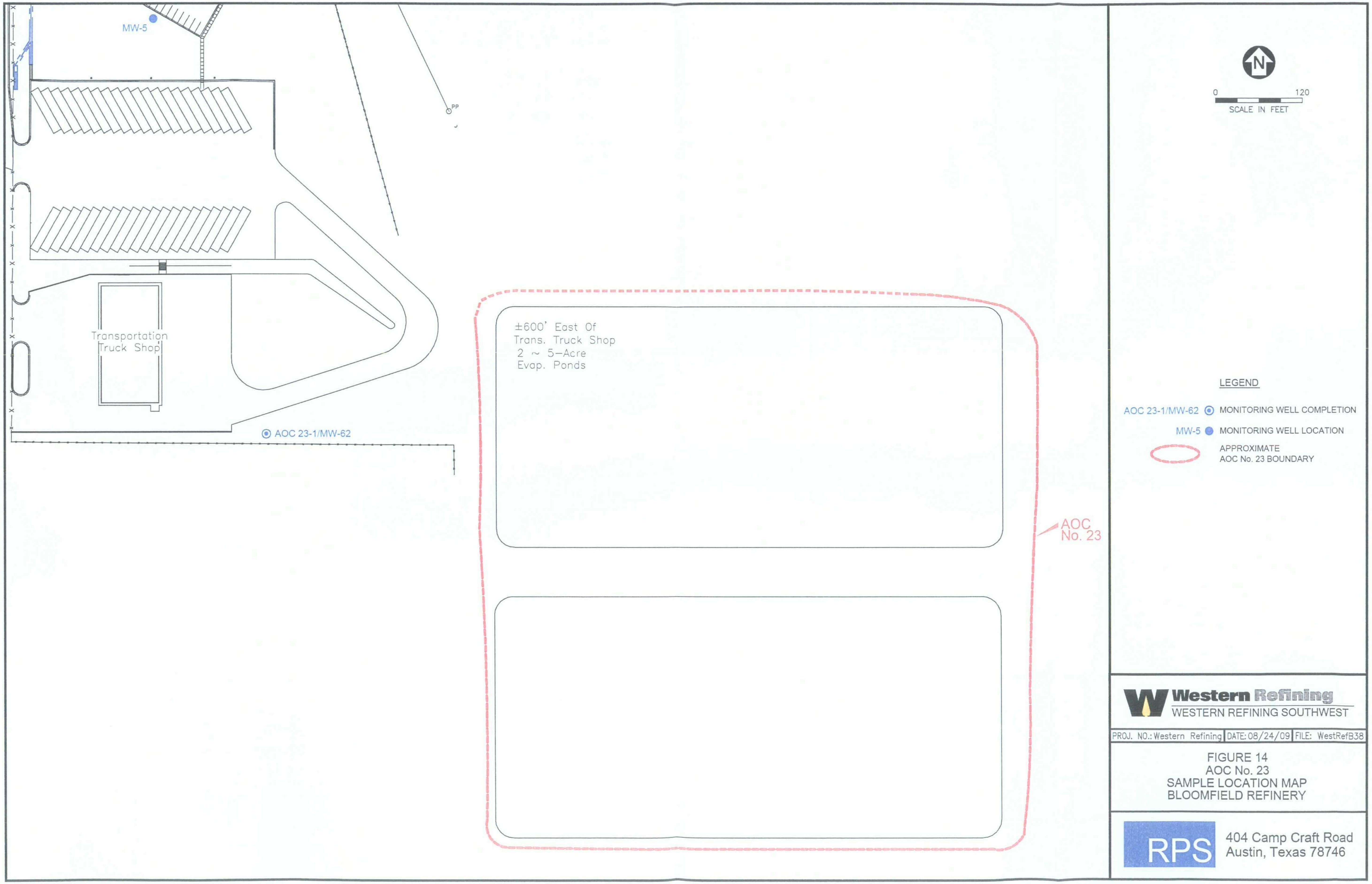
<0.000929(0–0.5')	XYLENES CONCENTRATION mg/kg, (SAMPLE DEPTH, FT.)
— — —	AFFECTED AREA
⬭	APPROXIMATE AOC No. 22 BOUNDARY
AOC 22-12 ◒	SOIL BORING LOCATION
AOC 22-15/MW-61 ⊙	MONITORING WELL COMPLETION
AOC 22-1 Ⓐ	SURFACE SOIL SAMPLE
B-3 ▲	1994 RFI SOIL BORING
●	DRAIN
– – –	UNDERGROUND PIPING (APPROX. LOCATION)

Western Refining
WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining | DATE: 08/22/09 | FILE: WestRefB37

FIGURE 13
AOC No. 22
XYLENES SOIL MAP
BLOOMFIELD REFINERY

RPS
404 Camp Craft Road
Austin, Texas 78746

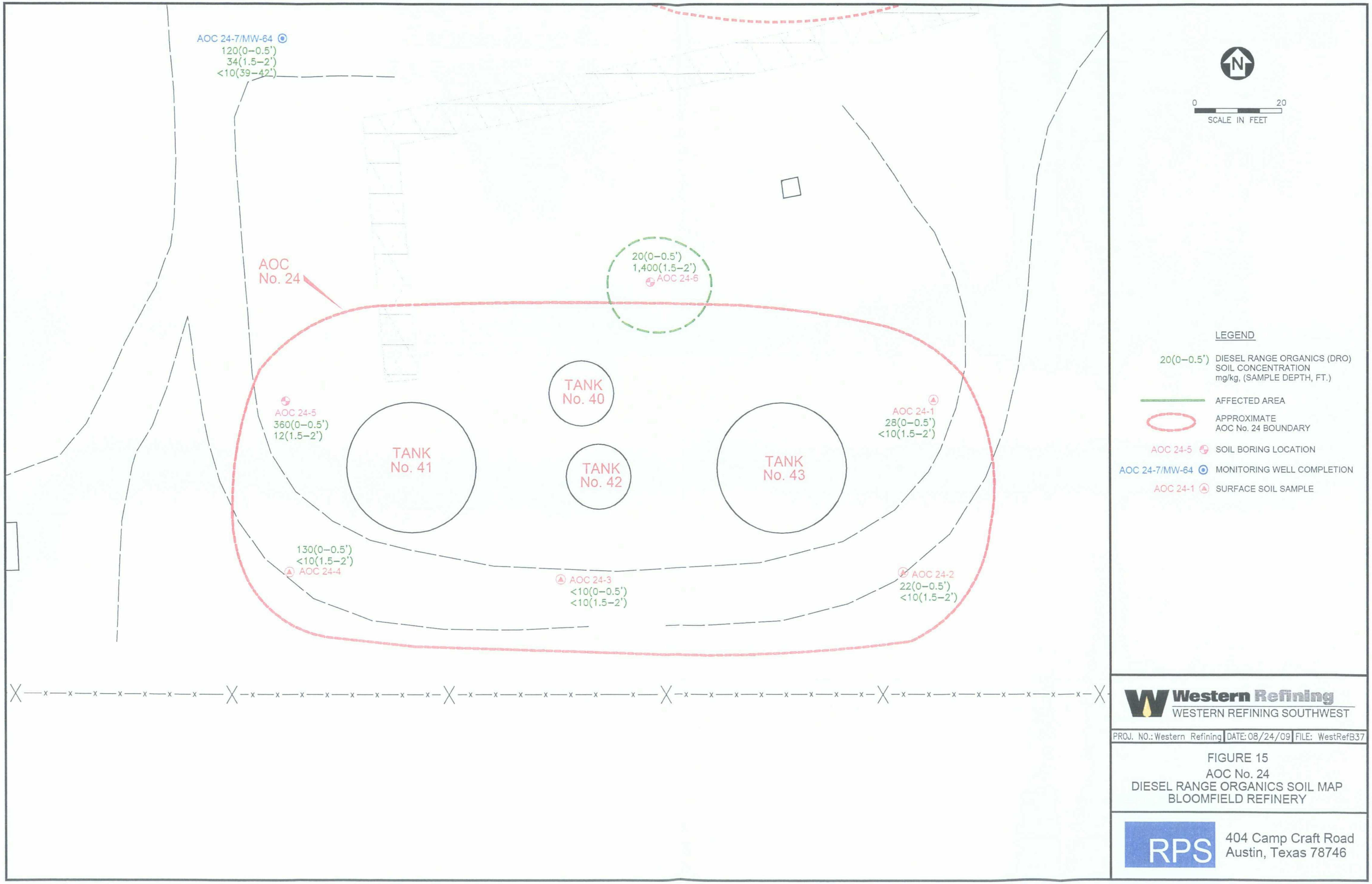


Western Refining
WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining	DATE: 08/24/09	FILE: WestRefB38

FIGURE 14
AOC No. 23
SAMPLE LOCATION MAP
BLOOMFIELD REFINERY

RPS
404 Camp Craft Road
Austin, Texas 78746

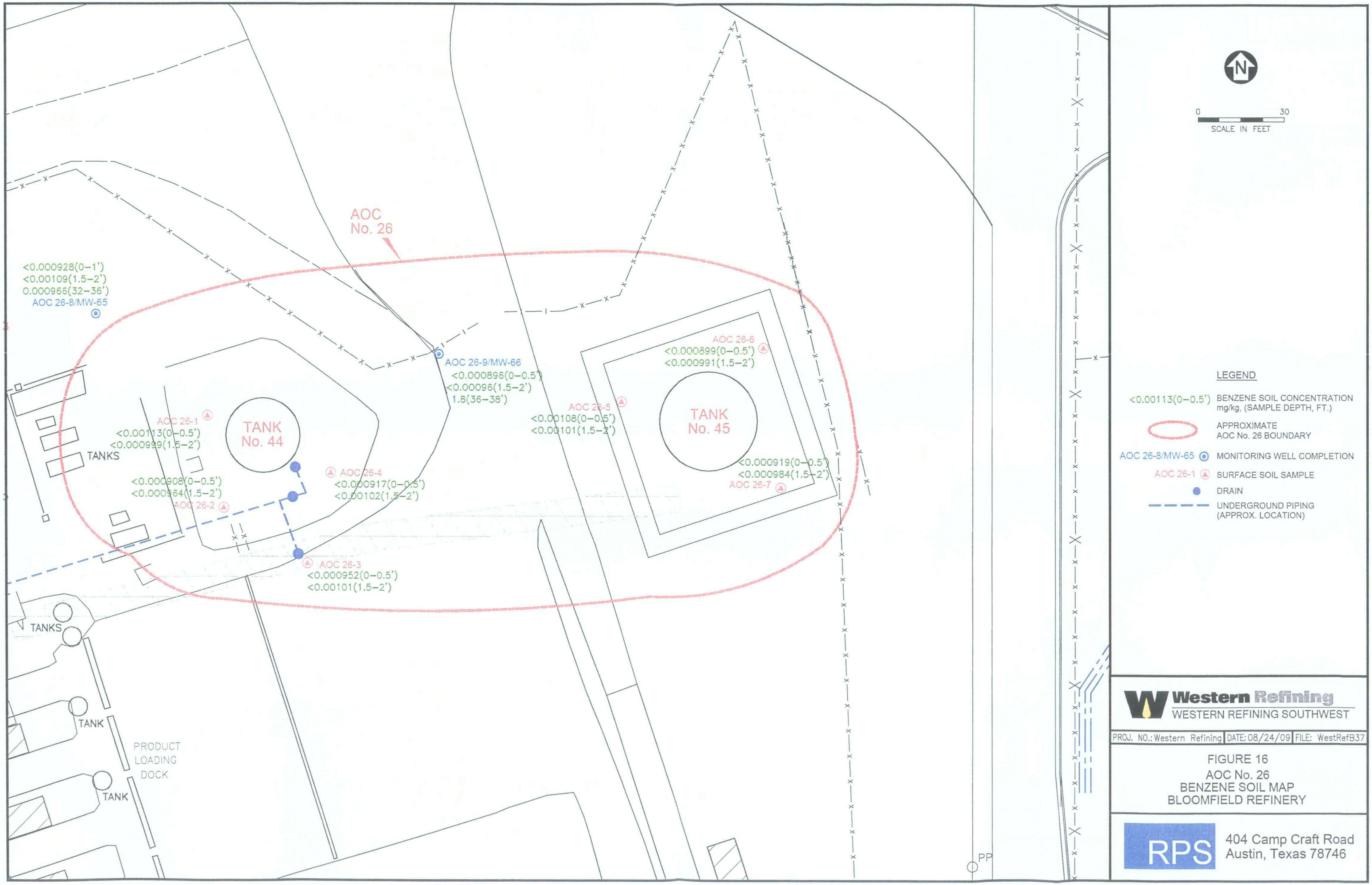


Western Refining
WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining	DATE: 08/24/09	FILE: WestRefB37

FIGURE 15
AOC No. 24
DIESEL RANGE ORGANICS SOIL MAP
BLOOMFIELD REFINERY

RPS
404 Camp Craft Road
Austin, Texas 78746

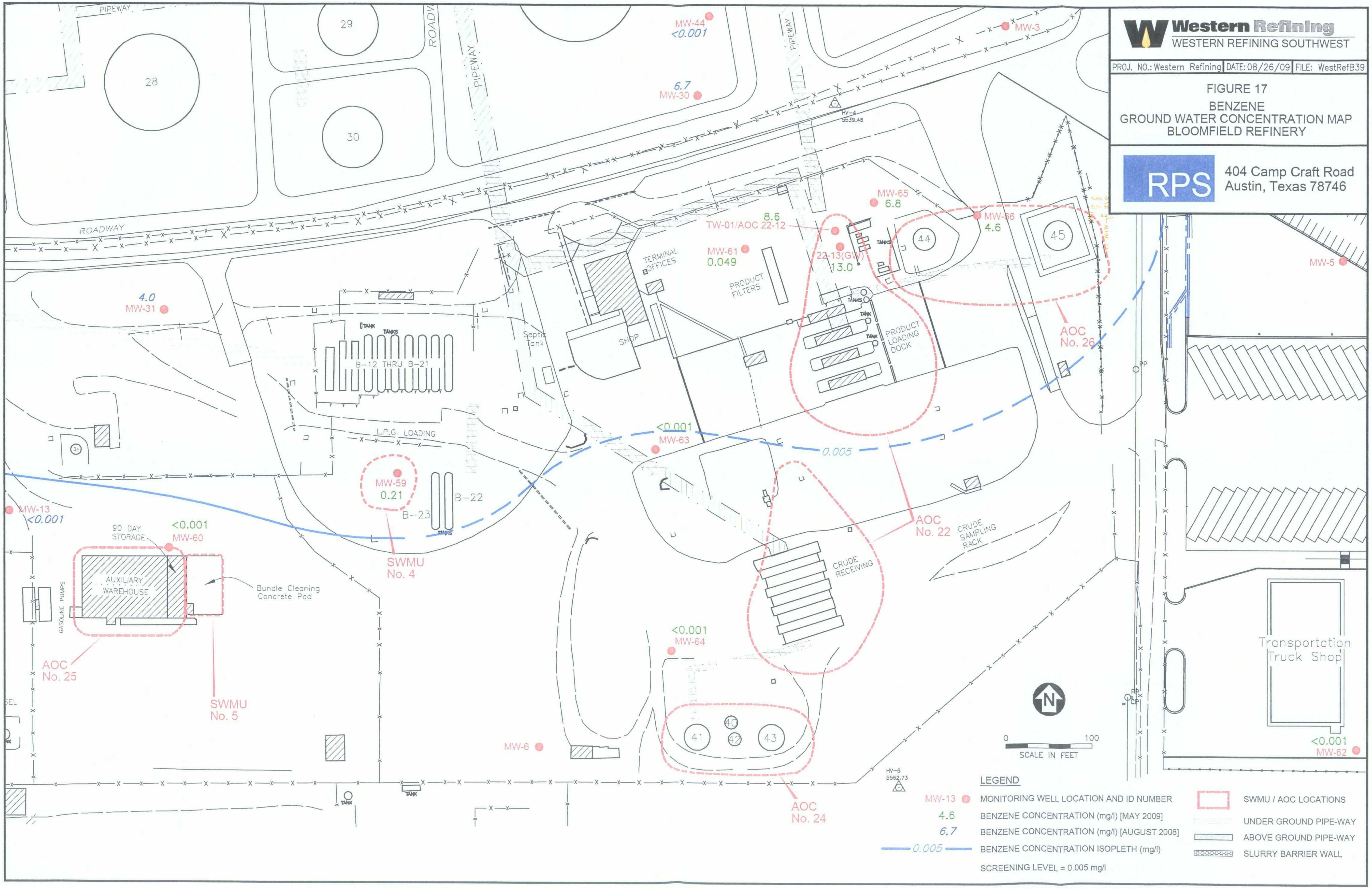


Western Refining
WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining | DATE: 08/24/09 | FILE: WestRefB37

FIGURE 16
AOC No. 26
BENZENE SOIL MAP
BLOOMFIELD REFINERY

RPS
404 Camp Craft Road
Austin, Texas 78746



Western Refining
WESTERN REFINING SOUTHWEST

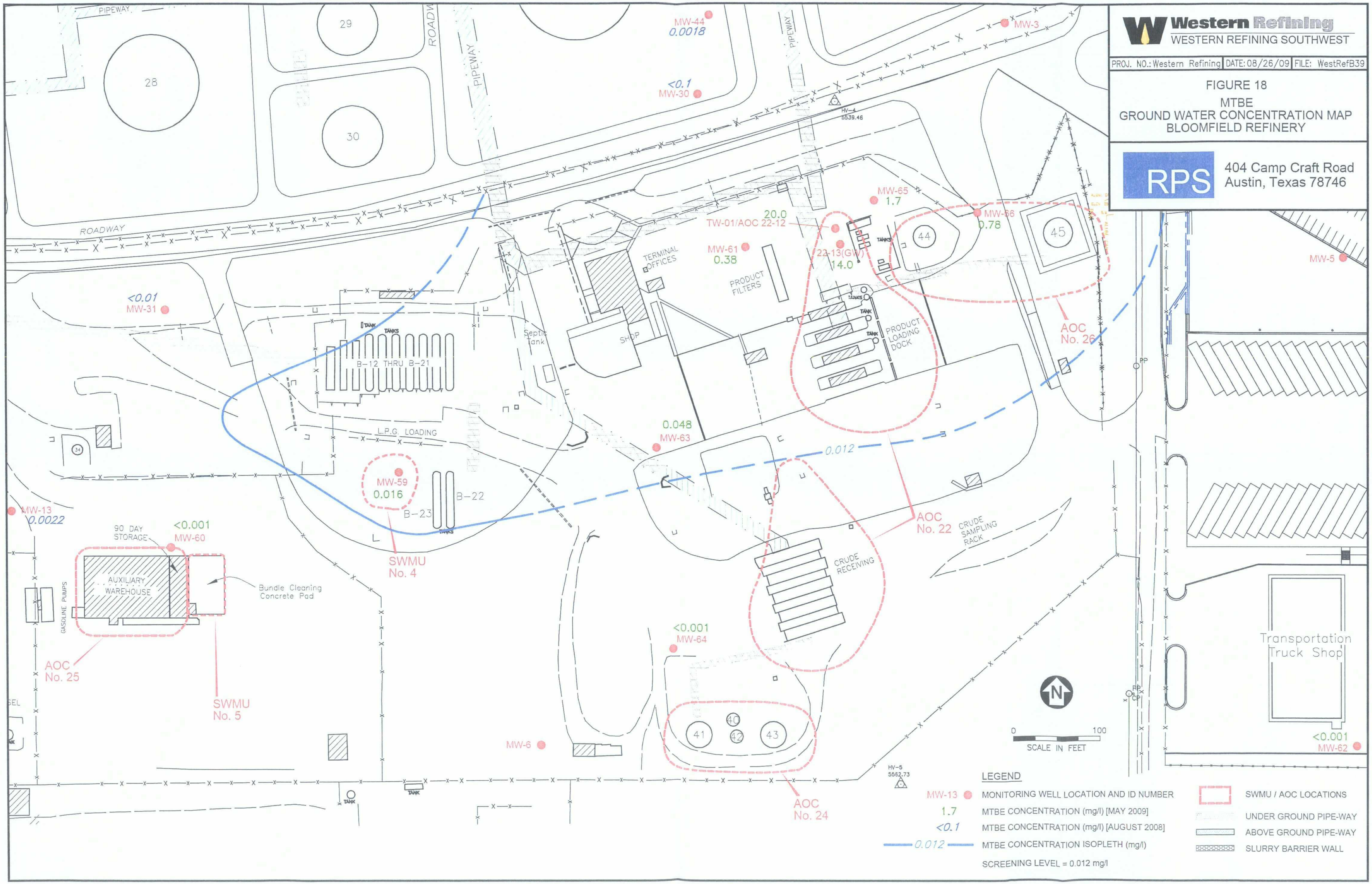
PROJ. NO.: Western Refining | DATE: 08/26/09 | FILE: WestRefB39

FIGURE 17
BENZENE
GROUND WATER CONCENTRATION MAP
BLOOMFIELD REFINERY

RPS
404 Camp Craft Road
Austin, Texas 78746

LEGEND

MW-13 ●	MONITORING WELL LOCATION AND ID NUMBER
4.6	BENZENE CONCENTRATION (mg/l) [MAY 2009]
6.7	BENZENE CONCENTRATION (mg/l) [AUGUST 2008]
— 0.005 —	BENZENE CONCENTRATION ISOPLETH (mg/l)
	SCREENING LEVEL = 0.005 mg/l
▭	SWMU / AOC LOCATIONS
▨	UNDER GROUND PIPE-WAY
▭	ABOVE GROUND PIPE-WAY
▩	SLURRY BARRIER WALL



Western Refining
WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining | DATE: 08/26/09 | FILE: WestRefB39

FIGURE 18
MTBE
GROUND WATER CONCENTRATION MAP
BLOOMFIELD REFINERY

RPS
404 Camp Craft Road
Austin, Texas 78746

LEGEND

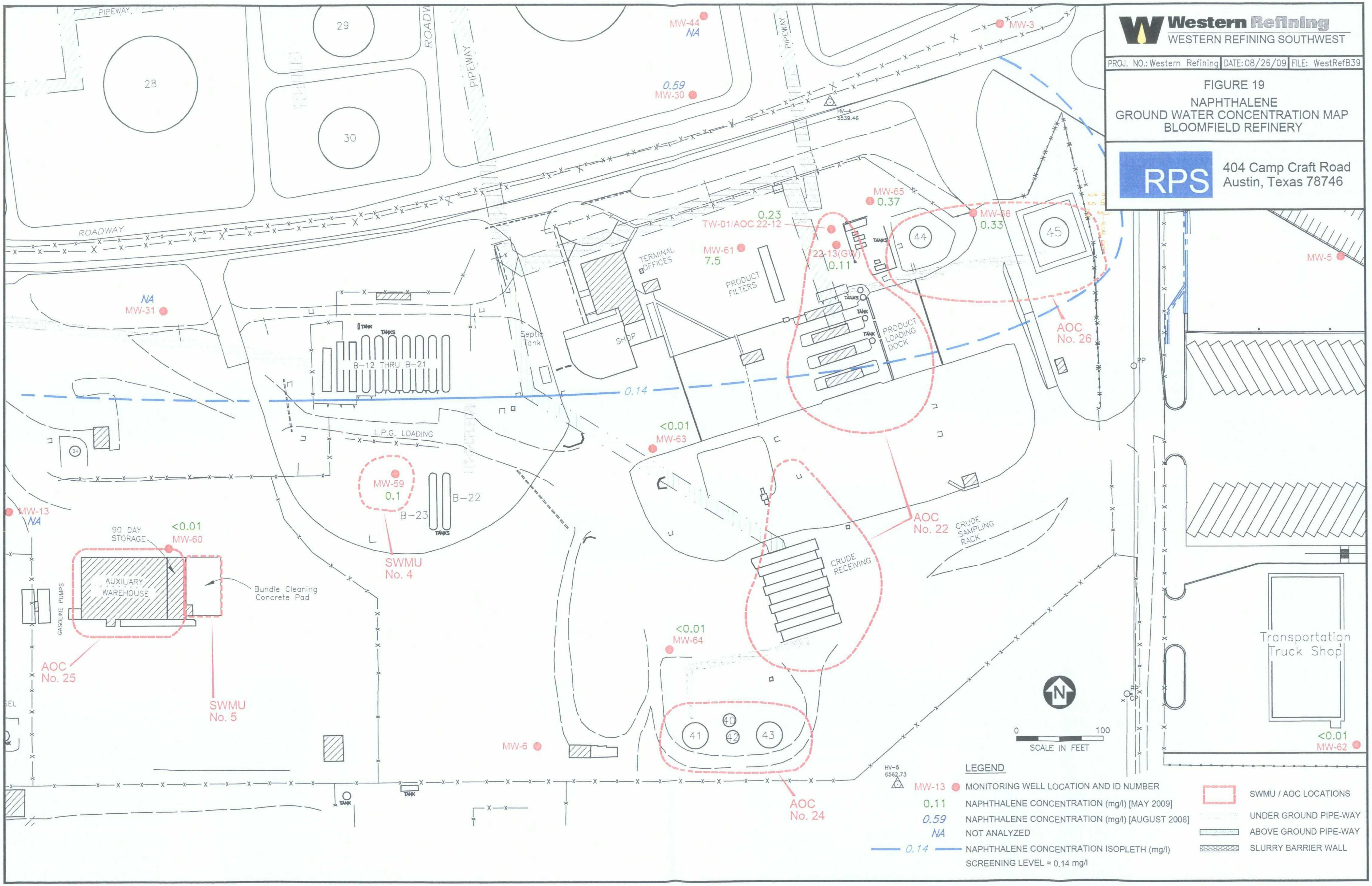
MW-13 ●	MONITORING WELL LOCATION AND ID NUMBER
1.7	MTBE CONCENTRATION (mg/l) [MAY 2009]
<0.1	MTBE CONCENTRATION (mg/l) [AUGUST 2008]
— 0.012 —	MTBE CONCENTRATION ISOPLETH (mg/l)
	SCREENING LEVEL = 0.012 mg/l
▭	SWMU / AOC LOCATIONS
▨	UNDER GROUND PIPE-WAY
▭	ABOVE GROUND PIPE-WAY
▩	SLURRY BARRIER WALL

Western Refining
WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining | DATE: 08/26/09 | FILE: WestRefB39

FIGURE 19
NAPHTHALENE GROUND WATER CONCENTRATION MAP BLOOMFIELD REFINERY

RPS
404 Camp Craft Road
Austin, Texas 78746



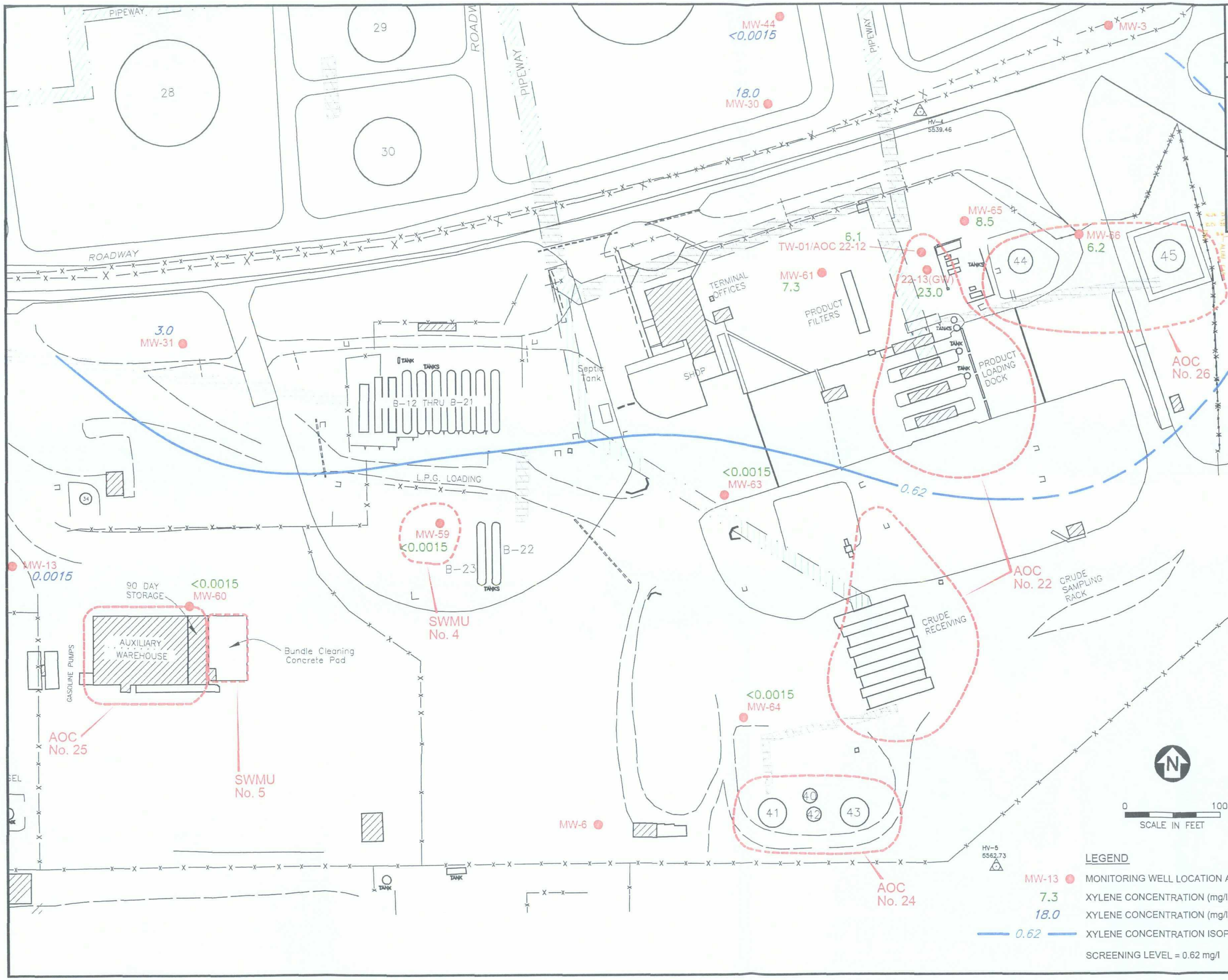
NAPHTHALENE

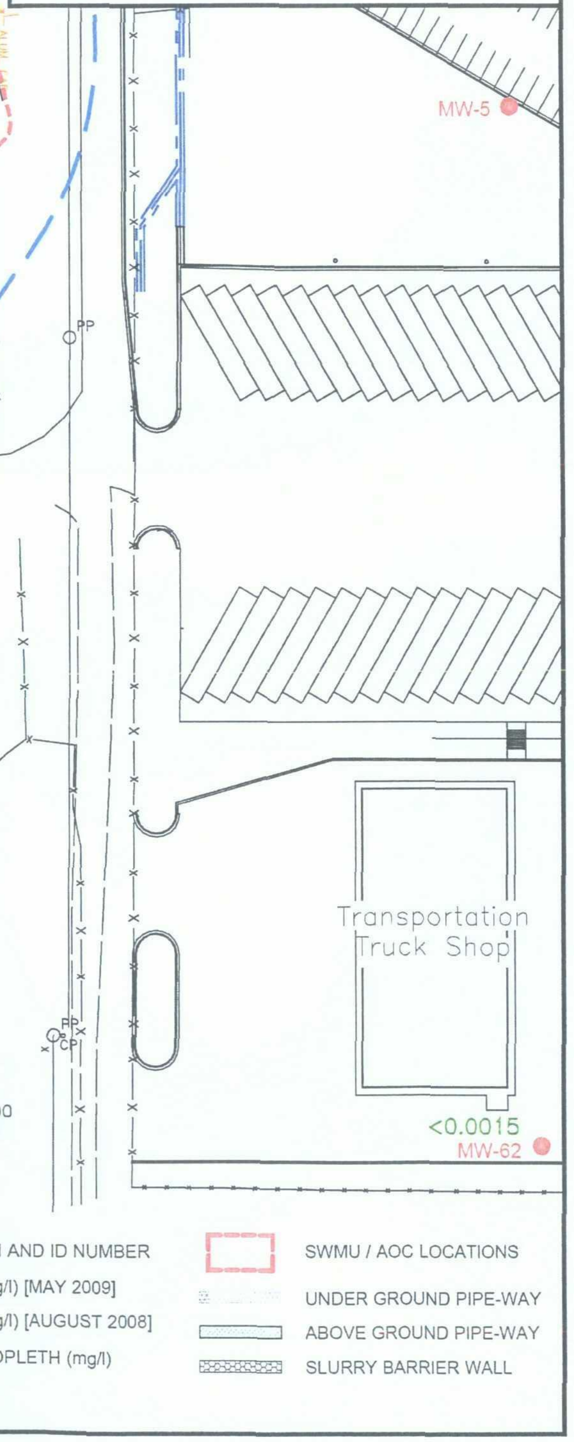
Western Refining
WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining | DATE: 08/26/09 | FILE: WestRefB39

FIGURE 20
XYLENES
GROUND WATER CONCENTRATION MAP
BLOOMFIELD REFINERY

RPS
404 Camp Craft Road
Austin, Texas 78746



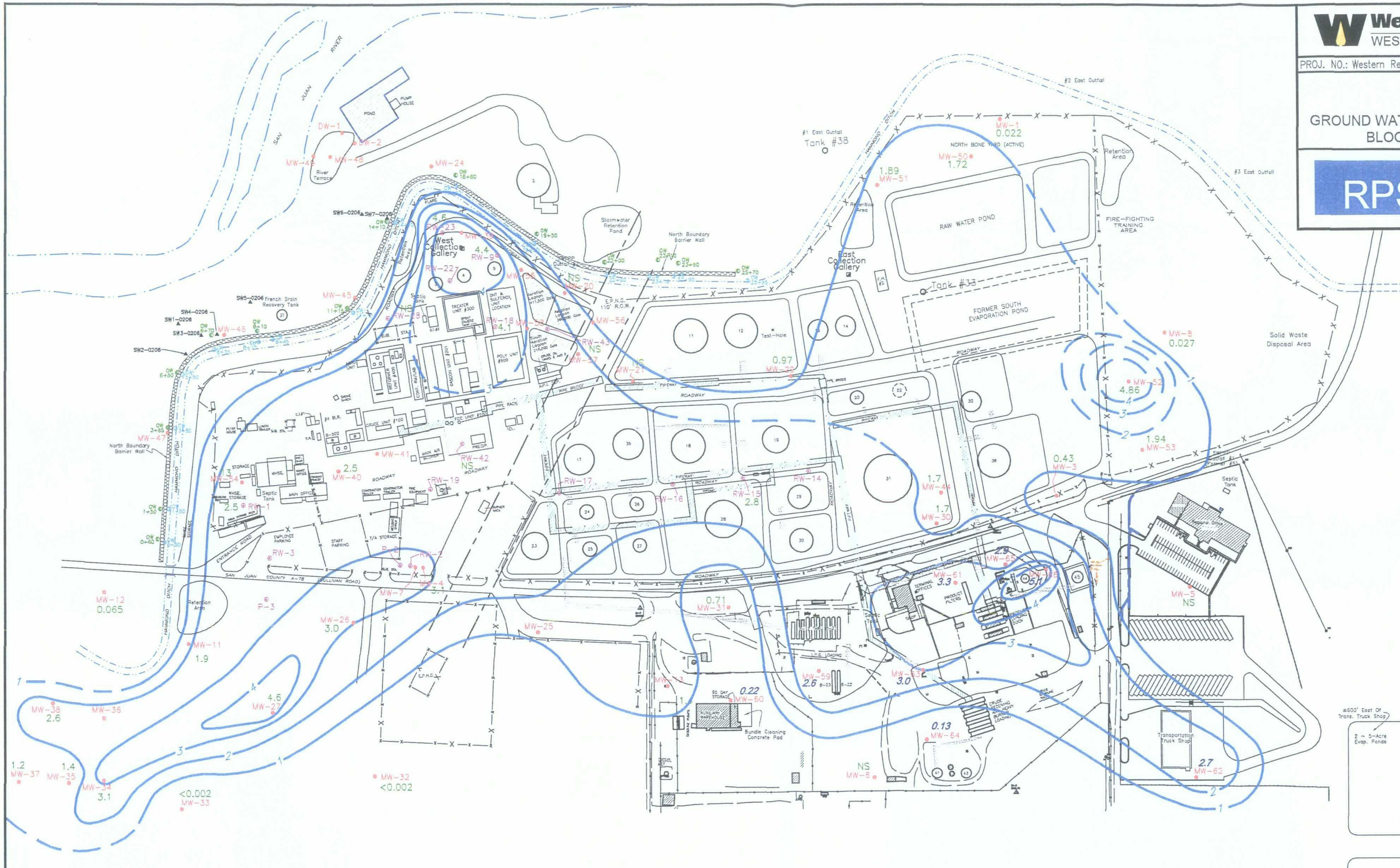


Western Refining
WESTERN REFINING SOUTHWEST

PROJ. NO.: Western Refining | DATE: 09/15/09 | FILE: WestRef-B44

FIGURE 21
MANGANESE
GROUND WATER CONCENTRATION MAP
BLOOMFIELD REFINERY

RPS
404 Camp Craft Road
Austin, Texas 78746



LEGEND

MW-1 ●	MONITORING WELL LOCATION AND IDENTIFICATION NUMBER
RW-1 ⊕	RECOVERY WELL LOCATION AND IDENTIFICATION NUMBER
OW 1+50 ⊙	OBSERVATION WELL LOCATION AND IDENTIFICATION NUMBER
CW ⊙	COLLECTION WELL LOCATION AND IDENTIFICATION NUMBER
SW1-0206 ▲	SUMP WELL LOCATION AND IDENTIFICATION NUMBER
P-2	PIEZOMETER IDENTIFICATION
— 1 —	CONTOUR OF MANGANESE CONCENTRATION (mg/l) CONTOUR INTERVAL = 1.0 mg/l
1.7	MANGANESE CONCENTRATION (mg/l) (AUGUST - OCTOBER 2008 DATA WHERE AVAILABLE, OTHERWISE HISTORIC DATA, SEE TABLE 3)
2.7	MANGANESE CONCENTRATION (mg/l) (MAY 2009)
NS	NOT SAMPLED
	UNDER GROUND PIPE-WAY
▭	ABOVE GROUND PIPE-WAY
▨	SLURRY BARRIER WALL
◌	FORMER TANK LOCATION

NOTE:
MW-54 NOT INCLUDED IN CONTOURS

Appendix A

Photographs

Photograph 1
Solid Waste Management Unit #4, looking east across location of former sump.

Photograph 2
Solid Waste Management Unit #5, facing west and looking across bundle cleaning pad at east end of warehouse building/90-storage area (AOC No. 25).

Photograph 3
Solid Waste Management Unit #5, looking northwest across bundle cleaing pad.

Photograph 4
Area of Concern 25. Picture taken inside warehouse buliding, looking at dry materials (e.g., catalyst) stored inside.

Photograph 5
Area of Concern 25. Picture of materials stored inside warehouse.

Photograph 6
Area of Concern 25. Picture of employee exercise area in west end
of warehouse building.

Photograph 7
Area of Concern 25 Looking southwest from northeast corner of warehouse building/90-day storage area. The 90-day storage area is located inside open door way.

Photograph 8
Area of Concern 22 Looking east from west end of crude receiving rack facilities sump, location of new MW-63.

Photograph 9
Area of Concern 22 Looking south from northern portion of crude receiving rack.

Photograph 10
Area of Concern 22 Looking southeast from western portion of crude receiving rack facilities area.

Photograph 11
Area of Concern 24 Looking southeast toward Tanks 40 and 42,
Tank 43 in background.

Photograph 12
Area of Concern 24 Looking southeast at Tank 43 from northern
edge of containment area.

Photograph 13
Area of Concern 22 Looking east at product loading racks.

Photograph 14
Area of Concern 22 From northwest corner of product loading rack,
looking east at Tanks 44 and 45 in background, center.

Photograph 15
Area of Concern 22 From northwest corner of product loading rack, looking northwest at product filters. Tanks in background are located on north side of County Rd 4990.

Photograph 16
Area of Concern 26 From south side of Tank 44, looking east at Tank 45.

Photograph 17
Area of Concern 26 From northwest corner of Tank 45, looking southeast.

Photograph 18
Area of Concern 27 From northwest corner of holding pond,
looking east-southeast.

Photograph 19
Area of Concern 25 Drums stored inside 90-day storage area, concrete sump in center with metal cover.

Appendix B

Correspondence

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone (505) 476-6000 Fax (505) 476-6030
www.nmenv.state.nm.us

BILL RICHARDSON
Governor

DIANE DENISH
Lieutenant Governor

RON CURRY
Secretary

JON GOLDSTEIN
Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

October 27, 2009

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

RE: EXTENSION REQUEST APPROVAL
FOR THE SUBMITTAL OF THE GROUP 3 INVESTIGATION REPORT
WESTERN REFINING SOUTHWEST INC., BLOOMFIELD REFINERY
EPA ID# NMD089416416
HWB-GRCB-08-004

Dear Mr. Schmaltz:

The New Mexico Environment Department (NMED) received Western Refining Southwest Inc., Bloomfield Refinery's (Western) *Group 3 Investigation Report Extension Request* letter, dated October 15, 2009. Western is requesting a sixty day extension from the October 19, 2009 due date for the submittal of the Group 3 Investigation Report. Western has made this request because of delays in receipt of sample analytical data from the contract laboratory. NMED hereby approves this 60 day extension; the Group 3 Investigation Report is due to NMED on or before December 21, 2009.

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

Sincerely,

John E. Kieling
Program Manager
Permits Management Program
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB
H. Monzeglio, NMED HWB
File: GRCB 2009 and Reading
HWB-GRCB-08-004

Western Refining
OOMFIELD REFINERY

WNR
LISTED
NYSE

Fed Ex Priority Overnight # 8709 9688 0454

October 15, 2009

Ms. Hope Monzeglio
State of New Mexico Environmental Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

Re: Giant Refining Company, Bloomfield Refinery (currently known as Western Refining Southwest, Inc. – Bloomfield Refinery) Order No. HWB 07-34 (CO) Group 3 Investigation Report Submittal Extension Request

Dear Ms. Monzeglio:

During review Western Refining Southwest, Inc. – Bloomfield Refining discovered that we had not received all the analytical data from the contract laboratory for sampling that had taken place during the Group 3 Investigation. Western has been working with the lab and the missing reporting is forth coming. As of Wednesday October 14, 2009 there is still some outstanding data which Western is anticipating by weeks end.

Given this information and the need to process this information, Western requests a sixty day extension of the October 19, 2009 deadline for submittal of the Group 3 Investigation Report.

Your consideration in this matter is greatly appreciated!

Sincerely,

James R. Schmaltz
Environmental Manager

50 Road 4990, Bloomfield, New Mexico 87413 • 505 632-8013 • www.wnr.com
Mail: P.O. Box 159, Bloomfield, New Mexico 87413

Scott Crouch

From: Monzeglio, Hope, NMENV [hope.monzeglio@state.nm.us]
Sent: Friday, March 27, 2009 12:26 PM
To: Robinson, Kelly
Cc: Schmaltz, Randy; Scott Crouch; Cobrain, Dave, NMENV
Subject: RE: RCRA Investigation Group 3- Proposed Revised Boring Locations

Kelly

The proposed locations are fine.

Hope

From: Robinson, Kelly [mailto:Kelly.Robinson@wnr.com]
Sent: Friday, March 27, 2009 10:34 AM
To: Monzeglio, Hope, NMENV
Cc: Schmaltz, Randy; Scott Crouch
Subject: RCRA Investigation Group 3- Proposed Revised Boring Locations

Good Morning Hope,

Thank you for talking with Randy and I yesterday afternoon. As we had briefly mentioned to you during our phone discussion yesterday, we would like to propose slightly adjusted locations for two monitoring wells and one soil boring that pertain to the Group 3 Investigation activities at the Bloomfield Refinery.

Over the past few days, we have conducted extensive efforts to identify underground utility and process piping within all proposed drilling locations for Group 3. As a result of those efforts, we have identified three areas in particular where we would like to modify the location of the respective borings to avoid damaging underground piping and provide safer clearance from exiting underground utilities.

The attached map is a mark-up of the original Figure 8 included in the approved Group 3 Work Plan. The originally approved boring locations shaded in yellow are areas where underground utility and process piping has been identified. The adjacent yellow circles represent Western's proposed "alternative" drilling location for each area.

We would like NMED's approval of the proposed modified locations. If you have any questions or need any additional information, please don't hesitate to contact either Randy or myself at your convenience.

Thank you for your time!

Sincerely,

Kelly R. Robinson
Environmental Engineer

Western Refining Southwest, Inc. - Bloomfield Refinery
P.O. Box 159
50 Road 4990
Bloomfield, NM87413

office: (505) 632-4166
cell: (602) 908-6617
fax: (505) 632-3911


AOC
No
W
W
B-4
AOC
No. 22
W
B-3
W
AOC
No. 24

Appendix C

Analytical Data Reports

COC 1 of 2

Chain-of-Custody Record

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Client: Western Refining Southwest, Inc.
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type) Excel

Turn-Around Time:
☑ Standard ☐ Rush
Project Name: RCRA Investigation - Group 3
Project #: —
Project Manager: Kelly Robinson
Sampler: Tracy Payne
On Ice ☒ Yes ☐ No
Sample Temperature: 1/

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904095	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) DRO GRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Ethanol	NO_2 / NO_3	Cyanide	Gen Chemistry	Air Bubbles (Y or N)
4/5/9	1515	GW	EBS-040509	(1) Poly	NaOH	-1														X		
				(1) Poly	HNO_3	-1							X									
				(5) VOAs	HCl	-1										X						
				(1) VOA	None	-1				X												
4/5/9	1645	Soil	AOC 25-2 (0-0.5')	(3) Jar	None	-2				X			X				X			X		
				(2) Encore	None	-2										X						
				(2) Vials	MeOH	-2										X						
4/5/9	1645	Soil	AOC 25-2 (0-0.5')-DUP	(3) Jar	None	-3				X			X				X			X		
				(2) Encore	None	-3										X						
				(2) Vials	~~None~~ MeOH	-3										X						
—	—	GW	MeOH Blank	(2) Vials	MeOH	-4										X						
—	—	GW	Trip Blank	(2) VOAs	HCl	-5										X						

Date:	Time:	Relinquished by:	Received by:	Date	Time
4/6/9	1500	Kelly Robinson	FedEx		
Date:	Time:	Relinquished by:	Received by:	Date	Time
				4/7/09	1000

Remarks:
* See attached analyte list

If ne ry, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytic rt.

COC 2 of 2

Chain-of-Custody Record

Client: Western Refining Southwest Inc
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
☐ Other
☒ EDD (Type) Excel

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: RCRA Investigation - Group 3
Project #:
Project Manager: Kelly Robinson
Sampler: Tracy Payne
On Ice: X Yes No
Sample Temperature:

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904093	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) DRO, MRO GRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Gen. Chemistry	NO_2/NO_3	Cyanide	Ethanol	Air Bubbles (Y or N)
4/5/9	1715	Soil	AOC 25-2 (36-38')	(3) Jars	None	-6				X			X				X			X		
				(2) Encores	None	-6										X						
↓	↓	↓	↓	(2) Vials	MeOH	-6										X						
4/5/9	1700	Soil	AOC 25-2 (1.5-2.0')	(3) Jars	None	-7				X			X				X			X		
				(2) Encores	None	-7										X						
↓	↓	↓	↓	(2) Vials	MeOH	-7										X						
4/5/9	1500	GW ~~1500~~	FB-040509	(1) Poly	NaOH	-8														X		
				(1) Poly	HNO_3	-8							X									
				(5) Voas	HCl	-8										X						
				(1) Voa	None	-8				X												
↓	↓	↓	↓	(1) Amber	None	-8											X					
4/5/9	1515	GW	EBS-040509	(1) Amber	None	-1-9											X					

Date: 4/6/9 Time: 1500 Relinquished by: Kelly Robinson
Received by: Fed Ex Date Time
Date: Time: Relinquished by:
Received by: Date Time 4/7/09 1000

Remarks:
* See attached analyte list.

If nece[illegible]amples submitted to Hall Environmental may be subcontracted to other accredited laboratories. [illegible]ves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical

Chain-of-Custody Record

Client: Westen Refining Southwest Inc.
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com

QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type) Excel

Turn-Around Time:
☑ Standard ☐ Rush

Project Name: RCRA Investigation - Group 3

Project #:

Project Manager: Kelly Robinson

Sampler:

On Ice: ☒ Yes ☐ No

Sample Temperature:

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904094	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) DRO GRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Gen Chemistry *	Cyanide	NO_2/NO_3	Ethanol	Air Bubbles (Y or N)
4/6/9	1200	Aq	FB-040609	(5) VOAs	HCl	-6										X						
				(1) VOA	None	-6				X												
				(1) Amber	None	-6											X					
				(1) Poly	HNO_3	-6							X									
				(1) Poly	NaOH	-6													X			
4/6/9	1215	Aq	EBS-040609	(5) VOAs	HCl	-7										X						
				(1) VOA	None	-7				X												
				(1) Amber	None	-7											X					
				(1) Poly	HNO_3	-7							X									
				(1) Poly	NaOH	-7													X			

Date:	Time:	Relinquished by:	Received by:	Date	Time
4/6/9	1500	Kelly Robinson	Fed Ex		
Date:	Time:	Relinquished by:	Received by:	Date 4/7/09	Time 1000

Remarks:
* See attached for analyte list.

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytic ort.

Chain-of-Custody Record

Client: Westen Refining Southwest, Inc
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type) Excel

Turn-Around Time:
☑ Standard ☐ Rush
Project Name: RCRA Investigation Group 3
Project #:
Project Manager: Kelly Robinson
Sampler: Tracy Payne
On Ice: ☒ Yes ☐ No
Sample Temperature:

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904099	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) DRO GRO MRO	~~EDB (Method 504.1)~~ Dissolved Metals	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	NO_2/NO_3	Cyanide	Gen Chemistry	Ethanol	Air Bubbles (Y or N)
4/6/9	845	Soil	SWMU 4-1 (0-0.5')	(2) Encore		-1										X						
↓	↓	↓	↓	(2) VIALS		-1										X						
↓	↓	↓	↓	(3) Jars		-1				X			X				X		X			
4/6/9	930	Soil	SWMU 4-1 (1.5-2.0')	(2) Encore		-2										X						
↓	↓	↓	↓	(2) VIALS		-2										X						
↓	↓	↓	↓	(3) Jars		-2				X			X				X		X			
4/6/9	1130	Soil	SWMU 4-1 (6-8')	(2) Encore		-3										X						
↓	↓	↓	↓	(2) VIALS		-3										X						
↓	↓	↓	↓	(3) Jars		-3				X			X				X		X			
—	—	Aq	MeOH Blank	MeOH		-4										X						
—	—	Aq	Trip Blank	(2) VOAs		-5										X						

Date:	Time:	Relinquished by:	Received by:	Date	Time
4/6/9	1500	Kelly Robinson	FedEx		
Date:	Time:	Relinquished by:	Received by:	Date	Time
				4/7/09	1000

Remarks:
* See attached analyte list.

