GW - 14

MONITORING REPORTS

DATE:

2002-2001

NAVAJO REFINING COMPANY

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August 22, 2002

Mr. Bill Olsen
NM Oil Conservation Division
Environmental Bureau
1220 S. St. Francis
Santa Fe, NM 87505

RE: Groundwater Monitoring and Remediation – Lea Refining Company

Dear Bill,

Enclosed, please find two copies of our annual report for the remediation at Lea Refinery. We continue to have warm water at depth which is very puzzling to us since we have tested and replaced every pipe we know of. The plume is not expanding however, we are still seeing free product right at the oil/water separator area. This product is being recovered. What the story boils down to , we are holding steady with no new contamination reaching our outlying wells, but still with free product in RW-1, MW-1, and MW-7.

We are looking into doing surface excavation to see if we can find piping or buried boxes that we don't know about. Remember, we bought this facility from Southern Union so the possibility exists that something like that could exist.

If there are any questions concerning this submission, please call me at 505-748-3311.

Sincerely,
NAVAJO REFINING COMPANY

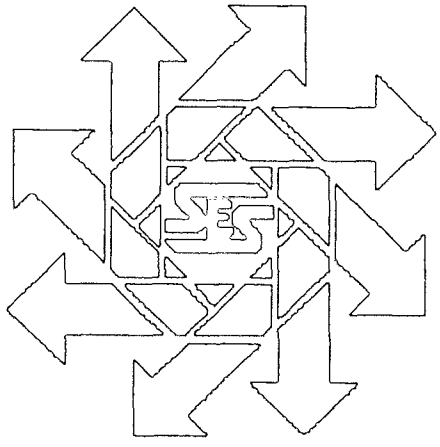
Darrell Moore

Darrell Moore
Environmental Manager for Water and Waste

Encl.

Groundwater Monitoring and Remediation System Performance Report July 2001 – June 2002 Navajo Refining Company – Lea Refinery Lovington, New Mexico

August 15, 2002



Prepared for:

Navajo Refining Company
P.O. Box 159
Artesia, New Mexico 88211

By:

Safety & Environmental Solutions, Inc.
703 E. Clinton, Suite 102
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I. Introduction

Safety and Environmental Solutions, Inc. (SESI) performs groundwater monitoring, sampling, and product recovery at Navajo Refining Company's Lea Refinery in Lovington, New Mexico (Figure 1). The work performed at the refinery includes quarterly measurement of water and product levels, sampling of monitor wells for water quality in accordance with the requirements of the New Mexico Oil Conservation Division (OCD), and maintenance of the hydrocarbon product recovery system installed at the facility. This report documents the results of sampling conducted at the site during the period from July 1, 2001 through June 30, 2002, and includes product recovery data for the remediation system. The groundwater sampling and monitoring events, and operation and maintenance activities for the remediation system were performed by SESI under the direction of Mr. David Boyer, P.G.

II. Work Performed

The following activities were conducted to document the groundwater quality conditions and remediation system performance in accordance with the remediation work plan, and the OCD letters dated November 21, 1996 and March 26, 1998. The locations of the referenced wells are shown on Figure 2.

- Measured depth to groundwater in monitoring wells MW-1 through MW-10.
- Collected quarterly groundwater samples from MW-3, MW-6, MW-8, MW-9 and MW-10 for BTEX analysis (EPA Method 8021B).
- Collected annual groundwater samples from MW-2, MW-3, MW-4, MW-5, MW-6, MW-8, MW-9, and MW-10 for BTEX analysis, metals, and anions/TDS.
- Measured free product thickness in monitoring wells RW-1, MW-1 and MW-7. All three wells had a measurable thickness of free product and groundwater from these wells was not sampled.
- Collected groundwater samples from the refinery's North and South water wells.
- In May 2002 installed a deeper replacement well (MW-6R) adjacent to MW-6, which has become unusable do to a declining water table.

Groundwater measurement and sampling activities were conducted on August 28, 2001, December 19, 2001, March 12, 2002, and June 20, 2002. The annual groundwater sampling of all monitor wells for BTEX, metals, and anions/TDS was performed on December 19, 2001. Prior to sampling, the monitoring wells at the Lea Refinery were gauged for depth to groundwater and total depth using a Solinst Model 101 water level meter. Where present, thickness of free product (phase-separated hydrocarbons) was measured using an oil/water interface probe (Solinst Model 122).

Immediately prior to collecting groundwater samples, the monitoring wells were purged of a minimum of three well casing volumes of water using clean, decontaminated PVC bailers. Monitoring wells MW-1 and MW-7 were not sampled due to the presence of free product. During each sampling event, an approximate total of 25 gallons of water was

purged from those monitoring wells that were sampled. Groundwater parameters of conductivity, temperature and pH were measured during purging operations.

Samples taken for benzene, toluene, ethylbenzene, and total xylene (BTEX) analyses were transferred into air-tight, septum-sealed, 40-milliliter (ml) glass volatile organic analyte (VOA) sample vials with zero head space and preserved with HCl. Samples were placed in an ice-filled cooler immediately after collection and shipped to TraceAnalysis, Inc., in Lubbock, Texas. The samples were analyzed for BTEX using EPA Method 8021B. Chain of custody (COC) forms documenting sample identification numbers, collection times, and delivery times to the laboratory were completed for each set of samples.

Samples collected for metals and anion/Total Dissolved Solids (TDS) analysis were collected in separate containers. Metals were collected in a 500-ml plastic bottle and preserved with HNO_3. Samples for anion/TDS analysis were collected in liter plastic bottles and placed on ice. The samples were analyzed using methods EPA methods 6010B for metals, and methods 300.0 and 160.1, respectively, for anions and TDS.