If nece[illegible] samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. [illegible]erves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytica[illegible]

METALS ANALYSES

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.3/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

GENERAL CHEMISTRY ANALYSES

Analyte	Analytical Method
Total Dissolved Solids	SM-2540C
Bicarbonate	SW-846 method 310.1
Chloride	EPA method 300.0
Sulfate	EPA method 300.0
Calcium	SW-846 method 7140
Magnesium	SW-846 method 7450
Sodium	SW-846 method 7770
Potassium`	SW-846 method 7610
Manganese	SW-846 method 6010/6020
Nitrate/nitrite	EPA method 300.0
Ferric/ferrous Iron	SW-846 method 6010/6020 & SM 3500F e2+

Group 3

1 of 2

Chain-of-Custody Record

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Client: Western Refining Southwest, Inc. Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type) Excel

Turn-Around Time:
☑ Standard ☐ Rush
Project Name: RCRA INVESTIGATION - Group 3
Project #:
Project Manager: Kelly Robinson
Sampler: Tracy Payne
On Ice [✓ Yes] ☐ No
Sample Temperature: 3

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904167	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) DRO, GRO, MRO	~~EDB (Method 504.1)~~ Dissolved Metals *	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO$_3$,NO$_2$,PO$_4$,SO$_4$)	8081 Pesticides / 8082 PCB's	8260B (~~VOA~~)	8270 (Semi-VOA)	Gen. Chemistry *	NO$_2$/NO$_3$	Cyanide	Ethanol	Air Bubbles (Y or N)
4/6/9	1700	Soil	SWMU 4-1 (36-38')	(3) Jars	None	1				X			X				X			X		
↓	↓	↓	↓	(2) Encore	None	1										X						
↓	↓	↓	↓	(2) Vials	MeOH	1										X						
4/7/9	1130	Soil	AOC 24-7 (0-0.5')	(3) Jars	None	2				X			X				X			X		
↓	↓	↓	↓	(2) Encore	None	2										X						
↓	↓	↓	↓	(2) Vials	MeOH	2										X						
4/7/9	1145	Soil	AOC 24-7 (1.5-2.0')	(3) Jars	None	3				X			X				X			X		
↓	↓	↓	↓	(2) Encore	None	3										X						
↓	↓	↓	↓	(2) Vials	MeOH	3										X						
4/7/9	1200	Aq	FB-040709	(5) VOAs	HCl	4										X						
↓	↓	↓	↓	(1) VOA	None	4				X												
↓	↓	↓	↓	(1) Amber	None	4											X					

Date:	Time:	Relinquished by:	Received by:	Date	Time
4/7/9	1500	Kelly Robinson	Fed Ex		

Date:	Time:	Relinquished by:	Received by:	Date	Time
				4/8/09	1025

Remarks:
* Refer to attached for analyte list.

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COC 292

Chain-of-Custody Record

Client: Western Refining Southwest Inc
Bloomfield Refinery

Mailing Address: 50 Road 4990
Bloomfield, NM 87413

Phone #: (505) 632-4166

email or Fax#: Kelly.Robinson@wnr.com

QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other ______
☑ EDD (Type) Excel

Turn-Around Time:
☑ Standard ☐ Rush

Project Name: RCRA Investigation - Group 3

Project #: —

Project Manager: Kelly Robinson

Sampler: Tracy Payne

On Ice: Yes No

Sample Temperature: 3

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904167	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) DRO, GRO, MRO	~~EDB (Method 504.1)~~ Dissolved Met *	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO$_3$,NO$_2$,PO$_4$,SO$_4$)	~~8081 Pesticides / 8082 PCB's~~	8260B (VOA)	8270 (Semi-VOA)	General Chemistry *	NO$_2$/NO$_3$	Cyanide	Ethanol	Air Bubbles (Y or N)
4/7/9	1200	Aq	FB-040709	(1) Poly	HNO$_3$	~~5~~ 4							X									
↓	↓	↓	↓	(1) Poly	NaOH	TJ ~~5~~ 4														X		
4/7/9	1215	Aq	EBS-040709	(5) VOAs	HCl	5										X						
↓	↓	↓	↓	(1) VOA	None	5				X												
↓	↓	↓	↓	(1) Amber	None	5											X					
↓	↓	↓	↓	(1) Poly	HNO$_3$	5							X									
↓	↓	↓	↓	(1) Poly	NaOH	5														X		
—	—	Aq	MeOH Blank	(1) Vial	MeOH	6										X						
—	—	↓	Trip Blank	(2) VOAs	HCl	7										X						

Date: 4/7/9 Time: 1500 Relinquished by: Kelly Robinson
Received by: Fed Ex Date Time

Date: Time: Relinquished by:
Received by: Date 4/8/09 Time 1025

Remarks:
* Refer to attached for analyte list.

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

METALS ANALYSES

Analyte	**Analytical Method**
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.3/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

GENERAL CHEMISTRY ANALYSES

Analyte	**Analytical Method**
Total Dissolved Solids	SM-2540C
Bicarbonate	SW-846 method 310.1
Chloride	EPA method 300.0
Sulfate	EPA method 300.0
Calcium	SW-846 method 7140
Magnesium	SW-846 method 7450
Sodium	SW-846 method 7770
Potassium	SW-846 method 7610
Manganese	SW-846 method 6010/6020
Nitrate/nitrite	EPA method 300.0
Ferric/ferrous Iron	SW-846 method 6010/6020 & SM 3500F e2+

COC 1 of 2

Chain-of-Custody Record

Client: Western Refining Southwest
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type) Excel

Turn-Around Time:
☑ Standard ☐ Rush
Project Name: RCRA Investigation - Group 3
Project #: ——
Project Manager: Kelly Robinson
Sampler: Tracy Payne
On Ice: ☑ Yes ☐ No
Sample Temperature: 3

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904413	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH ~~(Method 418.1)~~ DRO GRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B ~~(VOA)~~	8270 (Semi-VOA)	Gen Chemistry	Cyanide	NO_2/NO_3	Dissolved Metals	Air Bubbles (Y or N)
4/7/9	1815	SOIL	AOC 24-7 (39-42')	(3) Jars		-1				X			X				X		X			
				(2) Encores		-1										X						
↓	↓	↓	↓	(2) VIALS		-1										X						
4/8/9	1100	Soil	AOC 24-5 (0-0.5')	(3) Jars		-2				X			X				X		X			
				(2) Encors		-2										X						
↓	↓	↓	↓	(2) Vials		-2										X						
4/8/9	1100	Soil	AOC 24-5 (0-0.5') DUP	(3) Jar		-3				X			X				X		X			
				(2) Encore		-3										X						
↓	↓	↓	↓	(2) Vials		-3										X						
4/8/9	1200		AOC 24-5 (1.5-2.0')	(3) Jars		-4				X			X				X		X			
				(2) VIALS		-4										X						
↓	↓	↓	↓	(2) Encore		-4										X						

Date: 4/8/9 Time: 1500 Relinquished by: Kelly Robinson
Received by: Fed Ex Date Time

Date: Time: Relinquished by:
Received by: Date 4/9/09 Time 1015

Remarks:
* Refer to attached analyte list.

If n ary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratorie 's serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analyti ort.

COC 282

Chain-of-Custody Record

Client: Western Refining Southwest, Inc. Bloomfield Refinery

Mailing Address: 50 Road 4990 Bloomfield NM

Phone #: (505) 632-4166

email or Fax#: Kelly.robinson@wnr.com

QA/QC Package:

☐ Standard ☑ Level 4 (Full Validation)

☐ Other

☑ EDD (Type) Excel

Turn-Around Time:

☑ Standard ☐ Rush

Project Name: RCRA Investigation - Group 3

Project #: —

Project Manager: Kelly Robinson

Sampler: Tracy Payne

On Ice: [✓ Yes] No

Sample Temperature: 3

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904145	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) MRO DRO GRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Gen. Chemistry	Dissolved Metals	NO_2/NO_3	Cyanide	Air Bubbles (Y or N)
4/8/9	—	Aq	MeOH Blank	(2) Vial	MeOH	-5										X						
4/8/9	1255 0855	Soil	AOC 24-6 (0-0.5')	(2) VIAL	MeOH	-6										X						
↓	↓	↓	↓	(2) Encore	None	-6										X						
↓	↓	↓	↓	(3) Jar	↓	-6				X			X				X				X	
↓	1315	Soil	AOC 24-6 (1.5-2.0')	(2) Encore	None	-7										X						
↓	↓	↓	↓	(2) VIAL	MeOH	-7										X						
↓	↓	↓	↓	(3) Jar	None	-7				X			X				X				X	

Date: 4/8/9 Time: 1500 Relinquished by: Kelly Robinson

Received by: FedEx Date Time

Date: Time: Relinquished by:

Received by: Date 4/9/09 Time 1015

Remarks:

* Refer to attached analyte list

If nec samples submitted to Hall Environmental may be subcontracted to other accredited laboratories erves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytic t.

Chain-of-Custody Record

Client: Western Refining Southwest Inc
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type)

Turn-Around Time:
☑ Standard ☐ Rush
Project Name: RCRA Investigation - Group 3
Project #: —
Project Manager: Kelle Robinson
Sampler: Tracy Payne
On Ice: ☑ Yes ☐ No
Sample Temperature:

CoC 1 of 2

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904153	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH ~~(Method 418.1)~~ GRO DRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA~~ 8 Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B ~~(VOA)~~	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
4/8/9	1420	Soil	AOC22-14 (1.5-2.0')	(3) Jars	None	-1				X			X				X	X				
↓	↓	↓	↓	(2) Vials	MeOH	-1										X						
				(2) Encores	None	-1										X						
4/8/9	1410	Soil	AOC 22-14 (0-0.5')	(3) Jars	None	-2				X			X				X	X				
↓	↓	↓	↓	(2) Encores	None	-2										X						
				(2) Vials	MeOH	-2										X						
4/8/9	1840	Aq	FB 040809	(5) VOAs	HCl	-3										X						
↓	↓	↓	↓	(1) VOA	None	-3				X												
				(1) Poly	HNO_3	-3							X									
				(1) Poly	NaOH	-3												X				
				(1) Amber	None	-3											X					
—	—	Aq	MeOH Blank	(2) Vials	MeOH	-4										X						

Date: 4/9/9 Time: 1200 Relinquished by: Kelle Robinson
Received by: Date 4/9/09 Time 14:40
Date: Time: Relinquished by:
Received by: Date Time

Remarks:
* See attached analyte list

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

COC 292
5

Chain-of-Custody Record

Client: Western Refining Southwest Inc
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com

QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other ______
☑ EDD (Type) Excel

Turn-Around Time:
☑ Standard ☐ Rush

Project Name: RCRA Investigation-Gap 3

Project #:

Project Manager: Kelly Robinson

Sampler: Tracy Payne

On Ice ☑ Yes ☐ No

Sample Temperature 1°

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904155	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) DRO, GRO, MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (~~VOA~~)	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
4/8/9	1830	Aq	EBS-040809	(5) VOAs	HCl	-5										X						
↓	↓	↓		(1) VOA	None	-5				X												
				(1) Poly	NaOH	-5												X				
				(1) Poly	HNO_3	-5							X									
↓	↓	↓	↓	(1) Amber	None	-5											X					
			Trip Blank Added			-6				x						x	x					

Date: 4/9/9 Time: 1200 Relinquished by: Kelly Robinson
Received by: Date 4/9/09 Time 14:40

Date: Time: Relinquished by:
Received by: Date Time

Remarks: See previous Remarks.

If ne… …mples submitted to Hall Environmental may be subcontracted to other accredited laboratories …es as notice of this possibility. Any sub-contracted data will be clearly notated on the analytic…

METALS ANALYSES

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.3/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

GENERAL CHEMISTRY ANALYSES

Analyte	Analytical Method
Total Dissolved Solids	SM-2540C
Bicarbonate	SW-846 method 310.1
Chloride	EPA method 300.0
Sulfate	EPA method 300.0
Calcium	SW-846 method 7140
Magnesium	SW-846 method 7450
Sodium	SW-846 method 7770
Potassium`	SW-846 method 7610
Manganese	SW-846 method 6010/6020
Nitrate/nitrite	EPA method 300.0
Ferric/ferrous Iron	SW-846 method 6010/6020 & SM 3500F e2+

COC 1 of 3

Chain-of-Custody Record

Client: Western Refining Southwest Inc
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type) Excel

Turn-Around Time:
☑ Standard ☐ Rush
Project Name:
RCRA Investigation - Group 3
Project #:
—
Project Manager:
Kelly Robinson
Sampler: Tracy Payne
On Ice: ☑ Yes ☐ No
Sample Temperature: 1.0

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time Arrilon SS 1545	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904155	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) DRO, GRO, MRO	~~EDB (Method 504.1)~~ Dissolved Metals	~~8310 (PNA or PAH)~~ NO₂/NO₃	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (~~VOA~~)	8270 (Semi-VOA)	Gen Chemistry	Cyanide	Ethanol		Air Bubbles (Y or N)
4/5/9	~~4/5/9~~	Soil	AOC 22-13 (1.5-2.0')	(3) Jars		-1				X			X				X		X			
↓	↓	↓	↓	(2) VOA		-1										X						
↓	↓	↓	↓	(2) Encore		-1										X						
4/8/9	1810	Soil	AOC 22-13 (32-34.5')	(3) Jars		-2				X			X				X		X			
↓	↓	↓	↓	(2) VOAs		-2										X						
↓	↓	↓	↓	(2) Encore		-2										X						
4/8/9	1800	Soil	AOC 22-13 (18-20')	(3) Jars		-3				X			X				X		X			
↓	↓	↓	↓	(2) VIALS		-3										X						
↓	↓	↓	↓	(2) Encore		-3										X						
4/8/9	1820	Soil	AOC 22-13 (37-39')	(2) VIALS		-4										X						
↓	↓	↓	↓	(1) Jar		-4				X												
—	—	Aq	MeOH Blank	(2) VIALS		-5										X						

Date: 4/9/9 Time: 1200 Relinquished by: Kelly Robinson
Received by: Date 4/9/09 Time 14:50

Date: Time: Relinquished by:
Received by: Date Time

Remarks:
*See Attached Analyte list + Work Plan.

If nec samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. erves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytica

COC: 2 of 6

Chain-of-Custody Record

Client: Western Refining Southwest, Inc.
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other ______
☑ EDD (Type) Excel

Turn-Around Time:
☑ Standard ☐ Rush ______
Project Name: RCRA INVESTIGATION - Group 3
Project #: ______
Project Manager: Kelly Robinson
Sampler: Tracy Payne
On Ice: ☑ Yes ☐ No
Sample Temperature: [illegible]

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904155	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	~~TPH (Method 418.1)~~ - DRO [illegible]	~~EDB (Method 504.1)~~ Dissolved Metals	~~8310 (PNA or PAH)~~ NO₂/NO₃	~~RCRA 8 Metals~~ Metals*	Anions (F,Cl,NO₃,NO₂,PO₄,SO₄)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Gen Chemistry	Cyanide	Ethanol	TPH-GRO, DRO, MRO	Air Bubbles (Y or N)
4/9/9	0810	Aq	AOC 22-13 (GW)	(1) Amber	None	-6											X					
				(5) VOAs	HCl	-6										X						
				(1) VOA	None	-6															X	
				(1) Poly	None	-6												X				
				(1) Poly	HNO3	-6							X									
				(1) Poly	NaOH	-6													X			
				(1) Poly	HNO3	-6					X											
				(1) Poly	H2SO4	-6						X										
4/8/9	1540	Soil	AOC 22-13 (0-0.5')	(3) Jars	None	-7							X				X		X		X	
				(2) VIALS	MeOH	-7										X						
				(2) Encor	None	-7										X						
—	—	Aq	Trip Blank	(3) VOAs	HCl	-8										X						

Date: 4/9/9 Time: 1200 Relinquished by: Kelly Robinson
Received by: Date 4/9/09 Time 14:50

Date: Time: Relinquished by:
Received by: Date Time

Remarks:
* See Attached analyte list for Metals.

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

COC 385

Chain-of-Custody Record

Client: Western Refining Southwest Inc
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☑ EDD (Type) Excel

Turn-Around Time:
☑ Standard ☐ Rush
Project Name: RCRA Investigation - Group 3
Project #: —
Project Manager: Kelly Robinson
Sampler: Tracy Payne
On Ice: ☑ Yes ☐ No
Sample Temperature:

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904155	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH ~~(Method 418.1)~~ DRO, MRO GRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B ~~(VOA)~~	8270 (Semi-VOA)	Gen Chemistry	NO_2/NO_3	Dissolved Metals	Cyanide	Air Bubbles (Y or N)
4/9/9	0935	Aq	FB-040909	(5) VOAS	HCl	-9										X						
				(1) VOA	None	-9				X												
				(1) Poly	None	-9												X				
				(1) Poly	HNO_3	-9							X									
				(1) Poly	H_2SO_4	-9													X			
				(1) Poly	HNO_3	-9														X		
				(1) Amber	None	-9											X					
				(1) Poly	NaOH	-9															X	

Date: 4/9/9 Time: 12:00 Relinquished by: Kelly Robinson
Received by: 14:40 Date 4/9/09 Time

Date: Time: Relinquished by:
Received by: Date Time

Remarks: See previous COC

If nece[illegible] samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. [illegible]ves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical

COC 1 OF [illegible]

Chain-of-Custody Record

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Client: WESTERN REFINING SOUTHWEST INC

BLOOMFIELD REFINERY

Mailing Address: 50 ROAD 4990

BLOOMFIELD, NM 87413

Phone #: 505·632·4166

email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:

☐ Standard ☑ Level 4 (Full Validation)

☐ Other

☑ EDD (Type) EXCEL

Turn-Around Time:

☑ Standard ☐ Rush

Project Name: RCRA INVESTIGATION GROUP 3

Project #: —

Project Manager: KELLY ROBINSON

Sampler: TRACY PAYNE

On Ice: [✓ Yes] No

Sample Temperature: 2

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904193	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH ~~(Method 418.1)~~ GRO DRO MRO	EDB (Method 504.1)	8310 (PNA or PAH) AS — 4/14/09	~~RCRA 8~~ Metals * Cyanide	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B ~~(VOA)~~	8270 (Semi-VOA)					Air Bubbles (Y or N)
4/13/9	0915	Soil	AOC 22-12 (0-0.5')	83 Jar	None	-1				X			X				X					
↓	↓	↓	↓	(2) Encore	↓	-1										X						
↓	↓	↓	↓	(2) VIALS	MeOH	-1										X						
4/13/9	0915	Soil	AOC 22-12 (0-0.5') DUP	(3) Jar	None	-2				X			X				X					
↓	↓	↓	↓	(2) Encore	↓	-2										X						
↓	↓	↓	↓	(2) VIALS	MeOH	-2										X						
4/13/9	0930	Soil	AOC 22-12 (1.5-2.0')	(3) Jar	None	-3				X			X				X					
↓	↓	↓	↓	(2) Encore	↓	-3										X						
↓	↓	↓	↓	(2) VIALS	MeOH	-3										X						
4/13/9	1150	Soil	AOC 22-12 (32-35')	(3) Jar	None	-4				X			X				X					
↓	↓	↓	↓	(2) Encore	↓	-4										X						
↓	↓	↓	↓	(2) Vials	MeOH	-4										X						

Date:	Time:	Relinquished by:	Received by:	Date	Time
4/13/9	1500	Kelly Robinson			

Date:	Time:	Relinquished by:	Received by:	Date	Time
				4/14/09	1015

Remarks:
* See Work Plan for analyte list.

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COC 2 OF ~~X~~

Chain of Custody Record

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Client: WESTERN REFINING SOUTHWEST INC.
BLOOMFIELD REFINERY
Mailing Address: 50 ROAD 4990
BLOOMFIELD, NM 87413
Phone #: 505-632-4166
email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type) EXCEL

Turn-Around Time:
☑ Standard ☐ Rush

Project Name: RCRA INVESTIGATION GROUP 3
Project #: —
Project Manager: KELLY ROBINSON
Sampler: TRACY PAYNE
On Ice: ☑ Yes ☐ No
Sample Temperature: 2

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904193	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH ~~(Method 418.1)~~ GRO/DRO/MRO	EDB (Method 504.1)	8310 (PNA or PAH) 4/14/09	~~RCRA 8 Metals~~ See Metals List	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Total Cyanide 4/14/09				Air Bubbles (Y or N)
4/13/9	1210	Soil	AOC 22-12 (36-37.75')	(2) VIAL	MeOH	-5										X						
↓	↓	↓	↓	(2) Encore	None	-5										X						
↓	↓	↓	↓	(1) Jar	None	-5				X			X				X					
—	—	Aq	MeOH Blank	(2) VIALS	MeOH	-6										X						
—	—	Aq	Trip Blank	(3) VOAs	HCl	-7										X						
4/13/9	1240	Aq	EBS-041309	(5) VOAs	HCl	-8				X						X						
↓	↓	↓	↓	(1) VOAs	None	-8				X												
↓	↓	↓	↓	(1) Amber	None	-8											X					
↓	↓	↓	↓	(2) Poly	HNO_3/NaOH	-8							X					X				
			~~EB-041309~~																			

Date: 4/13/9 Time: 1500 Relinquished by:
Received by: Date 4/14/09 Time 1015
Date: Time: Relinquished by:
Received by: Date Time

Remarks: See previous COC

Chain-of-Custody Record

COC ~~#~~1 OF ~~#~~2

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Client: WESTERN REFINING SOUTHWEST INC.
BLOOMFIELD REFINERY
Mailing Address: 50 ROAD 4990
BLOOMFIELD, NM 87413
Phone #: 505.632.4166
email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type) EXCEL

Turn-Around Time:
☑ Standard ☐ Rush

Project Name: RCRA INVESTIGATION GROUP 3

Project #: —

Project Manager: KELLY ROBINSON

Sampler: TRACY PAYNE

On Ice [✓ Yes] ☐ No

Sample Temperature 3

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904194	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) DRO GRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals*	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B ~~(VOA)~~	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
4/13/9	1250	Aq	FB-041309	(5) VOAS	HCl	-1										X						
				(1) VOA	None	-1				X												
				(1) Poly	NaOH	-1												X				
				(1) Poly	HNO3	-1							X									
↓	↓	↓	↓	(1) Amber	None	-1											X					
4/13/9	1325	Soil	AOC 22-16 (0-0.5')	(3) Jars	None	-2				X			X				X	X				
				(2) Encore	None	-2										X						
↓	↓	↓	↓	(2) VIALS	MeOH	-2										X						
4/13/9	1335	Soil	AOC 22-16 (1.5-2.0')	(3) Jars	None	-3				X			X				X	X				
				(2) Encore	↓	-3										X						
↓	↓	↓	↓	(2) Vial	MeOH	-3										X						
—	—	Aq	Trip Blank	(3) VOAs	HCl	-4										X						

Date:	Time:	Relinquished by:	Received by:	Date	Time
4/13/9	1500	Kelly Robinson		4/14/09	1012
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:
* See previous COC.

COC 2 OF 2

Chain-of-Custody Record

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Client: WESTERN REFINING SOUTHWEST INC.

BLOOMFIELD REFINERY

Mailing Address: 50 ROAD 4990

BLOOMFIELD, NM 87413

Phone #: 505.632.4166

email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:

☐ Standard ☒ Level 4 (Full Validation)

☐ Other

☒ EDD (Type) EXCEL

Turn-Around Time:

☒ Standard ☐ Rush

Project Name: RCRA INVESTIGATION GROUP3

Project #: —

Project Manager: KELLY ROBINSON

Sampler: TRACY PAYNE

On Ice: [✓ Yes] ☐ No

Sample Temperature: 3

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904194	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)					Air Bubbles (Y or N)
—	—	Aq	MeOH Blank	MeOH	MeOH	-5										X						

Date:	Time:	Relinquished by:	Received by:	Date	Time
4/13/09	1500	Kelly Robinson		4/14/09	1012
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:

* See attached analyte list

If nec[illegible] samples submitted to Hall Environmental may be subcontracted to other accredited laboratories[illegible]erves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytic[illegible].

Chain-of-Custody Record

COC 1 OF 2

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Client: WESTERN REFINING SOUTHWEST INC
BLOOMFIELD REFINERY
Mailing Address: 50 ROAD 4990
BLOOMFIELD, NM 87413
Phone #: 505-632-4166
email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type) EXCEL

Turn-Around Time:
☑ Standard ☐ Rush

Project Name: RCRA INVESTIGATION GROUP 3
Project #: —
Project Manager: KELLY ROBINSON
Sampler: TRACY PAYNE
On Ice: ☑ Yes ☐ No
Sample Temperature: 2°

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904212	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~ GRO, DRO, MRO)	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Gen. Chemistry	Dissolved Metals *	NO_2/NO_3	Cyanide	Air Bubbles (Y or N)
4/14/9	835	Aq	AOC 22-12 (GW)	(5) VOAS	HCl	-1										X						
↓	↓	↓	↓	(1) VOA	None	-1				X												
				(1) Amber	None	-1											X					
				(1) Poly	NaOH	-1															X	
				(1) Poly	H_2SO_4	-1														X		
				(1) Poly	HNO_3	-1							X									
				(1) Poly	HNO_3	-1													X			
				(1) Poly	~~NaOH~~ None	-1												X				
—	—	Aq	Trip Blank	(3) VOAs	HCl	-2										X						
4/14/9	1230	Soil	AOC 22-14 (36-38')	(3) Jars		-3				X			X				X				X	
↓	↓	↓	↓	(2) Encore		-3										X						
				(2) Vial		-3										X						

Date: 4/14/9 Time: 1500 Relinquished by: Kelly Robinson
Received by: Date 4/15/09 Time 10:00

Date: Time: Relinquished by:
Received by: Date Time

Remarks:
* See Attached

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

COC 2 OF 2

Ch[...]f-Custody Record

Client: WESTERN REFINING SOUTHWEST INC.
BLOOMFIELD REFINERY
Mailing Address: 50 ROAD 4990
BLOOMFIELD, NM 87413
Phone #: 505-632-4166
email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type) EXCEL

Turn-Around Time:
☑ Standard ☐ Rush

Project Name: RCRA INVESTIGATION GROUP 3

Project #: —

Project Manager: KELLY ROBINSON

Sampler: TRACY PAYNE

On Ice: ☑ Yes ☐ No

Sample Temperature: 2

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904212	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)					Air Bubbles (Y or N)
—	—	Aq	MeOH Blank	(2) VIALS		-4										X						

Date: 4/14/09 Time: 1500 Relinquished by: Kelly Robinson
Received by: 1000 Date 4/15/09 Time

Date: Time: Relinquished by:
Received by: Date Time

Remarks:

If nec[...] samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. [...]erves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytica[...]t.

Chain-of-Custody Record

COC 1 OF 2

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Client: WESTERN REFINING SOUTHWEST INC
BLOOMFIELD REFINERY
Mailing Address: 50 ROAD 4990
BLOOMFIELD, NM 87413
Phone #: 505 · 632 - 4166
email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ ~~Other~~
☑ EDD (Type) EXCEL

Turn-Around Time:
☑ Standard ☐ Rush

Project Name: RCRA INVESTIGATION GROUP 3

Project #: —

Project Manager: KELLY ROBINSON

Sampler: TRACY PAYNE

On Ice: ☑ Yes ☐ No

Sample Temperature: 3

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904214	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH ~~(Method 418.1)~~ DRO GRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals SEE ATTACHED	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B ~~(VOA)~~	8270 (Semi-VOA)					Air Bubbles (Y or N)
4/13/09	1630	SOIL	AOC 22-8(1.5-2.0)	(3) JARS	NONE	-1				X			X				X					
↓	↓	↓	↓	(2) ENCORE	↓	-1										X						
				(2) VIALS	MeOH	-1										X						
4/13/09	1630	SOIL	AOC 22-8(1.5-2.0) DUP	(3) JARS	NONE	-2				X			X				X					
↓	↓	↓	↓	(2) ENCORE	↓	-2										X						
				(2) VIALS	MeOH	-2										X						
4/13/09	1655	SOIL	AOC 22-9(0-0.5)	(3) JARS	NONE	-3				X			X				X					
↓	↓	↓	↓	(2) ENCORE	↓	-3										X						
				(2) ~~JARS~~ VIALS	MeOH	-3										X						
—	—	—	MeOH BLANK	(2) VIALS	MeOH	-4										X						

Date: 4/14/9 Time: 1500 Relinquished by: Kelly Robinson

Received by: Date Time 10:00 4/15/09

Date: Time: Relinquished by:

Received by: Date Time

Remarks:
* See Attached

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

COC 2 OF 2

Chain-of-Custody Record

Client: WESTERN REFINING SOUTHWEST, INC.

BLOOMFIELD REFINERY

Mailing Address: 50 ROAD 4990

BLOOMFIELD, NM 87413

Phone #: 505·632·4166

email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:

☐ Standard ☑ Level 4 (Full Validation)

☐ Other ______

☑ EDD (Type) EXCEL

Turn-Around Time:

☑ Standard ☐ Rush ______

Project Name: RCRA INVESTIGATION GROUP 3

Project #: —

Project Manager: KELLY ROBINSON

Sampler: TRACY PAYNE

On Ice: ☑ Yes ☐ No

Sample Temperature: 3°

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904214	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) DRO/GRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals See Attached	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (~~VOA~~)	8270 (Semi-VOA)					Air Bubbles (Y or N)
4/13/9	1705	SOIL	AOC 22-9 (1.5-2.0')	(3) Jars	None	-5 - 1				X			X				X					
↓	↓	↓	↓	(2) Encore	↓	-5 - 1										X						
				(2) VIALS	MeOH	-5 - 1										X						
4/13/09	1535	SOIL	AOC 22-7 (1.5-2.0)	(3) JARS	NONE	-6 - 2				X			X				X					
↓	↓	↓	↓	(2) ENCORE	↓	-6 - 2										X						
				(2) VIALS	MeOH	-6 - 2										X						
4/13/09	1525	SOIL	AOC 22-7 (0-0.5')	(3) JARS	NONE	-7 - 3				X			X				X					
↓	↓	↓	↓	(2) ENCORE	↓	-7 - 3										X						
				(2) VIALS	MeOH	-7 - 3										X						
4/13/09	1615	SOIL	AOC 22-8 (0-0.5')	(3) JARS	NONE	-8 - 4				X			X				X					
↓	↓	↓	↓	(2) ENCORE	↓	-8 - 4										X						
				(2) VIALS	MeOH	-8 - 4										X						

Date:	Time:	Relinquished by:	Received by:	Date	Time
4/14/9	1500	Kelly Robinson		4/15/09	10:00
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: See Attached list

If ne amples submitted to Hall Environmental may be subcontracted to other accredited laboratorie ves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytic

COC AT
COC 1 OF 2

Chain-of-Custody Record

Client: WESTERN REFINING SOUTHWEST INC
BLOOMFIELD REFINERY
Mailing Address: 50 ROAD 4990
BLOOMFIELD, NM 87413
Phone #: 505.632.4166
email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type) EXCEL

Turn-Around Time:
☑ Standard ☐ Rush

Project Name: RCRA INVESTIGATION GROUP 3

Project #: —

Project Manager: KELLY ROBINSON

Sampler: TRACY PAYNE

On Ice ☑ Yes ☐ No

Sample Temperature 4

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904240	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) GRO, DRO, MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
4/14/9	1410	Soil	AOC22-10(0-0.5')	(3) Jars	None	-1				X			X				X	X				
↓	↓	↓	↓	(2) VIALS	MeOH	-1										X						
↓	↓	↓	↓	(2) Encore	None	-1										X						
4/14/9	1425	Soil	AOC22-10(1.5'-2.0')	(3) Jar	None	-2				X			X				X	X				
↓	↓	↓	↓	(2) VIALS	MeOH	-2										X						
↓	↓	↓	↓	(2) Encore	None	-2										X						
4/14/9	1440	Soil	AOC22-11(0-0.5')	(3) Jar	None	-3				X			X				X	X				
↓	↓	↓	↓	(2) VIALS	MeOH	-3										X						
↓	↓	↓	↓	(2) Encore	None	-3										X						
4/14/9	1445	Soil	AOC22-11(1.5-2.0')	(3) Jars	None	-4				X			X				X	X				
↓	↓	↓	↓	(2) VIALS	MeOH	-4										X						
↓	↓	↓	↓	(2) Encore	None	-4										X						

Date: 4/15/9 Time: 1500 Relinquished by: Kelly Robinson
Received by: Date 4/16/09 Time 930

Date: Time: Relinquished by:
Received by: Date Time

Remarks:
* See Attached Analyte list for metals.

If n ary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratorie 's serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analyti ort.

C...f-Custody Record

COC "2" OF 2

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Client: WESTERN REFINING SOUTHWEST INC.
BLOOMFIELD REFINERY
Mailing Address: 50 ROAD 4990
BLOOMFIELD, NM 87413
Phone #: 505.632.4166
email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time:
☒ Standard ☐ Rush
Project Name: RCRA INVESTIGATION GROUP 3
Project #: —
Project Manager: KELLY ROBINSON
Sampler: TRACY PAYNE
On Ice: [✓ Yes] ☐ No
Sample Temperature: 4

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904246	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH ~~(Method 418.1)~~ DRO GRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
4/14/9	1335	Aq	FB-041409	(8) VOAs	HCl	-5										X						
↓	↓	↓	↓	(1) VOA	None	-5				X												
				(1) Amber	None	-5											X					
				(1) Poly	HNO_3	-5							X									
				(1) Poly	NaOH	-5												X				
4/14/9	1045	Aq	EBS-041409	(5) VOAs	HCl	-6										X						
↓	↓	↓	↓	(1) VOA	None	-6				X												
				(1) Amber	None	-6											X					
				(1) Poly	HNO_3	-6							X									
				(1) Poly	NaOH	-6												X				
—	—	Aq	TRIP BLANK	(3) VOAs	HCl	-7										X						
—	—	Aq	MeOH Blank	MeOH		-8										X						

Date: 4/15/9 Time: 1500 Relinquished by: Kelly Robinson
Received by: Date 4/16/09 Time 930

Date: Time: Relinquished by:
Received by: Date Time

Remarks:
* See Attached list for Metals analyte.

If neces[illegible] samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. [illegible]rves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical

METALS ANALYSES

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.3/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

GENERAL CHEMISTRY ANALYSES

Analyte	Analytical Method
Total Dissolved Solids	SM-2540C
Bicarbonate	SW-846 method 310.1
Chloride	EPA method 300.0
Sulfate	EPA method 300.0
Calcium	SW-846 method 7140
Magnesium	SW-846 method 7450
Sodium	SW-846 method 7770
Potassium	SW-846 method 7610
Manganese	SW-846 method 6010/6020
Nitrate/nitrite	EPA method 300.0
Ferric/ferrous Iron	SW-846 method 6010/6020 & SM 3500F e2+

Diss + Total Fe per AF 4/16/09

COC 1 OF 3

Chain of-Custody Record

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Client: WESTERN REFINING SOUTHWEST INC.
BLOOMFIELD REFINERY

Mailing Address: 50 ROAD 4990
BLOOMFIELD, NM 87413

Phone #: 505·632·4166

email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type) EXCEL

Turn-Around Time: ☑ Standard ☐ Rush

Project Name: RCRA INVESTIGATION GROUP 3

Project #: —

Project Manager: KELLY ROBINSON

Sampler: TRACY PAYNE

On Ice: [✓ Yes] No

Sample Temperature: 5

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904241	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) GRO DRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8 Metals~~ *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (~~VOA~~)	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
4/15/9	1135	Soil	AOC 22-15 (1.0-1.5')	(3) Jar		-1				X			X				X	X				
↓	↓	↓	↓	(2) Encore		-1										X						
↓	↓	↓	↓	(2) VIALS		-1										X						
4/15/9	1155	Soil	AOC 22-15 (1.5-2.0')	(3) Jar		-2				X			X				X	X				
↓	↓	↓	↓	(2) Encore		-2										X						
↓	↓	↓	↓	(2) VIALS		-2										X						
4/15/9	1155	Soil	AOC 22-15 (1.5-2.0') DUP	(3) Jar		-3				X			X				X	X				
↓	↓	↓	↓	(2) Encore		-3										X						
↓	↓	↓	↓	(2) VIALS		-3										X						
—	—	Aq	MeOH Blank	(2) VIALS		-4										X						

Date: 4/15/9 Time: 1500 Relinquished by: Kelly Robinson Received by: Date 4/16/09 Time 930

Date: Time: Relinquished by: Received by: Date Time

Remarks:
* See Attached Analyte list

If r samples submitted to Hall Environmental may be subcontracted to other accredited laboratori rves as notice of this possibility. Any sub-contracted data will be clearly notated on the analyt

COC 2 OF 3

Chain-of-Custody Record

Client: WESTERN REFINING SOUTHWEST INC
BLOOMFIELD REFINERY
Mailing Address: 50 ROAD 4990
BLOOMFIELD, NM 87413
Phone #: 505·632·4166
email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other ____
☑ EDD (Type) EXCEL

Turn-Around Time:
☑ Standard ☐ Rush ____
Project Name: RCRA INVESTIGATION GROUP 3
Project #: —
Project Manager: KELLY ROBINSON
Sampler: TRACY PAYNE
On Ice: [✓ Yes] No
Sample Temperature: 5

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904241	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH ~~(Method 418.1)~~ DRO, GRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals ~~X~~	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
4/15/9	1245	Soil	AOC 22-15 (30-32')	(3) Jar	None	-5				X			X				X	X				
↓	↓	↓	↓	(2) Encore	None	-5										X						
↓	↓	↓	↓	(2) Vials	MeOH	-5										X						
4/15/9	1315	Aq	FB-041509	(5) VOAs	HCl	-6										X						
↓	↓	↓	↓	(1) VOA	None	-6				X												
↓	↓	↓	↓	(1) Amber	None	-6											X					
↓	↓	↓	↓	(1) Poly	HNO_3	-6							X									
↓	↓	↓	↓	(1) Poly	NaOH	-6												X				
—	—	Aq	Trip Blank	(3) VOAs	HCl	-7										X						
4/15/9	1340	Soil	AOC 22-15 (34-36')	(3) Jar	None	-8				X			X				X	X				
↓	↓	↓	↓	(2) Vials	MeOH	-8										X						
↓	↓	↓	↓	(2) Encore	None	-8										X						

Date: 4/15/9 Time: 1800 Relinquished by: Kelly Robinson
Received by: Date 4/16/09 Time 930

Date: Time: Relinquished by:
Received by: Date Time

Remarks:
See Attached for Metals Analyte List.

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

COC 3 OF 3

Chain of-Custody Record

Client: WESTERN REFINING SOUTHWEST, INC.
BLOOMFIELD REFINERY
Mailing Address: 50 ROAD 4990
BLOOMFIELD, NM 87413
Phone #: 505.632.4166
email or Fax#: KELLY.ROBINSON@WNR.COM
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type) EXCEL

Turn-Around Time:
☑ Standard ☐ Rush
Project Name: RCRA INVESTIGATION GROUP 3
Project #: —
Project Manager: KELLY ROBINSON
Sampler: TRACY PAYNE
On Ice: ☑ Yes ☐ No
Sample Temperature: 3

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904244	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) GRO MRO DRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals *See Attached	Anions (F,Cl,NO$_3$,NO$_2$,PO$_4$,SO$_4$)	8081 Pesticides / 8082 PCB's	8260B (~~VOA~~)	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
4/15/9	1355	Aq	EBS-041509	(5) VOAs	HCl	-9										X						
↓	↓	↓	↓	(1) VOA	None	-9 - BAT 4/16/9				X												
				(1) Poly	HNO$_3$	-9							X									
				(1) Poly	NaOH	-9												X				
				(1) Amber	None	-9											X					

Date:	Time:	Relinquished by:	Received by:	Date	Time
4/16/9	1500	Kelly Robinson		4/16/09	930
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: See Attached analyte list for metals.

If ne[illegible] samples submitted to Hall Environmental may be subcontracted to other accredited laboratories [illegible]rves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytir

METALS ANALYSES

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.3/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

GENERAL CHEMISTRY ANALYSES

Analyte	Analytical Method
Total Dissolved Solids	SM-2540C
Bicarbonate	SW-846 method 310.1
Chloride	EPA method 300.0
Sulfate	EPA method 300.0
Calcium	SW-846 method 7140
Magnesium	SW-846 method 7450
Sodium	SW-846 method 7770
Potassium	SW-846 method 7610
Manganese	SW-846 method 6010/6020
Nitrate/nitrite	EPA method 300.0
Ferric/ferrous Iron	SW-846 method 6010/6020 & SM 3500F e2+

COC 1 OF 3

Chain of-Custody Record

Client: WESTERN REFINING SOUTHWEST INC.
BLOOMFIELD REFINERY
Mailing Address: 50 ROAD 4990
BLOOMFIELD, NM 87413
Phone #: 505-632-4166
email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time:
☒ Standard ☐ Rush

Project Name: RCRA INVESTIGATION GROUP 3
Project #: —
Project Manager: KELLY ROBINSON
Sampler: TRACY PAYNE
On Ice: ☒ Yes ☐ No
Sample Temperature: 3

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904215	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) DRO, MRO, GRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals See Attached	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cyanide	Ethanol			Air Bubbles (Y or N)
4/16/9	900	Soil	AOC 26-8 (0-1.0')	(4) Jar	None	-1				X			X				X	X	X			
↓	↓	↓	↓	(2) Encore	↓	-1										X						
↓	↓	↓	↓	(2) VIALS	MeOH	-1										X						
4/16/9	0900	Soil	AOC 26-8 (0-1.0') DUP	(4) Jar	None	-2				X			X				X	X	X			
↓	↓	↓	↓	(2) Encore	↓	-2										X						
↓	↓	↓	↓	(2) VIALS	MeOH	-2										X						
↓	0920	Soil	AOC 26-8 (1.5-2.0')	(4) Jar	None	-3				X			X				X	X	X			
↓	↓	↓	↓	(2) Encore	↓	-3										X						
↓	↓	↓	↓	(2) VIALS	MeOH	-3										X						
—	—	Aq	MeOH Blank	(2) Vials	MeOH	-4										X						
—	—	Aq	Trip Blank	(3) VOAs	HCl	-5										X						

Date:	Time:	Relinquished by:	Received by:	Date	Time
4/16/9	1500	Kelly Robinson		4/17/09	940
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: See Attached for Metals list.

If nec samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. erves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytic

LOC 2 OF 3

Chain of-Custody Record

Client: WESTERN REFINING SOUTHWEST, INC

BLOOMFIELD REFINERY

Mailing Address: 50 ROAD 4990

BLOOMFIELD, NM 87413

Phone #: 505.632.4166

email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:

☐ Standard ☑ Level 4 (Full Validation)

☐ ~~Other~~

☑ EDD (Type) EXCEL

Turn-Around Time:

☑ Standard ☐ Rush

Project Name: RCRA INVESTIGATION GROUP 3

Project #: —

Project Manager: KELLY ROBINSON

Sampler: TRACY PAYNE

On Ice: [✓ ☐ Yes] ☐ No

Sample Temperature: 3

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No 0904265	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) DRO GRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals*	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cyanide	Ethanol			Air Bubbles (Y or N)
4/16/9	0945	Aq	FB-041609	(5) VOAs	HCl	-6										X						
↓	↓	↓	↓	(3) VOAs	None	-6				X									X			
				(1) Amber	None	-6											X					
				(1) Poly	HNO_3	-6							X									
				(1) Poly	NaOH	-6												X				
	1215	Aq	EBS-041609	(5) VOAs	HCl	-7										X						
	↓	↓	↓	(3) VOAs	None	-7				X									X			
				(1) Amber	None	-7											X					
				(1) Poly	HNO_3	-7							X									
↓				(1) Poly	NaOH	-7												X				
4/16/9	1430	Soil	AOC26-8 (~~32.5-36~~)	(3) Jars	None	-8				X			X				X	X	X			
↓	↓	↓	↓ (32-36')	(2) encore	None	-8																

Date: 4/16/9 Time: 1500 Relinquished by: Kelly Robinson

Received by: Date 4/17/09 Time 940

Date: Time: Relinquished by:

Received by: Date Time

Remarks: *See Attached for metals analytes

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

COC 3 OF 3

Chain-of-Custody Record

Client: WESTERN REFINING SOUTHWEST INC

BLOOMFIELD REFINERY

Mailing Address: 50 ROAD 4990

BLOOMFIELD, NM 87413

Phone #: 505.632.4166

email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:

☐ Standard ☑ Level 4 (Full Validation)

☐ Other

☑ EDD (Type) EXCEL

Turn-Around Time:

☑ Standard ☐ Rush

Project Name: RCRA INVESTIGATION GROUP 3

Project #: —

Project Manager: KELLY ROBINSON

Sampler: TRACY PAYNE

On Ice: ☑ Yes ☐ No

Sample Temperature: 3

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904215	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)					Air Bubbles (Y or N)
4/16/9	1430	Soil	AOC 26-8 (32-36')	(2) VIALS	MeOH	-8										X						

Date:	Time:	Relinquished by:	Received by:	Date	Time
4/16/9	1500	Kelly Robinson		4/17/09	94
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: See attached for metals analysis

If nec[illegible] samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. [illegible]rves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytica

METALS ANALYSES

Analyte	**Analytical Method**
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.3/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

GENERAL CHEMISTRY ANALYSES

Analyte	**Analytical Method**
Total Dissolved Solids	SM-2540C
Bicarbonate	SW-846 method 310.1
Chloride	EPA method 300.0
Sulfate	EPA method 300.0
Calcium	SW-846 method 7140
Magnesium	SW-846 method 7450
Sodium	SW-846 method 7770
Potassium`	SW-846 method 7610
Manganese	SW-846 method 6010/6020
Nitrate/nitrite	EPA method 300.0
Ferric/ferrous Iron	SW-846 method 6010/6020 & SM 3500F e2+

COC 1 of 2

Chain-of-Custody Record

Client: WESTERN REFINING SOUTHWEST INC
BLOOMFIELD REFINERY
Mailing Address: 50 ROAD 4990
BLOOMFIELD, NM 87413
Phone #: 505.632.4166
email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type) EXCEL

Turn-Around Time:
☑ Standard ☐ Rush

Project Name: RCRA INVESTIGATION GROUP 3

Project #: —

Project Manager: KELLY ROBINSON

Sampler: TRACY PAYNE

On Ice: ☑ Yes ☐ No

Sample Temperature: [illegible]

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904216	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) GRO DRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals*	Anions (F,Cl,NO$_3$,NO$_2$,PO$_4$,SO$_4$)	8081 Pesticides / 8082 PCB's	8260B (~~VOA~~)	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
4/15/9	1615	SOIL	AOC 22-1(1.5-2.0')	(3) Jars	None	-1				X			X				X	X				
				(2) Encore	↓	-1										X						
↓	↓	↓	↓	(2) VIALS	MeOH	-1										X						
4/15/9	1600	Soil	AOC 22-1(0-0.5')	(3) Jars	None	-2				X			X				X	X	\			
	↓	↓	↓	(2) Encore	↓	-2										X						
				(2) VIALS	MeOH	-2										X						
	1630	SOIL	AOC 22-2(0-0.5')	(3) Jars	None	-3				X			X				X	X				
				(2) Encore	↓	-3										X						
↓	↓	↓	↓	(2) VIALS	MeOH	-3										X						
	1640	Soil	AOC 22-2 (1.5-2.0')	(3) Jars	None	-4				X			X				X	X				
				(2) Encore	↓	-4										X						
↓	↓	↓	↓	(2) VIALS	MeOH	-4										X						

Date: 4/16/9 Time: 1500 Relinquished by: Kelly Robinson
Received by: Date 4/17/09 Time 946

Date: Time: Relinquished by:
Received by: Date Time

Remarks: *See Analyte list for metals

If ne amples submitted to Hall Environmental may be subcontracted to other accredited laboratorie ves as notice of this possibility. Any sub-contracted data will be clearly notated on the analyti

COC 2 of 2

Chain-of-Custody Record

Client: WESTERN REFINING SOUTHWEST, INC.
BLOOMFIELD REFINERY
Mailing Address: 50 ROAD 4990
BLOOMFIELD, NM 87413
Phone #: 505·632·4166
email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ ~~Other~~
☑ EDD (Type) EXCEL

Turn-Around Time:
☑ Standard ☐ Rush

Project Name: RCRA INVESTIGATION GROUP3
Project #: —
Project Manager: KELLY ROBINSON
Sampler: TRACY PAYNE
On Ice: [✓ Yes] ☐ No
Sample Temperature: 4

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904216	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) DRO/MRO ORO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals*	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B ~~(VOA)~~	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
4/15/9	1650	Soil	AOC 22-3(0-0.5')	(3) Jar	None	-5				X			X				X	X				
↓	↓	↓	↓	(2) Encore	↓	-5										X						
				(2) Vials	MeOH	-5										X						
4/15/9	1700	Soil	AOC 22-3(1.5'-2.0')	(3) Jar	None	-6				X			X				X	X				
↓	↓	↓	↓	(2) Encore	↓	-6										X						
				(2) VIALS	MeOH	-6										X						
4/15/9	1710	SOIL	AOC 22-4 (0-0.5)	(3) JARS	NONE	-7				X			X				X	X				
↓	↓	↓	↓	(2) ENCORE	↓	-7										X						
				(2) VIALS	MeOH	-7										X						
4/15/9	1720	SOIL	AOC 22-4(1.5-2.0)	(3) JARS	NONE	-8				X			X				X	X				
↓	↓		↓	(2) ENCORE	↓	-8										X						
				(2) VIALS	MeOH	-8										X						
			MeOH Blank	(2) Vials	MeOH											X						

Date: 4/16/9 Time: 1500 Relinquished by: Kelly Robinson
Received by: Date 4/17/09 Time 940

Date: Time: Relinquished by:
Received by: Date Time

Remarks:
* See Attached Analyte List
Methanol Blank - 9 - 8260/GRO
4/17/09

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

METALS ANALYSES

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.3/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

GENERAL CHEMISTRY ANALYSES

Analyte	Analytical Method
Total Dissolved Solids	SM-2540C
Bicarbonate	SW-846 method 310.1
Chloride	EPA method 300.0
Sulfate	EPA method 300.0
Calcium	SW-846 method 7140
Magnesium	SW-846 method 7450
Sodium	SW-846 method 7770
Potassium`	SW-846 method 7610
Manganese	SW-846 method 6010/6020
Nitrate/nitrite	EPA method 300.0
Ferric/ferrous Iron	SW-846 method 6010/6020 & SM 3500F e2+

Chain-of-Custody Record

COC 1 of 2

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Client: WESTERN REFINING SOUTHWEST INC.
BLOOMFIELD REFINERY
Mailing Address: 50 ROAD 4990
BLOOMFIELD, NM 87413
Phone #: 505.632.4166
email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type) EXCEL

Turn-Around Time: ☑ Standard ☐ Rush

Project Name: RCRA INVESTIGATION GROUP 3
Project #: —
Project Manager: KELLY ROBINSON
Sampler: TRACY PAYNE
On Ice ☑ Yes ☐ No
Sample Temperature: 1

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904314	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) GRO DRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Ethanol	Cyanide			Air Bubbles (Y or N)
4/20/9	1250	Soil	AOC 26-3 (0-0.5')	(4) Jars	None	-1				X			X				X	X	X			
↓	↓	↓	↓	(2) Encore	↓	-1										X						
				(2) VIALS	MeOH	-1										X						
4/20/9	1300	Soil	AOC 26-3 (1.5-2.0')	(4) Jars	None	-2				X			X				X	X	X			
↓	↓	↓	↓	(2) Encore	↓	-2										X						
				(2) VIALS	MeOH	-2										X						
			AOC26-3 (1.5-2.0') DUP	(4) Jars	None	-3				X			X				X	X	X			
			↓	(2) Encore	↓	-3										X						
				(2) VIALS	MeOH	-3										X						
4/20/9	1325	SOIL	AOC 26-4 (0-0.5')	(4) Jars	None	-4				X			X				X	X	X			
↓	↓	↓	↓	(2) Encore	↓	-4										X						
				(2) VIALS	MeOH	-4										X						

Date: 4/20/9 Time: 1500 Relinquished by: Kelly Robinson
Received by: Date 4/21/09 Time 1005

Date: Time: Relinquished by:
Received by: Date Time

Remarks: Refer to Work Plan Summary table for analyte list

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

COC 2 of 2

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Chain-of-Custody Record

Client: WESTERN REFINING SOUTHWEST INC. BLOOMFIELD REFINERY

Mailing Address: 50 ROAD 4990 BLOOMFIELD, NM 87413

Phone #: 505.632.4166

email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type) EXCEL

Turn-Around Time: ☑ Standard ☐ Rush

Project Name: RCRA INVESTIGATION GROUP 3

Project #: —

Project Manager: KELLY ROBINSON

Sampler: TRACY PAYNE

On Ice: [✓ Yes] No

Sample Temperature: 1

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904311	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) GRO DRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA~~ 8 Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cyanide	Ethanol		Air Bubbles (Y or N)
4/20/9	1335	Soil	AOC 26-4(1.5-2.0')	(4) Jar	None	-5				X			X				X	X	X		
↓	↓	↓	↓	(2) Encore	↓	-5										X					
↓	↓	↓ 4/21/09	↓	(2) Vials	MeOH	-5										X					
—	—	MeOH Aq	MeOH Blank	2 VIAL	MeOH	-6										X					
4/20/9	1415	Aq	EBS-042009	(5) VOAs		-7										X					
				(2) VOAs		-7				X									X		
				(1) Amber		-7											X				
				(1) Poly	HNO_3	-7							X					~~X~~			
↓	↓	↓	↓	(1) Poly	NaOH	-7												X			
—	—	Aq	Trip Blank	(3) VOAs	HCl	-8										X					

Date: 4/20/9 Time: 1500 Relinquished by: Kelly Robinson

Received by: Date 4/21/09 Time 1005

Date: Time: Relinquished by:

Received by: Date Time

Remarks: Refer to Work Plan Survey tables for analyte list

If n samples submitted to Hall Environmental may be subcontracted to other accredited laboratorie rves as notice of this possibility. Any sub-contracted data will be clearly notated on the analyti

METALS ANALYSES

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.3/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

GENERAL CHEMISTRY ANALYSES

Analyte	Analytical Method
Total Dissolved Solids	SM-2540C
Bicarbonate	SW-846 method 310.1
Chloride	EPA method 300.0
Sulfate	EPA method 300.0
Calcium	SW-846 method 7140
Magnesium	SW-846 method 7450
Sodium	SW-846 method 7770
Potassium'	SW-846 method 7610
Manganese	SW-846 method 6010/6020
Nitrate/nitrite	EPA method 300.0
Ferric/ferrous Iron	SW-846 method 6010/6020 & SM 3500F e2+

COC 1 OF 2

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Chain-of-Custody Record

Client: WESTERN REFINING SOUTHWEST INC

BLOOMFIELD REFINERY

Mailing Address: 50 ROAD 4990

BLOOMFIELD, NM 87413

Phone #: 505-632-4166

email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:

☐ Standard ☒ Level 4 (Full Validation)

☐ Other

☒ EDD (Type) EXCEL

Turn-Around Time:

☒ Standard ☐ Rush

Project Name: RCRA INVESTIGATION GROUP 3

Project #: —

Project Manager: KELLY ROBINSON

Sampler: TRACY PAYNE

On Ice: ☒ Yes ☐ No

Sample Temperature: 5

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904215	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH ~~(Method 418.1)~~ DRO GRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals * See Remarks	Anions (F,Cl,NO$_3$,NO$_2$,PO$_4$,SO$_4$)	8081 Pesticides / 8082 PCB's	8260B ~~(VOA)~~	8270 (Semi-VOA)	Cyanide	Ethanol			Air Bubbles (Y or N)
4/20/9	955	Soil	AOC 26-9 (0-0.5')	(4) Jars	None	-1				X			X				X	X	X			
				(2) Encore	↓	-1										X						
	↓	↓	↓	(2) VIALS	MeOH	-1										X						
4/20/9	1000	Soil	AOC 26-9 (1.5-2.0')	(4) Jar	None	-2				X			X				X	X	X			
				(2) Encore	↓	-2										X						
↓	↓	↓	↓	(2) VIALS	MeOH	-2										X						
4/20/9	1200	Soil	AOC 26-1 (0-0.5')	(4) Jar	None	-3				X			X				X	X	X			
				(2) Encore	↓	-3										X						
		↓	↓	(2) VIALS	MeOH	-3										X						
	1215	Soil	AOC 26-1 (~~2.0~~ 1.5-2.0')	(4) Jar	None	-4				X			X				X	X	X			
				(2) Encore	↓	-4										X						
↓		↓	↓	(2) VIALS	MeOH	-4										X						

Date:	Time:	Relinquished by:	Received by:	Date	Time
4/20/9	1500	Kelly Robinson		4/21/09	1000
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:
* See Work Plan Summary Table for analysis

If ne samples submitted to Hall Environmental may be subcontracted to other accredited laboratorie rves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytic

COC 2 of 2

Chain-of-Custody Record

Client: WESTERN REFINING SOUTHWEST INC

BLOOMFIELD REFINERY

Mailing Address: 50 ROAD 4990

BLOOMFIELD, NM 87413

Phone #: 505·632·4166

email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:

☐ Standard ☑ Level 4 (Full Validation)

☐ Other ________

☑ EDD (Type) EXCEL

Turn-Around Time:

☑ Standard ☐ Rush

Project Name: RCRA INVESTIGATION GROUP 3

Project #: —

Project Manager: KELLY ROBINSON

Sampler: TRACY PAYNE

On Ice: [✓ Yes] ☐ No

Sample Temperature: 5

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904315	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) GRO, DRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cyanide	Ethanol			Air Bubbles (Y or N)
4/20/9	1115	Aq	FB-042009	(1) Amber	None	-5											X					
↓	↓	↓	↓	(5) VOAs	HCl	-5										X						
↓	↓	↓	↓	(3) VOAs	None	-5				X									X			
↓	↓	↓	↓	(1) Poly	HNO_3	-5							X									
↓	↓	↓	↓	(1) Poly	NaOH	-5												X				
4/20/9	1230	Soil	AOC 26-2 (0-0.5')	(4) Jars	None	-6				X			X				X	X	X			
↓	↓	↓	↓	(2) Encore	↓	-6										X						
↓	↓	↓	↓	(2) Vials	MeOH	-6										X						
4/20/9	1240	Soil	AOC 26-2 (1.5-2.0')	(4) Jars	None	-7				X			X				X	X	X			
↓	↓	↓	↓	(2) Encore	↓	-7										X						
↓	↓	↓	↓	(2) Vials	MeOH	-7										X						
—	—	Aq	Trip Blank	3 VOAs	HCl	-8										X						
—	—	Aq	MeOH Blank	2 Vials	MeOH	-9										X						

Date:	Time:	Relinquished by:	Received by:	Date	Time
4/20/9	1500			4/21/09	1000
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: See Work Plan Summary Tables for analyte list

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

METALS ANALYSES

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.3/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

GENERAL CHEMISTRY ANALYSES

Analyte	Analytical Method
Total Dissolved Solids	SM-2540C
Bicarbonate	SW-846 method 310.1
Chloride	EPA method 300.0
Sulfate	EPA method 300.0
Calcium	SW-846 method 7140
Magnesium	SW-846 method 7450
Sodium	SW-846 method 7770
Potassium'	SW-846 method 7610
Manganese	SW-846 method 6010/6020
Nitrate/nitrite	EPA method 300.0
Ferric/ferrous Iron	SW-846 method 6010/6020 & SM 3500F e2+

COC 1 OF 1

Chain of-Custody Record

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Client: WESTERN REFINING SOUTHWEST INC.

BLOOMFIELD REFINERY

Mailing Address: 50 ROAD 4990

BLOOMFIELD, NM 87413

Phone #: 505·632·4166

email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:

☐ Standard ☑ Level 4 (Full Validation)

☐ Other

☑ EDD (Type) EXCEL

Turn-Around Time:

☑ Standard ☐ Rush

Project Name: RCRA INVESTIGATION-GROUP #3

Project #: —

Project Manager: KELLY ROBINSON

Sampler: TRACY PAYNE

On Ice: ☑ Yes ☐ No

Sample Temperature: [illegible]

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904351	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) DRO, GRO, MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
4/21/9	1115	Soil	AOC 23-1 (0-0.5')	(3) Jar	None	-1				X			X				X	X				
↓	↓	↓	↓	(2) Encore	↓	-1										X						
↓	↓	↓	↓	(2) VIALS	MeOH	-1										X						
↓	1115	Soil	AOC 23-1 (0-0.5') DUP	(3) Jar	None	-2				X			X				X	X				
↓	↓	↓	↓	(2) Encore	↓	-2										X						
↓	↓	↓	↓	(2) VIALS	MeOH	-2										X						
4/21/9	1130	Soil	AOC 23-1 (1.5-2.0')	(3) Jar	None	-3																
↓	↓	↓	↓	(2) Encore	↓	-3																
↓	↓	↓	↓	(2) VIALS	MeOH	-3																

Date:	Time:	Relinquished by:	Received by:	Date	Time
4/21/9	1500	Kelly Robinson		4/22/09	9:35
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: * Refer to Work Plan Summary tables for analyte list

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analyt report.

METALS ANALYSES

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.3/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

GENERAL CHEMISTRY ANALYSES

Analyte	Analytical Method
Total Dissolved Solids	SM-2540C
Bicarbonate	SW-846 method 310.1
Chloride	EPA method 300.0
Sulfate	EPA method 300.0
Calcium	SW-846 method 7140
Magnesium	SW-846 method 7450
Sodium	SW-846 method 7770
Potassium`	SW-846 method 7610
Manganese	SW-846 method 6010/6020
Nitrate/nitrite	EPA method 300.0
Ferric/ferrous Iron	SW-846 method 6010/6020 & SM 3500F e2+

COC 1 & -

Chain-of-Custody Record

Client: Western Refining Southwest Inc
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other ________
☑ EDD (Type) Excel

Turn-Around Time:
☑ Standard ☐ Rush ________
Project Name: RCRA Investigation - Group 3
Project #: ——
Project Manager: Kelly Robinson
Sampler: Tracy Payne
On Ice: ☐ Yes ☐ No
Sample Temperature: N/A

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904397	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) GRO, DRO, MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
4/23/9	850 ~~900~~	Soil	AOC 24-1 (0-0.5')	(2) VIALS	MeOH	-1										X						
				(2) Encore	None	-1										X						
↓	↓	↓	↓	(3) Jars	↓	-1				X			X				X	X				
4/23/9	900	Soil	AOC 24-1 (1.5-2.0')	(2) VIALS	MeOH	-2										X						
				(2) Encore	None	-2										X						
↓	↓	↓	↓	(3) Jar	↓	-2				X			X				X	X				
4/23/9	930	Soil	AOC 24-2 (0-0.5')	(2) VIALS	MeOH	-3										X						
				(2) Encore	None	-3										X						
↓	↓	↓	↓	(3) Jar	↓	-3				X			X				X	X				
9/23/9	940	Soil	AOC 24-2 (1.5-2.0')	(2) VIALS	MeOH	-4										X						
				(2) Encore	None	-4										X						
↓	↓	↓	↓	(3) Jar	↓	-4				X			X				X	X				

Date: 4/23/9 Time: 1500 Relinquished by: Kelly Robinson
Received by: Date 4/24/09 Time 1035

Date: Time: Relinquished by:
Received by: Date Time

Remarks: Refer to Work Plan Summary Table for metals analyte list

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Cooler #2

COC 2 of 5

Chain-of-Custody Record

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Client: Weston Refining Southwest Inc
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, NM 87413
Phone #: (505) 632-4166
email or ~~Fax#~~: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☑ EDD (Type) Excel

Turn-Around Time:
☑ Standard ☐ Rush
Project Name: RCRA Investigation - Grp 3
Project #:
Project Manager: Kelly Robinson
Sampler: Tracy Payne
On Ice: ☐ Yes ☐ No
Sample Temperature: /

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904317	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) DRO ORO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
4/23/9	1000	Soil	AOC 24-3 (0-0.5')	(2) VIALS	MeOH	-5										X						
↓	↓	↓	↓	(2) Encores	None	-5										X						
↓	↓	↓	↓	(3) Jars	↓	-5				X			X				X	X				
4/23/9	1010	Soil	AOC 24-3 (1.5-2.0')	(2) VIALS	MeOH	-6										X						
↓	↓	↓	↓	(2) Encore	None	-6										X						
↓	↓	↓	↓	(3) Jars	↓	-6				X			X				X	X				
4/23/9	1030	Soil	AOC 24-4 (0-0.5')	(2) VIALS	MeOH	-7										X						
↓	↓	↓		(2) Encore	None	-7										X						
↓	↓	↓		(3) Jars	↓	-7				X			X				X	X				
4/23/9	1040	Soil	AOC 24-4 (1.5-2.0')	(2) VIALS	MeOH	-8										X						
↓	↓	↓	↓	(2) Encore	None	-8										X						
↓	↓	↓	↓	(3) Jars	↓	-8				X			X				X	X				

Date: 4/23/9 Time: 1500 Relinquished by: Kelly Robinson
Received by: Date 4/24/09 Time 1035

Date: Time: Relinquished by:
Received by: Date Time

Remarks:
* Refer to Work Plan Summary tables for Metals list

If n amples submitted to Hall Environmental may be subcontracted to other accredited laboratorie ves as notice of this possibility. Any sub-contracted data will be clearly notated on the analyt

COC 3 of

Chain-of-Custody Record

Client: Western Refining Southwest Inc
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☑ EDD (Type) Excel

Turn-Around Time:
☑ Standard ☐ Rush
Project Name:
RCRA Investigation - Group 3
Project #:
Project Manager:
Kelly Robinson
Sampler: Tracy Payne
On Ice: ☐ Yes ☐ No
Sample Temperature: 1.9

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904397	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) GRO DRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B ~~(VOA)~~	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
4/23/9	1040	Soil	AOC 24-4 (1.5-2.0') DUP	(2) VIAL	MeOH	-9										X						
↓	↓	↓	↓	(2) Encore	None	-9										X						
				(3) Jars	None	-9				X			X				X	X				
—	—	~~Aq~~ MeOH TT 4/24/09	MeOH Blank	(2) Vials	MeOH	-10										X						

Date:	Time:	Relinquished by:	Received by:	Date	Time
4/23/9	1500	Kelly Robinson		4/24/09	1035
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:
* Refer to Work Plan Summary Tables for Metals list.

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Cooler #2

METALS ANALYSES

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.3/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

GENERAL CHEMISTRY ANALYSES

Analyte	Analytical Method
Total Dissolved Solids	SM-2540C
Bicarbonate	SW-846 method 310.1
Chloride	EPA method 300.0
Sulfate	EPA method 300.0
Calcium	SW-846 method 7140
Magnesium	SW-846 method 7450
Sodium	SW-846 method 7770
Potassium`	SW-846 method 7610
Manganese	SW-846 method 6010/6020
Nitrate/nitrite	EPA method 300.0
Ferric/ferrous Iron	SW-846 method 6010/6020 & SM 3500F e2+

COC 1 OF 3

Chain-of-Custody Record

Client: WESTERN REFINING SOUTHWEST INC.
BLOOMFIELD REFINERY
Mailing Address: 50 ROAD 4990
BLOOMFIELD, NM 87413
Phone #: 505-632-4166
email or Fax#: KELLY.ROBINSON@WNR.COM
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type) EXCEL

Turn-Around Time:
☑ Standard ☐ Rush
Project Name: RCRA INVESTIGATION GROUP 3
Project #: —
Project Manager: KELLY ROBINSON
Sampler: TRACY PAYNE
On Ice ☒ Yes ☐ No
Sample Temperature [illegible]

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904399	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) GRO, DRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
4/21/9	1540	Aq	FB-042109	(5) VOA	HCl	-1										X						
				(1) VOA	None	-1				X												
				(1) Amber	None	-1											X					
				(1) Poly	HNO_3	-1							X									
				(1) Poly	NaOH	-1												X				
4/22/09	1540	Aq	FB-042209	(5) VOA	HCl	-2																
				(1) VOA	None	-2																
				(1) Amber	None	-2																
				(1) Poly	HNO_3	-2																
				(1) Poly	NaOH	-2																

Date:	Time:	Relinquished by:	Received by:	Date	Time
4/23/9	1500	Kelly Robinson		4/24/09	1035

Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:
* Refer to Work Plan Summary table for analyte list on metals

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Cooler #1

COC 2 OF 2

Chain-of-Custody Record

Client: WESTERN REFINING SOUTHWEST INC.

BLOOMFIELD REFINERY

Mailing Address: 50 ROAD 4990

BLOOMFIELD, NM 87413

Phone #: 505・632・4166

email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:

☐ Standard ☑ Level 4 (Full Validation)

☐ Other

☑ EDD (Type) EXCEL

Turn-Around Time:

☑ Standard ☐ Rush

Project Name: RCRA INVESTIGATION GROUP 3

Project #: —

Project Manager: KELLY ROBINSON

Sampler: TRACY PAYNE

On Ice: ☒ Yes ☐ No

Sample Temperature: 7

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904391	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) GRO DRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
4/22/9	1520	Aq	EBS-042209	(5) VOAs	HCl	-3										X						
↓	↓	↓	↓	(1) VOAs	None	-3				X												
				(1) Amber	None	-3											X					
				(1) Poly	HNO_3	-3							X									
				(1) Poly	NaOH	-3												X				
4/21/09	1520	Aq	EBS-042109	(5) VOAs	HCl	-4																
↓	↓	↓	↓	(1) VOA	None	-4																
				(1) Amber	~~An~~ None	-4																
				(1) Poly	HNO_3	-4																
				(1) Poly	NaOH	-4																
—	—	Aq	Trip Blank	(3) VOAs	HCl	-5										X						
—	—	~~Aq~~ MeOH 4/24/09 TP	MeOH Blank	(2) Vials	MeOH	-6										X						

Date: 4/23/9 Time: 1500 Relinquished by: Kelly Robinson

Received by: Anne Date 4/24/09 Time 1035

Date: Time: Relinquished by:

Received by: Date Time

Remarks:

* See Previous COC,

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Cooler #1

Chain-of-Custody Record

COC 3 OF 3

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Client: WESTERN REFINING SOUTHWEST INC.

BLOOMFIELD REFINERY

Mailing Address: 50 ROAD 4990

BLOOMFIELD, NM 87413

Phone #: 505-632-4166

email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:

☐ Standard ☑ Level 4 (Full Validation)

☐ Other

☑ EDD (Type) EXCEL

Turn-Around Time:

☑ Standard ☐ Rush

Project Name: RCRA INVESTIGATION GROUP 3

Project #: —

Project Manager: KELLY ROBINSON

Sampler: TRACY PAYNE

On Ice ☒ Yes ☐ No

Sample Temperature: 7

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904399	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) GRO DRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
4/22/9	1510	Soil	AOC 23-1(52-53')	(2) Encore		-7										X						
				(2) Vials		-7										X						
↓	↓	↓	↓	(3) Jars		-7				X			X				X	X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
4/23/9	1500	Kelly Robinson		4/24/09	1035

Remarks: See Previous COC.

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Cooler #1

cooler #1

Coc 1 of 2

Chain-of-Custody Record

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Client: Western Refining Southwest Inc
Bloomfield, NM
Mailing Address: 50 Road 4990
Bloomfield NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☐ EDD (Type) Excel

Turn-Around Time:
☑ Standard ☐ Rush
Project Name:
RCRA Investigation - Group 3
Project #: —
Project Manager:
Kelly Robinson
Sampler: Tracy Payne
On Ice: ☑ Yes ☐ No
Sample Temperature: 4

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904414	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) GRO DRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
4/23/9	1750	Aq	EBS-042309	(5) VOAs	HCl	-1										X						
↓	↓	↓	↓	(1) VOA	None	-1				X												
↓	↓	↓	↓	(1) Amber	None	-1											X					
↓	↓	↓	↓	(1) Poly	HNO_3	-1							X					~~X~~				
↓	↓	↓	↓	(1) Poly	NaOH	-1												X				
4/23/9	1740	Aq	FB-042309	(5) VOAs	HCl	-2										X						
↓	↓	↓	↓	(1) VOA	None	-2				X												
↓	↓	↓	↓	(1) Amber	None	-2											X					
↓	↓	↓	↓	(1) Poly	HNO_3	-2							X									
↓	↓	↓	↓	(1) Poly	NaOH	-2												X				
—	—	Aq	Trip Blank	(3) VOAs	HCL	-3										X						
—	—	Aq	MeOH Blank	(2) VIALS	MeOH	-4										X						

Date:	Time:	Relinquished by:	Received by:	Date	Time
4/24/9	1200	Kelly Robinson		4/24/09	16:20
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:
* Refer to Work Plan Summary table for metals list.

If nece[illegible]amples submitted to Hall Environmental may be subcontracted to other accredited laboratories. T[illegible]ves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Cooler #1 COC 2 of 2

Chain-of-Custody Record

Client: Western Refining Southwest Inc
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield NM
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☑ EDD (Type) Excel

Turn-Around Time:
☑ Standard ☐ Rush
Project Name: RCRA INVESTIGATION - Group 3
Project #:
Project Manager: Kelly Robinson
Sampler: Tracy Payne
On Ice: ☒ Yes ☐ No
Sample Temperature:

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. [illegible]	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) GRO DRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
4/23/9	1600	Soil	AOC 25-1 (0-0.5')	(3) Jars	None	-5				X			X				X	X				
↓	↓	↓	↓	(2) Encore	↓	-5										X						
				(2) Vials	MeOH	-5										X						
4/23/9	1610	Soil	AOC 25-1 (1.5-2.0')	(3) Jars	None	-6				X			X				X	X				
↓	↓	↓	↓	(2) Encore	↓	-6										X						
				(2) Vials	MeOH	-6										X						

Date: 4/24/9 Time: 1200 Relinquished by: Kelly Robinson
Received by: Time 16:20 Date 4/24/09
Date: Time: Relinquished by:
Received by: Date Time

Remarks: See previous COC

If n ry, samples submitted to Hall Environmental may be subcontracted to other accredited laboratorie serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analyti rt.

METALS ANALYSES

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.3/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

GENERAL CHEMISTRY ANALYSES

Analyte	Analytical Method
Total Dissolved Solids	SM-2540C
Bicarbonate	SW-846 method 310.1
Chloride	EPA method 300.0
Sulfate	EPA method 300.0
Calcium	SW-846 method 7140
Magnesium	SW-846 method 7450
Sodium	SW-846 method 7770
Potassium	SW-846 method 7610
Manganese	SW-846 method 6010/6020
Nitrate/nitrite	EPA method 300.0
Ferric/ferrous Iron	SW-846 method 6010/6020 & SM 3500F e2+

Cooler #2

COC 1 of 3

Chain-of-Custody Record

Client: WESTERN REFINING SOUTHWEST, INC.
BLOOMFIELD, NM
Mailing Address: 50 ROAD 4990
BLOOMFIELD, NM 87413
Phone #: (505) 632-4166
email or Fax#: KELLY.ROBINSON@WNR.COM
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☑ EDD (Type) EXCEL

Turn-Around Time:
☑ Standard ☐ Rush
Project Name: RCRA INVESTIGATION-GRP 3
Project #: —
Project Manager: KELLY ROBINSON
Sampler: TRACY PAYNE
On Ice ☑ Yes ☐ No
Sample Temperature: 5

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904415	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH ~~(Method 418.1)~~ Gro DRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO$_3$,NO$_2$,PO$_4$,SO$_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
4/23/9	1410	Soil	SWMU 5-1 (0-0.5')	(3) Jars	None	-1				X			X				X	X				
↓	↓	↓	↓	(2) Encore	↓	-1										X						
↓	↓	↓	↓	(2) Vials	MeOH	-1										X						
	1420	Soil	SWMU 5-1 (1.5-2.0')	(3) Jars	None	-2				X			X				X	X				
	↓	↓	↓	(2) Encore	↓	-2										X						
	↓	↓	↓	(2) Vials	MeOH	-2										X						
	1430	Soil	SWMU 5-2 (0-0.5')	(3) Jars	None	-3				X			X				X	X				
	↓	↓	↓	(2) Encore	↓	-3										X						
	↓	↓	↓	(2) Vials	MeOH	-3										X						
	1435	Soil	SWMU 5-2 (1.5-2.0')	(3) Jars	None	-4				X			X				X	X				
	↓	↓	↓	(2) Encore	↓	-4										X						
↓	↓	↓	↓	(2) Vials	MeOH	-4										X						

Date: 4/24/9 Time: 1200 Relinquished by: Kelly Robinson
Received by: Date 16:20 Time 4/24/09
Date: Time: Relinquished by:
Received by: Date Time

Remarks:
* Refer to Work Plan Summary Tables for metals analyte list

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Cooler #2   COC 2 of 3

Chain-of-Custody Record

Client: WESTERN REFINERIES SOUTHWEST INC
BLOOMFIELD, NM
Mailing Address: 50 ROAD 4990
BLOOMFIELD, NM 87413
Phone #: 505.632.4166
email or Fax#: KELLY.ROBINSON@WNR.COM
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other ________
☑ EDD (Type) EXCEL

Turn-Around Time:
☑ Standard ☐ Rush
Project Name: RCRA INVESTIGATION GROUP 3
Project #: ——
Project Manager: KELLY ROBINSON
Sampler: TRACY PAYNE
On Ice: ☑ Yes ☐ No
Sample Temperature: 4

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904415	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH ~~(Method 418.1)~~ DRO GRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
4/23/9	1440	Soil	SWMU 5-3 (0-0.5')	(3) Jars	None	-5				X			X				X	X				
↓				(2) Encore	↓	-5										X						
	↓	↓	↓	(2) Vials	MeOH	-5										X						
	1445	Soil	SWMU 5-3 (1.5-2.0')	(3) Jars	None	-6				X			X				X	X				
	↓	↓	↓	(2) Encore	↓	-6										X						
	↓	↓	↓	(2) Vials	MeOH	-6										X						
	1450	Soil	SWMU 5-~~3~~4 (0-0.5')	(3) Jars	None	-7				X			X				X	X				
	↓	↓	↓	(2) Encore	↓	-7										X						
	↓	↓	↓	(2) Vials	MeOH	-7										X						
	1455	Soil	SWMU 5-4 (1.5-2.0')	(3) Jars	None	-8				X			X				X	X				
↓	↓	↓	↓	(2) Encore	↓	-8										X						
↓	↓	↓	↓	(2) Vials	MeOH	-8										X						

Date: 4/24/9 Time: 1200 Relinquished by: Kelly Robinson
Received by: Date 4/24/09 Time 16:20
Date: Time: Relinquished by:
Received by: Date Time

Remarks: * Refer to previous COC.

If r amples submitted to Hall Environmental may be subcontracted to other accredited laborator rves as notice of this possibility. Any sub-contracted data will be clearly notated on the analy

Cooler #2

COC 3 of 3

Chain-of-Custody Record

Client: WESTERN REFINING SOUTHWEST INC.
BLOOMFIELD, NM
Mailing Address: 50 ROAD 4990
BLOOMFIELD, NM 87413
Phone #: 505-632-4166
email or Fax#: KELLY.ROBINSON@WNR.COM

QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other
☑ EDD (Type) EXCEL

Turn-Around Time:
☑ Standard ☐ Rush
Project Name:
RCRA INVESTIGATION-GRP 3
Project #: —
Project Manager:
KELLY ROBINSON
Sampler: TRACY PAYNE
On Ice: ☑ Yes ☐ No
Sample temperature: 4

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4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904495
4/23/9	1500	Soil	Sumu 5-5 (0-0.5')	(3) Jars	None	-9
↓	↓	↓	↓	(2) Encore	↓	-9
↓	↓	↓ At 4/27/09	↓	(2) VIALS	MeOH	-9
—	—	~~Aq~~ MeOH	MeOH Blank	(2) VIALS	MeOH	-10

Analysis Request

HEAL No.	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH/Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) DRO, GRO MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ * Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
-9				X			X				X	X				
-9										X						
-9										X						
-10										X						

Date: 4/24/9 Time: 1200 Relinquished by: Kelly Robinson
Received by: Date 4/24/09 Time 16:20
Date: Time: Relinquished by:
Received by: Date Time

Remarks:
* Refer to Work Plan Summary tables for metals analyte list.

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

METALS ANALYSES

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.3/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

GENERAL CHEMISTRY ANALYSES

Analyte	Analytical Method
Total Dissolved Solids	SM-2540C
Bicarbonate	SW-846 method 310.1
Chloride	EPA method 300.0
Sulfate	EPA method 300.0
Calcium	SW-846 method 7140
Magnesium	SW-846 method 7450
Sodium	SW-846 method 7770
Potassium	SW-846 method 7610
Manganese	SW-846 method 6010/6020
Nitrate/nitrite	EPA method 300.0
Ferric/ferrous Iron	SW-846 method 6010/6020 & SM 3500F e2+

Cooler #3 CoC 1 of 2

Chain-of-Custody Record

Client: Western Refining Southwest Inc
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield NM
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☑ EDD (Type) Excel

Turn-Around Time:
☑ Standard ☐ Rush
Project Name: RCRA INVESTIGATION - Group 3
Project #:
Project Manager: Kelly Robinson
Sampler: Tracy Payne
On Ice: Yes No
Sample Temperature:

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

							Analysis Request															
Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) DRO, GRO, MRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
4/23/9	1720	Soil	AOC 22-5 (0-0.5')	(3) Jars	None	-1				X			X				X	X				
				(2) Encore	↓	4/24/09 -81										X						
	↓	↓	↓	(3) VIALS	MeOH	-1										X						
	1730	Soil	AOC 22-5 (1.5-2.0')	(3) Jars	None	-2				X			X				X	X				
				(2) Encore	↓	-2										X						
	↓	↓	↓	(2) VIALS	MeOH	-2										X						
	1650	Soil	AOC 22-6 (0-0.5')	(3) Jars	None	-3				X			X				X	X				
				(2) Encore	↓	-3										X						
	↓	↓	↓	(2) VIALS	MeOH	-3										X						
	1655	Soil	AOC 22-6 (1.5-2.0')	(3) Jars	None	-4				X			X				X	X				
				(2) Encore	↓	-4										X						
↓	↓	↓	↓	(2) Vials	MeOH	-4										X						

Date: 4/24/9 Time: 1200 Relinquished by: Kelly Robinson
Received by: 16:20 Date 4/24/09 Time
Date: Time: Relinquished by:
Received by: Date Time

Remarks:
* Refer to Work Plan Summary Tables for Metals analyte list

If sary, samples submitted to Hall Environmental may be subcontracted to other accredited laborator his serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analy port.

Cooler #3

CoC 2 of 2

Chain-of-Custody Record

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Client: Western Refining Southwest Inc
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, NM
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☑ EDD (Type) EXCEL

Turn-Around Time:
☑ Standard ☐ Rush
Project Name:
RCRA INVESTIGATION - Group 3
Project #:
Project Manager:
Kelly Robinson
Sampler: Tracy Payne
On Ice: ☑ Yes ☐ No
Sample Temperature: 1.0

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0904414	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH ~~(Method 418.1)~~ DRO/MRO GRO	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
4/23/9	1505	Soil	SWMU 5-5 (1.5-2.0')	(3) Jars	None	-5				X			X				X	X				
↓	↓	↓	↓	(2) Encore	↓	-5										X						
↓	↓	↓	↓	(2) VIALS	MeOH	-5										X						
4/23/9	1505	Soil	SWMU 5-5 (1.5-2.0') DUP	(3) Jars	None	-6				X			X				X	X				
↓	↓	↓	↓	(2) Encores	↓	-6										X						
↓	↓	↓	↓	(2) VIALS	MeOH	-6										X						
4/23/9	1510	Soil	SWMU 5-6 (0-0.5')	(3) Jars	None	-7				X			X				X	X				
↓	↓	↓	↓	(2) Encore	↓	-7										X						
↓	↓	↓	↓	(2) VIALS	MeOH	-7										X						
4/23/9	1515	Soil	SWMU 5-6 (1.5-2.0')	(3) Jars	None	-8				X			X				X	X				
↓	↓	↓	↓	(2) Encore	↓	-8										X						
↓	↓	↓	↓	(2) VIALS	MeOH	-8										X						

MeOH Blank 3 Vials MeOH x-

Date: 4/24/9 Time: 1200 Relinquished by: Kelly Robinson
Received by: Date 4/24/09 Time 16:20
Date: Time: Relinquished by:
Received by: Date Time

Remarks:
* See Previous COC
MeOH Blank #9 AS

If necess[illegible]nples submitted to Hall Environmental may be subcontracted to other accredited laboratories. Th[illegible]s as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical re

METALS ANALYSES

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.3/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

GENERAL CHEMISTRY ANALYSES

Analyte	Analytical Method
Total Dissolved Solids	SM-2540C
Bicarbonate	SW-846 method 310.1
Chloride	EPA method 300.0
Sulfate	EPA method 300.0
Calcium	SW-846 method 7140
Magnesium	SW-846 method 7450
Sodium	SW-846 method 7770
Potassium	SW-846 method 7610
Manganese	SW-846 method 6010/6020
Nitrate/nitrite	EPA method 300.0
Ferric/ferrous Iron	SW-846 method 6010/6020 & SM 3500F e2+

COC 1 of ~~2~~

Chain-of-Custody Record

Client: Western Refining Southwest, Inc.
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☑ EDD (Type) EXCEL

Turn-Around Time:
☑ Standard ☐ Rush
Project Name:
RCRA INVESTIGATION - Group 3
Project #:
Project Manager:
Kelly Robinson
Sampler: Kelly Robinson
[illegible]
[illegible]

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type		BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) DRO MRO GRO	~~EDB (Method 504.1)~~ Gen Chemistry	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cyanide	Dissolved Metals	NO_2/NO_3		Air Bubbles (Y or N)
5/13/9	1130	Aq	MW-62	(1) VOA	NONE	-1				X												
				(1) Poly	None	-1					X											
				(2) Poly	HNO_3	-1							X						X			
				(5) VOAs	HCl	-1										X						
				(1) Amber	None	-1											X					
				(1) Poly	NaOH	-1												X				
				(1) Poly	H_2SO_4	-1														X		
5/12/9	1720	Aq	EBW-051209	(1) VOA	None	-2				X												
				(1) Poly	None	-2					X											
				(2) Poly	HNO_3	-2							X						X			
				(5) VOAs	HCl	-2										X						
				(1) Amber	None	-2											X					
				(1) Poly	NaOH	-2												X				
				(1) Poly	H_2SO_4	-2														X		

Date: 5/13/9 Time: 1500 Relinquished by: Kelly Robinson
Received by: Date Time
Date: Time: Relinquished by:
Received by: Date 5/14/09 Time 10:00

Remarks:
Refer to attached analytical list for metals and general chemistry

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

R.oort : 0905247

COC ~~2~~ of ~~2~~ 3

Chain-of-Custody Record

Client: Western Refining Southwest Inc
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☑ EDD (Type) EXCEL

Turn-Around Time:
☑ Standard ☐ Rush
Project Name:
RCRA Investigation - Group 3
Project #:
Project Manager:
Kelly Robinson
Sampler: Kelly Robinson

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	[illegible]	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) DRO, GRO, MRO	~~EDB (Method 504.1)~~ Gen Chemistry	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Dissolved Metals	Cyanide	NO_2 / NO_3		Air Bubbles (Y or N)
5/13/9	910	Aq	MW-61	(1) VOA	None	-3				X												
				(1) Poly	None	-3					X											
				(2) Poly	HNO_3	-3							X					X				
				(5) VOAs	HCl	-3										X						
				(1) Amber	None	-3											X					
				(1) Poly	NaOH	-3													X			
				(1) Poly	H_2SO_4	-3														X		
—	—	Aq	TRIP BLANK	(3) VOAs	HCl	-4										X						

Date: 5/13/9 Time: 1500 Relinquished by: Kelly Robinson
Received by: Date Time
Date: Time: Relinquished by:
Received by: Date 5/14/09 Time 10:00

Remarks:
See Previous COC

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Report # 0905247

Coc 3 of 3

Chain-of-Custody Record

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Client: Western Refining Southwest Inc.
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, ~~Refinery~~ NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
☐ Other
☒ EDD (Type) EXCEL

Turn-Around Time:
☒ Standard ☐ Rush
Project Name:
RCRA Investigation - Group 3
Project #: —
Project Manager: Kelly Robinson
Sampler: Kelly Robinson
On Ice: [illegible]
Sample Temperature: [illegible]

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	[illegible]	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) DRO MRO GRO	~~EDB (Method 504.1)~~ Gen Chemistry	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Dissolved Metals	Cyanide	NO_2/NO_3		Air Bubbles (Y or N)
5/12/9	1700	Aq	FB-051209	(1) VOA	None	-5				X												
↓	↓	↓	↓	(1) Poly	None	-5					X											
				(2) Poly	HNO_3	-5							X					X	~~X~~			
				(5) VOAs	HCl	-5										X						
				(1) Amber	None	-5											X					
				(1) Poly	H_2SO_4	-5														X		
				(1) Poly	NaOH	-5													X			

Date:	Time:	Relinquished by:	Received by:	Date	Time
5/13/9	1500	Kelly Robinson	—		
Date:	Time:	Relinquished by:	Received by:	Date	Time
				5/14/09	10:00

Remarks:
Refer to attached analytical list for metals and general chemistry

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Report # 0905247

METALS ANALYSES

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.3/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

GENERAL CHEMISTRY ANALYSES

Analyte	Analytical Method
Total Dissolved Solids	SM-2540C
Bicarbonate	SW-846 method 310.1
Chloride	EPA method 300.0
Sulfate	EPA method 300.0
Calcium	SW-846 method 7140
Magnesium	SW-846 method 7450
Sodium	SW-846 method 7770
Potassium'	SW-846 method 7610
Manganese	SW-846 method 6010/6020
Nitrate/nitrite	EPA method 300.0
Ferric/ferrous Iron	SW-846 method 6010/6020 & SM 3500F e2+

Total/Diss Fe

5/6/09
BT

COC 1 of 3

Chain-of-Custody Record

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Cooler #2

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Client: Western Refining Southwest, Inc.
Bloomfield Refinery

Mailing Address: 50 Road 4990
Bloomfield NM 87413

Phone #: (505) 632-4166

email or Fax#: Kelly.Robinson@wnr.com

QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other

☑ EDD (Type) Excel

Turn-Around Time:
☑ Standard ☐ Rush

Project Name:
RCRA INVESTIGATION - GROUP 3

Project #:

Project Manager: Kelly Robinson

Sampler: Kelly Robinson

On Ice: Yes ☐ No

Sample Temperature: 5.5

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0905258	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) DRO GRO MRO	EDB (Method 504.1)	~~8310 (PNA or PAH)~~ Gen Chem*	~~RCRA 8 Metals~~ *Dissolved Metal	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Metals* (See Reference)	Cyanide	Ethanol	NO_2/NO_3	Air Bubbles (Y or N)
5/12/9	1400	Aq	MW-66	(1) VOA	None	-1				X												
				(1) Poly	None	-1						X										
				(2) Poly	HNO_3	-1							X					X				
				(5) VOA	HCl	-1										X						
				(1) Amber	None	-1											X					
				(1) Poly	NaOH	-1													X			
				(1) VOA	NONE	-1														X		
				(1) Poly	H_2SO_4	-1															X	
—	—	Aq	TRIP BLANK	(3) VOAs	HCl	-2																

Date: 5/13/9 Time: 1500 Relinquished by: Kelly Robinson

Received by: Date Time 10:00 5/14/09

Date: Time: Relinquished by:

Received by: Date Time

Remarks:
* Refer to attached analyte list for metals and gen chemistry list.

If nec amples submitted to Hall Environmental may be subcontracted to other accredited laboratories ves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytic

Coc 2 3

Chain-of-Custody Record

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Cooler #2

Client: Western Refining Southwest, Inc
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package: ☐ Standard ☑ Level 4 (Full Validation)
Accreditation ☐ NELAP ☐ Other
☑ EDD (Type) Excel

Turn-Around Time: ☑ Standard ☐ Rush
Project Name: ~~RCRA~~ INVESTIGATION - Group 3
Project #: ——
Project Manager: Kelly Robinson
Sampler: Kelly Robinson
On Ice: ☑ Yes ☐ No
Sample Temperature: 5.5

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0905257	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) PRO GRO MRO	EDB (Method 504.1)	~~8310 (PNA or PAH)~~ Gen Chem*	~~RCRA 8 Metals~~ Dissolved Metals*	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Metals* (See Reference)	Cyanide	Ethanol	NO_2/NO_3	Air Bubbles (Y or N)
5/12/9	1630	Aq	~~MS~~ MW-65	(1) VOA	None	-3				X												
				(1) Poly	None	-3						X										
				(2) Poly	HNO_3 ~~H_2SO_4~~	-3							X					X				
				(5) VOAs	HCl	-3										X						
				(1) Poly	NaOH	-3													X			
				(2) VOAS	None	-3														X		
				(1) Poly	H_2SO_4	-3															X	
				(1) Amber	None	-3											X					

Date: 5/13/9 Time: 1500 Relinquished by: Kelly Robinson
Received by: [illegible] Date 5/14/09 Time 10:00

Date: Time: Relinquished by:
Received by: Date Time

Remarks: *Refer to attached analyte list for metals and general chemistry.

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

COC 3 of 3

Chain-of-Custody Record

Client: Western Refining Southwest, Inc.
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☑ EDD (Type) Excel

Turn-Around Time:
☑ Standard ☐ Rush
Project Name: RCRA INVESTIGATION - GROUP 3
Project #:
Project Manager: Kelly Robinson
Sampler: Kelly Robinson
On Ice: ☑ Yes ☐ No
Sample Temperature: 5.5

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Cooler #2

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0905235	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) DRO, MRO GRO	~~EDB (Method 504.1)~~ Gen Chem	8310 (PNA or PAH)	~~RCRA 8~~ Metals *	Anions (F,Cl,NO$_3$,NO$_2$,PO$_4$,SO$_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Dissolved Metals	Cyanide	Ethanol	NO$_2$/NO$_3$	Air Bubbles (Y or N)
5/12/9	1630	Aq	MW-65 (DUP)	(1) VOA	None	-4				X												
				(1) Poly	None	-4					X											
				(2) Poly	HNO_3	-4							X					X				
				(5) VOAs	HCl	-4										X						
				(1) Amber	None	-4											X					
				(1) Poly	NaOH	-4													X			
				(2) VOAs	None	-4														X		
				(1) Poly	H_2SO_4	-4															X	

Date: 5/13/9 Time: 1500 Relinquished by: Kelly Robinson
Received by: Date 5/14/09 Time 10:00
Date: Time: - Relinquished by:
Received by: Date Time

Remarks: Refer to attached analyte list for Metals and General Chemistry

If ne amples submitted to Hall Environmental may be subcontracted to other accredited laboratories ves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytic

METALS ANALYSES

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.3/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

GENERAL CHEMISTRY ANALYSES

Analyte	Analytical Method
Total Dissolved Solids	SM-2540C
Bicarbonate	SW-846 method 310.1
Chloride	EPA method 300.0
Sulfate	EPA method 300.0
Calcium	SW-846 method 7140
Magnesium	SW-846 method 7450
Sodium	SW-846 method 7770
Potassium	SW-846 method 7610
Manganese	SW-846 method 6010/6020
Nitrate/nitrite	EPA method 300.0
Ferric/ferrous Iron	SW-846 method 6010/6020 & SM 3500F e2+

Tot + Diss Fe

5/6/09
AT

CoC 1 2 of 2

Chain-of-Custody Record

Client: Western Refining Southwest, Inc
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com

QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type) EXCEL

Turn-Around Time:
☑ Standard ☐ Rush
Project Name: RCRA INVESTIGATION - GROUP 3
Project #: ~~RCRA Investigation Group 3~~
Project Manager: Kelly Robinson
Sampler: Kelly Robinson
On Ice: ☑ Yes ☐ No
Sample Temperature: 3.6

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0905297	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) DRO GRO MRO	EDB (Method 504.1)	~~8310 (PNA or PAH)~~ Gen Chem.	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Dissolved Metals *	Cyanide	NO_2/NO_3		Air Bubbles (Y or N)
5/14/9	1020	Aq	MW-60	(1) VOA	None	-3				X												
				(1) Poly	None	-3						X										
				(2) Poly	HNO_3	-3							X					X				
				(5) VOAs	HCl	-3										X						
				(1) Amber	None	-3											X					
				(1) ~~NaOH~~ Poly	NaOH	-3													X			
				(1) Poly	H_2SO_4	-3														X		
5/14/9	1215	Aq	FB-051409	(1) VOA	~~HCl~~ None	-4				X												
				(1) POLY	None	-4						X										
				(2) Poly	HNO_3								X					X				
				(5) VOAs	HCl	-4										X						
				(1) Amber	None												X					
				(1) Poly	NaOH	-4													X			
				(1) Poly	H_2SO_4															X		
–	–	Aq	TRIP BLANK	(3) VOAs	HCl	-5										X						

Date: 5/14/9 Time: 1500 Relinquished by: Kelly Robinson
Received by: Date Time 10:00 5/15/09
Date: Time: Relinquished by:
Received by: Date Time

Remarks:
Refer to attached analyte list for Gen Chem + metals.

If nece samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. rves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical

METALS ANALYSES

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.3/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

GENERAL CHEMISTRY ANALYSES

Analyte	Analytical Method
Total Dissolved Solids	SM-2540C
Bicarbonate	SW-846 method 310.1
Chloride	EPA method 300.0
Sulfate	EPA method 300.0
Calcium	SW-846 method 7140
Magnesium	SW-846 method 7450
Sodium	SW-846 method 7770
Potassium	SW-846 method 7610
Manganese	SW-846 method 6010/6020
Nitrate/nitrite	EPA method 300.0
~~Ferric/ferrous Iron~~	SW-846 method 6010/6020 & SM 3500F e2+

Diss & Total
Fe per AF
5/15/09
AF

LOC 1 of 3

Chain-of-Custody Record

Client: Western Refining Southwest, Inc
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☑ EDD (Type) EXCEL

Turn-Around Time:
☑ Standard ☐ Rush
Project Name: RCRA Investigation - Group 3
Project #: 0
Project Manager: Kelly Robinson
Sampler: Kelly Robinson

HALL ENVIRONMENTAL ANALYSIS LABORATORY #1 Cooler
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type		BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH ~~(Method 418.1)~~ DRO GRO MRO	EDB (Method 504.1)	~~8310 (PNA or PAH)~~ Gen Chemistry	~~RCRA 8~~ Metals *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Dissolved Metals Field Filtered	Cyanide	NO_2/NO_3		Air Bubbles (Y or N)
5/13/9	1515	Aq	MW-64	(1) VOA	None	-1				X												
				(1) Poly	None	-1						X										
				(2) Poly	HNO_3	-1							X					X				
				(5) VOAs	HCl	-1										X						
				(1) Amber	None	-1											X					
				(1) Poly	NaOH	-1													X			
				(1) Poly	H_2SO_4	-1														X		
5/13/9	1700	Aq	FB-051309	(1) VOA	None	-2				X												
				(1) Poly	None	-2						X						X				
				(2) Poly	HNO_3	-2							X									
				(5) VOAs	HCl	-2										X						
				(1) Amber	None	-2											X					
				(1) Poly	NaOH	-2													X			
				(1) Poly	H_2SO_4	-2														X		

Date:	Time:	Relinquished by:	Received by:		Date	Time
5/14/9	1500	Kelly Robinson		10:00	5/15/09	
Date:	Time:	Relinquished by:	Received by:		Date	Time

Remarks: Refer to attached analyte list for metals and general Chemistry
1) ~~The VOA for TPH~~

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Lab Report 0905299

COC 1 of 3

Chain-of-Custody Record

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Cooler #1

Client: Western Refining Southwest Inc
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
Accreditation
☐ NELAP ☐ Other
☑ EDD (Type) EXCEL

Turn-Around Time:
☑ Standard ☐ Rush
Project Name: RCRA Investigation - Group 3
Project #:
Project Manager: Kelly Robinson
Sampler: Kelly Robinson

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and # (22)	Preservative Type		BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~) DRO, MRO GRO	EDB (Method 504.1)	~~8310 (PNA or PAH)~~ Gen Chemistry	~~RCRA 8~~ Metals *	Anions (F,Cl,NO$_3$,NO$_2$,PO$_4$,SO$_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cyanide	Dissolved Metals	NO$_2$/NO$_3$		Air Bubbles (Y or N)
5/13/9	1640	Aq	~~MW-62~~ MW-63	(1) VOA	None	-3				X												
				(1) Poly	None	-3						X										
				(2) Poly	HNO$_3$	-3							X						X			
				(5) VOAS	HCl	-3										X						
				(1) Amber	None	-3											X					
				(1) Poly	H$_2$SO$_4$	-3														X		
				(1) Poly	NaOH	-3												X				
5/13/09	1730	Aq	EBW-051309	(1) VOA	None	-4																
				(3) Poly	None	-4																
				(2) Poly	HNO$_3$	-4																
				(5) VOAS	HCl	-4																
				(1) Amber	None	-4																

Date: 5/14/9 Time: 1500 Relinquished by: Kelly Robinson
Received by: [illegible] Date 5/15/09 Time 10:00
Date: Time: Relinquished by:
Received by: Date Time

Remarks: Refer to attached analyte list for metals and general Chemistry

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Lab Report 0905299

CoC 383

Chain-of-Custody Record

Client: Western Refining Southwest
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type) Excel

Turn-Around Time:
☑ Standard ☐ Rush
Project Name: RCRA Investigation - Group 3
Project #:
Project Manager: Kelly Robinson
Sampler: Kelly Robinson
On Ice: [illegible]
Sample Temperature: [illegible]

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Cooler #1

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0905299	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	NO./NO	Cyanide			Air Bubbles (Y or N)
5/13/9	1730	Aq	EBW-051309	(1) Poly	H_2SO_4	-4												X				
↓	↓	↓	↓	(1) Poly	NaOH	-4													X			
—	—	Aq	Trip Blank	(3) VOAs	HCl	-5										X						

Date: 5/14/9 Time: 1500 Relinquished by: Kelly Robinson
Received by: [illegible] Date 5/15/09 Time 10:00
Date: Time: Relinquished by:
Received by: Date Time

Remarks: See Previous COC.

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Lab Report 0905299

METALS ANALYSES

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.3/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

GENERAL CHEMISTRY ANALYSES

Analyte	Analytical Method
Total Dissolved Solids	SM-2540C
Bicarbonate	SW-846 method 310.1
Chloride	EPA method 300.0
Sulfate	EPA method 300.0
Calcium	SW-846 method 7140
Magnesium	SW-846 method 7450
Sodium	SW-846 method 7770
Potassium`	SW-846 method 7610
Manganese	SW-846 method 6010/6020
Nitrate/nitrite	EPA method 300.0
Ferric/ferrous Iron	SW-846 method 6010/6020 & SM 3500F e2+

Total + Diss Fe

Coc 1/2

Chain-of-Custody Record

Client: Western Refining Southwest Inc
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type) Excel

Turn-Around Time:
☑ Standard ☐ Rush
Project Name: RCRA Investigation - Group 3
Project #:
Project Manager: Kelly Robinson
Sampler: Kelly Robinson
On Ice: Yes ☐ No
Sample Temperature: 4.8

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0907225	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~)	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals Filtered *	Anions (F,Cl,NO$_3$,NO$_2$,PO$_4$,SO$_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Total Metals*	Gen Chemistry	Cyanide	NO$_2$/NO$_3$	Air Bubbles (Y or N)
7/15/9	1130	Aq	MW-64	(1)VOA	None	/				X												
				(5)VOA	HCl	/										X						
				(1) Poly	None	/													X			
				(4~~2~~) Poly	HNO$_3$	/							X					X				
				(1) Amber	None	/											X					
				(1) Poly	NaOH	/														X		
				(1) Poly	H$_2$SO$_4$	/															X	
—	—	Aq	TRIP BLANK	(3) VOA	HCl	2										X						

Date: 7/15/9 Time: 1500 Relinquished by: Kelly Robinson
Received by: Date 7/16/09 Time 1000
Date: Time: Relinquished by:
Received by: Date Time

Remarks:
* Refer to attached analyte list
Call with questions

If nec samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. rves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical

Cooler #2

COC 2 of 2

Chain-of-Custody Record

Client: Western Refining Southwest, Inc.
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com

QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other ____
☑ EDD (Type) EXCEL

Turn-Around Time:
☑ Standard ☐ Rush ____
Project Name:
RCRA Investigation - Group 3
Project #:

Project Manager: Kelly Robinson
Sampler: Kelly Robinson
On Ice: ☑ Yes ☐ No
Sample Temperature: 4.3

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0907225	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH ~~(Method 418.1)~~	~~EDB (Method 504.1)~~ Ethanol	8310 (PNA or PAH)	~~RCRA~~ 8 Metals Dissolved *	Anions (F,Cl,NO$_3$,NO$_2$,PO$_4$,SO$_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Total Metals *	Gen Chemistry *	NO$_2$/NO$_3$	Cyanide	Air Bubbles (Y or N)
7/15/9	0915	Aq	MW-66	(3) VOAS	None	3				X	X											
				(5) VOAS	HCl	3										X						
				(1) Poly	None	3													X			
				(4) ~~(2)~~ Poly	HNO$_3$	3							X					X				
				(1) Amber	None	3											X					
				(1) Poly	NaOH	3															X	
				(1) Poly	H$_2$SO$_4$	3														X		
			~~TRIP BLA~~																			

Date:	Time:	Relinquished by:	Received by:	Date	Time
7/15/9	1800	Kelly Robinson		7/16/09	1020
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:
* Refer to Analyte List.

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Cooler #2

METALS ANALYSES

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.3/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

GENERAL CHEMISTRY ANALYSES

Analyte	Analytical Method
Total Dissolved Solids	SM-2540C
Bicarbonate	SW-846 method 310.1
Chloride	EPA method 300.0
Sulfate	EPA method 300.0
Calcium	SW-846 method 7140
Magnesium	SW-846 method 7450
Sodium	SW-846 method 7770
Potassium`	SW-846 method 7610
Manganese	SW-846 method 6010/6020
Nitrate/nitrite	EPA method 300.0
Ferric/ferrous Iron	SW-846 method 6010/6020 & SM 3500F e2+

COC 1

Chain-of-Custody Record

Client: Western Refining Southwest, Inc. Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)
☐ Other
☒ EDD (Type)

Turn-Around Time: ☒ Standard ☐ Rush
Project Name: RCRA Investigation-Group 3
Project #:
Project Manager: Kelly Robinson
Sampler: Kelly Robinson

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 · Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	[illegible]	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~)	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals (Filtered) *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Gen. Chemistry *	Total Metals *	Cyanide	NO_2/NO_3	Air Bubbles (Y or N)
7/15/9	1300	Aq	MW-63 (DUP)	(1) VOA	None	3				X												
				(5) VOAs	HCl	3										X						
				(1) Poly	None	3												X				
				(2) Poly	HNO_3	3							X						X			
				(1) Amber	None	3											X					
				(1) Poly	NaOH	3														X		
				(1) Poly	H_2SO_4	3															X	

Date: 7/15 Time: 1500 Relinquished by: Kelly Robinson
Received by: Date 7/16/09 Time 1020
Date: Time: Relinquished by:
Received by: Date Time

Remarks: *Refer to attached analyte list
Call w/ questions.

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Cooler #1

Report 0907286

Coc 2 of 2

Chain-of-Custody Record

Client: Western Refining Southwest, Inc. Bloomfield Refinery

Mailing Address: 50 Road 4990

Bloomfield, NM 87413

Phone #: (505) 632-4166

email or Fax#: Kelly.Robinson@wnr.com

QA/QC Package:

☐ Standard ☑ Level 4 (Full Validation)

☐ Other

☑ EDD (Type) EXCEL

Turn-Around Time:

☑ Standard ☐ Rush

Project Name: RCRA Investigation - Group 3

Project #:

Project Manager: Kelly Robinson

Sampler: Kelly Robinson

On Ice: [illegible]

Sample Temperature: [illegible]

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

							Analysis Request																		
Date	Time	Matrix	Sample Request ID	Container Type and # KER	Preservative Type	HEAL No.	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~)	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals (Filtered) *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Gen Chemistry *	Total Metals *	Cyanide	NO_2/NO_3	Air Bubbles (Y or N)
7/15/9	1300	Aq	MW-~~[illegible]~~63	(1) VOAs	None	1				X												
				(5) VOAs	HCl	1										X						
				(1) Poly	None	1												X				
				4(2) Poly	HNO_3	1							X						X			
				(1) Amber	None	1											X					
				(1) Poly	NaOH	1														X		
				(1) Poly	H_2SO_4	1															X	
—	—	Aq	TRIP Blank	(3) VOA	HCl	2										X						

Date: 7/15/9 Time: 1500 Relinquished by: Kelly Robinson

Received by: Date 7/16/09 Time 1005

Date: Time: Relinquished by:

Received by: Date Time

Remarks:

* Refer to attached analyte list

Call with questions.

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Cooler #f Report 0907286

METALS ANALYSES

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.3/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

GENERAL CHEMISTRY ANALYSES

Analyte	Analytical Method
Total Dissolved Solids	SM-2540C
Bicarbonate	SW-846 method 310.1
Chloride	EPA method 300.0
Sulfate	EPA method 300.0
Calcium	SW-846 method 7140
Magnesium	SW-846 method 7450
Sodium	SW-846 method 7770
Potassium`	SW-846 method 7610
Manganese	SW-846 method 6010/6020
Nitrate/nitrite	EPA method 300.0
Ferric/ferrous Iron	SW-846 method 6010/6020 & SM 3500F e2+

COC 1 3

Chain of-Custody Record

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Client: Western Refining Southwest, Inc
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type) Excel

Turn-Around Time: ☒ Standard ☐ Rush
Project Name: RCRA Investigation - Group 3
Project #:
Project Manager: Kelly Robinson
Sampler: Kelly Robinson
On Ice: [✓ Yes] ☐ No
Sample Temperature: 4.0

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0907314	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH ~~(Method 418.1)~~	EDB (Method 504.1)	8310 (PNA or PAH)	* (Filtered) ~~RCRA 8~~ Metals	Anions (F,Cl,NO$_3$,NO$_2$,PO$_4$,SO$_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Gen Chemistry *	Total Metals *	Cyanide	NO$_2$/NO$_3$	Air Bubbles (Y or N)
7/16/9	1300	Aq	MW-61	(1) VOA	None	1				X												
				(5) VOAs	HCl	1										X						
				(1) Poly	None	1												X				
				(4) ~~(2)~~ Poly	HNO$_3$	1							X						X			
				(1) Amber	None	1											X					
				(1) Poly	NaOH	1														X		
				(1) Poly	H$_2$SO$_4$	1															X	
—	—	Aq	TRIP BLANKS	(3) VOAs	HCl	2										X						

Date:	Time:	Relinquished by:	Received by:	Date	Time
7/16/9	1500	Kelly Robinson		7/17/09	1025
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:
*Refer to attached analyte list.
Call w/ questions

If r samples submitted to Hall Environmental may be subcontracted to other accredited laborator erves as notice of this possibility. Any sub-contracted data will be clearly notated on the analyt

C ler #3

COC 6 of 5

C…of-Custody Record

Client: Western Refining Southwest Inc
Bloomfield Refinery

Mailing Address: 50 Road 4990
Bloomfield, NM 87413

Phone #: (505) 632-4166

email or Fax#: Kelly.Robinson@wnr.com

QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type) EXCEL

Turn-Around Time:
☑ Standard ☐ Rush

Project Name:
RCRA Investigation - Group 3

Project #:

Project Manager: Kelly Robinson

Sampler: Kelly Robinson

On Ice: ☑ Yes ☐ No

Sample Temperature: 4.9

HALL ENVIRONMENTAL
ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0907314	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~)	~~EDB (Method 504.1)~~ Ethanol	8310 (PNA or PAH)	~~RCRA 8~~ Metals (filtered)*	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Total Metals*	Gen Chemistry*	Cyanide	NO_2/NO_3	Air Bubbles (Y or N)
7/16/9	1145	Aq	MW-65	(3) VOA	None	3				X	X											
				(5) VOAs	HCl	3										X						
				(1) Poly	None	3													X			
				(2) Poly	HNO_3	3							X					X				
				(1) Amber	None	3											X					
				(1) Poly	NaOH	3														X		
				(1) Poly	H_2SO_4	3															X	

Date: 7/16/9 Time: 1500 Relinquished by: Kelly Robinson
Received by: Date 7/17/09 Time 1025

Date: Time: Relinquished by:
Received by: Date Time

Remarks:
* Refer to Analyte List.

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

COC 3-1-3

Chain-of-Custody Record

Client: Western Refining Southwest, Inc.
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type)

Turn-Around Time:
☑ Standard ☐ Rush
Project Name:
RCRA INVESTIGATION - GROUP ~~1~~ 3
Project #: —
Project Manager: Kelly Robinson
Sampler: Kelly Robinson
On Ice: ☑ Yes ☐ No
Sample Temperature: 4.9

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0907314	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~)	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals (Filtered)*	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Gen. Chemistry *	Total Metals *	Cyanide	NO_2/NO_3	Air Bubbles (Y or N)
7/16/9	0900	Aq	MW-59	(1) VOA	NONE	4				X												
				(5) VOAs	HCl	4										X						
				(1) Poly	None	4												X				
				(2) Poly	HNO_3	4							X						X			
				(1) Amber	None	4											X					
				(1) Poly	NaOH	4														X		
				(1) Poly	H_2SO_4	4															X	

Date: 7/16/9 Time: 1500 Relinquished by: Kelly Robinson
Received by: Date 7/17/09 Time 1025
Date: Time: Relinquished by:
Received by: Date Time

Remarks:
* Refer to attached analyte list.
Call with questions.

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

* Bullet 22/23

Cooler -3

METALS ANALYSES

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.3/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

GENERAL CHEMISTRY ANALYSES

Analyte	Analytical Method
Total Dissolved Solids	SM-2540C
Bicarbonate	SW-846 method 310.1
Chloride	EPA method 300.0
Sulfate	EPA method 300.0
Calcium	SW-846 method 7140
Magnesium	SW-846 method 7450
Sodium	SW-846 method 7770
Potassium`	SW-846 method 7610
Manganese	SW-846 method 6010/6020
Nitrate/nitrite	EPA method 300.0
Ferric/ferrous Iron	SW-846 method 6010/6020 & SM 3500F e2+

Lab Report 0907315

Chain-of-Custody Record

Client: Western Refining Southwest, Inc
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly. Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type)

Turn-Around Time:
☑ Standard ☐ Rush
Project Name:
RCRA Investigation - Group 3
Project #: 0
Project Manager: Kelly Robinson
Sampler: Kelly Robinson
On Ice: [illegible]
Sample Temperature: [illegible]

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and # VRK 8/18/9	Preservative Type	[illegible]	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~)	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals (filtered) *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Total Metals *	Gen. Chemistry	Cyanide	NO_2/NO_3	Air Bubbles (Y or N)
7/16/9	1030	Aq	~~MW-65~~ MW-62	(1) VOAs	None	1				X												
				(5) VOAs	HCl	1										X						
				(1) Poly	None	1													X			
				(4) (2) Poly	HNO_3	1							X					X				
				(1) Amber	None	1											X					
				(1) Poly	NaOH	1														X		
↓	↓	↓	↓	(1) Poly	H_2SO_4	1															X	
			~~EBD~~																			
7/15/9	1600	Aq	EBW-071509	(1) VOA	None	2				X												
				(5) VOAs	HCl	2										X						
				(1) Poly	None	2													✓			
↓	↓	↓	↓	(4) Poly	HNO_3	2							X					X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
7/16/9	1500	Kelly Robinson		7/17/09	1025

Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:
* Refer to attached analyte list.

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Lab Report 0907315

Chain-of-Custody Record

Client: Western Refining Southwest, Inc
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other
☑ EDD (Type) Excel

Turn-Around Time:
☑ Standard ☐ Rush
Project Name:
RCRA INVESTIGATION - Group 3
Project #:
—
Project Manager:
Kelly Robinson
Sampler: Kelly Robinson
On Ice:
Sample Temperature:

HALL ENVIRONMENTAL ANALYSIS LABORATORY

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4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type		BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO$_3$,NO$_2$,PO$_4$,SO$_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cyanide				Air Bubbles (Y or N)
7/15/9	1600	Aq	EBW-071509	(1) Amber	None	~~3~~ 2											X					
↓	↓	↓	↓	(1) Poly	H_2SO_4	TJ ~~3~~ 2												X				
7/15/9	1430	Aq	FB-071509	(1) VOA	None	~~4~~ 3																
				(5) VOA	HCl	3																
				(1) Poly	None	3																
				(1) Poly	HNO_3	3																
				(1) Amber	None	3																
				(1) Poly	NaOH	3																
↓	↓	↓	↓	(1) Poly	H_2SO_4	3																
—	—	Aq	TRIP BLANKS	(3) VOA	HCl	4																

Date:	Time:	Relinquished by:	Received by:	Date	Time
7/16/9	1500	Kelly Robinson		7/17/09	1005
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:
See Attached Analyte List

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

METALS ANALYSES

Analyte	Analytical Method
Antimony	SW-846 method 6010/6020
Arsenic	SW-846 method 6010/6020
Barium	SW-846 method 6010/6020
Beryllium	SW-846 method 6010/6020
Cadmium	SW-846 method 6010/6020
Chromium	SW-846 method 6010/6020
Cobalt	SW-846 method 6010/6020
Cyanide	SW-846 method 335.3/335.2 mod
Lead	SW-846 method 6010/6020
Mercury	SW-846 method 7470/7471
Nickel	SW-846 method 6010/6020
Selenium	SW-846 method 6010/6020
Silver	SW-846 method 6010/6020
Vanadium	SW-846 method 6010/6020
Zinc	SW-846 method 6010/6020

GENERAL CHEMISTRY ANALYSES

Analyte	Analytical Method
Total Dissolved Solids	SM-2540C
Bicarbonate	SW-846 method 310.1
Chloride	EPA method 300.0
Sulfate	EPA method 300.0
Calcium	SW-846 method 7140
Magnesium	SW-846 method 7450
Sodium	SW-846 method 7770
Potassium	SW-846 method 7610
Manganese	SW-846 method 6010/6020
Nitrate/nitrite	EPA method 300.0
Ferric/ferrous Iron	SW-846 method 6010/6020 & SM 3500F e2+

Chain-of-Custody Record

Client: Western Refining Southwest Inc
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☐ Standard ☑ Level 4 (Full Validation)
☐ Other ______
☑ EDD (Type) ______

Turn-Around Time:
☑ Standard ☐ Rush ______
Project Name: RCRA Investigation - Group 3
Project #: ______
Project Manager: Kelly Robinson
Sampler: Kelly Robinson
On Ice: ☒ Yes ☐ No
Sample Temperature: 1.7

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

							Analysis Request																
Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0907138	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (~~Method 418.1~~)	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals Total *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Dissolved Metals *	Cyanide	NO_2/NO_3	Gen Chemistry *	Air Bubbles (Y or N)
7/16/9	1445TD ~~1430~~	Aq	EBW-071609	(1) VOA	None	1				X												
				(5) VOAs	HCl	2 1				X						X						
				(4) Poly	HNO_3	TS 3 1							X					X				
				(1) Poly	NaOH	7/17/09 1													X			
				(1) Poly	H_2SO_4	5 1														X		
				(1) Amber	None	6 1											X					
				(1) Poly	None	7 1															X	
				~~(1) Poly~~																		

Date: 7/17/9 Time: 0800 Relinquished by: Kelly Robinson
Received by: Date 7/17/09 Time 845
Date: Time: Relinquished by:
Received by: Date Time

Remarks:
* See attached Analytical List

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: Western Refining Southwest, Inc
Bloomfield Refinery

Mailing Address: 50 Road 4990
Bloomfield NM 87413

Phone #: (505) 632-4166

email or Fax#: Kelly.Robinson@wnr.co

QA/QC Package:

☐ Standard ☑ Level 4 (Full Validation)

☐ Other ________

☑ EDD (Type) ________

Turn-Around Time:

☑ Standard ☐ Rush ________

Project Name: RCRA Investigation - Group 3

Project #: 0

Project Manager: Kelly Robinson

Sampler: Kelly Robinson

On Ice: ☑ Yes ☐ No

Sample Temperature: [illegible]

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0907138	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH ~~(Method 418.1)~~	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals Total *	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Dissolved Metals	NO_2/NO_3	Cyanide	Gen Chemistry *	Air Bubbles (Y or N)
7/16/9	1500	Aq	FB-071609	(1) VOA	None	2				X												
				(4) VOAs	HCl	2				X						X						
				(4) Poly	HNO_3	2							X					X				
				(1) Poly	NaOH	2														X		
				(1) Poly	H_2SO_4	2													X			
				(1) Amber	None	2											X					
				(1) Poly	None	2															X	
—	—	~~Aq~~	~~TRIP BLANKS~~	~~(3) VOA~~	~~HCl~~	~~3~~ TS 7/17/09										X						

Date:	Time:	Relinquished by:	Received by:	Date	Time
7/17/9	0800	Kelly Robinson		7/17/09	845
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: * See attached analyte list

If nec... samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. ...erves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytic...

CoC 1/5

Chain-of-Custody Record

Client: Western Refining Southwest Inc
Bloomfield Refinery
Mailing Address: 50 Road 4990
Bloomfield, NM 87413
Phone #: (505) 632-4166
email or Fax#: Kelly.Robinson@wnr.com
QA/QC Package:
☑ Standard ☐ Level 4 (Full Validation)
☐ Other
☑ EDD (Type) Excel

Turn-Around Time:
☐ Standard ☑ Rush 5 day
Project Name: RCRA INVESTIGATION - Grp 3
Project #: —
Project Manager: Kelly Robinson
Sampler: Kelly Robinson
On Ice: ☑ Yes ☐ No
Sample Temperature: 4.0

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0907371	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals - TCLP	Anions (F,Cl,NO$_3$,NO$_2$,PO$_4$,SO$_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Reactivity, Corrosivity, Ignitability	BTEX - ~~TCLP~~ 8021	PAHs - ~~TCLP~~ 8310			Air Bubbles (Y or N)
7/20/9	1050	Soil	AOC 22-IDW	(4) Jar	None	~~2~~ 1							X					X	X	X			
7/20/9	1315	Soil	AOC 24-IDW	(4) Jar	None	2							X					X	X	X			
7/20/9	1400	Soil	AOC 26-IDW	(4) Jar	None	3							X					X	X	X			
			~~TRIP BLANK~~	~~(3) VOAs~~	~~HCl~~																		

Date: 7/20/9 Time: 1500 Relinquished by: Kelly Robinson
Received by: To FedEx Date Time

Date: Time: Relinquished by:
Received by: Date 7/21/09 Time 9:30

Remarks: Report as separate Report.

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Cha of-Custody Record

Client: Western Refining Southwest, Inc

Bloomfield Refinery

Mailing Address: 50 Road 4990

Bloomfield, NM 87413

Phone #: (505) 632-4166

email ~~or Fax#~~: Kelly.Robinson@wnr.com

QA/QC Package:

☐ Standard ☑ Level 4 (Full Validation)

☐ Other

☑ EDD (Type) Excel

Turn-Around Time:

☑ Standard ☐ Rush

Project Name: RCRA Investigation - Group 3

Project #:

Project Manager: Kelly Robinson

Sampler: Kelly Robinson

On Ice: ☑ Yes ☐ No

Sample Temperature: 1.3

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time 7/30 13:20	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 0907559	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH ~~(Method 418.1)~~ *	EDB (Method 504.1)	8310 (PNA or PAH)	~~RCRA 8~~ Metals *, Total	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Dissolved Metals *	NO_2/NO_3	Gen Chemistry *	Cyanide	Air Bubbles (Y or N)
7/29/9	~~1320~~	Aq	TW-01	(5) VOAs	HCl	/				X						X						
				(1) VOA	None	/				X												
				(3) Poly	HNO_3	/							X					X				
				(1) Poly	NaOH	/															X	
				(1) Poly	None	/														X		
				(1) Poly	H_2SO_4	/													X			
				(1) Amber	None	/											X					
—	—	Aq	TRIP BLANK	(3) VOA	None	2										X						

Date: 7/29/9 Time: 1500 Relinquished by: Kelly Robinson

Received by: Fed Ex Date Time

Date: Time: Relinquished by:

Received by: 10:35 Date 7/30/09 Time

Remarks: * See attached analyte list for specific analytes.

If necess[illegible]mples submitted to Hall Environmental may be subcontracted to other accredited laboratories. T[illegible]es as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical r

Appendix D

Survey Data

Fixed width point lat/long/elevation listing

Project : WESTERN REFINERY

User name	hwilleto	**Date & Time**	9:55:07 AM 9/3/2009
Coordinate System	Projection from data collector	**Zone**	Zone from data collector
Project Datum	(WGS 84)		
Vertical Datum		**Geoid Model**	GEOID03
Coordinate Units	US survey feet		
Distance Units	US survey feet		
Height Units	US survey feet		

```
Point listing
            Name        Latitude          Longitude     Elevation         Feature Code
              64  36°41'48.66146"N 107°58'14.66801"W    5540.445       TANK 44 SOUTH
              65  36°41'48.66772"N 107°58'12.78343"W    5540.632       TANK 45 SOUTH
              66  36°41'48.01176"N 107°58'15.61914"W    5543.595  LOADING BAY #1 COR
              67  36°41'47.89084"N 107°58'15.56867"W    5543.567  LOADING BAY #1 COR
              68  36°41'47.66694"N 107°58'16.45442"W    5543.569  LOADING BAY #1 COR
              69  36°41'47.78111"N 107°58'16.50315"W    5543.774  LOADING BAY #1 COR
              70  36°41'47.53262"N 107°58'16.40604"W    5543.655  LOADING BAY #2 COR
              71  36°41'47.41675"N 107°58'16.35878"W    5543.508  LOADING BAY #2 COR
              72  36°41'47.64134"N 107°58'15.47457"W    5543.646  LOADING BAY #2 COR
              73  36°41'47.76306"N 107°58'15.52374"W    5543.700  LOADING BAY #2 COR
              74  36°41'47.51769"N 107°58'15.42746"W    5543.616  LOADING BAY #3 COR
              75  36°41'47.39555"N 107°58'15.37969"W    5543.508  LOADING BAY #3 COR
              76  36°41'47.27035"N 107°58'15.33252"W    5543.492  LOADING BAY #4 COR
              77  36°41'47.14612"N 107°58'15.28193"W    5543.540  LOADING BAY #4 COR
              78  36°41'46.92246"N 107°58'16.16575"W    5543.596  LOADING BAY #4 COR
              79  36°41'47.04449"N 107°58'16.21421"W    5543.500  LOADING BAY #4 COR
              80  36°41'47.16837"N 107°58'16.26543"W    5543.533  LOADING BAY #3 COR
              81  36°41'47.29019"N 107°58'16.31362"W    5543.499  LOADING BAY #3 COR
              82  36°41'44.96497"N 107°58'17.22097"W    5549.393           AOC 22-10
              83  36°41'44.55341"N 107°58'17.06316"W    5549.485           AOC 22-11
              84  36°41'45.15384"N 107°58'24.54356"W    5545.382        CONCRETE PAD
              85  36°41'45.15375"N 107°58'25.13052"W    5545.386        CONCRETE PAD
              86  36°41'45.05405"N 107°58'25.13172"W    5545.316        CONCRETE PAD
              87  36°41'45.05365"N 107°58'25.24909"W    5545.179        CONCRETE PAD
              88  36°41'45.18933"N 107°58'25.25039"W    5544.396             BLD COR
              89  36°41'44.66058"N 107°58'24.54189"W    5545.317        CONCRETE PAD
              90  36°41'44.66144"N 107°58'25.15767"W    5545.327CONCRETE PAD 8FT O/S
              91  36°41'44.49225"N 107°58'25.24860"W    5544.607             BLD COR
              92  36°41'44.49015"N 107°58'26.73399"W    5544.265             BLD COR
            8500  36°41'45.18715"N 107°58'26.73611"W    5544.396             BLD COR
            9049  36°41'48.83926"N 107°58'17.16476"W    5539.588AOC 22-15/MW-61 PVMT
            9050  36°41'48.82916"N 107°58'17.16031"W    5539.613 AOC 22-15/MW-61 PAD
            9051  36°41'48.82131"N 107°58'17.15514"W    5539.411AOC 22-15/MW-61 TOP OF CASING
            9052  36°41'49.20054"N 107°58'15.40126"W    5539.902 AOC 26-8/MW-65 PVMT
            9053  36°41'49.18933"N 107°58'15.39658"W    5539.941  AOC 26-8/MW-65 PAD
            9054  36°41'49.18120"N 107°58'15.39107"W    5539.517AOC 26-8/MW-65 TOP OF CASING
            9055  36°41'48.96076"N 107°58'13.11816"W    5540.206            AOC 26-5
            9056  36°41'49.08555"N 107°58'12.57862"W    5540.025            AOC 26-6
            9057  36°41'48.54564"N 107°58'12.67447"W    5540.360            AOC 26-7
            9058  36°41'48.99048"N 107°58'14.06416"W    5541.979AOC 26-9/MW-66 GRADE
            9059  36°41'48.98135"N 107°58'14.06109"W    5542.030  AOC 26-9/MW-66 PAD
            9060  36°41'48.97462"N 107°58'14.05858"W    5544.625AOC 26-9/MW-66 TOP OF CASING
            9061  36°41'48.62399"N 107°58'14.85771"W    5540.054            AOC 26-2
            9062  36°41'48.90866"N 107°58'14.97772"W    5540.088            AOC 26-1
            9063  36°41'48.70583"N 107°58'14.43626"W    5540.587            AOC 26-4
```

```
9064  36°41'48.41610"N 107°58'14.64503"W    5543.638            AOC 26-3
9065  36°41'48.63697"N 107°58'15.77033"W    5540.853            AOC 22-3
9066  36°41'48.83611"N 107°58'16.03057"W    5540.449AOC 22-12/TW-1 GRADE
9067  36°41'48.82723"N 107°58'16.02711"W    5540.336  AOC 22-12/TW-1 PAD
9068  36°41'48.82442"N 107°58'16.02512"W    5543.607AOC 22-12/TW-1 TOP OF CASING
9069  36°41'48.95123"N 107°58'16.04153"W    5540.379            AOC 22-2
9070  36°41'48.50044"N 107°58'16.34853"W    5540.103            AOC 22-1
9071  36°41'48.53647"N 107°58'16.20569"W    5540.324           AOC 22-13
9072  36°41'48.38276"N 107°58'15.95304"W    5541.189            AOC 22-4
9073  36°41'47.56329"N 107°58'16.74392"W    5543.605            AOC 22-5
9074  36°41'47.04554"N 107°58'16.49572"W    5543.874            AOC 22-6
9075  36°41'46.18239"N 107°58'17.09575"W    5543.745            AOC 22-7
9076  36°41'45.80509"N 107°58'17.08569"W    5546.880            AOC 22-9
9077  36°41'46.01420"N 107°58'17.35087"W    5545.296           AOC 22-14
9078  36°41'45.99895"N 107°58'16.85610"W    5545.715            AOC 22-8
9079  36°41'43.67391"N 107°58'17.17320"W    5552.073            AOC 24-6
9080  36°41'43.33506"N 107°58'16.48842"W    5551.597            AOC 24-1
9081  36°41'42.89208"N 107°58'18.26308"W    5550.914            AOC 24-4
9082  36°41'42.89601"N 107°58'17.40801"W    5550.986            AOC 24-3
9083  36°41'43.44358"N 107°58'18.28355"W    5550.721            AOC 24-5
9084  36°41'44.02484"N 107°58'18.38288"W    5549.111AOC 24-7/MW-64 GRADE
9085  36°41'44.02633"N 107°58'18.36885"W    5549.043  AOC 24-7/MW-64 PAD
9086  36°41'44.02863"N 107°58'18.35629"W    5552.285AOC 24-7/MW-64 TOP OF CASING
9087  36°41'46.18596"N 107°58'18.25178"W    5544.488AOC 22-16/MW-63 GRADE
9088  36°41'46.17832"N 107°58'18.24028"W    5544.482 AOC 22-16/MW-63 PAD
9089  36°41'46.17547"N 107°58'18.22906"W    5547.255AOC 22-16/MW-63 TOP OF CASING
9090  36°41'45.92894"N 107°58'22.23505"W    5542.373SWMU 4-1/MW-59 GRADE
9091  36°41'45.92727"N 107°58'22.21723"W    5542.365  SWMU 4-1/MW-59 PAD
9092  36°41'45.92938"N 107°58'22.20599"W    5545.196SWMU 4-1/MW-59 TOP OF CASING
9093  36°41'45.19215"N 107°58'24.95955"W    5544.569            SWMU 5-1
9094  36°41'45.20846"N 107°58'24.73350"W    5544.407            SWMU 5-2
9095  36°41'44.99208"N 107°58'24.49009"W    5544.918            SWMU 5-3
9096  36°41'44.82380"N 107°58'24.50076"W    5544.925            SWMU 5-4
9097  36°41'44.61681"N 107°58'24.73909"W    5544.880            SWMU 5-5
9098  36°41'44.61062"N 107°58'25.05289"W    5544.571            SWMU 5-6
9099  36°41'44.32802"N 107°58'25.68687"W    5544.772            AOC 25-1
9100  36°41'45.38988"N 107°58'25.99162"W    5544.007AOC 25-2/MW-60 GRADE
9101  36°41'45.37937"N 107°58'25.98861"W    5544.003  AOC 25-2/MW-60 PAD
9102  36°41'45.37028"N 107°58'25.98617"W    5543.711AOC 25-2/MW-60 TOP OF CASING
9103  36°41'42.90086"N 107°58'16.48495"W    5551.416            AOC 24-2
9104  36°41'43.03985"N 107°58'07.46838"W    5558.555AOC 23-1/MW-62 GRADE
9105  36°41'43.02840"N 107°58'07.46780"W    5558.703  AOC 23-1/MW-62 PAD
9106  36°41'43.02125"N 107°58'07.46590"W    5561.322  AOC 23-1/MW-62 PAD
```

Back to top

Appendix E

Boring Logs

RPS

WELL CONSTRUCTION

Well No.: MW-59 (SWMU 4-1)

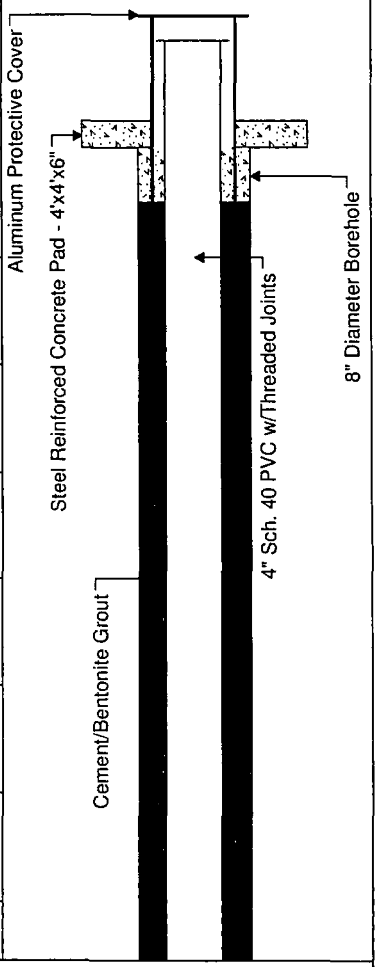
Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: N36º41.767' W107º58.370'

Total Depth: 44.25' bgl
Ground Water: Saturated @ 40' bgl
Elev., TOC (ft. msl): 5545.196
Elev., PAD (ft. msl): 5542.365
Elev., GL (ft. msl): 5542.373
Site Coordinates:
N 36º41'45.92938" **W** 107º58'22.20599"

Start Date: 4/6/2009
Finish Date: 4/6/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
-2								Ground Surface
0	0-0.5' 1.5-2'	0845 0930	G/2V/2E/3J G/2V/2E/3J		0.2 38ºF	▥	100	**Clayey Silt (ML)** Low plasticity, firm, damp, brown
2					2.9 37ºF	▥	80	**Clayey Silt (ML)** Similar to above
4					50.8 37ºF	▥	80	**Clayey Silt (ML)** Similar to above, mixed with soft black sticky sludge, odor
6	6-8'	1130	G/2V/2E/3J		214 37ºF	▥	80	**Clayey Silt/Sludge (ML)** Gray silt mixed with sludge
8					9.7 49ºF	▥	90	**Clayey Silt (ML)** Low plasticity, soft, damp, brown to light gray, 8.5-9' faint odor
10					41 49ºF	▥	80	**Clayey Silt (ML)** Similar to above, light gray/brown
12					9.5 49ºF	░	60	**Silty Sand (SM)** Very fine grain, compact, damp, brown
14						░		**Silty Sand (SM)** Similar to above

Completion Results

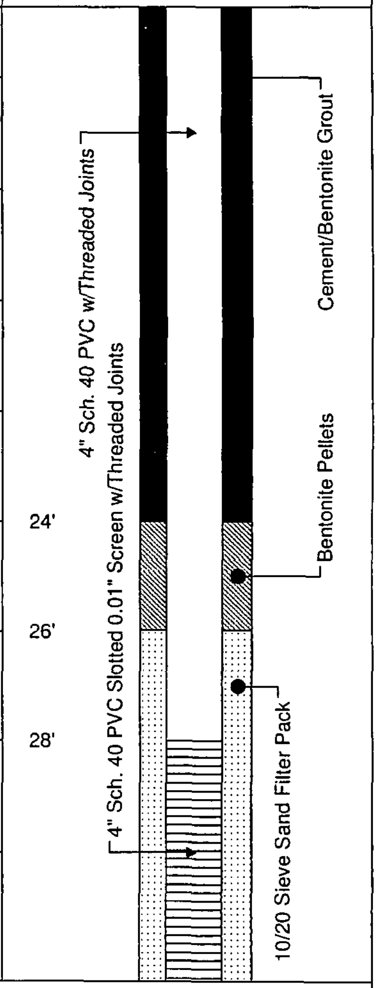


WELL CONSTRUCTION

Well No.: MW-59 (SWMU 4-1)
Start Date: 4/6/2009
Finish Date: 4/6/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: N36º41.767' W107º58.370'

Total Depth: 44.25' bgl
Ground Water: Saturated @ 40' bgl
Elev., TOC (ft. msl): 5545.196
Elev., PAD (ft. msl): 5542.365
Elev., GL (ft. msl): 5542.373
Site Coordinates:
N 36º41'45.92938" **W** 107º58'22.20599"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
					8.0 50ºF		50		
16					8.1 50ºF		60	**Silty Sand (SM)** Similar to above	
18					7.3 50ºF		80	**Silty Sand (SM)** Similar to above, gypsum crystals	
20					6.4 50ºF		80	**Silty Sand (SM)** Very fine to fine grain, loose to compact, light brown to tan	
22					6.6 50ºF		80	**Silty Sand (SM)** Similar to above	
24					5.5 50ºF		80	**Silty Sand (SM)** Similar to above	
26					6.3 50ºF		90	**Silty Sand (SM)** Similar to above	
28					4.2 50ºF		90	**Silty Sand (SM)** Similar to above	
30					3.9 50ºF		80	**Clayey Silt (ML)** Low plasticity, soft to firm, damp, brown	
32									

WELL CONSTRUCTION

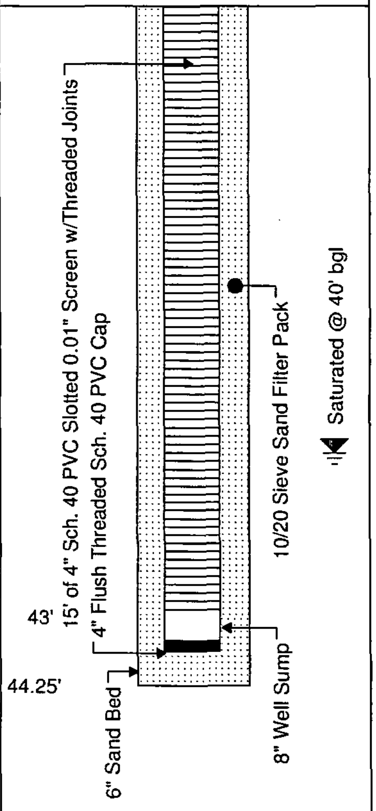
Well No.: MW-59 (SWMU 4-1)
Start Date: 4/6/2009
Finish Date: 4/6/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: N36º41.767' W107º58.370'

Total Depth: 44.25' bgl
Ground Water: Saturated @ 40' bgl
Elev., TOC (ft. msl): 5545.196
Elev., PAD (ft. msl): 5542.365
Elev., GL (ft. msl): 5542.373
Site Coordinates:
N 36º41'45.92938" **W** 107º58'22.20599"

Depth (ft.)	Sampling: Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class	Recovery (%)	Sample Description
33					2.8 50ºF		30	**Gravelly Sand (SW)** Fine to coarse grain, compact, damp, brown, medium to coarse gravel
								Sand (SP) Fine grain, loose, damp, brown
35					3.1 50ºF		60	**Sand (SP)** Similar to above
								Gravelly Sand (SW) Fine to coarse grain, compact, damp, brown, medium to coarse gravel
37	36-38'	1700	G/2V/2E/3J		3.8 70ºF		60	**Sand (SP)** Fine grain, loose, damp, brown
39							60	**Gravelly Sand (SW)** Fine to coarse grain, compact, damp, brown, medium to coarse gravel
				40'				**Gravelly Sand (SW)** Similar to above, moist
41							60	**Sand (SP)** Fine grain, loose, damp to moist, brown
								Gravelly Sand (SW) Fine to coarse grain, compact, saturated, brown, medium to coarse gravel
43							60	**Gravelly Sand (SW)** Similar to above
								Nacimiento Formation Sandstone (SS) Dense, damp, yellowish brown
45								Total Depth = 44.25' BGL
47								
49								

Completion Results



LOG OF BORING

RPS

Boring No.: SWMU 5-1
Start Date: 4/23/2009
Finish Date: 4/23/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.754' W107º58.417'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5544.569
Site Coordinates: **N** 36º41'45.19215"
W 107º58'24.95955"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
								Ground Surface	
0	0-0.5'	1410	G/2V/2E/3J		9.8 78ºF		100	**Gravelly Silty Sand (SM)** Fine grain, compact, dry to damp, brown	0
	1.5-2'	1420	G/2V/2E/3J		9.4 78ºF				
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

LOG OF BORING

Boring No.: SWMU 5-2
Start Date: 4/23/2009
Finish Date: 4/23/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.754' W107º58.414'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5544.407
Site Coordinates: **N** 36º41'45.20846"
W 107º58'24.73350"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
0								Ground Surface	0
	0-0.5'	1430	G/2V/ 2E/3J		7.7 78ºF		100	**Gravelly Silty Sand (SM)** Fine grain, compact, dry to damp, brown	
	1.5-2'	1435	G/2V/ 2E/3J		9.3 78ºF				
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

RPS

LOG OF BORING

Boring No.: SWMU 5-3
Start Date: 4/23/2009
Finish Date: 4/23/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.750' W107º58.409'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5544.918
Site Coordinates: **N** 36º41'44.99208"
W 107º58'24.49009"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
								Ground Surface	
0	0- 0.5'	1440	G/2V/ 2E/3J		12.2 80ºF	▨	100	**Gravelly Silty Sand (SM)** Fine grain, compact, damp, brown	0
	1.5- 2'	1445	G/2V/ 2E/3J		15.9 80ºF	▨			
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

LOG OF BORING

Boring No.: SWMU 5-4
Start Date: 4/23/2009
Finish Date: 4/23/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.747' W107º58.409'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5544.925
Site Coordinates: **N** 36º41'44.82380"
W 107º58'24.50076"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
								Ground Surface	
0	0- 0.5'	1450	G/2V/ 2E/3J		13.7 78ºF	▨	100	**Gravelly Silty Sand (SM)** Fine grain, compact, damp, brown	0
	1.5- 2'	1455	G/2V/ 2E/3J		14.3 78ºF	▨			
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

RPS

LOG OF BORING

Boring No.: SWMU 5-5
Start Date: 4/23/2009
Finish Date: 4/23/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.744' W107º58.414'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5544.880
Site Coordinates: **N** 36º41'44.61681"
W 107º58'24.73909"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
0								Ground Surface	0
	0-0.5' & Dup	1500	G/2V/ 2E/3J		12.0 80ºF	▨	100	**Gravelly Silty Sand (SM)** Fine grain, compact, dry to damp, brown	
2	1.5-2'	1505	G/2V/ 2E/3J		17.8 80ºF	▨		Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

RPS

LOG OF BORING

Boring No.: SWMU 5-6
Start Date: 4/23/2009
Finish Date: 4/23/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.744' W107º58.419'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5544.571
Site Coordinates: **N** 36º41'44".61062"
W 107º58'25.05289"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
								Ground Surface	
0	0-0.5'	1510	G/2V/ 2E/3J		16.0 80ºF	▨	100	**Gravelly Silty Sand (SM)** Fine grain, compact, dry to damp, brown	0
	1.5-2'	1515	G/2V/ 2E/3J		12.5 80ºF	▨			
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

RPS

LOG OF BORING

Boring No.: AOC 22-1
Start Date: 4/15/2009
Finish Date: 4/15/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.811' W107º58.272'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5540.103
Site Coordinates:
N 36º41'48.50044" **W** 107º58'16.34853"

	Sampling								
Depth (ft.)	**Sample Depth**	**Time**	**Sample Type/ Containe/No.**	**Saturation**	**Organic Vapor (ppm)**	**USCS Class**	**Recovery (%)**	**Sample Description**	**Depth (ft.)**
								Ground Surface	
0	0-0.5'	1600	G/2V/ 2E/3J		4.5 70ºF		100	**Silt (ML)** Very fine grain, loose, dry, brown	0
	1.5-2'	1615	G/2V/ 2E/3J		3.5 70ºF			**Clayey Silt (ML)** Low plasticity, soft, damp, brown	
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

RPS

LOG OF BORING

Boring No.: AOC 22-2
Start Date: 4/15/2009
Finish Date: 4/15/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.818' W107º58.266'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5540.379
Site Coordinates:
N 36º41'48.95123" **W** 107º58'16.04153"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
								Ground Surface	
0	0- 0.5'	1630	G/2V/ 2E/3J		16.1 70ºF	▥	100	**Silt (ML)** Very fine grain, loose, dry, brown	0
2	1.5- 2'	1640	G/2V/ 2E/3J		2.1 70ºF			Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

LOG OF BORING

Boring No.: AOC 22-3
Start Date: 4/15/2009
Finish Date: 4/15/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.813' W107º58.261'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5540.853
Site Coordinates: **N** 36º41'48.63697"
W 107º58'15.77033"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
0								Ground Surface	0
	0-0.5'	1650	G/2V/ 2E/3J		5.1 70ºF	▥	100	**Silt (ML)** Very fine grain, loose to compact, dry to damp, brown	
	1.5-2'	1700	G/2V/ 2E/3J		3.7 70ºF	▥			
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

RPS
3833 S. Staples, Suite N-229
Corpus Christi, TX 78411

Sheet: **1 of 1**

361/855-7335
361/855-7410 fax

RPS

LOG OF BORING

Boring No.: AOC 22-4
Start Date: 4/15/2009
Finish Date: 4/15/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.808' W107º58.265'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5541.189
Site Coordinates:
N 36º41'48.38276" **W** 107º58'15.95304"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
								Ground Surface	
0	0- 0.5'	1710	G/2V/ 2E/3J		3.4 70ºF	▥	100	**Sandy Silt (ML)** Very fine grain, loose to compact, dry to damp, brown, odor	0
	1.5- 2'	1720	G/2V/ 2E/3J		2429 70ºF	▥			
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

RPS

LOG OF BORING

Boring No.: AOC 22-5
Start Date: 4/15/2009
Finish Date: 4/15/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.793' W107º58.280'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5543.605
Site Coordinates:
N 36º41'47.56329" **W** 107º58'16.74392"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
0								Ground Surface	0
	0-0.5'	1720	G/2V/2E/3J		1.6 80ºF	▥	100	**Sandy Silt (ML)** Fine grain, loose, dry, gray	
	1.5-2'	1730	G/2V/2E/3J		1.4 80ºF	▥		**Clayey Silt (ML)** Fine grain, compact, moist, brown	
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

RPS

LOG OF BORING

Boring No.: AOC 22-6
Start Date: 4/23/2009
Finish Date: 4/23/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.783' W107º58.278'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5543.874
Site Coordinates:
N 36º41'47.04554" **W** 107º58'16.49572"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
0								Ground Surface	0
	0-0.5'	1650	G/2V/2E/3J		1.5 80ºF		100	**Sandy Silt (ML)** Fine grain, loose, dry, gray	
	1.5-2'	1655	G/2V/2E/3J		4.1 80ºF			**Clayey Silt (ML)** Fine grain, compact, moist, brown	
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

RPS

LOG OF BORING

Boring No.: AOC 22-7
Start Date: 4/13/2009
Finish Date: 4/13/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.770' W107º58.284'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5543.745
Site Coordinates:
N 36º41'46.18239" **W** 107º58'17.09575"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
								Ground Surface	
0	0-0.5'	1525	G/2V/2E/3J		1.3 68ºF	▥	100	**Silt (ML)** Very fine grain, loose to compact, damp, brown	0
	1.5-2'	1535	G/2V/2E/3J		2.6 68ºF	▥			
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

RPS

LOG OF BORING

Boring No.: AOC 22-8
Start Date: 4/13/2009
Finish Date: 4/13/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.767' W107º58.281'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5545.715
Site Coordinates:
N 36º41'45.99895 **W** 107º58'16.85610"

	Sampling								
Depth (ft.)	**Sample Depth**	**Time**	**Sample Type/ Containe/No.**	**Saturation**	**Organic Vapor (ppm)**	**USCS Class**	**Recovery (%)**	**Sample Description**	**Depth (ft.)**
								Ground Surface	
0	0-0.5'	1615	G/2V/ 2E/3J		1.4 68ºF	▥	100	**Silt (ML)** Very fine grain, loose to compact, dry to damp, brown	0
2	1.5-2' &Dup	1630	G/2V/ 2E/3J		1.2 68ºF			Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

RPS

LOG OF BORING

Boring No.: AOC 22-9
Start Date: 4/13/2009
Finish Date: 4/13/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.764' W107º58.286'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5546.880
Site Coordinates:
N 36º41'45.80509" **W** 107º58'17.08569"

	Sampling								
Depth (ft.)	**Sample Depth**	**Time**	**Sample Type/ Containe/No.**	**Saturation**	**Organic Vapor (ppm)**	**USCS Class**	**Recovery (%)**	**Sample Description**	**Depth (ft.)**
								Ground Surface	
0	▒ 0-0.5'	1655	G/2V/ 2E/3J		0.6 68ºF	▥	100	**Silt (ML)** Very fine grain, loose to compact, dry to damp, brown	0
	▒ 1.5-2'	1705	G/2V/ 2E/3J		1.1 68ºF	▥			
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

LOG OF BORING

Boring No.: AOC 22-10
Start Date: 4/14/2009
Finish Date: 4/14/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.749' W107º58.283'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5549.393
Site Coordinates:
N 36º41'44.96497" **W** 107º58'17.22097"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
								Ground Surface	
0	0-0.5'	1410	G/2V/ 2E/3J		7.9 72ºF		100	**Silt/Gravel Base (ML)** Very fine grain, compact, dry, brown	0
	1.5-2'	1425	G/2V/ 2E/3J		3.8 72ºF			**Clayey Silt (ML)** Low plasticity, very fine grain, compact, damp, brown	
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

RPS

LOG OF BORING

Boring No.: AOC 22-11
Start Date: 4/14/2009
Finish Date: 4/14/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.743' W107º58.281'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5549.485
Site Coordinates:
N 36º41'44.55341" **W** 107º58'17.06316"

	Sampling								
Depth (ft.)	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class	Recovery (%)	Sample Description	Depth (ft.)
0								Ground Surface	0
	0-0.5'	1440	G/2V/ 2E/3J		5.9 73ºF		100	**Clayey Silt (ML)** Low plasticity, compact, very fine grain, damp, brown, gravelly	
	1.5-2'	1445	G/2V/ 2E/3J		4.3 73ºF				
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

RPS

WELL CONSTRUCTION

Well No.: AOC 22-12 / TW-01

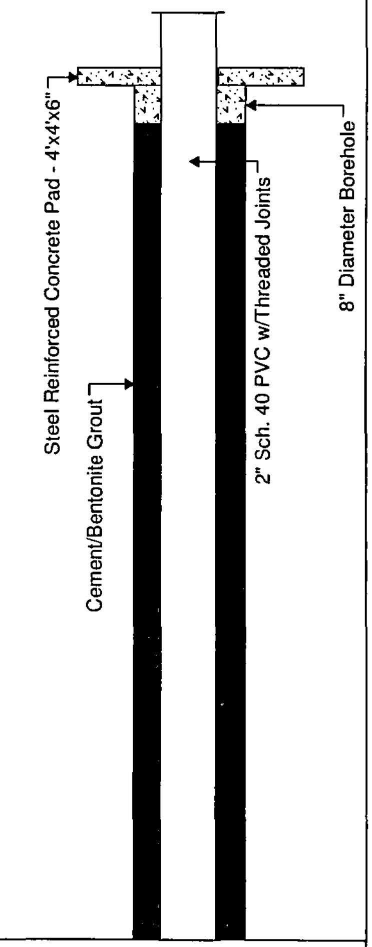
Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N36º41.816' W107º58.256'

Total Depth: 42' bgl
Ground Water: Saturated @ 37.75' bgl
Elev., TOC (ft. msl): 5543.607
Elev., PAD (ft. msl): 5540.336
Elev., GL (ft. msl): 5540.449
Site Coordinates:
N 36º41'48.82442" **W** 107º58'16.02512"

Start Date: 4/13/2009
Finish Date: 4/13/2009

Depth (ft.)	Sampling: Sample Depth	Sampling: Time	Sampling: Sample Type/Container/No	Sampling: Saturation	Sampling: Organic Vapor (ppm)	Sampling: USCS Class	Recovery (%)	Sample Description
-2								Ground Surface
0	0.5' 1.5-2'	0915 &Dup 0930	G/4V/4E/6J G/2V/2E/3J		0.9 53ºF 3.4 53ºF	▥	100	**Silt (ML)** Very fine grain, compact, damp, brown
2					4.9 60ºF	▥	80	**Clayey Silt (ML)** Similar to above
4					5.6 60ºF	▥	80	**Clayey Silt (ML)** Similar to above
6					5.2 60ºF	▥	90	**Clayey Silt (ML)** Similar to above
8					4.9 60ºF	▥	100	**Clayey Silt (ML)** Similar to above, trace fine grain sand
10					4.2 60ºF	▥	100	**Sandy Silt (ML)** Very fine grain, loose to compact, damp, light brown
12					6.3 60ºF	▥	90	**Sandy Silt (ML)** Similar to above
14					6.0 60ºF	▥	60	**Clayey Silt (ML)** Low plasticity, soft, very fine grain, compact, damp, brown
16					5.2 60ºF	▥	100	**Clayey Silt (ML)** Similar to above
18					5.1 60ºF	▥	100	**Sandy Silt (ML)** Very fine grain, loose to compact, damp, light brown
20					4.4 60ºF	▨	90	**Silty Sand (SM)** Very fine to fine grain, loose, damp, light brown
22						▨		

Completion Results



WELL CONSTRUCTION

Well No.: AOC 22-12 / TW-01

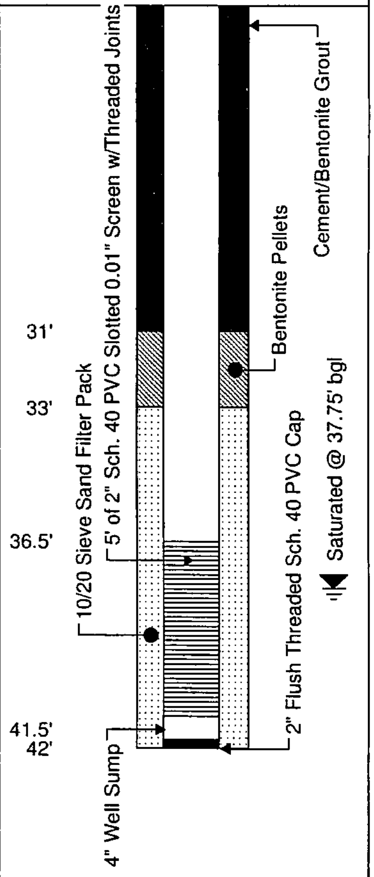
Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N36º41.816' W107º58.256'

Total Depth: 42' bgl
Ground Water: Saturated @ 37.75' bgl
Elev., TOC (ft. msl): 5543.607
Elev., PAD (ft. msl): 5540.336
Elev., GL (ft. msl): 5540.449
Site Coordinates:
N 36º41'48.82442" **W** 107º58'16.02512"

Start Date: 4/13/2009
Finish Date: 4/13/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
24					4.3 60ºF		50	**Silty Sand (SM)** Very fine to fine grain, loose, damp, light brown
26					5.7 60ºF		50	**Silty Sand (SM)** Similar to above, faint odor
28					5.2 60ºF		90	**Silty Sand (SM)** Similar to above, clayey sand at base, dark brown, odor
30					22.7 60ºF		100	**Sandy Clay (CL)** Low plasticity, soft, damp, dark brown, odor
32					35 60ºF		50	**Silty Sand (SM/SP)** Fine grain, loose, damp to very damp, dark gray, odor
34	32-35'	1150	G/2V/2E/3J		25 60ºF		50	**Gravelly Sand (SW)** Fine to medium grain, loose, damp, gray, coarse gravel, odor
36					68 60ºF		10	**Gravelly Sand (SW)** Similar to above
	36-37.75'	1210	G/2V/2E/3J	37.75'			10	No Recovery - similar to above
38								**Gravelly Sand (SW)** Similar to above, saturated at 37.37' bgl
40							90	**Sand (SW)** Fine to coarse grain, loose, saturated, gray, odor
42							90	**Sand (SW)** Similar to above, saturated, gray, odor
44								**Nacimiento Formation Clayey Sand/Weathered Sandstone (SC/SS)** Dense, damp, yellowish brown
46								Total Depth = 42' BGL

Completion Results



RPS

LOG OF BORING

Boring No.: AOC 22-13
Start Date: 4/8/2009
Finish Date: 4/8/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow Stem Augers
Sampling Method: Split Spoon
Comments: N36º41.811' W107º58.269'

Total Depth: 42.5' bgl
Ground Water: Saturated @ 39' bgl
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5540.324
Site Coordinates:
N 36º41'48.53647" **W** 107º58'16.20569"

Depth (ft.)	Sampling: Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class	Recovery (%)	Sample Description	Depth (ft.)
								Ground Surface	
0	0-0.5' 1.5-2'	1540 1555	G/2V/2E/3J G/2V/2E/3J		1427 76ºF		100	**Silt (ML)** Very fine grain, compact, dry, brown, odor	0
2					1186 76ºF		60	**Clayey Silt (ML)** Very fine grain, low plasticity, compact to loose, damp, brown, odor	2
4					1373 76ºF		70	**Clayey Silt (ML)** Similar to above, odor	4
6					1349 76ºF		70	**Clayey Silt (ML)** Similar to above, odor	6
8					1302 76ºF		70	**Clayey Silt (ML)** Similar to above, odor	8
10					1302 76ºF		60	**Clayey Silt (ML)** Similar to above, odor	10
12					1345 75ºF		90	**Clayey Silt (ML)** Similar to above, odor	12
14					1277 75ºF		90	**Clayey Silt (ML)** Similar to above, odor	14
16					1250 75ºF		90	**Clayey Silt (ML)** Similar to above, odor	16
18	18-20'	1800	G/2V/2E/3J		1660 74ºF		60	**Silty Sand (SM)** Very fine grain, loose, damp, light brown to tan, faint staining apparent, odor	18
20					1611 74ºF		70	**Silty Sand (SM)** Similar to above, odor	20
22					1336 74ºF		90	**Silty Sand (SM)** Similar to above, odor	22

LOG OF BORING

Boring No.: AOC 22-13
Start Date: 4/8/2009
Finish Date: 4/8/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow Stem Augers
Sampling Method: Split Spoon
Comments: N36º41.811' W107º58.269'

Total Depth: 42.5' bgl
Ground Water: Saturated @ 39' bgl
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5540.324
Site Coordinates:
N 36º41'48.53647" **W** 107º58'16.20569"

Depth (ft.)	Sampling: Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class	Recovery (%)	Sample Description	Depth (ft.)
25					1131 74ºF		100	**Silty Sand (SM)** Very fine grain, loose, damp, light brown to tan, faint staining apparent, odor	25
27					1131 73ºF		80	**Silty Sand (SM)** Similar to above, odor	27
29					1184 73ºF		80	**Silty Sand (SM)** Similar to above, sand lenses at base of interval, odor	29
31					1268 73ºF		60	**Sand (SP)** Fine grain, loose, damp, tan, stained, odor, gravelly sand at base	31
33	32-34.5'	1810	G/2V/2E/3J		1694 73ºF		50	**Sand (SP)** Similar to above, stained, odor, very damp, trace gravel	33
							0	No Recovery - similar to above	
35					1596 73ºF		50	**Gravelly Sand (SW)** Medium grain, loose, stained, odor, damp to very damp, coarse gravel	35
37					908 72ºF		10	**Gravelly Sand (SW)** Similar to above, odor	37
39	37-39'	1820	G/2V/2E/3J	▼ 39'	1228 72ºF		10	**Gravelly Sand (SW)** Similar to above, dark brown, odor, stained/oily appearance	39
							20	**Gravelly Sand (SW)** Similar to above, less gravel, saturated, dark gray, odor	
41							70	**Nacimiento Formation Sand/Sandstone (SS)** Fine to medium grain, dense, damp, yellowish brown clay lense at base	41
43							90	**Clay (CH)** High plasticity, very stiff, damp, yellowish brown	43
45								**Sandstone (SS)** Medium grained, dense	45

Total Depth = 42.5' BGL

LOG OF BORING

Boring No.: AOC 22-14
Start Date: 4/8/2009
Finish Date: 4/8/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow Stem Augers
Sampling Method: Split Spoon
Comments: N36º41.768' W107º58.290'

Total Depth: 10' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5545.296
Site Coordinates:
N 36º41'46.01420" **W** 107º58'17.35087"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
								Ground Surface	
0	0-0.5' 1.5-2'	1410 1420	G/2V/2E/3J G/2V/2E/3J		2.1/3.1 71ºF	▥	100	**Silt (ML)** Very fine grain, compact, dry, brown	0
2					6.3 71ºF	▥	90	**Clayey Silt (ML)** Very fine grain, low plasticity, loose, damp, brown	2
4					5.1 71ºF	▥	90	**Clayey Silt (ML)** Similar to above	4
6					4.6 71ºF	▥	90	**Clayey Silt (ML)** Similar to above	6
8					3.8 71ºF	▥	90	**Clayey Silt (ML)** Similar to above	8
10								Total Depth = 10' BGL	10
12									12
14									14
16									16

RPS
404 Camp Craft Road
Austin, Texas 78746

Sheet: **1 of 1**

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512/347-8243 fax

WELL CONSTRUCTION

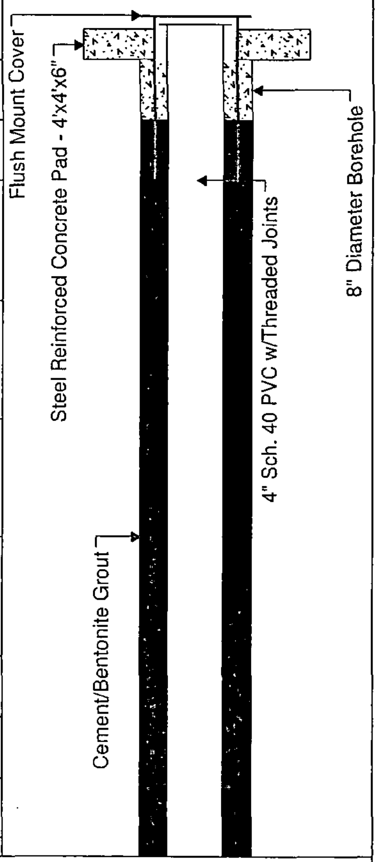
Well No.: MW-61 (AOC 22 -15)
Start Date: 4/15/2009
Finish Date: 4/15/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N36º41.813' W107º58.287'

Total Depth: 40.25' bgl
Ground Water: Saturated @ 36' bgl
Elev., TOC (ft. msl): 5539.411
Elev., PAD (ft. msl): 5539.613
Elev., GL (ft. msl): 5539.588
Site Coordinates:
N 36º41'48.82131" **W** 107º58'17.15514"

Depth (ft.)	Sampling						Recovery (%)	Sample Description
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
-2								
0							100	Ground Surface **Asphalt/Base**
	1-1.5'	1135	G/2V/2E/3J		2.8 63ºF			**Clayey Silt (ML)** Low plasticity, stiff, damp, brown
2	1.5-2' &Dup	1155	G/2V/2E/3J		29.5 63ºF 23.4 68ºF		60	**Clayey Silt (ML)** Similar to above, soft
4					5.5 68ºF		50	**Clayey Silt (ML)** Similar to above
6							0	**Clayey Silt (ML)** Similar to above - no recovery
8					13.1 68ºF		10	**Clayey Silt (ML)** Similar to above
10					18.1 68ºF		80	**Clayey Silt (ML)** Similar to above, trace very fine grain sand
								Silty Sand (SM) Very fine grain, loose, damp, brown
12							70	**Silty Sand (SM)** Similar to above

Completion Results



WELL CONSTRUCTION

Well No.: MW-61 (AOC 22 -15)

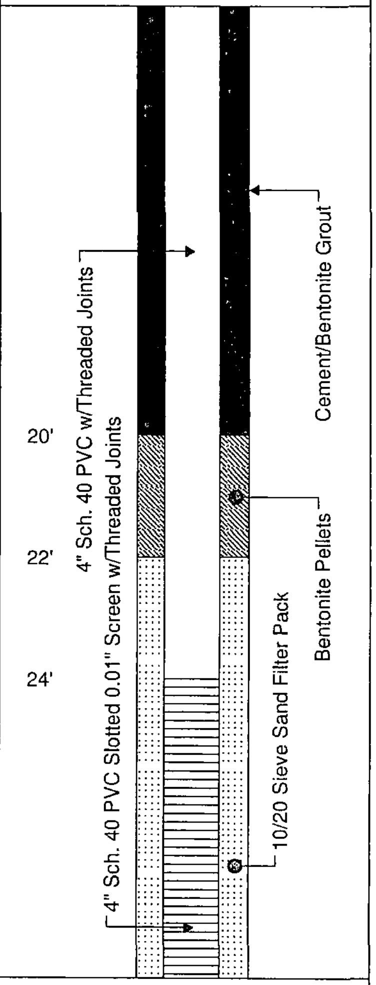
Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N36º41.813' W107º58.287'

Total Depth: 40.25' bgl
Ground Water: Saturated @ 36' bgl
Elev., TOC (ft. msl): 5539.411
Elev., PAD (ft. msl): 5539.613
Elev., GL (ft. msl): 5539.588
Site Coordinates:
N 36º41'48.82131" **W** 107º58'17.15514"

Start Date: 4/15/2009
Finish Date: 4/15/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
					16.6 68ºF			**Clayey Silt (ML)** Low plasticity, very fine grain, compact, damp, brown
15					11.2 68ºF		70	**Clayey Silt (ML)** Similar to above
17					6.5 68ºF		80	**Clayey/Silty Sand (SC/SM)** Very fine grain, compact, damp, brown
19					13.2 68ºF		90	**Silty Sand (SM)** Similar to above, less clay
21					13.2 68ºF		80	**Silty Sand (SM)** Similar to above
23					21.5 67ºF		60	**Silty Sand (SM)** Very fine grain, loose to compact, damp, brown to light brown
25					12.9 67ºF		60	**Clayey Silty Sand (SC/SM)** Similar to above, increase in clay content
27					16.0 67ºF		90	**Clayey Silty Sand (SC/SM)** Similar to above

Completion Results



WELL CONSTRUCTION

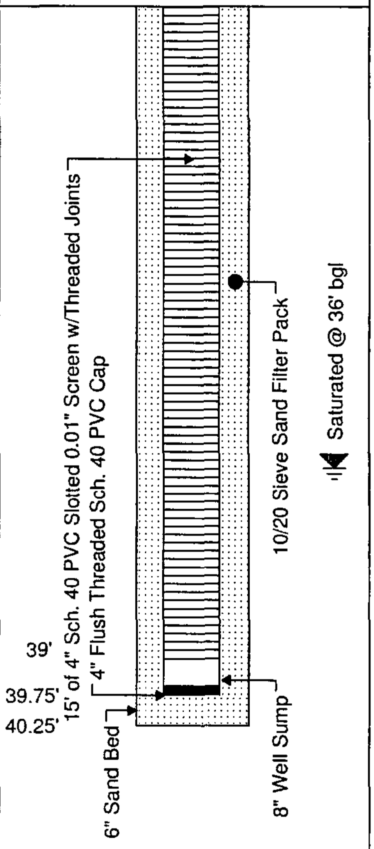
Well No.: MW-61 (AOC 22 -15)
Start Date: 4/15/2009
Finish Date: 4/15/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N36º41.813' W107º58.287'

Total Depth: 40.25' bgl
Ground Water: Saturated @ 36' bgl
Elev., TOC (ft. msl): 5539.411
Elev., PAD (ft. msl): 5539.613
Elev., GL (ft. msl): 5539.588
Site Coordinates:
N 36º41'48.82131" W 107º58'17.15514"

Depth (ft.)	Sampling: Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class	Recovery (%)	Sample Description
					17.1 67ºF	▨	90	**Clayey Silty Sand (SC/SM)** Similar to above, trace tan sand seams present
30					22 67ºF	▨	80	**Silty Sand (SM)** Very fine grain sand, compact, brown to gray, moist, odor **Gravelly Sand (SW)** Very fine to medium grain, compact to loose, brown to gray, odor, coarse gravel
32					165 67ºF	▨	60	**Gravelly Sand (SW)** Similar to above, fine to coarse sand, odor, stained
34	34-36'	1340	G/2V/2E/3J	36'	510 67ºF	▨	70	**Gravelly Sand (SW)** Similar to above, odor
36						▨	10	**Gravelly Sand (SW)** Similar to above
38						▨	10	**Nacimiento Formation Silty Sandy Clay (CL)** Low plasticity, firm, dry to damp, yellow brown to greenish gray, no odor
40								Total Depth = 40.25' BGL
42								
44								

Completion Results



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404 Camp Craft Road
Austin, Texas 78746

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512/347-8243 fax

WELL CONSTRUCTION

Well No.: MW-63 (AOC 22 -16)

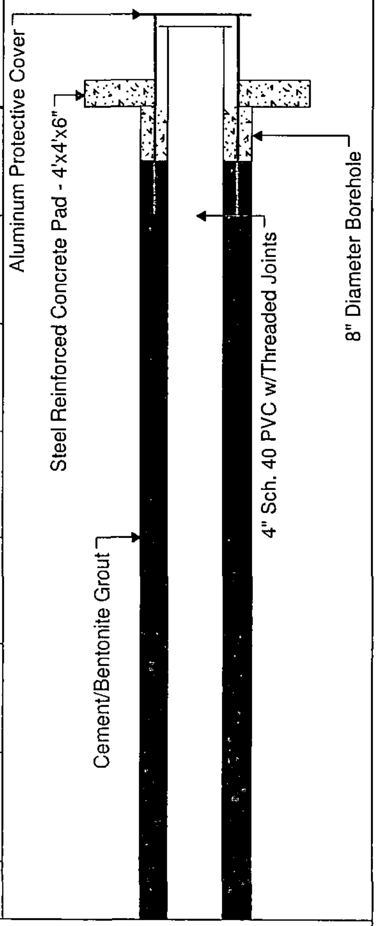
Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N36º41.771' W107º58.305'

Total Depth: 46' bgl
Ground Water: Saturated @ 39' bgl
Elev., TOC (ft. msl): 5547.255
Elev., PAD (ft. msl): 5544.482
Elev., GL (ft. msl): 5544.488
Site Coordinates:
N 36º41'46.17547" **W** 107º58'18.22906"

Start Date: 4/13/2009
Finish Date: 4/14/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
-2								Ground Surface
0	0-0.5' 1.5-2'	1325 1335	G/2V/2E/3J G/2V/2E/3J		1.6 0.9		100	**Silt (ML)** Very fine grain, compact, damp, brown
2					4.5 68ºF		50	**Clayey Silt (ML)** Similar to above
4					5.8 68ºF		60	**Clayey Silt (ML)** Similar to above
6					5.8 68ºF		70	**Clayey Silt (ML)** Similar to above
8					7.3 68ºF		80	**Clayey Silt (ML)** Similar to above
10					3.2 68ºF		10	**Clayey Silt (ML)** Similar to above
12					3.8 68ºF		90	**Clayey Silt (ML)** Similar to above, trace sand
14								**Clayey Silt (ML)** Similar to above

Completion Results



WELL CONSTRUCTION

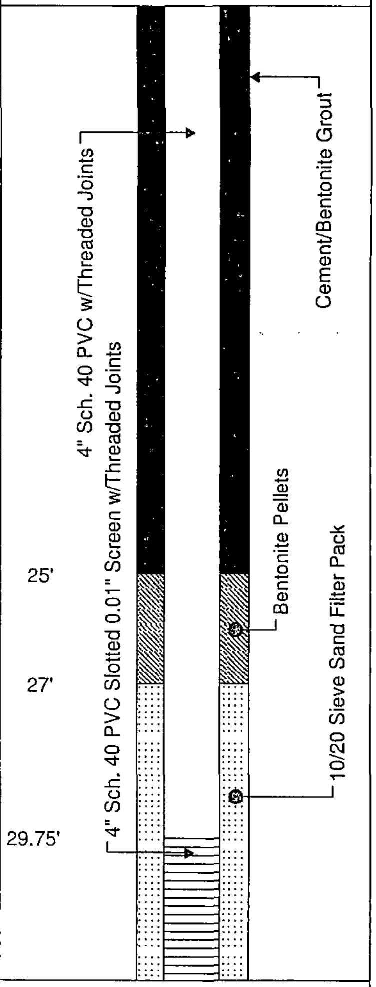
Well No.: MW-63 (AOC 22 -16)
Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N36º41.771' W107º58.305'

Total Depth: 46' bgl
Ground Water: Saturated @ 39' bgl
Elev., TOC (ft. msl): 5547.255
Elev., PAD (ft. msl): 5544.482
Elev., GL (ft. msl): 5544.488
Site Coordinates:
N 36º41'46.17547" **W** 107º58'18.22906"

Start Date: 4/13/2009
Finish Date: 4/14/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
					6.2 68ºF		90	
16					5.8 68ºF		80	**Clayey Silt (ML)** Similar to above
18					5.7 68ºF		90	**Clayey Silt/Silt (ML)** Similar to above, trace light brown to tan sand in partings
20					5.8 68ºF		90	**Silty Sand (SM)** Very fine grain, loose, damp, light brown to tan
22					6.8 68ºF		90	**Silty Sand (SM)** Similar to above, tan
24					4.9 68ºF		90	**Silty Sand (SM)** Very fine grain, loose, damp, tan
26					7.5 68ºF		90	**Silty Sand (SM)** Similar to above
28					7.9 68ºF		90	**Silty Sand (SM)** Similar to above
30					6.0 68ºF		90	**Silty Sand (SM)** Similar to above
32								

Completion Results



RPS

WELL CONSTRUCTION

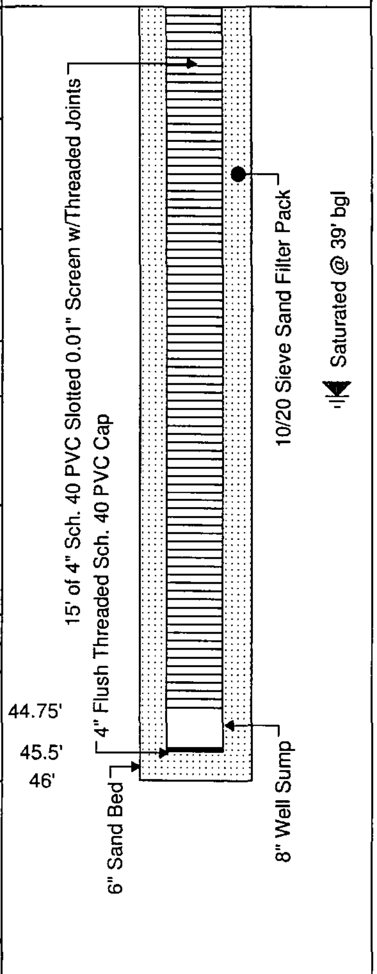
Well No.: MW-63 (AOC 22 -16)
Start Date: 4/13/2009
Finish Date: 4/14/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N36º41.771' W107º58.305'

Total Depth: 46' bgl
Ground Water: Saturated @ 39' bgl
Elev., TOC (ft. msl): 5547.255
Elev., PAD (ft. msl): 5544.482
Elev., GL (ft. msl): 5544.488
Site Coordinates:
N 36º41'46.17547" W 107º58'18.22906"

Depth (ft.)	Sampling						Recovery (%)	Sample Description
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
33					6.5 68ºF		50	**Gravelly Sand (SW)** Medium to coarse grain, loose, damp, brown, coarse gravel
35					10.9 70ºF		60	**Gravelly Sand (SW)** Similar to above
37	36- 38'	1230	G/2V/ 2E/3J		12.2 70ºF		70	**Gravelly Sand (SW)** Similar to above
				39'			0	No recovery - similar to above
39							40	**Sand (SW)** Medium to coarse grain, loose, saturated, brown, trace gravel
41							40	**Sand (SW)** Similar to above
43							20	**Sand (SW)** Similar to above
							0	No recovery - similar to above
45							50	**Nacimiento Formation Weathered Sandstone/Sandstone (SS)** Dense to fine grain, dry, greenish gray
								Total Depth = 46' BGL
47								
49								

Completion Results



RPS

WELL CONSTRUCTION

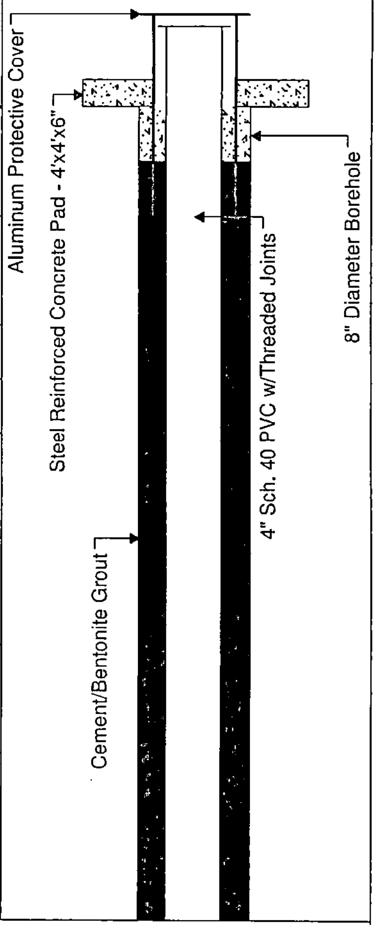
Well No.: MW-62 (AOC 23 -1)
Start Date: 4/21/2009
Finish Date: 4/21/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: N36º41.717' W107º58.123'

Total Depth: 58.25' bgl
Ground Water: Saturated @ 55' bgl
Elev., TOC (ft. msl): 5561.322
Elev., PAD (ft. msl): 5558.703
Elev., GL (ft. msl): 5558.555
Site Coordinates:
N 36º41'43.02125" W 107º58'07.46590"

Depth (ft.)	Sampling						Recovery (%)	Sample Description
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
-2								
0	0-0.5' &Dup 1.5-2'	1115 1130	G/2V/2E/3J G/2V/2E/3J		3.1 71ºF 3.3 71ºF		100	Ground Surface **Silt (ML)** Very fine grain, loose, dry, brown
2					14.5 74ºF		40	**Silt (ML)** Similar to above, damp
4					14.4 74ºF		90	**Silt (ML)** Similar to above **Sand (SP)** Fine grain, loose, damp, dark brown
6					14.8 74ºF		100	**Sand (SP)** Similar to above, brown to light brown
8					12.3 74ºF		60	**Gravelly Sand (SW)** Fine to coarse grain, loose, dry, brown, coarse gravel
10							0	**Gravelly Sand (SW)** Similar to above, no recovery
12					7.1 77ºF		100	**Silty Sand (SM)** Fine grain, loose to compact, damp, light grayish tan
14					17.6 77ºF		90	**Silty Sand (SM)** Similar to above, compact

Completion Results



WELL CONSTRUCTION

Well No.: MW-62 (AOC 23 -1)

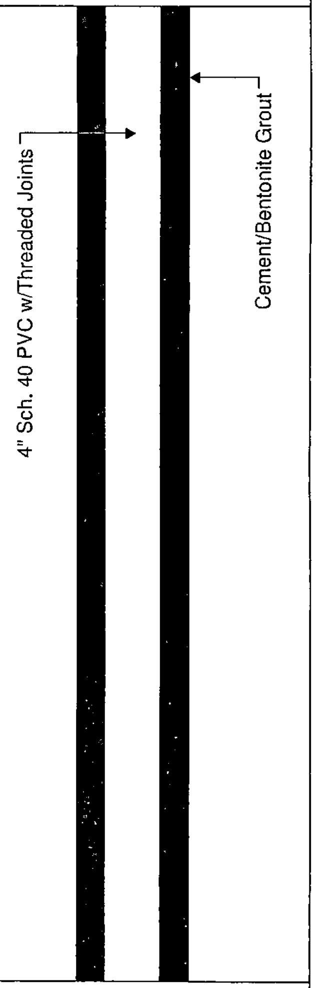
Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: N36º41.717' W107º58.123'

Total Depth: 58.25' bgl
Ground Water: Saturated @ 55' bgl
Elev., TOC (ft. msl): 5561.322
Elev., PAD (ft. msl): 5558.703
Elev., GL (ft. msl): 5558.555
Site Coordinates:
N 36º41'43.02125" **W** 107º58'07.46590"

Start Date: 4/21/2009
Finish Date: 4/21/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
							0	**Silty Sand (SM)** Similar to above, sandstone present, yellowish brown
16					8.7 78ºF		60	**Silty Sand (SM)** Similar to above, no recovery
							0	**Clayey Silty Sand (SC/SM)** Fine grain, very dense, damp, tan
18					2.2 78ºF		100	**Clayey Silty Sand (SC/SM)** Similar to above, no recovery
20								**Clayey Silty Sand (SC/SM)** Similar to above, grayish tan, organics at 18.5' bgl, pinkish tan 18.25 to 18.75' bgl
					3.9 78ºF		100	**Clayey Silty Sand (SC/SM)** Fine grain, very dense, damp, grayish tan
22					2.4 78ºF		100	**Clayey Silty Sand (SC/SM)** Similar to above, compact
24					1.6 78ºF		90	**Clayey Silty Sand (SC/SM)** Similar to above
							0	**Clayey Silty Sand (SC/SM)** Similar to above, no recovery
26					4.0 77ºF		90	**Silty Sand (SM)** Fine grain, compact, damp, light brown
							0	**Silty Sand (SM)** Similar to above, no recovery
28					3.6 77ºF		90	**Silty Sand (SM)** Similar to above, clay/silt lenses present
								Silty Sand (SM) Similar to above, no recovery
30					5.4 77ºF		90	**Silty Sand (SM)** Similar to above, increase in silt content
32								

Completion Results



RPS

WELL CONSTRUCTION

Well No.: MW-62 (AOC 23 -1)

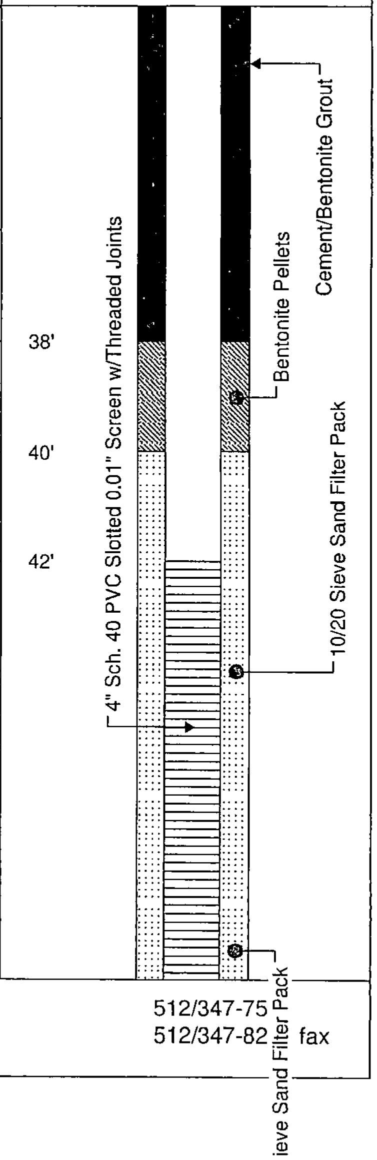
Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: N36º41.717' W107º58.123'

Total Depth: 58.25' bgl
Ground Water: Saturated @ 55' bgl
Elev., TOC (ft. msl): 5561.322
Elev., PAD (ft. msl): 5558.703
Elev., GL (ft. msl): 5558.555
Site Coordinates:
N 36º41'43.02125" **W** 107º58'07.46590"

Start Date: 4/21/2009
Finish Date: 4/21/2009

Depth (ft.)	Sampling Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class	Recovery (%)	Sample Description
33					3.2 58ºF		50	**Sandy Silt (ML)** Very fine grain, compact, dry, greenish gray, no plasticity
35					3.3 58ºF		50	**Sandy Silt (ML)** Similar to above, dense, fine grain sand lenses present, rusty brown and tan
37					4.4 62ºF		50	**Silty Sand (SM)** Fine grain, compact, damp, light greenish gray
39					5.3 63ºF		90	**Silty Sand (SM)** Similar to above, slightly cemented, black organics present, gray sand
41					3.3 71ºF		90	**Silty Sand (SM)** Similar to above, trace clay
43							0	**Silty Sand (SM)** Similar to above
45					3.3 73ºF		20	**Silty Sand (SM)** Similar to above
47							0	**Silty Sand (SM)** Similar to above
49					2.3 84ºF		50	**Silty Sand (SM)** Fine grain, poorly cemented, damp, light greenish gray

Completion Results



WELL CONSTRUCTION

Well No.: MW-62 (AOC 23 -1)

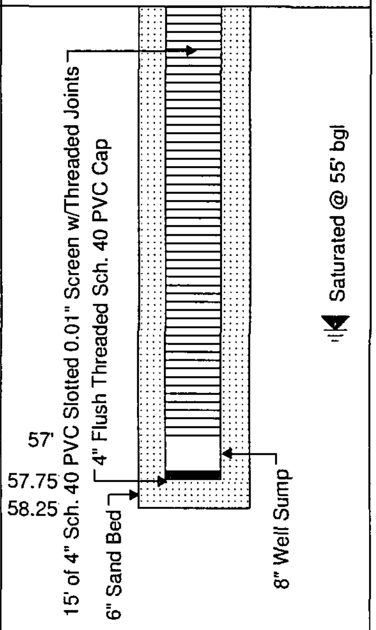
Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: N36º41.717' W107º58.123'

Total Depth: 58.25' bgl
Ground Water: Saturated @ 55' bgl
Elev., TOC (ft. msl): 5561.322
Elev., PAD (ft. msl): 5558.703
Elev., GL (ft. msl): 5558.555
Site Coordinates:
N 36º41'43.02125" **W** 107º58'07.46590"

Start Date: 4/21/2009
Finish Date: 4/21/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
51					3.8 82ºF		90	**Silty Sand (SM)** Similar to above, trace clay, poorly cemented, standstone present
53	52- 53'	1510	G/2V/ 2E/3J		4.4 83ºF		90	**Silty Sand (SM)** Similar to above
							10	**Silty Sand (SM)** Similar to above
55				55'			0 90	**Silty Sand/Sand (SM/SW)** Medium to coarse grain, loose, moist to saturated at 55' bgl
							90	**Silty Sand (SM)** Similar to above, saturated, brown to yellowish brown
57								**Nacimiento Formation Silt/Shale (ML)** Very dense, dry, black, no odor
								Total Depth = 58.25' BGL
59								
61								
63								
65								

Completion Results



RPS

LOG OF BORING

Boring No.: AOC 24-1
Start Date: 4/23/2009
Finish Date: 4/23/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.723' W107º58.276'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5551.597
Site Coordinates: **N** 36º41'43.33506"
W 107º58'16.48842"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
								Ground Surface	
0	0-0.5'	0850	G/2V/2E/3J		3.3 60ºF	▥	100	**Silt (ML)** Very fine grain, loose, damp, brown	0
	1.5-2'	0900	G/2V/2E/3J		3.9 60ºF	▥			
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

RPS

LOG OF BORING

Boring No.: AOC 24-2
Start Date: 4/23/2009
Finish Date: 4/23/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.716' W107º58.278'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5551.416
Site Coordinates: **N** 36º41'42.90086"
W 107º58'16.48495"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
								Ground Surface	
0	0- 0.5'	0930	G/2V/ 2E/3J		2.7 62ºF		100	**Clayey Silt (ML)** Very fine grain, compact, damp, brown	0
	1.5- 2'	0940	G/2V/ 2E/3J		4.1 62ºF				
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

RPS

LOG OF BORING

Boring No.: AOC 24-3
Start Date: 4/23/2009
Finish Date: 4/23/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.722' W107º58.288'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5550.986
Site Coordinates: **N** 36º41'42.89601"
W 107º58'17.40801"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
								Ground Surface	
0	0-0.5'	1000	G/2V/ 2E/3J		1.7 65ºF	▨	100	**Gravelly Silty Sand (SM/SP)** Fine grain, compact, damp, brown	0
	1.5-2'	1010	G/2V/ 2E/3J		7.7 65ºF				
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

LOG OF BORING

Boring No.: AOC 24-4
Start Date: 4/23/2009
Finish Date: 4/23/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.717' W107º58.303'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5550.914
Site Coordinates: **N** 36º41'42.89208"
W 107º58'18.26308"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
								Ground Surface	
0	0- 0.5'	1030	G/2V/ 2E/3J		3.9 70ºF		100	**Gravelly Silty Sand (SM/SP)** Fine grain, loose to compact, damp, brown	0
	1.5- 2' &Dup	1040	G/2V/ 2E/3J		6.4 70ºF				
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

RPS
404 Camp Craft Road
Austin, Texas 78746

Sheet: **1 of 1**

512/347-7588
512/347-8243 fax

RPS

LOG OF BORING

Boring No.: AOC 24-5
Start Date: 4/8/2009
Finish Date: 4/8/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow Stem Augers
Sampling Method: Split Spoon
Comments: N36º41.724' W107º58.304'

Total Depth: 10' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5550.721
Site Coordinates: **N** 36º41'43.44358"
W 107º58'18.28355"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
								Ground Surface	
0	0-0.5' &Dup 1.5-2'	1100 1200	G/2V/2E/3J G/2V/2E/3J		1.2 69ºF 6.0 69ºF		100	**Silt (ML)** Very fine grain, compact, dry, brown, gravelly	0
2					5.4 69ºF		100	**Clayey Silt (ML)** Low plasticity, very fine grain, compact, damp, brown	2
4					6.4 69ºF		100	**Clayey Silt (ML)** Similar to above	4
6					7.8 69ºF		50	**Clayey Silt (ML)** Similar to above	6
8					5.9 69ºF		100	**Clayey Silt (ML)** Similar to above, trace of very fine grain sand	8
10								Total Depth = 10' BGL	10
12									12

RPS
404 Camp Craft Road
Austin, Texas 78746

Sheet: **1 of 1**

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512/347-8243 fax

LOG OF BORING

Boring No.: AOC 24-6
Start Date: 4/8/2009
Finish Date: 4/8/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow Stem Augers
Sampling Method: Split Spoon
Comments: N36º41.728' W107º58.287'

Total Depth: 10' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5552.073
Site Coordinates: **N** 36º41'43.67391"
W 107º58'17.17320"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
								Ground Surface	
0	0-0.5' 1.5-2'	1255 1315	G/2V/2E/3J G/2V/2E/3J		0.3 74ºF 5.0 74ºF		100	**Silt (ML)** Low plasticity, very fine grain, loose to compact, dry, brown, black nodule of asphaltic material, no staining of the soil was observed	0
2					4.8 74ºF		80	**Clayey Silt (ML)** Similar to above, clayey	2
4					4.9 74ºF		80	**Clayey Silt (ML)** Similar to above	4
6					2.0 74ºF		80	**Clayey Silt (ML)** Similar to above	6
8					5.3 74ºF		100	**Clayey Silt (ML)** Similar to above, trace of very fine grain sand	8
10								Total Depth = 10' BGL	10
12									12

RPS
404 Camp Craft Road
Austin, Texas 78746

Sheet: **1 of 1**

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512/347-8243 fax

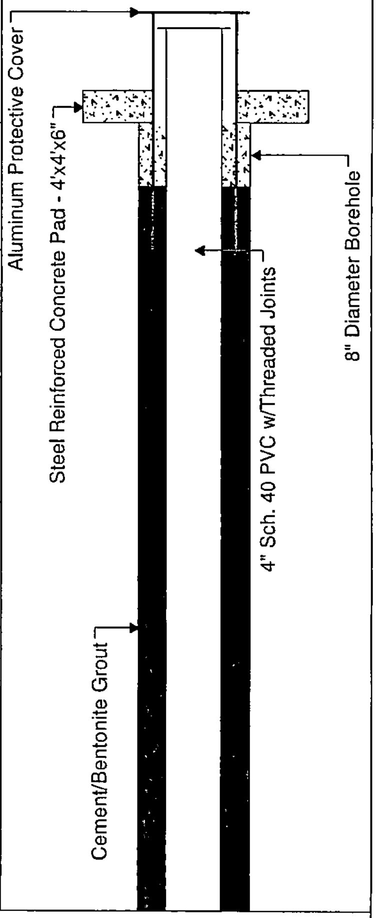
WELL CONSTRUCTION

Well No.: MW-64 (AOC 24 -7)
Start Date: 4/7/2009
Finish Date: 4/7/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N36º41.736' W107º58.304'

Total Depth: 50.25' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): 5552.285
Elev., PAD (ft. msl): 5549.043
Elev., GL (ft. msl): 5549.111
Site Coordinates:
N 36º41'44.02863" **W** 107º58'18.35629"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
-2									
0	0-0.5' 1.5-2'	1130 1145	G/2V/2E/3J G/2V/2E/3J		0.4 57ºF		100	Ground Surface **Clayey Silt (ML)** Low plasticity, stiff, damp, brown	
2					0.4 57ºF		60	**Clayey Silt (ML)** Similar to above	
4					0.2 57ºF		90	**Sandy Silt (ML)** Low plasticity, fine grain sand, compact, damp, brown	
6					0.3 57ºF		60	**Sandy Silt (ML)** Similar to above	
8					0.4 57ºF		70	**Sandy Silt (ML)** Similar to above	
10					0.3 57ºF		90	**Clayey Silt (ML)** Low plasticity, firm, damp, brown	
12									



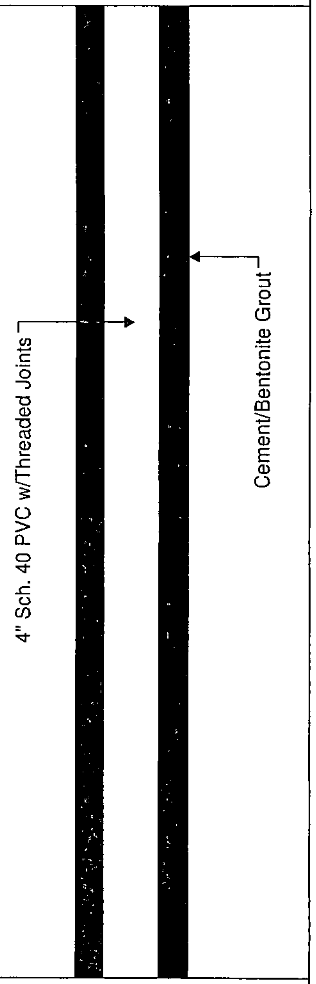
WELL CONSTRUCTION

Well No.: MW-64 (AOC 24 -7)
Start Date: 4/7/2009
Finish Date: 4/7/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N36º41.736' W107º58.304'

Total Depth: 50.25' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): 5552.285
Elev., PAD (ft. msl): 5549.043
Elev., GL (ft. msl): 5549.111
Site Coordinates:
N 36º41'44.02863" **W** 107º58'18.35629"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
					0.4 57ºF		80	**Sandy Silt (ML)** Low plasticity, fine grain sand, compact, damp, brown, trace gravel	
14					0.4 57ºF		20	**Sandy Silt (ML)** Similar to above	
16					0.1 57ºF		100	**Sandy Silt (ML)** Similar to above	
18					0.5 57ºF		100	**Sandy Silt (ML)** Similar to above, loose, more sand	
20					0.3 57ºF		100	**Silty Sand (SM)** Very fine grain, loose, damp, brown	
22					0.1 57ºF		100	**Silty Sand (SM)** Similar to above, light brown/tan	
24					0.1 57ºF		100	**Silty Sand (SM)** Similar to above	
26								**Silty Sand (SM)** Similar to above	



RPS

WELL CONSTRUCTION

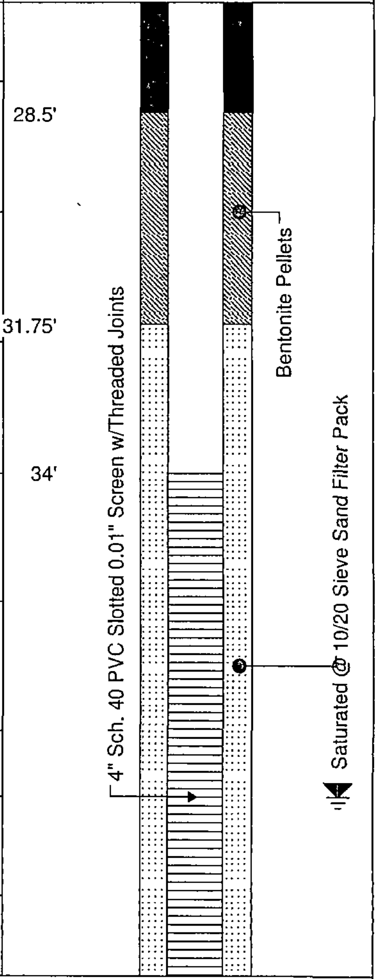
Well No.: MW-64 (AOC 24 -7)

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N36º41.736' W107º58.304'

Total Depth: 50.25' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): 5552.285
Elev., PAD (ft. msl): 5549.043
Elev., GL (ft. msl): 5549.111
Site Coordinates:
N 36º41'44.02863" **W** 107º58'18.35629"

Start Date: 4/7/2009
Finish Date: 4/7/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
					0.1 57ºF		100		
28					0.3 57ºF		100	**Silty Sand (SM)** Very fine grain, loose, damp, tan	
30					0.2 57ºF		100	**Silty Sand (SM)** Similar to above, decrease in silt	
32					0.4 57ºF		100	**Silty Sand (SM)** Similar to above	
34					0.9 57ºF		100	**Silty Sand (SM)** Similar to above	
36					3.4 57ºF		100	**Silty Sand (SM)** Fine grain, compact, damp, brown, trace gravelly sand at base	
38							0	**Gravelly Sand (SW)**	
40	39-42'	1815	G/2V/2E/3J		4.4 68ºF		50	**Gravelly Sand (SW)** Medium to coarse grain, loose, damp, brown, coarse gravel	
					1.2 68ºF		50	**Gravelly Sand (SW)** Similar to above	



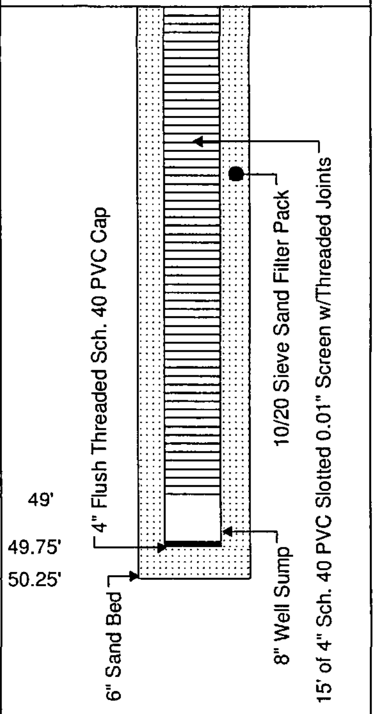
WELL CONSTRUCTION

Well No.: MW-64 (AOC 24 -7)
Start Date: 4/7/2009
Finish Date: 4/7/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger
Sampling Method: Split Spoon
Comments: N36º41.736' W107º58.304'

Total Depth: 50.25' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): 5552.285
Elev., PAD (ft. msl): 5549.043
Elev., GL (ft. msl): 5549.111
Site Coordinates:
N 36º41'44.02863" **W** 107º58'18.35629"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
43					3.1 68ºF		80	**Gravelly Sand (SW)** Similar to above, sand lenses present	
45					3.1 68ºF		20	**Gravelly Sand (SW)** Medium to coarse grain, loose, damp, brown, coarse gravel	
47					3.6 68ºF		50	**Gravelly Sand (SW)** Similar to above	
49							90	**Nacimiento Formation Sandy Clay (CH)** Dense, very stiff, dry to damp, yellowish brown	
								Total Depth = 50.25' BGL	
51									
53									
55									



RPS

LOG OF BORING

Boring No.: AOC 25-1
Start Date: 4/23/2009
Finish Date: 4/23/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.741' W107º58.429'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5544.772
Site Coordinates:
N 36º41'44.32802" **W** 107º58'25.68687"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
								Ground Surface	
0	0-0.5'	1600	G/2V/2E/3J		5.5 82ºF	▨	100	**Gravelly Silty Sand (SM)** Fine grain, compact, dry to damp, brown	0
	1.5-2'	1610	G/2V/2E/3J		5.5 82ºF	▨			
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

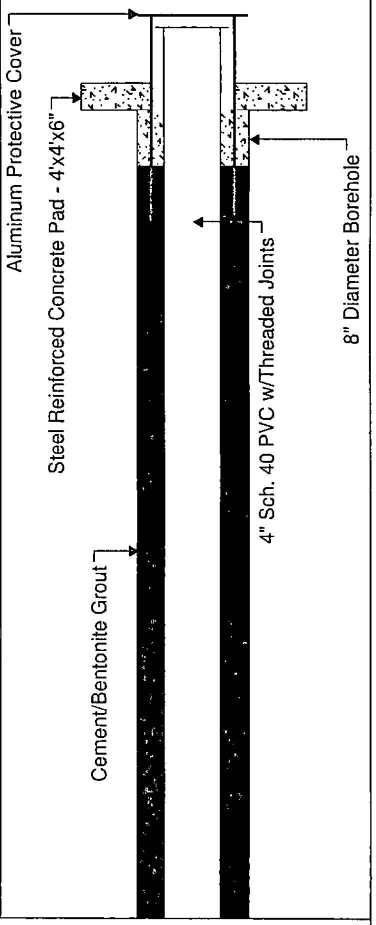
RPS

WELL CONSTRUCTION

Well No.: MW-60 (AOC 25 -2)
Start Date: 4/5/2009
Finish Date: 4/5/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: Hydroexcavated to 8' bgl. N36º41.754' W107º58.434'

Total Depth: 45.5' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): 5543.711
Elev., PAD (ft. msl): 5544.003
Elev., GL (ft. msl): 5544.007
Site Coordinates:
N 36º41'45.37028" **W** 107º58'25.98617"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
-2									
								Ground Surface	
0	0-0.5' &Dup 1.5-2'	1645 1700	G/4V/4E/6J G/2V/2E/3J		0.1 53ºF		100	**Clayey Silt (ML)** Low plasticity, very soft, damp, brown	
2					0.1 53ºF		100	**Clayey Silt (ML)** Similar to above	
4							0	**Clayey Silt (ML)** Similar to above, no recovery	
6					0.1 53ºF		100	**Clayey Silt (ML)** Similar to above	
8					0.0 43ºF		90	**Clayey Silt (ML)** Low plasticity, very soft, damp, brown	
10					0.0 43ºF		80	**Clayey Silt (ML)** Similar to above	
12					0.1 43ºF		100	**Silty Sand (SM)** Very fine grain, loose to compact, damp, brown	
14									

RPS

WELL CONSTRUCTION

Well No.: MW-60 (AOC 25 -2)

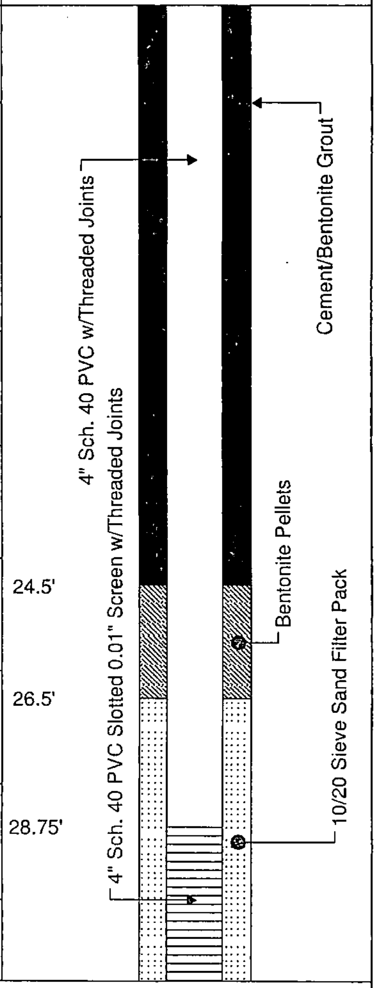
Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: Hydroexcavated to 8' bgl. N36º41.754' W107º58.434'

Total Depth: 45.5' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): 5543.711
Elev., PAD (ft. msl): 5544.003
Elev., GL (ft. msl): 5544.007
Site Coordinates:
N 36º41'45.37028" **W** 107º58'25.98617"

Start Date: 4/5/2009
Finish Date: 4/5/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
					0.0 43ºF		90	**Silty Sand (SM)** Very fine grain, loose to compact, damp, brown
16					0.2 43ºF		90	**Silty Sand (SM)** Similar to above
18					0.4 43ºF		100	**Silty Sand (SM)** Similar to above
20					0.1 43ºF		100	**Silty Sand (SM)** Similar to above
22					0.3 44ºF		100	**Silty Sand (SM)** Similar to above
24					0.4 44ºF		100	**Silty Sand (SM)** Similar to above
26					0.3 44ºF		100	**Silty Sand (SM)** Similar to above
28					0.2 44ºF		100	**Silty Sand (SM)** Similar to above
30					0.1 44ºF		100	**Silty Sand (SM)** Similar to above

Completion Results



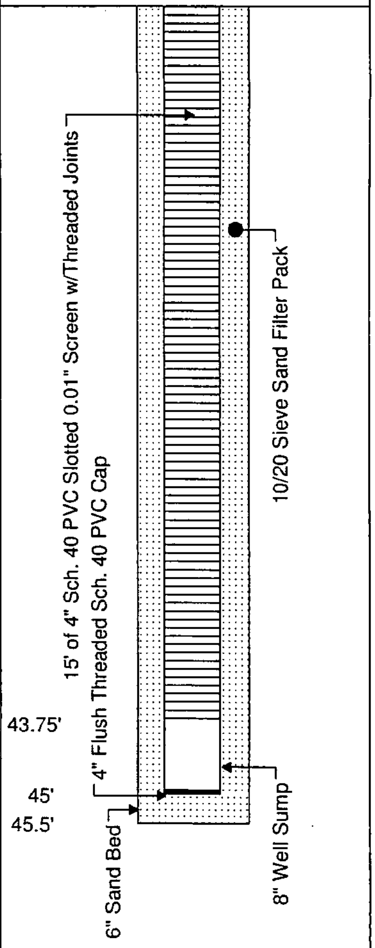
WELL CONSTRUCTION

Well No.: MW-60 (AOC 25 -2)
Start Date: 4/5/2009
Finish Date: 4/5/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: Hydroexcavated to 8' bgl. N36º41.754' W107º58.434'

Total Depth: 45.5' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): 5543.711
Elev., PAD (ft. msl): 5544.003
Elev., GL (ft. msl): 5544.007
Site Coordinates:
N 36º41'45.37028" **W** 107º58'25.98617"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
33					3.6 44ºF		100	**Silty Sand (SM)** Very fine grain, loose to compact, damp, brown	
35					2.5 44ºF		100	**Sand (SP)** Fine to medium grain, loose, damp, brown **Gravelly Sand (SW)** Medium to coarse grain, compact, damp, brown, coarse to fine gravel	
37	36- 38'	1715	G/2V/ 2E/3J		4.2 44ºF		80	**Gravelly Sand (SW)** Similar to above	
							10	**Gravelly Sand (SW)** Similar to above	
39							0	**Gravelly Sand (SW)** Similar to above, no recovery	
41							50	**Gravelly Sand (SW)** Similar to above	
43							0	**Gravelly Sand (SW)** Similar to above, no recovery	
45							100	**Nacimiento Formation Weathered Sandstone/Sandstone (SS)** Fine grain, dense, damp, light yellowish brown	
47								Total Depth = 45.5' BGL	



RPS

LOG OF BORING

Boring No.: AOC 26-1
Start Date: 4/20/2009
Finish Date: 4/20/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.815' W107º58.249'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5540.088
Site Coordinates: **N** 36º41'48.90866"
W 107º58'14.97772"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
								Ground Surface	
0	0- 0.5'	1200	G/2V/ 2E/4J		5.6 72ºF	▥	100	**Clayey Silt (ML)** Very fine grain, compact, damp, brown	0
	1.5- 2'	1215	G/2V/ 2E/4J		3.5 72ºF	▥			
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

LOG OF BORING

Boring No.: AOC 26-2
Start Date: 4/20/2009
Finish Date: 4/20/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.811' W107º58.247'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5540.054
Site Coordinates: **N** 36º41'48.62399"
W 107º58'14.85771"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
								Ground Surface	
0	0- 0.5'	1230	G/2V/ 2E/4J		4.6 72ºF	▥	100	**Clayey Silt (ML)** Very fine grain, compact, damp, brown	0
	1.5- 2'	1240	G/2V/ 2E/4J		3.9 72ºF	▥			
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

RPS
404 Camp Craft Road
Austin, Texas 78746

Sheet: **1 of 1**

512/347-7588
512/347-8243 fax

RPS

LOG OF BORING

Boring No.: AOC 26-3
Start Date: 4/20/2009
Finish Date: 4/20/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.809' W107º58.244'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5543.638
Site Coordinates: **N** 36º41'48.41610"
W 107º58'14.64503"

	Sampling								
Depth (ft.)	**Sample Depth**	**Time**	**Sample Type/ Containe/No.**	**Saturation**	**Organic Vapor (ppm)**	**USCS Class**	**Recovery (%)**	**Sample Description**	**Depth (ft.)**
								Ground Surface	
0	0-0.5'	1250	G/2V/2E/4J		4.3 73ºF	▥	100	**Clayey Silt (ML)** Very fine grain, compact, damp to moist, brown	0
	1.5-2' &Dup	1300	G/2V/2E/4J		7.2 73ºF	▥			
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

RPS

LOG OF BORING

Boring No.: AOC 26-4
Start Date: 4/20/2009
Finish Date: 4/20/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.811' W107º58.243'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5540.587
Site Coordinates: **N** 36º41'48.70583"
W 107º58'14.43626"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
								Ground Surface	
0	0-0.5'	1325	G/2V/ 2E/4J		4.5 74ºF	▥	100	**Clayey Silt (ML)** Very fine grain, loose to compact, damp, brown	0
	1.5-2'	1335	G/2V/ 2E/4J		4.1 74ºF	▥			
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

RPS

LOG OF BORING

Boring No.: AOC 26-5
Start Date: 4/20/2009
Finish Date: 4/20/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.816' W107º58.220'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5540.206
Site Coordinates: **N** 36º41'48.96076"
W 107º58'13.11816"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
								Ground Surface	
0	0-0.5'	1530	G/2V/ 2E/4J		9.2 77ºF	▥	100	**Clayey Silt (ML)** Very fine grain, loose to compact, dry to moist, brown	0
	1.5-2'	1545	G/2V/ 2E/4J		15.2 77ºF	▥			
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

LOG OF BORING

Boring No.: AOC 26-6
Start Date: 4/20/2009
Finish Date: 4/20/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.818' W107º58.210'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5540.025
Site Coordinates: **N** 36º41'49.08555"
W 107º58'12.57862"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
								Ground Surface	
0	0-0.5'	1600	G/2V/2E/4J		9.3 77ºF	▥	100	**Clayey Silt (ML)** Very fine grain, loose to compact, dry to moist, brown	0
	1.5-2'	1605	G/2V/2E/4J		6.6 77ºF	▥			
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

LOG OF BORING

Boring No.: AOC 26-7
Start Date: 4/20/2009
Finish Date: 4/20/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: N/A
Drilling Rig: N/A
Drilling Method: Hand Auger
Sampling Method: Auger Bucket
Comments: N36º41.809' W107º58.211'

Total Depth: 2' bgl
Ground Water: Not Encountered
Elev., TOC (ft. msl): --
Elev., PAD (ft. msl): --
Elev., GL (ft. msl): 5540.360
Site Coordinates: **N** 36º41'48.54564"
W 107º58'12.67447"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Depth (ft.)
	Sample Depth	Time	Sample Type/ Containe/No.	Saturation	Organic Vapor (ppm)	USCS Class			
								Ground Surface	
0	0- 0.5'	1615	G/2V/ 2E/4J		5.5 77ºF	▥	100	**Clayey Silt (ML)** Very fine grain, loose to compact, dry to moist, brown	0
	1.5- 2'	1630	G/2V/ 2E/4J		6.1 77ºF	▥			
2								Total Depth = 2' BGL	2
4									4
6									6
8									8
10									10
12									12

RPS

WELL CONSTRUCTION

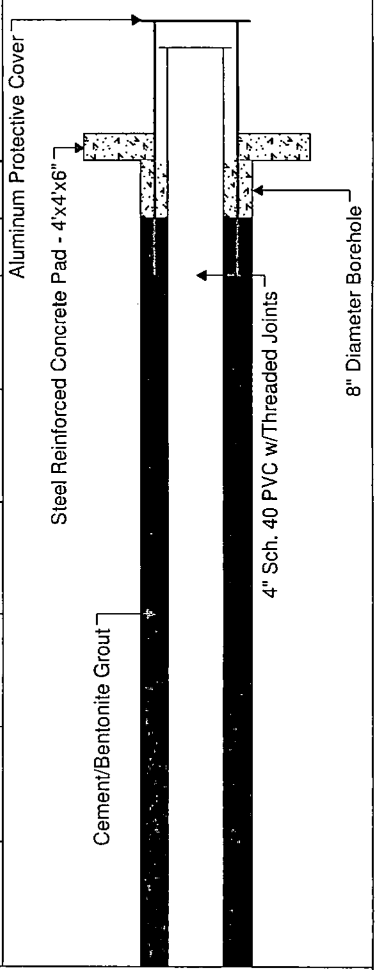
Well No.: MW-65 (AOC 26-8)

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: N36º41.826' W107º58.244'

Total Depth: 44.25' bgl
Ground Water: Saturated @ 36' bgl
Elev., TOC (ft. msl): 5539.517
Elev., PAD (ft. msl): 5539.941
Elev., GL (ft. msl): 5539.902
Site Coordinates:
N 36º41'49.18120" **W** 107º58'15.39107"

Start Date: 4/16/2009
Finish Date: 4/16/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
-2								Ground Surface	
0	0-1' &Dup	0900	G/2V/2E/4J		1.8 50ºF		100	**Silt/Gravel** Six inches of asphalt	
	1.5-2'	0920	G/2V/2E/4J		1.0 50ºF			**Clayey Silt (ML)** Low plasticity, soft, damp, brown	
2					2.3 50ºF		100	**Clayey Silt (ML)** Similar to above	
4					2.0 50ºF		100	**Clayey Silt (ML)** Similar to above	
6					1.2 50ºF		100	**Clayey Silt (ML)** Similar to above	
8					1.0 50ºF		100	**Clayey Silt (ML)** Similar to above	
10					1.9 46ºF		80	**Sandy Silt (ML)** Very fine grain, compact to loose, damp, brown, trace clay	
12					2.5 46ºF		70	**Sandy Silt (ML)** Similar to above	
14									



WELL CONSTRUCTION

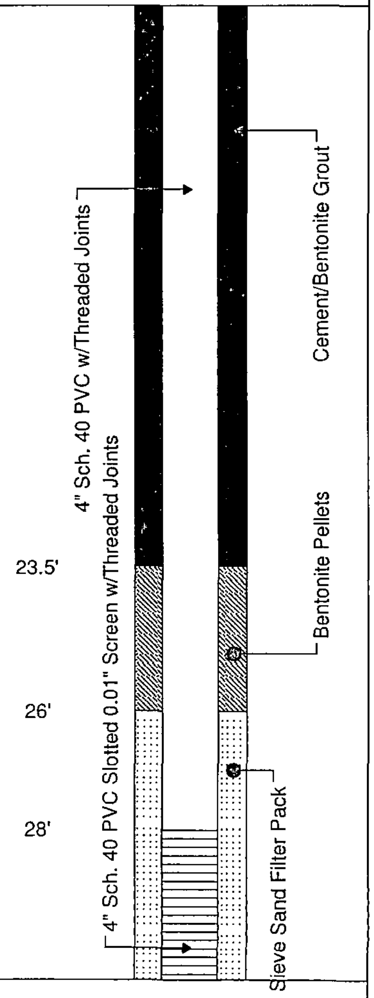
Well No.: MW-65 (AOC 26-8)
Start Date: 4/16/2009
Finish Date: 4/16/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: N36º41.826' W107º58.244'

Total Depth: 44.25' bgl
Ground Water: Saturated @ 36' bgl
Elev., TOC (ft. msl): 5539.517
Elev., PAD (ft. msl): 5539.941
Elev., GL (ft. msl): 5539.902
Site Coordinates:
N 36º41'49.18120" **W** 107º58'15.39107"

Depth (ft.)	Sampling						Recovery (%)	Sample Description
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
15					2.1 46ºF		70	**Sandy Silt (ML)** Very fine grain, compact to loose, damp, brown, trace clay
17					2.1 46ºF		80	**Sandy Silt (ML)** Similar to above
19					1.8 45ºF		90	**Silty Sand (SM)** Very fine grain, loose, damp, light brown
21					1.2 44ºF		80	**Silty Sand (SM)** Similar to above, tan sand in seams, calcareous
23					1.1 44ºF		80	**Silty Sand (SM)** Similar to above
25					1.3 44ºF		80	**Silty Sand (SM)** Similar to above
27					2.4 45ºF		80	**Clayey Silty Sand (SC/SM)** Very fine grain, compact, damp, brown, calcareous
29					11 46ºF		80	**Clayey Silty Sand (SC/SM)** Similar to above, faint odor **Sand (SW)** Fine to medium grain, loose, damp, brown, faint odor

Completion Results



WELL CONSTRUCTION

Well No.: MW-65 (AOC 26-8)
Start Date: 4/16/2009
Finish Date: 4/16/2009

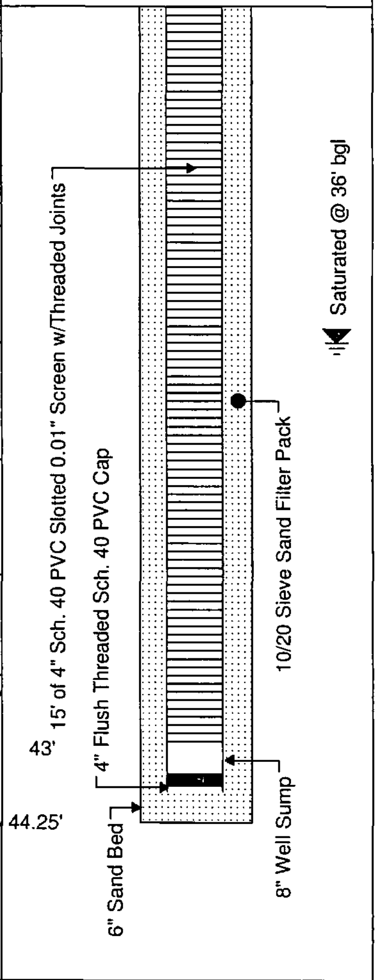
Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: N36º41.826' W107º58.244'

Total Depth: 44.25' bgl
Ground Water: Saturated @ 36' bgl
Elev., TOC (ft. msl): 5539.517
Elev., PAD (ft. msl): 5539.941
Elev., GL (ft. msl): 5539.902
Site Coordinates:
N 36º41'49.18120" **W** 107º58'15.39107"

Depth (ft.)	Sampling						Recovery (%)	Sample Description
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
30-32					20.8 44ºF		80	**Gravelly Sand (SW)** Fine to coarse grain, gravelly at base, damp to moist, odor, gray
32-34	32-36'	1430	G/2V/2E/4J		58.7 48ºF		60	**Gravelly Sand (SW)** Fine to coarse grain, damp, gravelly, gray, strong odor, trace dark to black clay
34-36				36'	145 47ºF		80	**Gravelly Sand (SW)** Similar to above, odor
36-38							10	**Gravelly Sand (SW)** Similar to above, moist to saturated, strong hydrocarbon odor
38-40							10	**Gravelly Sand (SW)** Similar to above, saturated, black
40-42							70	**Sand (SW)** Fine to coarse grain, compact, saturated, dark gray, odor
42-44.25							--	**Sandy Clay/Clayey Sand (CL/SC)** Fine grain, very stiff, damp, yellowish brown **Nacimiento Formation Sandy Clay/Clayey Sand (CL/SC)** *Similar to above, becomes very dense, greenish gray*

Total Depth = 44.25' BGL

Completion Results



RPS
404 Camp Craft Road
Austin, Texas 78746

Sheet: **3 of 3**

512/347-7588
512/347-8243 fax

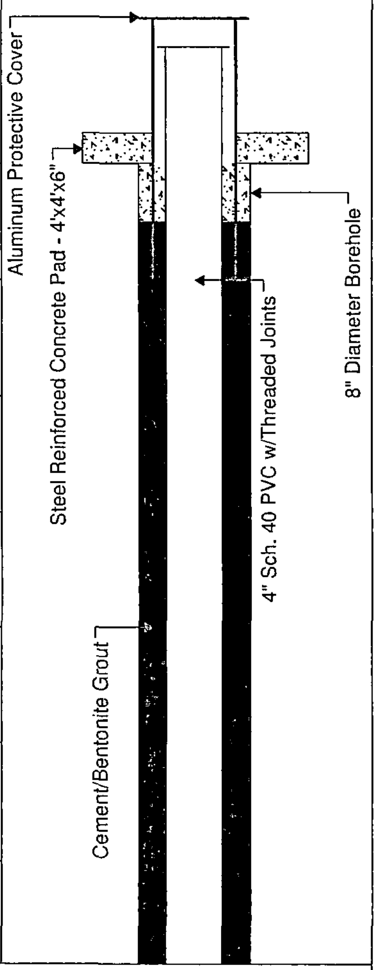
WELL CONSTRUCTION

Well No.: MW-66 (AOC 26-9)
Start Date: 4/16/2009
Finish Date: 4/20/2009

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: N36º41.818' W107º58.234'

Total Depth: 43.25' bgl
Ground Water: Saturated @ 38' bgl
Elev., TOC (ft. msl): 5544.625
Elev., PAD (ft. msl): 5542.030
Elev., GL (ft. msl): 5541.979
Site Coordinates:
N 36º41'48.97462" **W** 107º58'14.05858"

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
-2									
0								Ground Surface	
0–2	0-0.5' 1.5-2'	0955 1000	G/2V/2E/4J G/2V/2E/4J		8.6 66ºF		100	**Clayey Silt (ML)** Low plasticity, firm, damp, brown	
2–4					10.5 66ºF		100	**Clayey Silt (ML)** Similar to above	
4–6					10.5 66ºF		60	**Clayey Silt (ML)** Similar to above	
6–8					9.0 66ºF		70	**Clayey Silt (ML)** Similar to above	
8–10					10.0 66ºF		90	**Sandy Silt (ML)** Very fine grain, compact to loose, damp, brown	
10–12					8.3 66ºF		10	**Sandy Silt (ML)** Similar to above	
12–					8.2 66ºF		70	**Sandy Silt (ML)** Similar to above	



WELL CONSTRUCTION

Well No.: MW-66 (AOC 26-9)

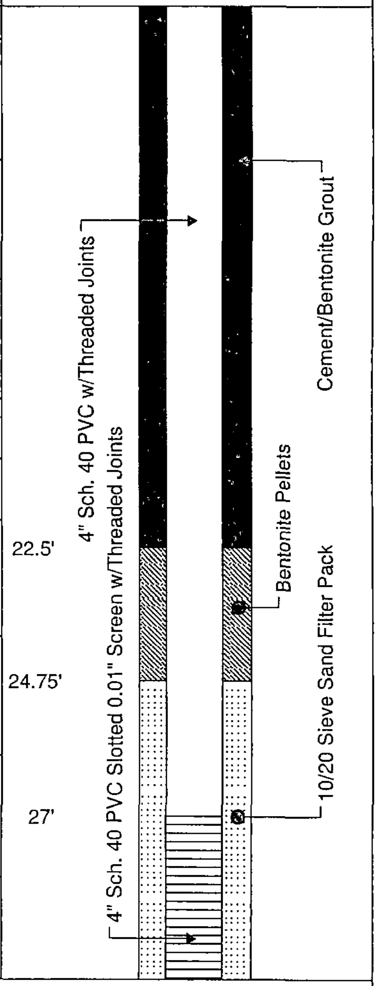
Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: N36º41.818' W107º58.234'

Total Depth: 43.25' bgl
Ground Water: Saturated @ 38' bgl
Elev., TOC (ft. msl): 5544.625
Elev., PAD (ft. msl): 5542.030
Elev., GL (ft. msl): 5541.979
Site Coordinates:
N 36º41'48.97462" **W** 107º58'14.05858"

Start Date: 4/16/2009
Finish Date: 4/20/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class		
15					9.6 66ºF		80	**Sandy Silt (ML)** Very fine grain, compact to loose, damp, brown
17					9.5 66ºF		90	**Sandy Silt (ML)** Similar to above
19					8.8 66ºF		90	**Sandy Silt (ML)** Similar to above, tan and brown
21					10.9 66ºF		80	**Sandy Silt (ML)** Similar to above, increase in sand **Silty Sand (SM)** Very fine grain, compact to loose, damp, light brown
23					10.4 68ºF		90	**Silty Sand (SM)** Similar to above
25					10.0 68ºF		100	**Silty Sand (SM)** Similar to above
27					9.5 68ºF		80	**Silty Sand (SM)** Similar to above
29					7.9 68ºF		70	**Silty Sand (SM)** Fine to medium grained, compact, damp, brown, trace gravel, clayey

Completion Results



WELL CONSTRUCTION

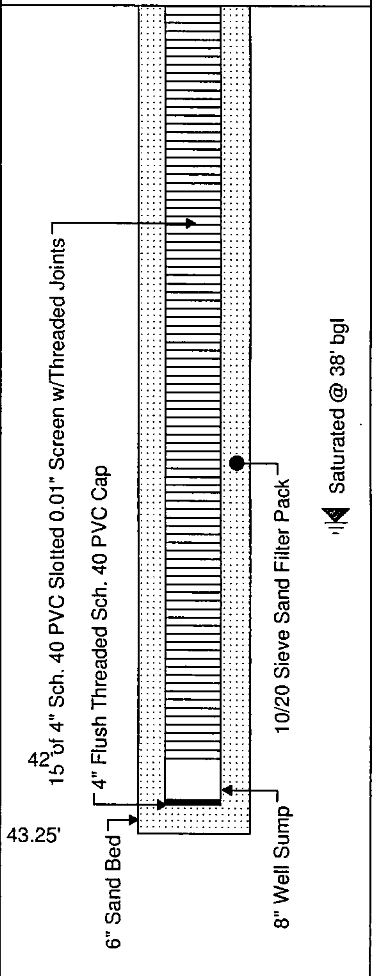
Well No.: MW-66 (AOC 26-9)

Client: Western Refining Southwest, Inc.
Site: SWMU Group #3, Bloomfield Refinery
Job No.: 354 - Bloomfield, NM
Geologist: Tracy Payne
Driller: Enviro-Drill, Inc.
Drilling Rig: CME 75
Drilling Method: Hollow-Stem Auger/ODEX
Sampling Method: Split Spoon
Comments: N36º41.818' W107º58.234'

Total Depth: 43.25' bgl
Ground Water: Saturated @ 38' bgl
Elev., TOC (ft. msl): 5544.625
Elev., PAD (ft. msl): 5542.030
Elev., GL (ft. msl): 5541.979
Site Coordinates:
N 36º41'48.97462" **W** 107º58'14.05858"

Start Date: 4/16/2009
Finish Date: 4/20/2009

Depth (ft.)	Sampling						Recovery (%)	Sample Description	Completion Results
	Sample Depth	Time	Sample Type/Container/No	Saturation	Organic Vapor (ppm)	USCS Class			
31					5.6 68ºF		90	**Silty Clayey Sand (SM/SC)** Fine to medium grain, compact, damp, brown, trace gravel, clayey **Gravelly Sand (SW)** Fine to medium grain, loose, damp, brown, coarse gravel	
33					6.3 68ºF		100	**Gravelly Sand (SW)** Similar to above	
35					25.3 68ºF		30	**Gravelly Sand (SW)** Similar to above	
37	36- 38'	1520	G/2V/ 2E/4J	38'	3939 75ºF		70	**Gravelly Sand (SW)** Medium to coarse grain, loose, damp to moist, brown and gray, coarse gravel, odor	
39							50	**Gravelly Sand (SW)** Similar to above, saturated, odor	
41							100	**Sand (SP)** Medium grain, loose, saturated, gray, odor **Nacimiento Formation Sandy Silty Clay (CL)** Low to moderate plasticity, stiff to very stiff, dry, grayish green	
43								Total Depth = 43.25' BGL	
45									



Appendix F

Field Methods

Field Methods

Pursuant to Section IV of the Order, an investigation of soils and ground water was conducted to determine and evaluate the presence, nature, extent, fate, and transport of contaminants. To accomplish this objective, soil borings and monitoring wells were installed at the SWMU No. 4 Transportation Terminal Sump, SWMU No. 5 Heat Exchanger Bundle Cleaning Area, AOC No. 22 Product Loading Rack and Crude Receiving Loading Racks, AOC No. 23 Southeast Holding Ponds, AOC No. 24 Tank Areas 41 and 43, AOC No. 25 Auxiliary Warehouse and 90-Day Storage Area, and AOC No. 26 Tank Areas 44 and 45.

The soil borings were drilled using hollow-stem auguring (HSA) method or air rotary-ODEX method. The drilling equipment was decontaminated between each borehole using a high pressure potable water wash. All soil borings were drilled to a minimum depth of 10 feet with at least one boring at each of the individual SWMUs/AOCs drilled to the top of saturation, with the exception of SWMU No. 5 where surface soil (i.e., 0-0.5' and 1.5-2') samples were collect. Soil samples were collected continuously and logged by a qualified geologist in accordance with USCS nomenclature. As shown on the boring logs the data recorded included the lithologic interval, symbol, percent recovery and a sample description of the cuttings and core samples, and field screening results. Samples obtained from the borings were screened in the field on 2 foot intervals for evidence of contaminants. Field screening results were used to aid in the selection of soil samples for laboratory analysis. The primary screening methods include: (1) visual examination, (2) olfactory examination, and (3) headspace vapor screening for volatile organic compounds. The headspace vapor screening was conducted using a MiniRae 2000 portable VOC monitor PGM-7600. The instrument was calibrated at the beginning of each work day to a concentration of 100 ppm isobutylene.

Soil samples were collected using split-spoon samplers. The split-spoon samplers were decontaminated between each use using a potable water rinse, an Alconox wash and then a distilled water rinse. In the event that more than one SWMU/AOC was investigated during the day a new batch of wash water and rinse water was prepared prior to decontamination. The decontamination water was collected in buckets and placed in open top 55-gallon drums, which were sealed at the end of each work day. Each drum was labeled. Soil cuttings were also placed in open top 55-gallon drums and were sealed when not in use.

Soil borings completed as permanent monitoring wells were drilled to the top of bedrock (Nacimiento Formation). The depth to separate phase hydrocarbon, if present, and ground water was measured prior to purging the wells of potentially stagnant ground water. Monitoring wells were purged of a minimum of three well volumes prior to sample collection. Field measurements of ground water stabilization parameters included pH, specific conductance, dissolved oxygen concentrations, oxidation-reduction potential, and temperature. Ground water samples were collected with disposable bailers and immediately poured directly into clean laboratory supplied sample containers.

The instrument used to measure ground water stabilization parameters was an Ultrameter 6P manufactured by Myron L Company. The calibration solutions used at the beginning of each day are as follows:

- 4.0 pH solution;
- 7.0 pH solution;
- 10.0 pH solution; and
- 1.413 mS/cm conductivity solution.

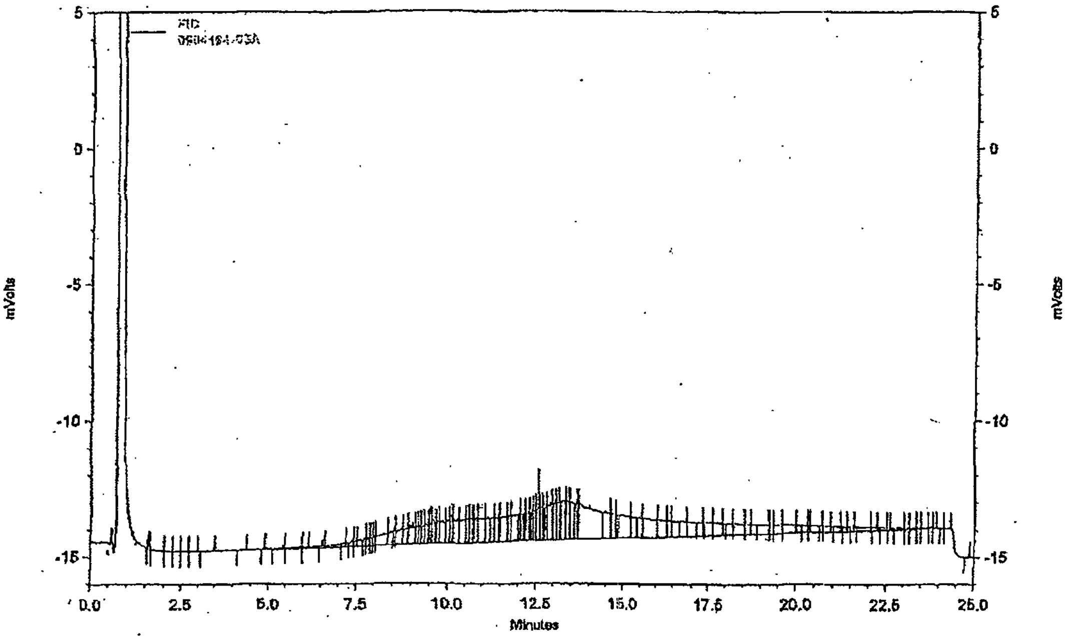
There were no field conditions encountered during the sampling event that affected procedural or sample testing results.

Appendix G

Laboratory Chromatograms

Instument: **GC-17A FID#2 (Offline)** Vial #: **51** User: **System**
Sample ID: **0904194-03A** Data Descritpion: **20x Dilution**

Method: H:\EZsemi\8015dro\Data 2008\Methods\FID #2\DRO FID #2 090319.met
File: H:\EZsemi\8015dro\Data 2008\Data\090417F\0904194-03A 04-18-09 8-15-07 AM.dat
Aquired: 04/18/09 8:25:01 AM



FID Results

Name	Retention Time	Area	ug/ml
DRO		165556	53.102
MRO		238876	35.997
DNOP		8372	~~2.263~~

DNOP Not Recovered Due To Dilution

Analyst S

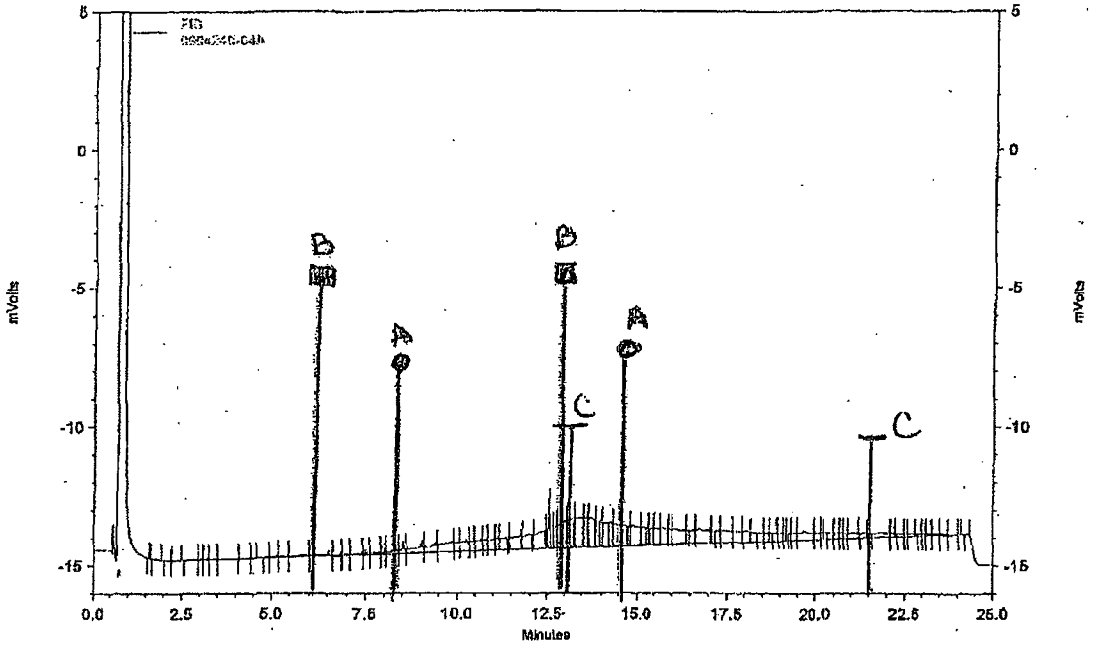
Reviewed By

Single Point From
200ppm Motor Oil
DRO → 50.5
MRO → 62.12

Sample: AOC 22-16 (1.5 - 2.0') - DRO

Instument: **GC-17A FID#2 (Offline)** Vial #: **86** User: **System**
Sample ID: **0904240-04A** Data Descritpion: **20x Dilution**

Method: H:\EZseml\8015dro\Data 2008\Methods\FID #2\DRO FID #2 090319.met
File: H:\EZseml\8015dro\Data 2008\Data\0904240-04A 04-19-09 4-43-56 AM.dat
Aquired: 04/19/09 4:53:51 AM



FID Results

Name	Retention Time	Area	ug/ml
DRO		66985	23.783
MRO		204658	30.620
DNOP		5118	~~1.418~~

Sample: Ā = >50%.
B = 40%
C = >50%

DNP Not Recovered Due to Dilution

Analyst SC

Reviewed By

Single Point From
200ppm Motor Oil
DRO → 20.43

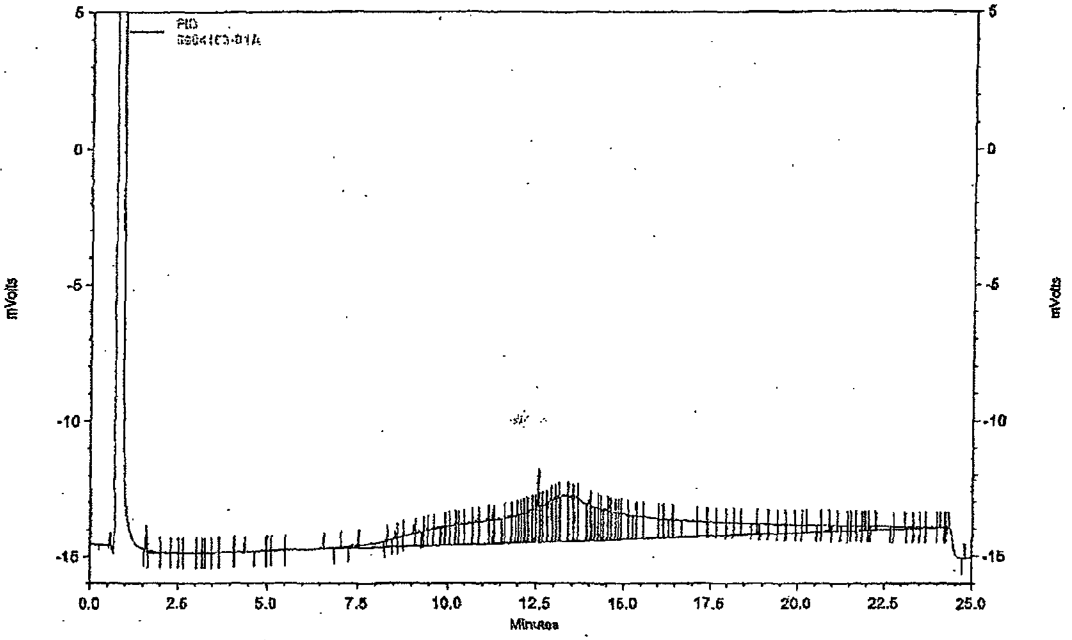
MRO → 53.22

Lab Report: 0904240-04
Sample ID: AOC 22-11 (1.5-2.

Instument: **GC-17A FID#2 (Offline)** Vial #: **75** User: **System**
Sample ID: **0904153-01A** Data Descritpion: **20x Dilution**

Method: H:\EZsemi\8015dro\Data 2008\Methods\FID #2\DRO FID #2 090319.met
File: H:\EZsemi\8015dro\Data 2008\Data\0904153-01A 04-12-09 10-03-52 AM.dat
Aquired: 04/12/09 10:13:47 AM

DRO



FID Results

Name	Retention Time	Area	ug/ml
DRO		121867	40.132
MRO		291208	43.651
DNOP		8324	~~2.264~~

DNOP Not Reported Due to Dilution

Analyst Sc

Reviewed By JK

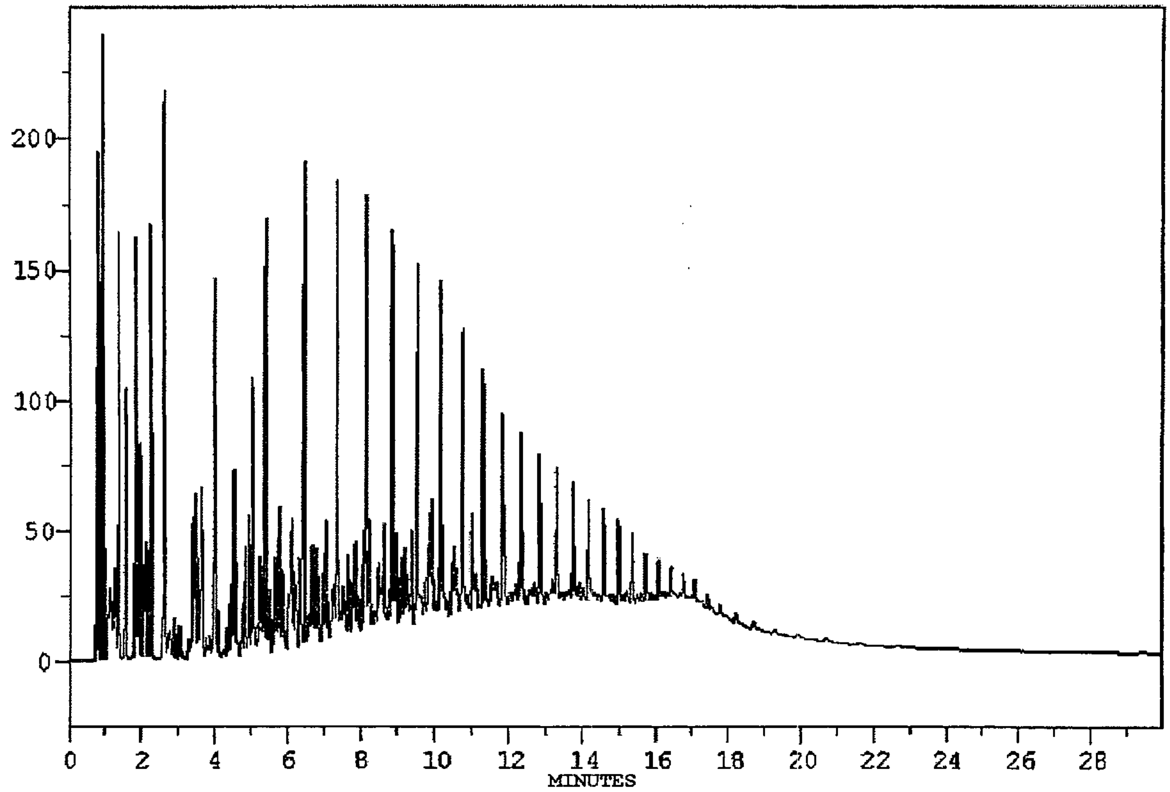
Single Point From
200ppm Motor Oil
DRO → 33.39

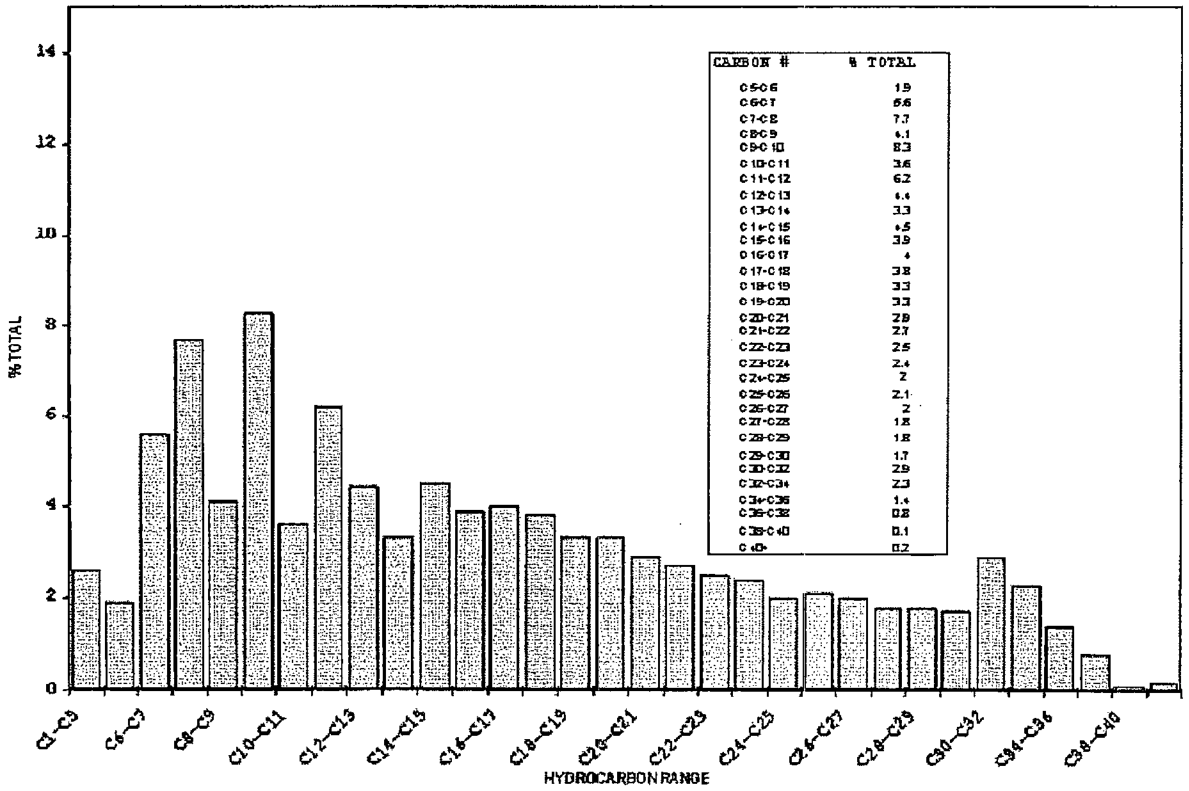
MRO → 88.55

Sample: AOC 22-14(1.5-2.0')

Report: 0904153

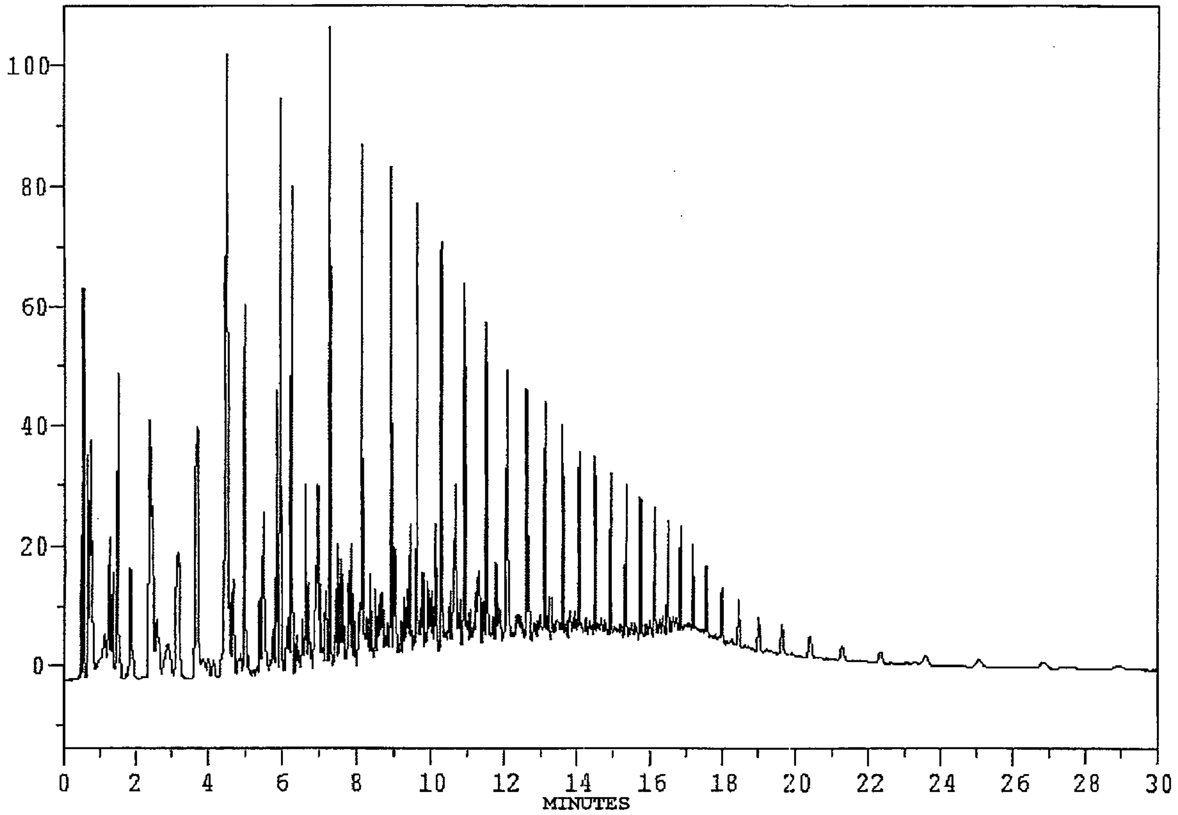
CRUDE OIL SUSSEX FORMATION CAMPBELL CO., WY

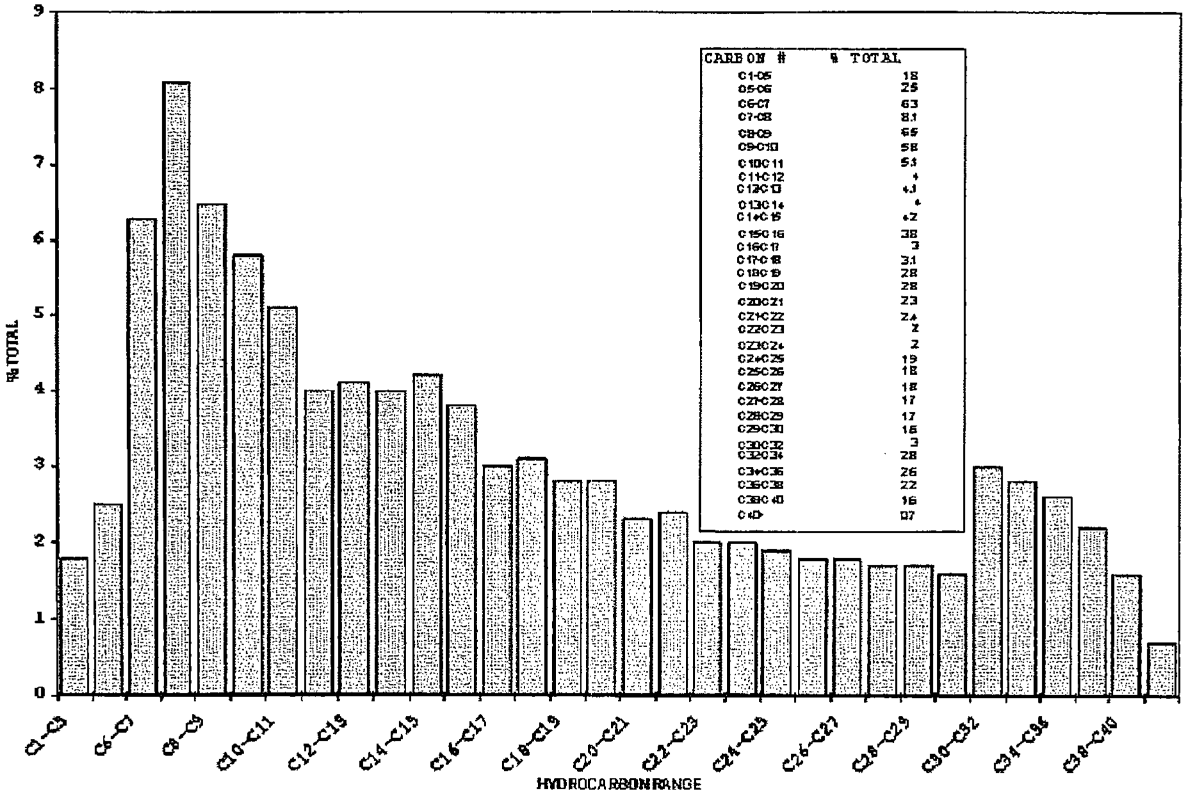




CARBON #	% TOTAL
C5-C6	1.9
C6-C7	5.6
C7-C8	7.7
C8-C9	4.1
C9-C10	8.3
C10-C11	3.6
C11-C12	6.2
C12-C13	4.4
C13-C14	3.3
C14-C15	4.5
C15-C16	3.9
C16-C17	4
C17-C18	3.8
C18-C19	3.3
C19-C20	3.3
C20-C21	2.9
C21-C22	2.7
C22-C23	2.5
C23-C24	2.4
C24-C25	2
C25-C26	2.1
C26-C27	2
C27-C28	1.8
C28-C29	1.8
C29-C30	1.7
C30-C32	2.9
C32-C34	2.3
C34-C36	1.4
C36-C38	0.8
C38-C40	0.1
C40+	0.2

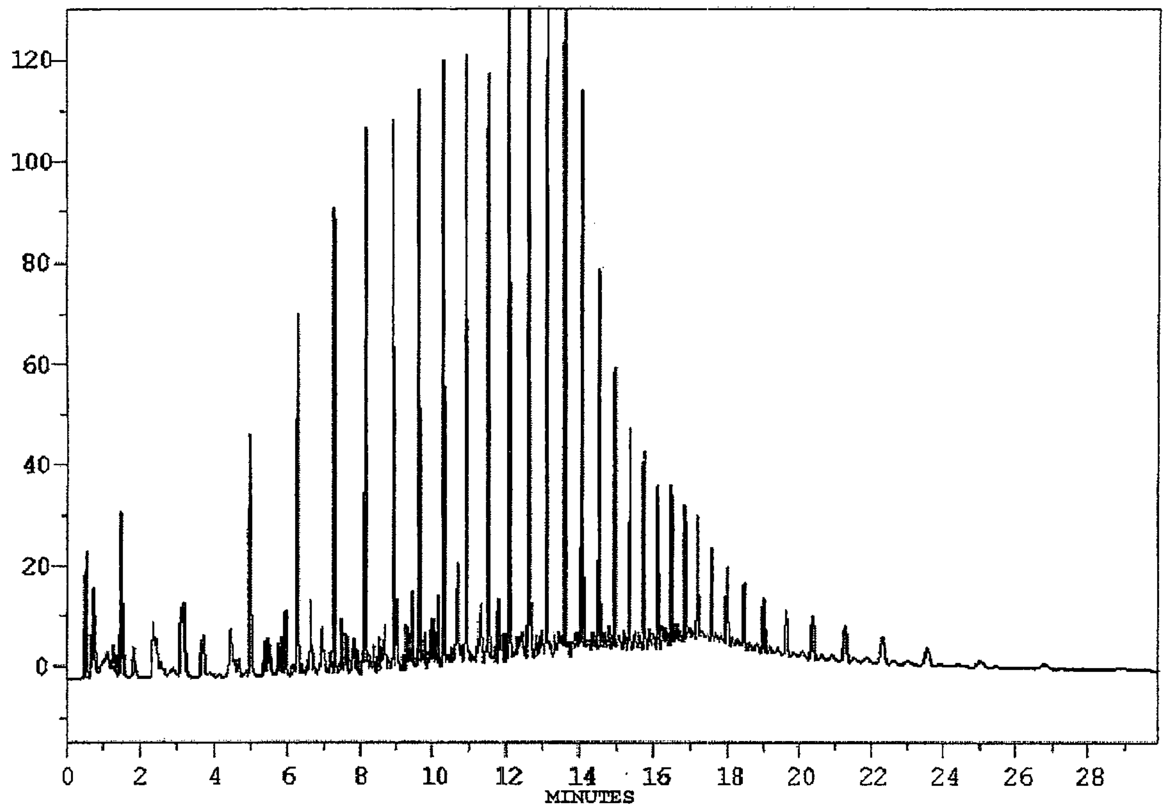
CRUDE OIL MISSION CANYON FORMATION
BILLINGS CO., ND

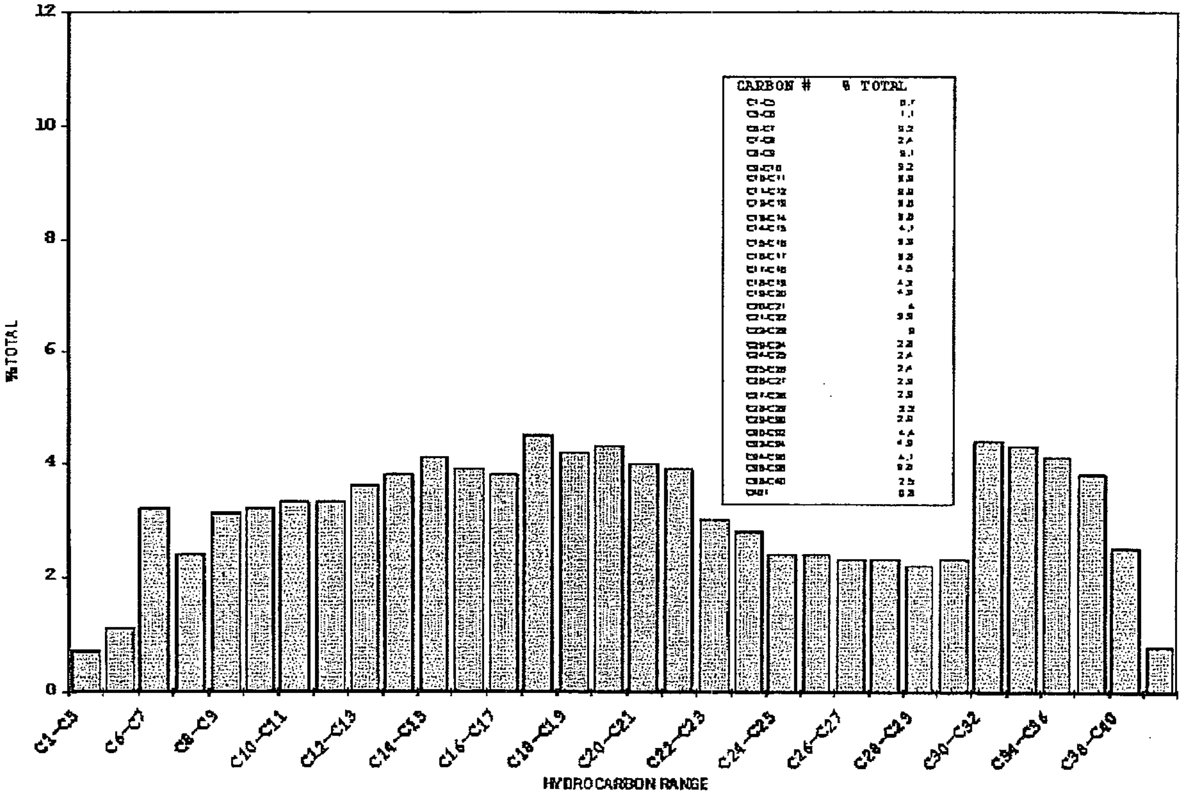


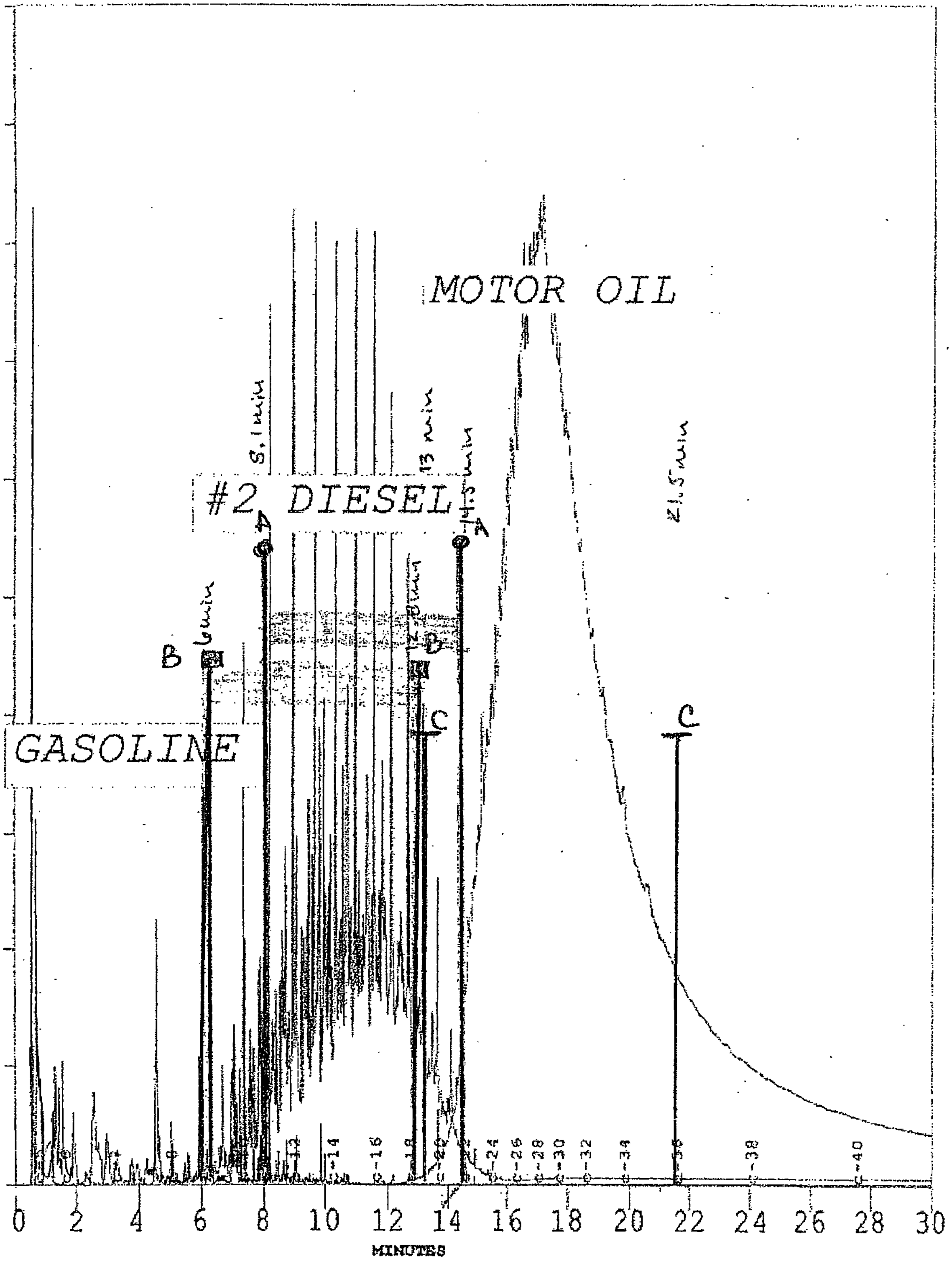


CARBON #	% TOTAL
C1-C5	18
C5-C6	25
C6-C7	63
C7-C8	8.1
C8-C9	65
C9-C10	58
C10C11	5.1
C11-C12	4
C12C13	4.1
C13C14	4
C14C15	4.2
C15C16	38
C16C17	3
C17-C18	3.1
C18C19	28
C19C20	28
C20C21	23
C21-C22	2.4
C22C23	2
C23C24	2
C24C25	19
C25C26	18
C26C27	18
C27-C28	17
C28C29	17
C29C30	16
C30C32	3
C32C34	28
C34C36	26
C36C38	22
C38C40	16
C40+	07

CRUDE OIL TYLER FORMATION BILLINGS CO., ND






MOTOR OIL
#2 DIESEL
GASOLINE
B 6min
8.1min
A
13 min
14.5 min
A
12.8min
B
C
21.5min
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c-14
c-16
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MINUTES

Appendix H

Quality Assurance/Quality Control Review

1.0 Data Validation Introduction

This summary presents data verification results for soil and ground water samples collected from soil boring and monitoring wells installed at the Bloomfield Refinery in accordance with the approved Investigation Work Plan - Group 3. The data review was performed in accordance with the procedures specified in the Order issued by NMED (NMED, 2007), USEPA Functional Guidelines for Organic and Inorganic Data Review, and quality assurance and control parameters set by the project laboratory Hall Environmental Analysis Laboratory, Inc.

A total of 109 soil samples and 18 ground water samples were collected between April 2009 and July 2009 in accordance with the Group 3 Investigation Work Plan. Soil and ground water samples were submitted to Hall Environmental Analysis Laboratory for the following parameters in accordance with the approved Work Plan:

- Volatile organic compounds (VOCs) by USEPA Method 8260B;
- Semi-volatile organic compounds (SVOCs) by USEPA Method 8270;
- Gasoline, diesel, and motor oil range organics by SW-846 Method 8015B;
- Ethanol by SW-846 Method 8015B (AOC 26 samples only);
- Total recoverable metals (Antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, lead, nickel, selenium, silver, vanadium, and zinc) by SW846 Method 6010/6020;
- Cyanide by SW-846 method 9012; and
- Mercury by EPA Method 7470.

In addition as stated in the approved Work Plan, ground water samples submitted to Hall Environmental Analysis Laboratory were analyzed for the following additional analytes:

- Anions (chloride, Nitrate/Nitrite, and sulfate) by USEPA Method 300.0;
- Alkalinity (total alkalinity, carbonate, and bicarbonate) by USEPA Method 310.1;
- Dissolved metals (iron, calcium, magnesium, potassium, and sodium) by USEPA Method 6010B; and
- Total dissolved solids by SM-2540C

Additional analytes reported by the lab, including the analysis of ethanol for designated soil samples, were not required by the Work Plan, and therefore are not listed in their entirely in the summary above. The soil and ground water sample analyses were completed as required by the approved Group 3 Site Investigation Work Plan, with the following exceptions:

Soil Sample Exceptions:

- AOC 22-12 (36-37.75') was inadvertently not analyzed for cyanide due to laboratory miscommunication;
- AOC 22-13 (37-39') was not analyzed for total metals due to limited sample recovery.
- AOC 22-13 (37-39') was not analyzed for SVOCs due to limited sample recovery.

Ground Water Sample Exceptions:

- NO_2+NO_3 was reported for sample MW-59, MW-60, MW-61, MW-62, MW-63, MW-64, MW-65, and MW-66 for at least one sample event in order to report results within the accepted holding time.
- Dissolved manganese was not reported for sample MW-61, MW-62, and MW-65; however total manganese was reported for each of the above mentioned samples.

Additionally, 80 quality assurance samples consisting of trip blanks, field blanks, equipment rinsate blanks, and field duplicates were collected and analyzed as part of the investigation activities. Table A-1 presents a summary of the sample identifications, laboratory sample identifications, and requested analytical parameters.

2.0 Quality Control Parameters Reviewed

Sample results were subject to a Level II data review that includes an evaluation of the following quality control (QC) parameters:

- Chain-of-Custody;
- Sample Preservation and Temperature Upon Laboratory Receipt;
- Holding Times;
- Blank Contamination (method blanks, trip blanks, field blanks, and equipment rinsate blanks);
- Surrogate Recovery (for organic parameters);
- Laboratory Control Sample (LCS) Recovery and Relative Percent Difference (RPD);
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recovery and RPD;
- Duplicates (field duplicate, laboratory duplicate); and
- Other Applicable QC Parameters.

The data qualifiers used to qualify the analytical results associated with QC parameters outside of the established data quality objectives are defined below:

J+	The analyte was positively identified; however, the result should be considered an estimated value with a potential high bias.
J-	The analyte was positively identified; however, the result should be considered an estimated value with a potential low bias.
UJ	The reporting limit is considered an estimated value.
R	Quality control indicates that the data is not usable.

Results qualified as "J+", "J-", or "UJ" are of acceptable data quality and may be used quantitatively to fulfill the objectives of the analytical program, per EPA guidelines.

Results for the performance monitoring events that required qualification based on the data verification are summarized in Table A-2.

2.1 Chain-Of-Custody

The chain-of-custody documentation associated with project samples was found to be complete. Chain-of-custodies included sample identifications, date and time of collection, requested parameters, and relinquished/received signatures.

2.2 Sample Preservation and Temperature Upon Laboratory Receipt

Samples collected were received preserved and intact by Hall Environmental Laboratories, Inc. Samples were received by the laboratory at a temperature of 6.0 degrees Celsius or lower. Data qualification on lower temperature samples was not required.

2.3 Holding Times

All samples were extracted and analyzed within method-specified holding time limits with the exception of the following:

- Orthophosphate was analyzed past its holding time by over 10 days for numerous ground water samples collected from the new monitoring wells. Associated field sample results were rejected, and qualified "R." Orthophosphate was not a required analyte per the approved Work Plan.

2.4 Blank Contamination

2.4.1 Method Blank

Method blanks were analyzed at the appropriate frequency. Target compounds were not detected in the method blanks, with the exception of the following:

- Methylene chloride was detected in numerous analytical method blanks. Associated field sample detections of methylene chloride were most likely the result of laboratory contamination. The analytical laboratory noted issues with their new air ventilation system during the same time frame the samples for Group 3 were being analyzed. This issue was further confirmed by the methylene chloride detections in numerous field method blanks. Refer to **Section 2.4.4 Common Laboratory Contaminants** for additional data qualification information.

- Acetone was detected in numerous analytical method blanks. Associated field sample detections of acetone were most likely the result of laboratory contamination. The analytical laboratory noted issues with their new air ventilation system during the same time frame the samples for Group 3 were being analyzed. This issue was further confirmed by the acetone detections in numerous field method blanks. Refer to **Section 2.4.4 Common Laboratory Contaminants** for additional data qualification information.

2.4.2 Trip Blank

Trip blanks were analyzed at the appropriate frequency as specified in the Order. Target compounds were not detected in the trip blanks.

2.4.3 Field Blanks/Equipment Rinsate Blank

Field and equipment rinsate blanks were collected at the appropriate frequency as specified in the Group 3 Investigation Work Plan. Target compounds were not detected in the field blanks and equipment rinsate blank, with the exception of the following:

- Bromodichloromethane was detected in several field and equipment rinsate blanks. Data qualification was not required because associated samples were non-detect for this analyte.

- Bromoform was detected in the following field and equipment blanks:
    - EBS-041509 at 1.3 ug/L
    - FB-041409 at 1.1 ug/L
    - FB-041509 at 1.5 ug/L
    - FB-042009 at 1.1 ug/L
    - FB-042309 at 1.0 ug/L
    - FB-051409 at 1.0 ug/L

  Data qualification was not required because associated field samples were non-detect for this analyte.

- Chloroform was detected in several field and equipment rinsate blanks. Associated field samples with detected concentrations of chloroform less than 10 time the blank concentration were qualified "J+" to account for a potential high bias.

- Dibromochloromethane was detected in several field and equipment blanks. Data qualification was not required because associated field samples were non-detect for this analyte.

- Chloride was detected in the following field and equipment blanks:
    - EBW-051209 at 2.2 mg/L
    - EBW-051309 at 2.5 mg/L
    - EBW-051409 at 2.2 mg/L
    - EBW-071509 at 1.8 mg/L
    - EBW-071609 at 0.62 mg/L
    - FB-040909 at 0.68 mg/L
    - FB-051209 at 2.2 mg/L
    - FB-051309 at 2.2 mg/L
    - FB-051409 at 2.5 mg/L

- Data qualification was not required because detected concentrations in associated field samples were more than 10 times the blank detected concentration for this analyte.

- Sulfate was detected in the following field and equipment blanks:
    - EBW-051309 at 1.0 mg/L
    - EBW-051409 at 1.1 mg/L
    - FB-051209 at 0.52 mg/L
    - FB-051309 at 0.99

mg/L

- EBW-071509 at 1.0 mg/L
- EBW-071609 at 1.0 mg/L
- FB-051409 at 1.0 mg/L
- FB-071509 at 1.0 mg/L

Data qualification was not required because associated sample results were at concentrations greater than 10 times the blank detected concentration for this analyte.

- Manganese was detected in field blank FB-071509 (0.0034 mg/L). Data qualification was not required because associated samples results were of concentrations greater than 10 times the field blank concentration for this analyte.

- Zinc was detected in field blank FB-051309 (0.021 mg/L). The associated field sample results for MW-63 and MW-64 were qualified "J+" to account for a potential high bias.

2.4.4 Common Laboratory Contaminants

Per USEPA guidelines, common laboratory contaminants for VOC analysis are acetone, 2-butanone (MEK), cyclohexane, and methylene chloride. Common laboratory contaminants for SVOC analysis include phthalates. Analytical results were qualified if the detected sample concentration is less than 10 times the method reporting limit.

- Methylene chloride was detected in several soil samples at concentrations less than 10 times the method reporting limit; therefore the associated field data results were qualified "J+" due to potential laboratory contamination.

- Acetone was detected in several soil samples at concentrations less than 10 times the method reporting limit; therefore the associated data results were qualified "J+" due to potential laboratory contamination.

2.5 Surrogate Recovery

Surrogate recoveries for the organic and inorganic analyses were performed at the required frequency and were within laboratory acceptance limits, with the following exceptions:

- Surrogate recovery for DNOP (0%) was below the lower acceptance limit of 61.7% for the following field samples:
  - SWMU 4-1 (6-8')
  - AOC 24-6 (1.5-2.0')
  - AOC 22-13 (0-0.5')
  - AOC 22-11 (1.5-2.0')
  - SWMU 5-1 (0-0.5')
  - AOC 22-14 (1.5-2.0')
  - AOC 22-13 (37-39')
  - AOC 22-16 (1.5-2.0')
  - AOC 22-4 (1.5-2.0')
  - SWMU 5-3 (0-0.5')

  Low surrogate recovery was due to required sample dilution for analytical analysis; therefore data qualification was not required.

- Surrogate recovery for BFB (218%) was above the upper acceptance limit of 123% for sample AOC 22-4 (1.5-2.0'). Associated data was qualified "J+" to account for the potential high bias.

- Surrogate recovery for BFB (206%) was above the upper acceptance limit of 123% for sample AOC 22-13 (0-0.5'). Associated data was qualified "J+" to account for a potential high bias.

- Surrogate recovery for BFB (364%) was above the upper acceptance limit of 123% for sample AOC 22-13 (18-20'). Associated field data result was qualified "J+" to account for a potential high bias.

- Surrogate recovery for BFB (279%) was above the upper acceptance limit of 123% for sample AOC 22-13 (37-39'). Associated data was qualified "J+" to account for a potential high bias.

- Surrogate recovery for BFB (304%) was above the upper acceptance limit of 123% for sample AOC 22-15 (34-36'). Associated data was qualified "J+" to account for the potential high bias.

- Surrogate recovery for BFB (311%) was above the upper acceptance limit of 122% for sample MW-60. Associated field data was qualified "J+" to account for the potential high bias.

- Surrogate recovery for 2,4,6-Tribromophenol (24.7%) was below the lower acceptance limits of 35.5% for soil sample SWMU 4-1 (6-8'). Data qualification was not required because all other acid and base/neutral fractions were within acceptance limits.

- Surrogate recover for 2,4,6-tribromophenol (30.4%) was below the lower acceptance limit of 35.5% for sample AOC 22-4 (1.5-2.0'). Data qualification was not required and all other surrogates were within acceptance limits.

- Surrogate recovery for 2,4,6-Tribromophenol (32.4%) was below the lower acceptance limit of 35.5% for soil sample AOC 22-13 (1.5-2.0'). Data qualification was not required because all other acid and base/neutral fractions were within acceptance limits.

- Surrogate recovery for 2,4,6-Tribromophenol (32.4%) was below the lower acceptance limits of 35.5% for soil sample AOC 22-13 (1.5-2.0). Data qualification was not required because all other acid and base/neutral fractions were within acceptance limits.

- Surrogate recovery for 2,4,6-Tribromophenol (0%), 2-Fluorophenol (0%), and Nitrobenzene-d5 (0%) were below the lower acceptance limits of 16.6%, 9.5%, and 14.6%, respectively. The low recovery was due to the required dilution for sample analysis; therefore data qualification was not required.

- Surrogate recovery for 2,4,6-Tribromophenol (5.44%) and 2-Fluorophenol (0%) were below the lower acceptance limit of 16.6% and 9.54%, respectively, for ground water sample MW-66. Data qualification was not required because all other acid and base/neutral fractions were within acceptance limits.

- Surrogate recovery for 2,4,6-Tribromophenol (8.94%) was below the lower acceptance limit of 16.6% for ground water sample MW-66. Data qualification was not required because all other acid and base/neutral fractions were within acceptance limits.

- Surrogate recovery for 2-Fluorophenol (0%) was below the lower acceptance limit of 9.54% for ground water sample MW-65 and MW-65 (DUP). Data qualification was not required because all other acid and base/neutral fractions were within acceptance limits.

- Surrogate recovery for 4-Bromofluorobenzene (116%) was above the upper acceptance limit of 111% for sample AOC 22-13 (32-34.5'). Data qualification was not required because remaining acid and base/neutral fractions were within acceptance limits.

- Surrogate recoveries for 4-Bromofluorobenzene (125%) and dibromofluoromethane (114%) were above the upper acceptance limits of 111% and 105%, respectively for field sample AOC 22-13 (18-20'). Data qualification was not required because the other two surrogates were within acceptance limits.

- Surrogate recoveries for 4-Bromofluorobenzene (145%) was above the upper acceptance limits of 130% for field sample AOC 22-13 (0-0.5'). Data qualification was not required because other three surrogates were within acceptance limits.

- Surrogate recoveries for 4-Bromofluorobenzene (67.9%) and Toluene-d8 (68.4%) were below the lower acceptance limits of 70% for sample AOC 22-16 (36-38'). Data qualification was not required because other surrogates were within acceptance limits.

- Surrogate recovery for 4-Bromofluorobenzene (48.1%) was below the lower acceptance limit of 70% for sample AOC 22-15 (34-36'). Data qualification was not required because the other three surrogates were within acceptance limits.

- Surrogate recovery for 4-Bromofluorobenzene (114%) was above the upper acceptance limit of 111% for sample AOC 22-4 (1.5-2.0'). Data qualification was not required because the other three surrogates were within acceptance limits.

- Surrogate recoveries for 4-Bromofluorobenzene (136%) and Toluene-d8 (132%) were above the upper acceptance limits of 130% for analytical bath 18990. Data qualification was not required because other surrogates were within acceptance limits.

- Surrogate recovery for 4-Terphenyl-d14 was below the lower acceptance limit of 22% for sample MW-60. The surrogate recovery was caused by emulsion of the sample during extraction. Data qualification was not required because all other surrogates were within acceptance limits.

- Surrogate recovery for Phenol-d5 (36.3%) is below the lower acceptance limit of 37.6% for sample AOC 22-9 (0-0.5'). Data qualification was not required because the other surrogates were within acceptance limits.

- Surrogate recovery for Toluene-d8 was below the lower acceptance limit of 70% for samples AOC 22-12 (0-0.5') DUP, AOC 22-12 (36-37.75'), and AOC 22-12 (32-35'). Data qualification was not required because the other three surrogates were within acceptance limits.

- Surrogate recovery for toluene-d8 (67.8%) is below the lower acceptance limit of 70% for sample AOC 22-8 (0-0.5'). Data qualification was not required because the other surrogates were within acceptance limits.
- Surrogate recovery for toluene-d8 (69.4%) was below the lower acceptance limit of 70% for sample AOC 22-11 (0-0.5'). Data qualification was not required because the other surrogates were within acceptance limits.

2.6 LCS Recovery and Relative Percent Difference

LCS/LCS duplicates were performed at the required frequency and were evaluated based on the following criteria:

- If the analyte recovery was above acceptance limits for the LCS or LCS duplicate, but the analyte was not detected in the associated batch, then data qualification was not required.
- If the analyte recovery was above acceptance limits for the LCS or LCS duplicate and the analyte was detected in the associated batch, then the analyte results were qualified "J+" to account for a potential high bias.
- If the analyte recovery was below acceptance limits for LCS or LCS duplicate then the analyte results in the associated analytical batch were qualified ("UJ" for non-detects and "J-" for detected results) to account for a potential low bias.

LCS/LCSD percent recoveries and relative percent differences (RPDs) were within acceptance limits except for the following:

- The LCS recovery for 1,1-Dichloroethene (93.9%) and trichloroethene (88.1%) was below the lower acceptance limit of 97.9% and 90.5%, respectively, for analytical batch 33138. The associated field data was non-detect, and therefore qualified "UJ" to account for potential low bias.
- The LCS percent recovery for 1,1-Dichloroethene (95.6%) was below the lower limit of 97.9% for analytical batch 33198. The associated field data was non-detect, and therefore was qualified "UJ" to account for a potential low bias.
- The LCS recovery for 1,1-Dichloroethene (132%) was above the upper acceptance limit of 130% for analytical batch 18946. Data qualification was not required because all associated field samples were non-detect.
- The LCS recovery for 1,1-Dichloroethene (86.1%) was below the lower acceptance limit of 97.9% for analytical batch R33263. The associated field data was non-detect, and therefore qualified "UJ" to account for a potential low bias.
- The LCS recovery for 4-Bromofluorobenzene (136%) and toluene-d8 (132%) were above the upper acceptance limit of 130% for analytical batch 18990. Data

qualification was not required because other two surrogates were within acceptance limits.

- The LCS percent recovery for 4-bromofluorobenzene (137%) and dibromofluoromethane (131%) was above the upper acceptance limit of 130% for analytical batch 19000. Data qualification was not required because the other two surrogates were within limits.
- The LCS percent recovery for chlorobenzene (80.2%) was below the lower acceptance limit of 80.7% for analytical batch R34645. Associated field sample results were qualified "UJ" to account for a potential low bias.
- The LCS percent recovery for trichloroethene (142%) was above the upper acceptance limit of 130% for batch 18838. Data qualification was not required because all associated field samples were non-detect.
- The LCS percent recovery for trichloroethene (140%) was above the upper acceptance limit of 130% for batch 19000. Data qualification was not required because all associated field samples were non-detect.
- The LCS recovery for Antimony (121%) was above the upper acceptance limit of 115% for analytical batch ICPMS4-c_090414A. Data qualification was not required because all associated samples were non-detect.
- The LCS recovery for Antimony (116%) was above the upper acceptance limit of 115% for batch ICPMS4-C_090415A. Data qualification was not required because all associated samples were non-detect.
- The LCS percent recovery for chloride (112%) was above the upper acceptance limit of 110% for analytical batch 33842. Associated field sample results were qualified "J+" to account for a potential high bias.
- The LCS percent recovery for fluoride (112% and 120%) was above the upper acceptance limit of 110% for analytical batch R33842 and R33861, respectively. Associated field sample results were qualified "J+" to account for a potential high bias.

2.7 MS/MSD Recovery and Relative Percent Difference

MS/MSD samples were performed at the required frequency and were evaluated by the following criteria:

- If the MS or MSD recovery for an analyte was above acceptance limits but the analyte was not detected in the associated analytical batch, then data qualification was not required.
- If the MS or MSD recovery for an analyte was above acceptance limits and the analyte was detected in the associated analytical batch, then analyte results were qualified "J+" to account for a potential low bias.

- Low MS/MSD recoveries for inorganic parameters result in sample qualification of the associated analytical batch.
- Results were not qualified based on non-project specific MS/MSD (i.e., batch QC) recoveries.

MS/MSD percent recoveries and RPDs were within acceptance limits except for the following:

- MS/MSD recoveries for Antimony (14.1% / 14.5%) were below the lower The acceptance limit of 75% for analytical batch 18855. Associated field sample results for Antimony were non-detect. Data qualification "UJ" was required to indicate a potential bias for the associated samples.
- The MS/MS duplicate percent recoveries for Antimony (19.9%/32.7%) were below the lower acceptance limit of 75% for analytical batch 18890. The associated field data was qualified "UJ" to account for potential low bias.
- The MS duplicate recovery for selenium (71.3%) and antimony (12.3%) were below the respective low acceptance limit of 75%. Data qualification was not required because the MS recovery and relative percent difference were within acceptance limits.
- The MS/MS duplicate percent recoveries for Antimony (20.3% / 0%) and Selenium (50.6% / 57.6%) were below the lower acceptance limit of 75% for analytical batch 18924. The associated field data was qualified "UJ" to account for potential low bias.
- The MS/MS duplicate recovery for antimony (16.3%/14.6%) were below the lower acceptance limit of 75% for analytical batch 18967. Associated field data results was non-detect; therefore the results were qualified "UJ" for potential low bias.
- The MS/MS duplicate recoveries for antimony (14.6% / 16.3%) were below the lower acceptance limit of 75% for analytical batch 18967. Associated field data was qualified "UJ" for potential low bias.
- The MS/MSD recovery for antimony (25.9%/22.8%) and selenium (57.5%/51.0%) were below the lower acceptance limit of 75% for analytical batch 19089. Associated field samples were non-detect and where therefore qualified "UJ" to account for potential low bias.
- The MS/MSD recovery for antimony (72%/73%) was below the lower acceptance limit of 75% for analytical batch B09071596. Ground water field data was qualified "UJ" for non-detects (MW-64) and "J-" for detected concentrations (MW-66) to account for a potential low bias.
- The MS duplicate recovery for cyanide (111%) was above the upper acceptance limit of 110% for analytical batch B09041656-005MSD. Data qualification was not required because the MS percent recovery was within acceptance limits.
- The MS duplicate percent recovery for cyanide (112%) was above the upper acceptance limit of 110% for analytical batch B09041381-001. Data qualification was not required because the MS percent recovery was within limits.

- The MS duplicate recovery for cyanide (113%) was above the upper acceptance limit of 110% for analytical batch B09042019-006. Data qualification was not required by the MS percent recovery was within acceptance limits.

- The MS recovery for cyanide (89%) was below the lower acceptance limit of 90% for analytical batch 09051460-001. Data qualification was not required because the MSD recovery was within limits.

- The MSD recovery for cyanide (114% and 113%) was above the upper acceptance limit of 110% for analytical batch B09051459 and B09051454. Data qualification was not required because MS recoveries were within acceptance limits.

- The MS/MSD recovery for cyanide (111%/112%) was above the upper acceptance limit of 110% for analytical batch B09051662. Data qualification was not required because the associated field samples were non-detect.

- The MS/MSD recovery for cyanide (81%/82%) was below the lower acceptance limit of 90% for analytical batch AUTOAN201-B_090720A. Associated field data was qualified "UJ" for associated ground water samples to account for a potential low bias.

- The MS/MSD recoveries for cyanide (114%/114%) were above the upper acceptance limit of 110% for analytical batch B09051662-002. Data qualification was not required because all associated field data was non-detect.

- The MS/MSD recoveries for cyanide (117%/117%) were above the upper acceptance limit of 110% for analytical batch B09051671-001. Data qualification was not required because all associated field data was non-detect.

- The MS recovery for selenium (67.9%) was below the lower acceptance limit of 75% for analytical batch 18967. Data qualification was not required because the MS duplicate recovery was within limits.

- The MS recovery for selenium (67.9%) was below the lower acceptance limit of 75% for analytical batch 18967. Data qualification was not required because the MSD recoveries were within acceptance limits.

- The MS/MS duplicate recovery for mercury (152%/133%) was above the upper acceptance limit of 125% for analytical batch 18995. Data qualification was not required because associated sample results were non-detect.

- The MSD recovery for trichloroethene (85.8%) was below the lower acceptance limit of 87.1% for analytical batch R33223. Data qualification was not required because the associated MS recovery was within the acceptance limits.

- The MS duplicate recovery for Gasoline Range Organics (121%) was above the upper acceptance limit of 120% for analytical batch R33224. Data qualification was not required since the MS and relative percent difference were within acceptance limits.

- The MS/MSD percent recoveries for 2,4-Dinitrotoluene (0%), N-Nitrosodi-n-prypylamine (0%), and 1,2,4-Trichlorobenzene (0%) were below the lower acceptance limits of 28%, 28%, and 17.9% respectively, for analytical batch 18828. The relative percent differences were within limits. The associated field sample data was qualified "UJ" to account for potential low bias.

- The MS/MSD surrogate recoveries for 2,4,6-tribromophenol (31.3%/26.0%) and phenol-d5 (34.0%/34.1%) were below the lower acceptance limit of 35.5% and 37.6%, respectively for analytical batch 18828. Data qualification was not required because the remaining surrogates were within acceptance limits.
- The MS/MSD recoveries for benzene (79.6%/80%) and 1,1-Dichloroethene (83.1%/84.4%) were below the lower acceptance limit of 84.9% and 88%, respectively for analytical batch R34645. The associated field data was qualified UJ to account for the potential low bias.
- The MS/MS duplicate relative percent difference for analytical batch R33310 (17.8%) was above the acceptance limit of 15%. Data qualification was not required because the MS/MSD percent recoveries were within acceptance limits.
- The MSD recoveries for toluene (78.1%) and trichloroethene (86.0%) were below the lower acceptance limits of 80.3% and 87.1%, respectively. Data qualification was not required because MS recoveries were within acceptance limits.
- The MS recovery for trichloroethene (115%) was above the upper acceptance limit of 114% for analytical batch 33452. Data qualification was not required because the associated sample results were non-detect.
- The MS recovery for trichloroethene (115%) was above the upper acceptance limit of 114% for analytical batch 33452. Data qualification was not required because the associated field sample results were non-detect.
- The MS duplicate recovery for BFB (118%) was above the upper acceptance limit of 116% for analytical batch R33510. Data qualification was not required because the MS recovery was within acceptance limits.
- The MS/MSD recovery for gasoline range organics (124%/124%) was above the upper acceptance limit of 120% for analytical batch 33529. Data qualification was not required because the associated field samples were non-detect.
- The MS/MS duplicate recovery for gasoline range organics (138%/143%) was above the upper acceptance limit of 115% for analytical batch 33820. Associated field data for MW-59 and MW-60 was qualified J+ due to potential high bias.

2.8 Duplicates

2.8.1 Field Duplicates

Field duplicates were collected at a rate of 10 percent and submitted for analysis. The RPDs between the field duplicate and its associated sample were calculated and are presented in Table A-3. The field duplicates were evaluated by the following criteria:

- If an analyte was detected at a concentration greater than five times the method reporting limit, the RPD should be less than 35 percent for soil and 25 percent for ground water samples.

- If an analyte was detected at a concentration that is less than five times the method reporting limit, then the difference between the sample and the field duplicate should not exceed the method reporting limit.

- Duplicate RPDs are calculated by dividing the difference of the concentrations by the average of the concentrations.

Field duplicate RPDs were within acceptance limits except for the following:

- Chromium for field sample AOC 25-2 (0-0.5');

- Lead for field sample AOC 22-8 (1.5-2.0');

- TPH-MRO, 1,2,4-trimethylbenzene, and barium for field sample AOC 26-8 (0-1.0');

- Chromium and lead for field sample AOC 26-3 (1.5-2.0');

- Acetone for field sample AOC 23-1 (0-0.5');

- Chromium, cobalt, and zinc for field sample AOC 24-4 (1.5-2.0');

- Arsenic for field sample MW-65; and

- Iron for field sample MW-63.

2.9 Other Applicable qc parameters

2.9.1 Calibration

- The 5 ppb continuing standard had a high recovery for acetone at 142.7%. Data qualification was not required because the percent different between the initial and continuing RRFs was less than 25%.

- Bis(2-ethylbexyl)phthalate failed high on the opening standard at 142%. The laboratory acceptance range is 60-140% of the expected value. Data qualification was not required because all other calibration standard recoveries were within acceptance limits.

3.0 Completeness Summary

Two types of completeness were calculated for this project: contract and technical. The following equations were used to calculate the two types of completeness:

$$\%\ \text{Contract Completeness} = \left(\frac{\text{Number of contract compliant results}}{\text{Number of reported results}}\right)\times 100$$

$$\%\ \text{Technical Completeness} = \left(\frac{\text{Number of usable results}}{\text{Number of reported results}}\right)\times 100$$

The overall contract completeness, which includes the evaluation of protocol and contract deviations, which includes the evaluation of the QC parameters listed in Section 2.0, was approximately 94 percent for soil analysis and 96 percent for ground water analysis. The technical completeness attained for Group 3 RCRA Investigation activities was 100 percent. The completeness results are provided in Table A-4. The analytical results for the required analytes per the approved Group 3 Work Plan were considered usable for the intended purposes and the project DQOs have been met.

TABLE A-1
Sampling and Analysis Schedule

Table A-1
Sampling and Analysis Schedule
Group 3 Investigation Report
Western Refining Southwest, Inc. - Bloomfield Refinery

Sample ID	Lab ID	Date Collected	Sample Type
EBS-040509	0907095-01	4/5/2009	EB-Soil
AOC 25-2 (0-0.5')	0904095-02	4/5/2009	N
AOC 25-2 (0-0.5')-DUP	0904095-03	4/5/2009	N
Methanol Blank	0904095-04	na	MB
Trip Blank	0904095-05	na	TB
AOC 25-2 (36-38')	0904095-06	4/5/2009	N
AOC 25-2 (1.5-2.0')	0904095-07	4/5/2009	N
FB-040509	0904095-08	4/5/2009	FB
SWMU 4-1 (0-0.5')	0904098-01	4/6/2009	N
SWMU 4-1 (1.5-2.0')	0904098-02	4/6/2009	N
SWMU 4-1 (6-8')	0904098-03	4/6/2009	N
Methanol Blank	0904098-04	na	MB
Trip Blank	0904098-05	na	TB
FB-040609	0904098-06	4/6/2009	FB
EBS-040609	0904098-07	4/6/2009	EB-Soil
SWMU 4-1 (36-38')	0904107-01	4/6/2009	N
AOC 24-7 (0-0.5')	0904107-02	4/7/2009	N
AOC 24-7 (1.5-2.0')	09047107-03	4/7/2009	N
FB-040709	0904107-04	4/7/2009	FB
EBS-040709	0904107-05	4/7/2009	EB-Soil
Methanol Blank	0904107-06	na	MB
Trip Blank	0904107-07	na	TB
AOC 24-7 (39-42')	0904143-01	4/7/2009	N
AOC 24-5 (0-0.5')	0904143-02	4/8/2009	N
AOC 24-5 (0-0.5') DUP	0904143-03	4/8/2009	N
AOC 24-5 (1.5-2.0')	0904143-04	4/8/2009	N
Methanol Blank	0904143-05	na	MB
AOC 24-6 (0-0.5')	0904143-06	4/8/2009	N
AOC 24-6 (1.5-2.0')	0904143-07	4/8/2009	N
AOC 22-14 (1.5-2.0')	0904153-01	4/8/2009	N
AOC 22-14 (0-0.5')	0904153-02	4/8/2009	N
FB 040809	0904153-03	4/8/2009	FB
Methanol Blank	0904153-04	na	MB
EBS-040809	0904153-05	4/8/2009	EB-Soil
Trip Blank	0904153-06	na	TB
AOC 22-13 (1.5-2.0')	0904155-01	4/8/2009	N
AOC 22-13 (32-34.5')	0904155-02	4/8/2009	N
AOC 22-13 (18-20')	0904155-03	4/8/2009	N
AOC 22-13 (37-39')	0904155-04	4/8/2009	N
Methanol Blank	0904155-05	na	MB
AOC 22-13 (GW)	0904155-06	4/9/2009	N
AOC 22-13 (0-0.5')	0904155-07	4/8/2009	N
Trip Blank	0904155-08	na	TB
FB-040909	0904155-08	4/9/2009	FB
AOC 22-12 (0-0.5')	0904193-01	4/13/2009	N
AOC 22-12 (0-0.5)-DUP	0904193-02	4/13/2009	N
AOC 22-12 (1.5-2.0')	0904193-03	4/13/2009	N
AOC 22-12 (32-35')	0904193-04	4/13/2009	N
AOC 22-12 (36-37.75')	0904193-05	4/13/2009	N
Methanol Blank	0904193-06	na	MB
Trip Blank	0904193-07	na	TB
EBS-041309	0904193-08	4/13/2009	EB-Soil
FB-041309	0904194-01	4/13/2009	FB
AOC 22-16 (0-0.5')	0904194-02	4/13/2009	N
AOC 22-16 (1.5-2.0')	0904194-03	4/13/2009	N
Trip Blank	0904194-04	na	TB
Methanol Blank	0904194-05	na	MB
AOC 22-12 (GW)	0904212-01	4/14/2009	N
Trip Blank	0904212-02	na	TB
AOC 22-16 (36-38')	0904212-03	4/14/2009	N
Methanol Blank	0904212-04	na	MB
AOC 22-8 (1.5-2.0')	0904214-01	4/13/2009	N
AOC 22-8 (1.5-2.0') DUP	0904214-02	4/13/2009	N
AOC 22-9 (0-0.5')	0904214-03	4/13/2009	N
Methanol Blank	0904214-04	na	MB

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Western Refining Southwest, Inc. - Bloomfield Refinery

Sample ID	Lab ID	Date Collected	Sample Type
AOC 22-9 (1.5-2.0')	0904214-05	4/13/2009	N
AOC 22-7 (1.5-2.0')	09042014-06	4/13/2009	N
AOC 22-7 (0-0.5')	0904214-07	4/13/2009	N
AOC 22-8 (0-0.5')	0904214-08	4/13/2009	N
AOC 22-10 (0-0.5')	0904240-01	4/14/2009	N
AOC 22-10 (1.5-2.0')	0904240-02	4/14/2009	N
AOC 22-11 (0-0.5')	0904240-03	4/14/2009	N
AOC 22-11 (1.5-2.0')	0904240-04	4/14/2009	N
FB-041409	0904240-05	4/14/2009	FB
EBS-041409	0904240-06	4/14/2009	EB-Soil
Trip Blank	0904240-07	na	TB
Methanol Blank	0904240-08	na	MB
AOC 22-15 (1.0-0.5')	0904241-01	4/15/2009	N
AOC 22-15 (1.5-2.0')	0904241-02	4/15/2009	N
AOC 22-15 (1.5-2.0') DUP	0904241-03	4/15/2009	N
Methanol Blank	0904241-04	na	MB
AOC 22-15 (30-32')	0904241-05	4/15/2009	N
FB-041509	0904241-06	4/15/2009	FB
Trip Blank	0904241-07	na	TB
AOC 22-15 (34-36')	0904241-08	4/15/2009	N
EBS-041509	0904241-09	4/15/2009	EB-Soil
AOC 26-8 (0-1.0')	0904265-01	4/16/2009	N
AOC 26-8 (0-1.0') DUP	0904265-02	4/16/2009	N
AOC 26-8 (1.5-2.0')	0904265-03	4/16/2009	N
Methanol Blank	0904265-04	na	MB
Trip Blank	0904265-05	na	TB
FB-041609	0904265-06	4/16/2009	FB
EBS-041609	0904265-07	4/16/2009	EB-Soil
AOC 26-8 (32-36')	0904265-08	4/16/2009	N
AOC 22-1 (1.5-2.0')	0904266-01	4/15/2009	N
AOC 22-1 (0-0.5')	0904266-02	4/15/2009	N
AOC 22-2 (0-0.5')	0904266-03	4/15/2009	N
AOC 22-2 (1.5-2.0')	0904266-04	4/15/2009	N
AOC 22-3 (0-0.5')	0904266-05	4/15/2009	N
AOC 22-3 (1.5-2.0')	0904266-06	4/15/2009	N
AOC 22-4 (0-0.5')	0904266-07	4/15/2009	N
AOC 22-4 (1.5-2.0')	0904266-08	4/15/2009	N
Methanol Blank	0904266-09	na	MB
AOC 26-3 (0-0.5')	0904311-01	4/20/2009	N
AOC 26-3 (1.5-2.0')	0904311-02	4/20/2009	N
AOC 26-3 (1.5-2.0') DUP	0904311-03	4/20/2009	N
AOC 26-4 (0-0.5')	0904311-04	4/20/2009	N
AOC 26-4 (1.5-2.0')	0904311-05	4/20/2009	N
Methanol Blank	0904311-06	na	MB
EBS-042009	0904311-07	4/20/2009	EB-Soil
Trip Blank	0904311-08	na	TB
AOC 26-9 (0-0.5')	0904315-01	4/20/2009	N
AOC 26-9 (1.5-2.0')	0904315-02	4/20/2009	N
AOC 26-1 (0-0.5')	0904315-03	4/20/2009	N
AOC 26-1 (1.5-2.0')	0904315-04	4/20/2009	N
FB-042009	0904315-05	4/20/2009	FB
AOC 26-2 (0-0.5')	0904315-06	4/20/2009	N
AOC 26-2 (1.5-2.0')	0904315-07	4/20/2009	N
Trip Blank	0904315-08	na	TB
Methanol Blank	0904315-09	na	MB
AOC 26-5 (0-0.5')	0904356-01	4/20/2009	N
AOC 26-5 (1.5-2.0')	0904356-02	4/20/2009	N
AOC 26-6 (0-0.5')	0904356-03	4/20/2009	N
AOC 26-6 (1.5-2.0')	0904356-04	4/20/2009	N
AOC 26-7 (0-0.5')	0904356-05	4/20/2009	N
AOC 26-7 (1.5-2.0')	0904356-06	4/20/2009	N
AOC 26-9 (36-38')	0904356-08	4/20/2009	N
AOC 23-1 (0-0.5')	0904359-01	4/21/2009	N
AOC 23-1 (0-0.5') DUP	0904359-02	4/21/2009	N
AOC 23-1 (1.5-2.0')	0904359-03	4/21/2009	N
AOC 24-1 (0-0.5')	0904397-01	4/23/2009	N

Table A-1
Sampling and Analysis Schedule
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Sample ID	Lab ID	Date Collected	Sample Type
AOC 24-1 (1.5-2.0')	0904397-02	4/23/2009	N
AOC 24-2 (0-0.5')	0904397-03	4/23/2009	N
AOC 24-2 (1.5-2.0')	0904397-04	4/23/2009	N
AOC 24-3 (0-0.5')	0904397-05	4/23/2009	N
AOC 24-3 (1.5-2.0')	0904397-06	4/23/2009	N
AOC 24-4 (0-0.5')	0904397-07	4/23/2009	N
AOC 24-4 (1.5-2.0')	0904397-08	4/23/2009	N
AOC 24-4 (1.5-2.0) DUP	0904397-09	4/23/2009	N
Methanol Blank	0904397-10	na	MB
FB-042109	0904399-01	4/21/2009	FB
FB-042209	0904399-02	4/22/2009	FB
EBS-042209	0904699-03	4/22/2009	EB-Soil
EBS-042109	0904399-04	4/21/2009	EB-Soil
Trip Blank	0904399-05	na	TB
Methanol Blank	0904399-06	na	MB
AOC 23-1 (52-53')	0904399-07	4/22/2009	N
EBS-042309	0904414-01	4/23/2009	EB-Soil
FB-042309	0904414-02	4/23/2009	FB
Trip Blank	0904414-03	na	TB
Methanol Blank	0904414-04	na	MB
AOC 25-1 (0-0.5')	0904414-05	4/23/2009	N
AOC 25-1 (1.5-2.0')	0904414-06	4/23/2009	N
SWMU 5-1 (0-0.5')	0904415-01	4/23/2009	N
SWMU 5-1 (1.5-2.0')	0904415-02	4/23/2009	N
SWMU 5-2 (0-0.5')	0904415-03	4/23/2009	N
SWMU 5-2 (1.5-2.0')	0904415-04	4/23/2009	N
SWMU 5-3 (0-0.5')	0904415-05	4/23/2009	N
SWMU 5-3 (1.5-2.0')	0904415-06	4/23/2009	N
SWMU 5-4 (0-0.5')	0904415-07	4/23/2009	N
SWMU 5-4 (1.5-2.0')	0904415-08	4/23/2009	N
SWMU 5-5 (0-0.5')	0904415-09	4/23/2009	N
Methanol Blank	0904415-10	na	MB
AOC 22-5 (0-0.5')	0904416-01	4/23/2009	N
AOC 22-5 (1.5-2.0')	0904416-02	4/23/2009	N
AOC 22-6 (0-0.5')	0904416-03	4/23/2009	N
AOC 22-6 (1.5-2.0')	0904416-04	4/23/2009	N
SWMU 5-5 (1.5-2.0')	0904416-05	4/23/2009	N
SWMU 5-5 (1.5-2.0') DUP	0904416-06	4/23/2009	N
SWMU 5-6 (0-0.5')	0904416-07	4/23/2009	N
SWMU 5-6 (1.5-2.0')	0904416-08	4/23/2009	N
Methanol Blank	0904416-09	na	MB
MW-62	0905247-01	5/13/2009	N
EBW-051209	0905247-02	5/12/2009	EB-Water
MW-61	0905247-03	5/13/2009	N
Trip Blank	0905247-04	na	TB
FB-051209	0905247-05	5/12/2009	FB
MW-59	0905297-01	5/14/2009	N
EBW-051409	0905297-02	5/14/2009	EB-Water
MW-60	0905297-03	5/14/2009	N
FB-051409	0905297-04	5/14/2009	FB
Trip Blank	0905297-05	na	TB
MW-66	0905258-01	5/12/2009	N
Trip Blank	0905258-02	na	TB
MW-65	0905258-03	5/12/2009	N
MW-65 (DUP)	0905258-04	5/12/2009	N
MW-64	0905299-01	5/13/2009	N
FB-051309	0905299-02	5/13/2009	FB
MW-63	0905299-03	5/13/2009	N
EBW-051309	0905299-04	5/13/2009	EB-Water
Trip Blank	0905299-05	na	TB
MW-64	0907285-01	7/15/2009	N
Trip Blank	0907285-02	na	TB
MW-66	0907285-03	7/15/2009	N
MW-63	0907286-01	7/15/2009	N

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Sample ID	Lab ID	Date Collected	Sample Type
Trip Blank	0907286-02	na	TB
MW-63 (DUP)	0907286-03	7/15/2009	N
MW-61	0907314-01	7/16/2009	N
Trip Blank	0907314-02	na	TB
MW-65	0907314-03	7/16/2009	N
MW-59	0907314-04	7/16/2009	N
MW-62	0907315-01	7/16/2009	N
EBW-071509	0907315-02	7/15/2009	EB-Water
FB-071509	0907315-03	7/15/2009	FB
Trip Blank	0907315-04	na	TB
EBW-071609	0907318-01	7/16/2009	EB-Water
FB-071609	0907318-02	7/16/2009	FB
TW-01	0907559-01	7/29/2009	N
Trip Blank	0907559-02	na	TB

Notes:

VOCs = Volatile Organic Compounds
N = Normal field sample
FD = Field duplicate
na = not applicable

TB = Trip Blank
EB = Equipment Blank
MB = Methanol Blank

TABLE A-2
Qualified Data

Table A-2
Qualified Data
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Sample ID	Date Collected	Analyte	Result	Units	Matrix	Qualifier	Comments
AOC 22-13 (0-0.5')	4/8/2009	1,1-Dichloroethene	< 1.10	µg/Kg-dry	Soil	UJ	Qualified due to low LCS recovery
AOC 22-13 (1.5-2.0')	4/8/2009	1,1-Dichloroethene	< 1.0	mg/Kg	Soil	UJ	Qualified due to low LCS recovery
AOC 22-13 (18-20')	4/8/2009	1,1-Dichloroethene	< 0.50	mg/Kg	Soil	UJ	Qualified due to low LCS recovery
AOC 22-13 (32-34.5')	4/8/2009	1,1-Dichloroethene	< 0.050	mg/Kg	Soil	UJ	Qualified due to low LCS recovery
AOC 22-13 (37-39')	4/8/2009	1,1-Dichloroethene	< 5.0	mg/Kg	Soil	UJ	Qualified due to low LCS recovery
AOC 22-16 (36-38')	4/14/2009	1,1-Dichloroethene	< 0.965	µg/Kg-dry	Soil	UJ	Qualified due to low LCS recovery
MW-62	7/16/2009	1,1-Dichloroethene	< 1.0	µg/L	GW	UJ	Qualified due to low MS/MSD recovery
SWMU 4-1 (0-0.5')	4/6/2009	1,1-Dichloroethene	< 0.050	mg/Kg	Soil	UJ	Qualified due to low LCS recovery
SWMU 4-1 (0-0.5')	4/6/2009	1,1-Dichloroethene	< 0.933	µg/Kg-dry	Soil	UJ	Qualified due to low LCS recovery
SWMU 4-1 (1.5-2.0')	4/6/2009	1,1-Dichloroethene	< 0.050	mg/Kg	Soil	UJ	Qualified due to low LCS recovery
SWMU 4-1 (1.5-2.0')	4/6/2009	1,1-Dichloroethene	< 0.991	µg/Kg-dry	Soil	UJ	Qualified due to low LCS recovery
SWMU 4-1 (36-38')	4/6/2008	1,1-Dichloroethene	< 1.02	ug/kg-dry	Soil	UJ	Qualified due to low LCS recovery
SWMU 4-1 (6-8')	4/6/2009	1,1-Dichloroethene	< 0.10	mg/Kg	Soil	UJ	Qualified due to low LCS recovery
AOC 22-13 (0-0.5')	4/8/2009	1,2,4-Trichlorobenzene	< 1.10	µg/Kg-dry	Soil	UJ	Qualified due to low MS/MSD recovery
AOC 22-13 (1.5-2.0')	4/8/2009	1,2,4-Trichlorobenzene	< 1.0	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery
AOC 22-13 (18-20')	4/8/2009	1,2,4-Trichlorobenzene	< 0.50	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery
AOC 22-13 (32-34.5')	4/8/2009	1,2,4-Trichlorobenzene	< 0.050	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery
AOC 22-13 (0-0.5')	4/8/2009	2,4-Dinitrotoluene	< 2.5	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery
AOC 22-13 (1.5-2.0')	4/8/2009	2,4-Dinitrotoluene	< 5.0	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery
AOC 22-13 (18-20')	4/8/2009	2,4-Dinitrotoluene	< 0.50	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery
AOC 22-13 (32-34.5')	4/8/2009	2,4-Dinitrotoluene	< 0.50	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery
AOC 22-12 (32-35')	4/13/2009	Acetone	30.1	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-12 (36-37.75')	4/13/2009	Acetone	21.0	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 23-1 (0-0.5')	4/21/2009	Acetone	13.6	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 23-1 (0-0.5') DUP	4/21/2009	Acetone	25.4	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 23-1 (1.5-2.0')	4/21/2009	Acetone	26.2	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 23-1 (52-53')	4/22/2009	Acetone	16.2	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 24-7 (39-42')	4/7/2009	Acetone	7.80	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 25-1 (0-0.5')	4/23/2009	Acetone	176	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 25-1 (1.5-2.0')	4/23/2009	Acetone	33.9	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 25-2 (36-38')	4/5/2009	Acetone	4.21	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-1 (0-0.5')	4/20/2009	Acetone	15.9	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-1 (1.5-2.0')	4/20/2009	Acetone	9.75	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-2 (0.0.5')	4/20/2009	Acetone	15.3	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-2 (1.5-2.0')	4/20/2009	Acetone	10.6	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-4 (1.5-2.0')	4/20/2009	Acetone	5.06	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-5 (0-0.5')	4/20/2009	Acetone	44.8	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-5 (1.5-2.0')	4/20/2009	Acetone	7.14	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-6 (0-0.5')	4/20/2009	Acetone	49.8	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-6 (1.5-2.0')	4/20/2009	Acetone	6.34	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-7 (0-0.5')	4/20/2009	Acetone	78.0	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-7 (1.5-2.0')	4/20/2009	Acetone	25.8	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-9 (0-0.5')	4/20/2009	Acetone	7.73	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-9 (1.5-2.0')	4/20/2009	Acetone	6.71	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
SWMU 5-1 (0-0.5')	4/23/2009	Acetone	8.35	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
SWMU 5-1 (1.5-2.0')	4/23/2009	Acetone	5.74	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.

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SWMU 5-2 (0-0.5')	4/23/2009	Acetone	7.89	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
SWMU 5-2 (1.5-2.0')	4/23/2009	Acetone	6.05	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
SWMU 5-3 (0-0.5')	4/23/2009	Acetone	8.43	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
SWMU 5-3 (1.5-2.0')	4/23/2009	Acetone	7.89	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
SWMU 5-4 (0-0.5')	4/23/2009	Acetone	11.1	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
SWMU 5-4 (1.5-2.0')	4/23/2009	Acetone	19.6	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
SWMU 5-5 (0-0.5')	4/23/2009	Acetone	20.7	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-7 (0-0.5')	4/13/2009	Antimony	< 2.5	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery.
AOC 22-7 (1.5-2.0)	4/13/2009	Antimony	< 2.5	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery.
AOC 22-8 (1.5-2.0)	4/13/2009	Antimony	< 2.5	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery.
AOC 22-8 (1.5-2.0) DUP	4/13/2009	Antimony	< 2.5	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery.
AOC 22-9 (0-0.5)	4/13/2009	Antimony	< 2.5	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery.
AOC 22-9 (1.5-2.0')	4/13/2009	Antimony	< 2.5	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery.
AOC 23-1 (0-0.5')	4/21/2009	Antimony	< 2.5	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery.
AOC 23-1 (0-0.5') DUP	4/21/2009	Antimony	< 2.5	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery.
AOC 23-1 (1.5-2.0')	4/21/2009	Antimony	< 2.5	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery.
AOC 23-1 (52-53')	4/22/2009	Antimony	<2.5	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery.
AOC 25-2 (0-0.5')	4/5/2009	Antimony	< 12	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery.
AOC 25-2 (0-0.5')-DUP	4/5/2009	Antimony	< 2.5	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery.
AOC 25-2 (1.5-2.0')	4/5/2009	Antimony	< 2.5	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery.
AOC 25-2 (36-38')	4/5/2009	Antimony	< 2.5	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery.
AOC 26-3 (0-0.5')	4/20/2009	Antimony	< 12	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery.
AOC 26-3 (1.5-2.0')	4/20/2009	Antimony	< 12	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery.
AOC 26-3 (1.5-2.0') DUP	4/20/2009	Antimony	< 13	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery.
AOC 26-4 (0-0.5')	4/20/2009	Antimony	< 12	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery.
AOC 26-4 (1.5-2.0')	4/20/2009	Antimony	< 13	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery.
MW-63	7/15/2009	Antimony	<0.001	mg/L	GW	UJ	Qualified due to low MS/MSD recovery.
MW-63 (DUP)	7/15/2009	Antimony	<0.001	mg/L	GW	UJ	Qualified due to low MS/MSD recovery.
MW-64	7/15/2009	Antimony	<0.001	mg/L	GW	UJ	Qualified due to low MS/MSD recovery.
MW-66	7/15/2009	Antimony	0.004	mg/L	GW	J-	Qualified due to low MS/MSD recovery.
SWMU 5-6 (1.5-2.0')	4/23/2009	Antimony	< 2.5	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery.
MW-62	7/16/2009	Benzene	< 1.0	µg/L	GW	UJ	Qualified due to low MS/MSD recovery.
MW-61	5/13/2009	Chloride	67	mg/L	GW	J+	Qualified due to high LCS recovery.
MW-62	5/13/2009	Chloride	15	mg/L	GW	J+	Qualified due to high LCS recovery.
MW-62	5/13/2009	Chlorobenzene	< 1.0	µg/L	GW	UJ	Qualified due to low LCS recovery.
MW-60	5/14/2009	Chloroform	1.2	ug/L	GW	J+	Qualified due to equipment blank detection.
MW-63	7/15/2009	Cyanide	<0.005	mg/L	GW	UJ	Qualified due to low MS/MSD recovery.
MW-63 (DUP)	7/15/2009	Cyanide	<0.005	mg/L	GW	UJ	Qualified due to low MS/MSD recovery.
MW-64	7/15/2009	Cyanide	<0.005	mg/L	GW	UJ	Qualified due to low MS/MSD recovery.
MW-66	7/15/2009	Cyanide	<0.005	mg/L	GW	UJ	Qualified due to low MS/MSD recovery.
MW-65	5/12/2009	Fluoride	0.21	mg/L	GW	J+	Qualified due to high LCS recovery
MW-65 (DUP)	5/12/2009	Fluoride	0.22	mg/L	GW	J+	Qualified due to high LCS recovery
MW-66	5/12/2009	Fluoride	0.22	mg/L	GW	J+	Qualified due to high LCS recovery
AOC 22-13 (0-0.5')	4/8/2009	Gasoline Range Organics (GRO)	180	mg/Kg	Soil	J+	Qualified due to high surrogate recovery
AOC 22-13 (18-20')	4/8/2009	Gasoline Range Organics (GRO)	1300	mg/Kg	Soil	J+	Qualified due to high surrogate recovery
AOC 22-13 (37-39')	4/8/2009	Gasoline Range Organics (GRO)	5500	mg/Kg	Soil	J+	Qualified due to high surrogate recovery
AOC 22-15 (34-36')	4/15/2009	Gasoline Range Organics (GRO)	15	mg/Kg	Soil	J+	Qualified due to high surrogate recovery

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AOC 22-4 (1.5-2.0)	4/15/2009	Gasoline Range Organics (GRO)	2200	mg/Kg	Soil	J+	Qualified due to high surrogate recovery
MW-59	*5/14/2009*	*Gasoline Range Organics (GRO)*	*2.6*	*mg/L*	*GW*	*J+*	*Qualified due to high MS/MSD recovery*
MW-60	5/14/2009	Gasoline Range Organics (GRO)	0.15	mg/L	GW	J+	Qualified due to high surrogate recovery, and high MS/MSD recovery
AOC 22-1 (0.0.5')	4/15/2009	Methylene chloride	8.24	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-1 (1.5-2.0')	4/15/2009	Methylene chloride	10.3	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-10 (0-0.5')	4/14/2009	Methylene chloride	10.6	µg/Kg-dry	Soil	J+	*Qualified due to potential laboratory contamination.*
AOC 22-10 (1.5'-2.0')	4/14/2009	Methylene chloride	9.42	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-11 (0-0.5')	4/14/2009	Methylene chloride	9.64	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-11 (1.5'-2.0')	4/14/2009	Methylene chloride	11.4	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-12 (0-0.5')	4/13/2009	Methylene Chloride	6.76	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-12 (0-0.5') DUP	4/13/2009	Methylene Chloride	5.77	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-12 (1.5-2.0')	4/13/2009	Methylene Chloride	7.36	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-12 (32-35')	4/13/2009	Methylene Chloride	7.43	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-12 (36-37.75')	4/13/2009	Methylene Chloride	8.30	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-13 (0-0.5')	4/8/2009	Methylene Chloride	14	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-14 (1.5-2.0')	4/8/2009	Methylene Chloride	2.02	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-15 (1.0-1.5')	4/15/2009	Methylene chloride	16.3	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-15 (1.5-2.0')	4/15/2009	Methylene chloride	11.0	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-15 (1.5-2.0') DUP	4/15/2009	Methylene chloride	9.09	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-15 (30-32')	4/15/2009	Methylene chloride	12.1	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-15 (34-36')	4/15/2009	Methylene chloride	15.6	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-16 (0-0.5')	4/13/2009	Methylene Chloride	8.85	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-16 (1.5-2.0')	4/13/2009	Methylene Chloride	7.26	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-16 (36-38')	4/14/2009	Methylene Chloride	13.2	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-2 (0-0.5')	4/15/2009	Methylene chloride	7.26	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-2 (1.5-2.0')	4/15/2009	Methylene chloride	9.35	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-3 (0-0.5')	4/15/2009	Methylene chloride	8.30	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-3 (1.5'-2.0')	4/15/2009	Methylene chloride	11.0	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-4 (0-0.5')	4/15/2009	Methylene chloride	8.26	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-5 (0-0.5')	4/23/2009	Methylene chloride	2.02	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-5 1.5-2.0')	4/23/2009	Methylene chloride	2.22	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-6 (1.5-2.0')	4/23/2009	Methylene chloride	7.05	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-7 (0-0.5')	4/13/2009	Methylene chloride	9.29	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-7 (1.5-2.0)	4/13/2009	Methylene chloride	12.3	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-8 (0-0.5')	4/13/2009	Methylene chloride	3.29	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-8 (1.5-2.0)	4/13/2009	Methylene chloride	9.01	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-8 (1.5-2.0) DUP	4/13/2009	Methylene chloride	8.71	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-9 (0-0.5)	4/13/2009	Methylene chloride	8.83	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 22-9 (1.5-2.0')	4/13/2009	Methylene chloride	11.1	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 23-1 (0-0.5')	4/21/2009	Methylene chloride	8.75	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 23-1 (0-0.5') DUP	4/21/2009	Methylene chloride	8.12	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 23-1 (1.5-2.0')	4/21/2009	Methylene chloride	8.91	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 23-1 (52-53')	4/22/2009	Methylene Chloride	113	µg/Kg-dry	Soil	J+	*Qualified due to potential laboratory contamination.*
AOC 24-1 (0-0.5')	4/23/2009	Methylene chloride	2.59	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 24-1 (1.5-2.0')	4/23/2009	Methylene chloride	2.77	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 24-2 (0-0.5')	4/23/2009	Methylene chloride	3.11	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 24-2 (1.5-2.0')	4/23/2009	Methylene chloride	4.46	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.

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AOC 24-3 (0-0.5')	4/23/2009	Methylene chloride	2.13	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 24-4 (0-0.5')	4/23/2009	Methylene chloride	3.48	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 24-4 (1.5-2.0')	4/23/2009	Methylene chloride	5.49	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 24-4 (1.5-2.0') DUP	4/23/2009	Methylene chloride	3.85	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 24-5 (0-0.5')	4/8/2009	Methylene Chloride	2.42	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 24-5 (1.5-2.0')	4/8/2009	Methylene Chloride	2.18	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 24-7 (0-0.5')	4/7/2009	Methylene Chloride	2.37	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 24-7 (1.5-2.0')	4/7/2009	Methylene Chloride	2.39	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 24-7 (39-42')	4/7/2009	Methylene Chloride	2.71	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 25-1 (0-0.5')	4/23/2009	Methylene Chloride	8.39	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 25-1 (1.5-2.0')	4/23/2009	Methylene Chloride	25.8	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-1 (0-0.5')	4/20/2009	Methylene chloride	7.64	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-1 (1.5-2.0')	4/20/2009	Methylene chloride	5.85	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-2 (0.0.5')	4/20/2009	Methylene chloride	5.81	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-2 (1.5-2.0')	4/20/2009	Methylene chloride	6.43	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-3 (0-0.5')	4/20/2009	Methylene chloride	8.97	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-3 (1.5-2.0')	4/20/2009	Methylene chloride	9.83	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-3 (1.5-2.0') DUP	4/20/2009	Methylene chloride	10.8	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-4 (0.0.5')	4/20/2009	Methylene chloride	7.78	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-4 (1.5-2.0')	4/20/2009	Methylene chloride	7.58	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-5 (0-0.5')	4/20/2009	Methylene chloride	6.28	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-5 (1.5-2.0')	4/20/2009	Methylene chloride	7.83	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-6 (0-0.5')	4/20/2009	Methylene chloride	4.63	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-6 (1.5-2.0')	4/20/2009	Methylene chloride	7.82	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-7 (0-0.5')	4/20/2009	Methylene chloride	5.14	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-7 (1.5-2.0')	4/20/2009	Methylene chloride	6.38	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-8 (0-1.0')	4/16/2009	Methylene chloride	8.24	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-8 (0-1.0') DUP	4/16/2009	Methylene chloride	9.76	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-8 (32-36')	4/16/2009	Methylene chloride	8.38	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-9 (0-0.5')	4/20/2009	Methylene chloride	5.73	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-9 (1.5-2.0')	4/20/2009	Methylene chloride	6.57	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-8 (0-1.0') DUP	4/16/2009	Methylene chloride	10.5	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
AOC 26-8 (1.5-2.0')	4/16/2009	Methylene chloride	9.76	µg/Kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
SWMU 4-1 (1.5-2.0')	4/6/2009	Methylene Chloride	2.29	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
SWMU 4-1 (36-38')	4/6/2008	Methylene Chloride	2.29	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
SWMU 5-1 (0-0.5')	4/23/2009	Methylene chloride	4.05	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
SWMU 5-1 (1.5-2.0')	4/23/2009	Methylene chloride	2.49	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
SWMU 5-2 (0-0.5')	4/23/2009	Methylene chloride	14.3	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
SWMU 5-2 (1.5-2.0')	4/23/2009	Methylene chloride	3.28	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
SWMU 5-3 (0-0.5')	4/23/2009	Methylene chloride	20.1	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
SWMU 5-3 (1.5-2.0')	4/23/2009	Methylene chloride	2.98	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
SWMU 5-4 (0-0.5')	4/23/2009	Methylene chloride	10.9	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
SWMU 5-4 (1.5-2.0')	4/23/2009	Methylene chloride	7.32	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
SWMU 5-5 (0-0.5')	4/23/2009	Methylene chloride	5.72	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
SWMU 5-5 (1.5-2.0')	4/23/2009	Methylene chloride	6.70	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
SWMU 5-5 (1.5-2.0') DUP	4/23/2009	Methylene chloride	4.67	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
SWMU 5-6 (0-0.5')	4/23/2009	Methylene chloride	5.68	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.

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SWMU 5-6 (1.5-2.0')	4/23/2009	Methylene chloride	2.52	ug/kg-dry	Soil	J+	Qualified due to potential laboratory contamination.
SWMU 4-1 (6-8')	4/6/2009	Motor Oil Range Organics (MRO)	4000	mg/Kg	Soil	J-	Qualified due to low surrogate recovery
AOC 22-13 (0-0.5')	4/8/2009	N-Nitrosodi-n-propylamine	< 1.0	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery
AOC 22-13 (1.5-2.0')	4/8/2009	N-Nitrosodi-n-propylamine	< 2.0	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery
AOC 22-13 (18-20')	4/8/2009	N-Nitrosodi-n-propylamine	< 0.20	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery
AOC 22-13 (32-34.5')	4/8/2009	N-Nitrosodi-n-propylamine	< 0.20	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery
MW-59	5/14/2009	Phosphorus, Orthophosphate (As P)	< 0.50	mg/L	GW	R	Rejected due to analyzed past holding time
MW-59	7/16/2009	Phosphorus, Orthophosphate (As P)	< 0.50	mg/L	GW	R	Rejected due to analyzed past holding time
MW-60	5/14/2009	Phosphorus, Orthophosphate (As P)	< 0.50	mg/L	GW	R	Rejected due to analyzed past holding time
MW-61	5/13/2009	Phosphorus, Orthophosphate (As P)	< 0.50	mg/L	GW	R	Rejected due to analyzed past holding time
MW-61	7/16/2009	Phosphorus, Orthophosphate (As P)	< 0.50	mg/L	GW	R	Rejected due to analyzed past holding time
MW-62	5/13/2009	Phosphorus, Orthophosphate (As P)	< 0.50	mg/L	GW	R	Rejected due to analyzed past holding time
MW-63	7/16/2009	Phosphorus, Orthophosphate (As P)	< 0.50	mg/L	GW	R	Rejected due to analyzed past holding time
MW-64	5/13/2009	Phosphorus, Orthophosphate (As P)	< 0.50	mg/L	GW	R	Rejected due to analyzed past holding time
MW-65	5/12/2009	Phosphorus, Orthophosphate (As P)	< 0.50	mg/L	GW	R	Rejected due to analyzed past holding time
MW-65	7/16/2009	Phosphorus, Orthophosphate (As P)	< 0.50	mg/L	GW	R	Rejected due to analyzed past holding time
MW-65 (DUP)	7/16/2009	Phosphorus, Orthophosphate (As P)	< 0.50	mg/L	GW	R	Rejected due to analyzed past holding time
MW-66	5/12/2009	Phosphorus, Orthophosphate (As P)	< 0.50	mg/L	GW	R	Rejected due to analyzed past holding time
AOC 26-3 (0-0.5')	4/20/2009	Selenium	< 12	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery
AOC 26-3 (1.5-2.0')	4/20/2009	Selenium	< 12	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery
AOC 26-3 (1.5-2.0') DUP	4/20/2009	Selenium	< 13	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery
AOC 26-4 (0.0.5')	4/20/2009	Selenium	< 12	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery
AOC 26-4 (1.5-2.0')	4/20/2009	Selenium	< 13	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery
SWMU 5-5 (1.5-2.0')	4/23/2009	Selenium	< 13	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery
SWMU 5-6 (1.5-2.0')	4/23/2009	Selenium	< 13	mg/Kg	Soil	UJ	Qualified due to low MS/MSD recovery
SWMU 4-1 (0-0.5')	4/6/2009	Trichloroethene (TCE)	< 0.050	mg/Kg	Soil	UJ	Qualified due to low LCS recovery
SWMU 4-1 (0-0.5')	4/6/2009	Trichloroethene (TCE)	< 0.933	µg/Kg-dry	Soil	UJ	Qualified due to low LCS recovery
SWMU 4-1 (1.5-2.0')	4/6/2009	Trichloroethene (TCE)	< 0.050	mg/Kg	Soil	UJ	Qualified due to low LCS recovery
SWMU 4-1 (1.5-2.0')	4/6/2009	Trichloroethene (TCE)	< 0.991	µg/Kg-dry	Soil	UJ	Qualified due to low LCS recovery
SWMU 4-1 (36-38')	4/6/2008	Trichloroethene (TCE)	< 1.02	µg/Kg-dry	Soil	UJ	Qualified due to low LCS recovery
SWMU 4-1 (6-8')	4/6/2009	Trichloroethene (TCE)	< 0.10	mg/Kg	Soil	UJ	Qualified due to low LCS recovery
MW-63	5/13/2009	Zinc	0.074	mg/L	GW	J+	Qualified due to detection in associated field blank
MW-64	5/13/2009	Zinc	0.085	mg/L	GW	J+	Qualified due to detection in associated field blank
AOC 24-4 (1.5-2.0')	4/23/2009	Chromium	4.1	mg/kg	Soil	J-	Qualified due to field duplicate outlier.
AOC 24-4 (1.5-2.0')	4/23/2009	Lead	3.3	mg/kg	Soil	J-	Qualified due to field duplicate outlier.
AOC 24-4 (1.5-2.0')	4/23/2009	Zinc	18	mg/kg	Soil	J-	Qualified due to field duplicate outlier.
MW-63	7/15/2009	Iron	0.028	mg/L	GW	J-	Qualified due to field duplicate outlier.
MW-65	5/12/2009	Arsenic	0.021	mg/L	GW	J-	Qualified due to field duplicate outlier.

Notes:

mg/L - milligrams per liter
ug/L - microgram per liter
UJ - Estimated reporting limit
J - potential bias

RPD - Relative Percent Difference
MS/MSD - Matrix spike/matrix spike duplicate

TABLE A-3
Field Duplicate Summary

Table A-3
Field Duplicate Summary
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	Parameter	MW-65 Sample Result	MW-65 (DUP) Sample Result	RPD (%)
TPH (mg/L):	Ethanol	<1.0	<1.0	NC
	Diesel Range Organics (DRO)	14	14	0.0
	Motor Oil Range Organics (MRO)	< 5.0	< 5.0	NC
	Gasoline Range Organics (GRO)	42	44	4.6
VOCs (ug/L):	1,1,1,2-Tetrachloroethane	< 20	< 20	NC
	1,1,1-Trichloroethane	< 20	< 20	NC
	1,1,2,2-Tetrachloroethane	< 40	< 40	NC
	1,1,2-Trichloroethane	< 20	< 20	NC
	1,1-Dichloroethane	< 20	< 20	NC
	1,1-Dichloroethene	< 20	< 20	NC
	1,1-Dichloropropene	< 20	< 20	NC
	1,2,3-Trichlorobenzene	< 20	< 20	NC
	1,2,3-Trichloropropane	< 40	< 40	NC
	1,2,4-Trichlorobenzene	< 20	< 20	NC
	1,2,4-Trimethylbenzene	1400	1500	6.9
	1,2-Dibromo-3-chloropropane	< 40	< 40	NC
	1,2-Dibromoethane (EDB)	< 20	< 20	NC
	1,2-Dichlorobenzene	< 20	< 20	NC
	1,2-Dichloroethane (EDC)	220	250	12.8
	1,2-Dichloropropane	< 20	< 20	NC
	1,3,5-Trimethylbenzene	500	510	1.9
	1,3-Dichlorobenzene	< 20	< 20	NC
	1,3-Dichloropropane	< 20	< 20	NC
	1,4-Dichlorobenzene	< 20	< 20	NC
	1-Methylnaphthalene	150	170	12.5
	2,2-Dichloropropane	< 40	< 40	NC
	2-Butanone	< 200	< 200	NC
	2-Chlorotoluene	< 20	< 20	NC
	2-Hexanone	< 200	< 200	NC
	2-Methylnaphthalene	220	230	4.4
	4-Chlorotoluene	< 20	< 20	NC
	4-Isopropyltoluene	< 20	< 20	NC
	4-Methyl-2-pentanone	< 200	< 200	NC
	Acetone	< 200	< 200	NC
	Benzene	6800	7100	4.3
	Bromobenzene	< 20	< 20	NC
	Bromodichloromethane	< 20	< 20	NC
	Bromoform	< 20	< 20	NC
	Bromomethane	< 20	< 20	NC
	Carbon disulfide	< 200	< 200	NC
	Carbon Tetrachloride	< 20	< 20	NC
	Chlorobenzene	< 20	< 20	NC
	Chloroethane	< 40	< 40	NC
	Chloroform	< 20	< 20	NC
	Chloromethane	< 20	< 20	NC
	cis-1,2-DCE	< 20	< 20	NC
	cis-1,3-Dichloropropene	< 20	< 20	NC
	Dibromochloromethane	< 20	< 20	NC
	Dibromomethane	< 20	< 20	NC
	Dichlorodifluoromethane	< 20	< 20	NC
	Ethylbenzene	1800	2000	10.5
	Hexachlorobutadiene	< 20	< 20	NC
	Isopropylbenzene	84	92	9.1
	Methyl tert-butyl ether (MTBE)	1700	1800	5.7
	Methylene Chloride	< 60	< 60	NC
	Naphthalene	480	520	8.0
	n-Butylbenzene	49	50	2.0
	n-Propylbenzene	230	240	4.3
	sec-Butylbenzene	< 20	< 20	NC
	Styrene	< 20	< 20	NC
	tert-Butylbenzene	< 20	< 20	NC
	Tetrachloroethene (PCE)	< 20	< 20	NC
	Toluene	2500	2800	11.3
	trans-1,2-DCE	< 20	< 20	NC
	trans-1,3-Dichloropropene	< 20	< 20	NC
	Trichloroethene (TCE)	< 20	< 20	NC
	Trichlorofluoromethane	< 20	< 20	NC
	Vinyl chloride	< 20	< 20	NC
	Xylenes, Total	8500	9200	7.9

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Field Duplicate Summary
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	Parameter	MW-65 Sample Result	MW-65 (DUP) Sample Result	RPD (%)
SVOCs (ug/L):	1,2,4-Trichlorobenzene	< 10	< 10	NC
	1,2-Dichlorobenzene	< 10	< 10	NC
	1,3-Dichlorobenzene	< 10	< 10	NC
	1,4-Dichlorobenzene	< 10	< 10	NC
	2,4,5-Trichlorophenol	< 10	< 10	NC
	2,4,6-Trichlorophenol	< 10	< 10	NC
	2,4-Dichlorophenol	< 20	< 20	NC
	2,4-Dimethylphenol	24	22	8.7
	2,4-Dinitrophenol	< 20	< 20	NC
	2,4-Dinitrotoluene	< 10	< 10	NC
	2,6-Dinitrotoluene	< 10	< 10	NC
	2-Chloronaphthalene	< 10	< 10	NC
	2-Chlorophenol	< 10	< 10	NC
	2-Methylnaphthalene	160	150	6.5
	2-Methylphenol	< 10	< 10	NC
	2-Nitroaniline	< 10	< 10	NC
	2-Nitrophenol	< 10	< 10	NC
	3,3′-Dichlorobenzidine	< 10	< 10	NC
	3+4-Methylphenol	< 10	< 10	NC
	3-Nitroaniline	< 10	< 10	NC
	4,6-Dinitro-2-methylphenol	< 20	< 20	NC
	4-Bromophenyl phenyl ether	< 10	< 10	NC
	4-Chloro-3-methylphenol	< 10	< 10	NC
	4-Chloroaniline	< 10	< 10	NC
	4-Chlorophenyl phenyl ether	< 10	< 10	NC
	4-Nitroaniline	< 10	< 10	NC
	4-Nitrophenol	< 10	< 10	NC
	Acenaphthene	< 10	< 10	NC
	Acenaphthylene	< 10	< 10	NC
	Aniline	< 10	< 10	NC
	Anthracene	< 10	< 10	NC
	Azobenzene	< 10	< 10	NC
	Benz(a)anthracene	< 10	< 10	NC
	Benzo(a)pyrene	< 10	< 10	NC
	Benzo(b)fluoranthene	< 10	< 10	NC
	Benzo(g,h,i)perylene	< 10	< 10	NC
	Benzo(k)fluoranthene	< 10	< 10	NC
	Benzoic acid	< 20	< 20	NC
	Benzyl alcohol	< 10	< 10	NC
	Bis(2-chloroethoxy)methane	< 10	< 10	NC
	Bis(2-chloroethyl)ether	< 10	< 10	NC
	Bis(2-chloroisopropyl)ether	< 10	< 10	NC
	Bis(2-ethylhexyl)phthalate	< 10	< 10	NC
	Butyl benzyl phthalate	< 10	< 10	NC
	Carbazole	< 10	< 10	NC
	Chrysene	< 10	< 10	NC
	Dibenz(a,h)anthracene	< 10	< 10	NC
	Dibenzofuran	< 10	< 10	NC
	Diethyl phthalate	< 10	< 10	NC
	Dimethyl phthalate	< 10	< 10	NC
	Di-n-butyl phthalate	< 10	< 10	NC
	Di-n-octyl phthalate	< 10	< 10	NC
	Fluoranthene	< 10	< 10	NC
	Fluorene	< 10	< 10	NC
	Hexachlorobenzene	< 10	< 10	NC
	Hexachlorobutadiene	< 10	< 10	NC
	Hexachlorocyclopentadiene	< 10	< 10	NC
	Hexachloroethane	< 10	< 10	NC
	Indeno(1,2,3-cd)pyrene	< 10	< 10	NC
	Isophorone	< 10	< 10	NC
	Naphthalene	370	350	5.6
	Nitrobenzene	< 10	< 10	NC
	N-Nitrosodimethylamine	< 10	< 10	NC
	N-Nitrosodi-n-propylamine	< 10	< 10	NC
	N-Nitrosodiphenylamine	< 10	< 10	NC
	Pentachlorophenol	< 20	< 20	NC
	Phenanthrene	< 10	< 10	NC
	Phenol	49	49	0.0
	Pyrene	< 10	< 10	NC
	Pyridine	< 10	< 10	NC

Table A-3
Field Duplicate Summary
Group 3 Investigation Report
Western Refining Southwest, Inc. - Bloomfield Refinery

	Parameter	MW-65 Sample Result	MW-65 (DUP) Sample Result	RPD (%)
Metals (mg/L):	Antimony	0.001	<0.001	NC
	Arsenic	0.021	0.015	33.3 *
	Barium	0.15	0.13	14.3
	Beryllium	< 0.0030	< 0.0030	NC
	Cadmium	< 0.0020	< 0.0020	NC
	Chromium	< 0.0060	< 0.0060	NC
	Cobalt	< 0.0060	< 0.0060	NC
	Cyanide	<0.005	<0.005	NC
	Iron	3.5	3.6	2.8
	Lead	< 0.0050	0.0060	NC
	Mercury	< 0.00020	< 0.00020	NC
	Nickel	< 0.010	< 0.010	NC
	Selenium	< 0.050	< 0.050	NC
	Silver	< 0.0050	< 0.0050	NC
	Vanadium	< 0.050	< 0.050	NC
	Zinc	< 0.020	< 0.020	NC
General Chemistry (mg/L):	Calcium	230	230	0.0
	Iron	0.98	1.1	11.5
	Magnesium	79	79	0.0
	Potassium	3.8	3.7	2.7
	Sodium	480	480	0.0
	Specific Conductance	2900	2800	3.5
	Total Dissolved Solids	2300	2400	4.2
	Chloride	140	130	7.4
	Fluoride	0.21	0.22	4.6
	Nitrate (As N)+Nitrite (As N)	< 1.0	< 1.0	NC
	Phosphorus, Orthophosphate (As P)	< 0.50	< 0.50	NC
	Sulfate	790	750	5.2
	Alkalinity, Total (As CaCO3)	1000	1000	0.0
	Bicarbonate	1000	1000	0.0
	Carbonate	< 2.0	< 2.0	NC

Notes:
RPD = Relative percent difference; [(difference)/(average)]* 100
NC = Not calculated; RPD values were not calculated for non-detects
ug/L = micrograms per liter
mg/L = milligrams per liter
* = Field Duplicate RPD Outlier

Table A-3
Field Duplicate Summary
Group 3 Investigation Report
Western Refining Southwest, Inc. - Bloomfield Refinery

	Parameter	MW-65 Sample Result	MW-65 (DUP) Sample Result	RPD (%)
TPH (mg/L):	Ethanol	<1.0	<1.0	NC
	Diesel Range Organics (DRO)	14	14	0.0
	Motor Oil Range Organics (MRO)	< 5.0	< 5.0	NC
	Gasoline Range Organics (GRO)	42	44	4.6
VOCs (ug/L):	1,1,1,2-Tetrachloroethane	< 20	< 20	NC
	1,1,1-Trichloroethane	< 20	< 20	NC
	1,1,2,2-Tetrachloroethane	< 40	< 40	NC
	1,1,2-Trichloroethane	< 20	< 20	NC
	1,1-Dichloroethane	< 20	< 20	NC
	1,1-Dichloroethene	< 20	< 20	NC
	1,1-Dichloropropene	< 20	< 20	NC
	1,2,3-Trichlorobenzene	< 20	< 20	NC
	1,2,3-Trichloropropane	< 40	< 40	NC
	1,2,4-Trichlorobenzene	< 20	< 20	NC
	1,2,4-Trimethylbenzene	1400	1500	6.9
	1,2-Dibromo-3-chloropropane	< 40	< 40	NC
	1,2-Dibromoethane (EDB)	< 20	< 20	NC
	1,2-Dichlorobenzene	< 20	< 20	NC
	1,2-Dichloroethane (EDC)	220	250	12.8
	1,2-Dichloropropane	< 20	< 20	NC
	1,3,5-Trimethylbenzene	500	510	1.9
	1,3-Dichlorobenzene	< 20	< 20	NC
	1,3-Dichloropropane	< 20	< 20	NC
	1,4-Dichlorobenzene	< 20	< 20	NC
	1-Methylnaphthalene	150	170	12.5
	2,2-Dichloropropane	< 40	< 40	NC
	2-Butanone	< 200	< 200	NC
	2-Chlorotoluene	< 20	< 20	NC
	2-Hexanone	< 200	< 200	NC
	2-Methylnaphthalene	220	230	4.4
	4-Chlorotoluene	< 20	< 20	NC
	4-Isopropyltoluene	< 20	< 20	NC
	4-Methyl-2-pentanone	< 200	< 200	NC
	Acetone	< 200	< 200	NC
	Benzene	6800	7100	4.3
	Bromobenzene	< 20	< 20	NC
	Bromodichloromethane	< 20	< 20	NC
	Bromoform	< 20	< 20	NC
	Bromomethane	< 20	< 20	NC
	Carbon disulfide	< 200	< 200	NC
	Carbon Tetrachloride	< 20	< 20	NC
	Chlorobenzene	< 20	< 20	NC
	Chloroethane	< 40	< 40	NC
	Chloroform	< 20	< 20	NC
	Chloromethane	< 20	< 20	NC
	cis-1,2-DCE	< 20	< 20	NC
	cis-1,3-Dichloropropene	< 20	< 20	NC
	Dibromochloromethane	< 20	< 20	NC
	Dibromomethane	< 20	< 20	NC
	Dichlorodifluoromethane	< 20	< 20	NC
	Ethylbenzene	1800	2000	10.5
	Hexachlorobutadiene	< 20	< 20	NC
	Isopropylbenzene	84	92	9.1
	Methyl tert-butyl ether (MTBE)	1700	1800	5.7
	Methylene Chloride	< 60	< 60	NC
	Naphthalene	480	520	8.0
	n-Butylbenzene	49	50	2.0
	n-Propylbenzene	230	240	4.3
	sec-Butylbenzene	< 20	< 20	NC
	Styrene	< 20	< 20	NC
	tert-Butylbenzene	< 20	< 20	NC
	Tetrachloroethene (PCE)	< 20	< 20	NC
	Toluene	2500	2800	11.3
	trans-1,2-DCE	< 20	< 20	NC
	trans-1,3-Dichloropropene	< 20	< 20	NC
	Trichloroethene (TCE)	< 20	< 20	NC
	Trichlorofluoromethane	< 20	< 20	NC
	Vinyl chloride	< 20	< 20	NC
	Xylenes, Total	8500	9200	7.9

Table A-3
Field Duplicate Summary
Group 3 Investigation Report
Western Refining Southwest, Inc. - Bloomfield Refinery

	Parameter	MW-65 Sample Result	MW-65 (DUP) Sample Result	RPD (%)
SVOCs (ug/L):	1,2,4-Trichlorobenzene	< 10	< 10	NC
	1,2-Dichlorobenzene	< 10	< 10	NC
	1,3-Dichlorobenzene	< 10	< 10	NC
	1,4-Dichlorobenzene	< 10	< 10	NC
	2,4,5-Trichlorophenol	< 10	< 10	NC
	2,4,6-Trichlorophenol	< 10	< 10	NC
	2,4-Dichlorophenol	< 20	< 20	NC
	2,4-Dimethylphenol	24	22	8.7
	2,4-Dinitrophenol	< 20	< 20	NC
	2,4-Dinitrotoluene	< 10	< 10	NC
	2,6-Dinitrotoluene	< 10	< 10	NC
	2-Chloronaphthalene	< 10	< 10	NC
	2-Chlorophenol	< 10	< 10	NC
	2-Methylnaphthalene	160	150	6.5
	2-Methylphenol	< 10	< 10	NC
	2-Nitroaniline	< 10	< 10	NC
	2-Nitrophenol	< 10	< 10	NC
	3,3′-Dichlorobenzidine	< 10	< 10	NC
	3+4-Methylphenol	< 10	< 10	NC
	3-Nitroaniline	< 10	< 10	NC
	4,6-Dinitro-2-methylphenol	< 20	< 20	NC
	4-Bromophenyl phenyl ether	< 10	< 10	NC
	4-Chloro-3-methylphenol	< 10	< 10	NC
	4-Chloroaniline	< 10	< 10	NC
	4-Chlorophenyl phenyl ether	< 10	< 10	NC
	4-Nitroaniline	< 10	< 10	NC
	4-Nitrophenol	< 10	< 10	NC
	Acenaphthene	< 10	< 10	NC
	Acenaphthylene	< 10	< 10	NC
	Aniline	< 10	< 10	NC
	Anthracene	< 10	< 10	NC
	Azobenzene	< 10	< 10	NC
	Benz(a)anthracene	< 10	< 10	NC
	Benzo(a)pyrene	< 10	< 10	NC
	Benzo(b)fluoranthene	< 10	< 10	NC
	Benzo(g,h,i)perylene	< 10	< 10	NC
	Benzo(k)fluoranthene	< 10	< 10	NC
	Benzoic acid	< 20	< 20	NC
	Benzyl alcohol	< 10	< 10	NC
	Bis(2-chloroethoxy)methane	< 10	< 10	NC
	Bis(2-chloroethyl)ether	< 10	< 10	NC
	Bis(2-chloroisopropyl)ether	< 10	< 10	NC
	Bis(2-ethylhexyl)phthalate	< 10	< 10	NC
	Butyl benzyl phthalate	< 10	< 10	NC
	Carbazole	< 10	< 10	NC
	Chrysene	< 10	< 10	NC
	Dibenz(a,h)anthracene	< 10	< 10	NC
	Dibenzofuran	< 10	< 10	NC
	Diethyl phthalate	< 10	< 10	NC
	Dimethyl phthalate	< 10	< 10	NC
	Di-n-butyl phthalate	< 10	< 10	NC
	Di-n-octyl phthalate	< 10	< 10	NC
	Fluoranthene	< 10	< 10	NC
	Fluorene	< 10	< 10	NC
	Hexachlorobenzene	< 10	< 10	NC
	Hexachlorobutadiene	< 10	< 10	NC
	Hexachlorocyclopentadiene	< 10	< 10	NC
	Hexachloroethane	< 10	< 10	NC
	Indeno(1,2,3-cd)pyrene	< 10	< 10	NC
	Isophorone	< 10	< 10	NC
	Naphthalene	370	350	5.6
	Nitrobenzene	< 10	< 10	NC
	N-Nitrosodimethylamine	< 10	< 10	NC
	N-Nitrosodi-n-propylamine	< 10	< 10	NC
	N-Nitrosodiphenylamine	< 10	< 10	NC
	Pentachlorophenol	< 20	< 20	NC
	Phenanthrene	< 10	< 10	NC
	Phenol	49	49	0.0
	Pyrene	< 10	< 10	NC
	Pyridine	< 10	< 10	NC

Table A-3
Field Duplicate Summary
Group 3 Investigation Report
Western Refining Southwest, Inc. - Bloomfield Refinery

	Parameter	MW-65 Sample Result	MW-65 (DUP) Sample Result	RPD (%)
Metals (mg/L):	Antimony	0.001	<0.001	NC
	Arsenic	0.021	0.015	33.3 *
	Barium	0.15	0.13	14.3
	Beryllium	< 0.0030	< 0.0030	NC
	Cadmium	< 0.0020	< 0.0020	NC
	Chromium	< 0.0060	< 0.0060	NC
	Cobalt	< 0.0060	< 0.0060	NC
	Cyanide	<0.005	<0.005	NC
	Iron	3.5	3.6	2.8
	Lead	< 0.0050	0.0060	NC
	Mercury	< 0.00020	< 0.00020	NC
	Nickel	< 0.010	< 0.010	NC
	Selenium	< 0.050	< 0.050	NC
	Silver	< 0.0050	< 0.0050	NC
	Vanadium	< 0.050	< 0.050	NC
	Zinc	< 0.020	< 0.020	NC
General Chemistry (mg/L):	Calcium	230	230	0.0
	Iron	0.98	1.1	11.5
	Magnesium	79	79	0.0
	Potassium	3.8	3.7	2.7
	Sodium	480	480	0.0
	Specific Conductance	2900	2800	3.5
	Total Dissolved Solids	2300	2400	4.2
	Chloride	140	130	7.4
	Fluoride	0.21	0.22	4.6
	Nitrate (As N)+Nitrite (As N)	< 1.0	< 1.0	NC
	Phosphorus, Orthophosphate (As P)	< 0.50	< 0.50	NC
	Sulfate	790	750	5.2
	Alkalinity, Total (As CaCO3)	1000	1000	0.0
	Bicarbonate	1000	1000	0.0
	Carbonate	< 2.0	< 2.0	NC

Notes:

RPD = Relative percent difference; [(difference)/(average)]* 100
NC = Not calculated; RPD values were not calculated for non-detects
ug/L = micrograms per liter
mg/L = milligrams per liter
* = Field Duplicate RPD Outlier

TABLE A-4
Completeness Summaries

Table A-4
Completeness Summary - Soil
Group 3 Investigation Report
Western Refining Southwest, Inc. - Bloomfield Refinery

	Parameter	Total Number of Results	Number of Contractual Compliance	Percent Contractural Compliance	Number of Usable Results	Percent Technical Compliance
TPH (mg/kg-dry):	Ethanol	15	15	100	15	100
	Diesel Range Organics (DRO)	109	111	100	109	100
	Motor Oil Range Organics (MRO)	109	110 [a]	99.1	109	100
	Gasoline Range Organics (GRO)	109	106 [b]	95.5	109	100
VOCs (ug/kg-dry)	1,1 Dichloroethene	109	98 [c,e]	88.3	109	100
	1,2,4-Trichlorobenzene	109	107 [e]	96.4	109	100
	Acetone	109	79 [f]	71.2	109	100
	Methylene chloride	109	19 [f]	17.1	109	100
	Trichloroethene (TCE)	109	105 [c]	94.6	109	100
	All remaining VOC analytes	109	109	100.0	109	100
SVOCs (mg/kg-dry):	2,4-Dinitrotoluene	108	106 [e]	96.4	108	100
	N-Nitrosodi-n-propylamine	108	106 [e]	96.4	108	100
	All remaining SVOC analytes	108	108	100.0	108	100
Metals (mg/kg-dry):	Mercury	108	108	100.0	108	100
	Antimony	108	90 [c]	81.8	108	100
	Arsenic	108	108	100.0	108	100
	Barium	108	108	100.0	108	100
	Beryllium	108	108	100.0	108	100
	Cadmium	108	108	100.0	108	100
	Chromium	108	109 [d]	99.1	108	100
	Cobalt	108	108	100.0	108	100
	Cyanide	108	106 [e]	96.4	108	100
	Lead	108	109 [d]	99.1	108	100
	Nickel	108	108	100.0	108	100
	Selenium	108	103 [e]	93.6	108	100
	Silver	108	108	100.0	108	100
	Vanadium	108	108	100.0	108	100
	Zinc	108	109 [d]	99.1	108	100

Notes:

Number of samples used in completeness calculations includes field duplicates but does not include equipment rinsate, field, or trip blanks.

Percent Contractural Compliance = (number of contract compliant results / Number of reported results)*100

Percent Technial Compliance = (Number of usable results / Number of reported results) * 100

a = Qualified due to low surrogate recoveries

b = Qualified due to high surrogate recoveries

c = Qualified due to low LCS recovery

d = Qualified due to high field duplicate relative percent difference.

e = Qualified due to low MS/MSD recovery

f = Qualified due to potential laboratory contamination.