III. Groundwater Elevations, Flow Direction, and Hydraulic Gradient

Groundwater elevations for the current year and for previous monitoring events are summarized in Table 1. Water table elevation maps (potentiometric surface) and direction of groundwater flow for each quarter are depicted in Figures 3 through 6.

Based on past measurements, the water table elevations have been declining at the rate of approximately 1.35 feet per year for the past five years. Measurements for the past year indicate a decline of 1.15 feet. Depth to groundwater occurs at approximately 77 to 98 feet below ground surface across the site. The direction of flow is to the southeast with an average hydraulic gradient across the site of approximately 0.004 ft./ft. However, the gradient is slightly steeper to the southeast with an approximate gradient of 0.005 ft./ft. and slightly flatter to the northwest (0.003 ft./ft.). A possible explanation is drawdown due to the refinery's North and South water wells, which supply water for domestic use and crude oil processing. These two wells are approximately 500 ft. southeast and downgradient from monitor well MW-3. Because MW-3 may be within the pumping cone of depression for these wells, quarterly monitoring for BTEX in these wells is now conducted as described below.

IV. Distribution of Hydrocarbons in Groundwater

Analytical results for BTEX in groundwater for the current and previous sampling events are summarized in Table 2. Constituents with concentrations above the New Mexico Water Quality Control Commission (WQCC) standards are highlighted in boldface type. The laboratory reports and COC documentation for samples obtained by SESI are included in the Appendix.

Based on the most recent analytical data for samples collected by SESI on June 20, 2002 (or on December 19, 2001 for those wells sampled annually), the distribution of hydrocarbons at the Lea Refinery is described below:

- BTEX concentrations in upgradient monitoring wells MW-2 and MW-4, and downgradient wells MW-3, MW-5, MW-6, MW-8, MW-9 and MW-10 were below the laboratory detection limit and below WQCC standards. The method reporting limit for all analyses is 0.001 mg/L except for well MW-4 (0.005 mg/L). As described above and absent hydrocarbon product, wells MW-1, MW-3, MW-6, MW-7, MW-8, MW-9 and MW-10 are sampled quarterly while the others (MW-2, MW-4, MW-5) listed in this group are sampled annually.

- Benzene concentrations in downgradient well MW-9 declined from a high of 1.69 mg/L in April 1996 to below the WQCC standard (0.01 mg/L) in August 1998. The benzene concentration in MW-9 has remained below the WQCC standard since 1998 and below the laboratory detection limits of 0.005 mg/L since August 1999. Since installation and monitoring of this well began in April 1996, all BTEX constituents other than benzene have remained near or below laboratory detection limits and below WQCC standards. Results for the most recent sampling (June 2002) show all BTEX constituents are less than detection limits (<0.001 mg/L).

- BTEX concentrations in downgradient well MW-3 were measured at levels near or below the laboratory detection limit and below WQCC standards from the initial sampling event in September 1995 through August 1999. From November 1999 through August 2001, the benzene concentrations in MW-3 have exceeded the WQCC standard and the xylene concentrations have exceeded the laboratory detection limit. In December 2001, all BTEX constituents were below the laboratory detection limit of 0.005 mg/L. However, in March 2002, benzene again was detected at a value of 0.0159 mg/L. No BTEX was detected in the June 2002 sampling at a reporting level of 0.001 mg/L.

  It is suspected that the 1999 increase in dissolved hydrocarbons represents the downgradient movement of a limited slug of contaminants that was observed in upgradient well MW-9 during the period from April 1996 through August 1998. Based on the maximum benzene levels observed in each well, it appears that the benzene slug is migrating at approximately 0.35 feet per day and attenuating at a rate of approximately one half-life per 150 feet. At this rate the benzene slug could impact the North water supply well in approximately 2.5 years at an estimated concentration of 0.05 mg/L. It should be noted that this estimate assumes that the production from the water well occurs only in the upper 10 feet (mixing zone) of the aquifer, which is not the case for a large volume production water well.

- During the past year the refinery's North water well exhibited a maximum benzene concentration of 0.003 mg/L while other BTEX constituents were not detected. This value is less than both the WQCC limit of 0.010 mg/L and the EPA drinking water standard of 0.005 mg/L. The most recent sampling (June 2002) detected benzene in the North well at the laboratory detection level of 0.001 mg/L. The South water well

remains unimpacted. A June 2001 sample from the refinery fresh water system (used for drinking, worker showers, process water) did not detect BTEX at 0.001 mg/L.

- Measurable free product in MW-7 was observed following installation in April 1996 and continuing through November of 1999. Hydrocarbon product was again observed in this well in June 2001. During the past year, the thickness of hydrocarbon product in this well has continued to increase, and Navajo is investigating whether the product is the result of delayed drainage from the earlier release or represents a new leak.

- During the past year monitoring wells MW-1 and RW-1 had measurable hydrocarbon product and were not sampled. At the time of the June 2002 sampling, fluid levels in MW-1 had declined below the bottom of the well and no further measurements, sampling or hydrocarbon recovery are possible from the well.

V. Sampling Results for Inorganic Constituents

The annual sampling for WQCC anions, TDS, and selected metals was conducted in December 2001. The results for 2000 and 2001 are shown in Table 3. In 2001, two wells (MW-5 and MW-6) exceeded WQCC standards for iron and MW-3 exceeded the standard for manganese. Several wells in 2001 exceeded one or more WQCC standards for chloride, fluoride and TDS. The standard for chloride was exceeded in MW-3, MW-8 and MW-9. Fluoride was exceeded in MW-6, MW-8, and MW-9. MW-3 and MW-8 had exceedances for TDS. Although several wells have slightly elevated levels of fluoride, Navajo does not utilize hydrofluoric acid at the Lea Refinery and the levels are thought to be naturally occurring.

VI. Total Fluids Recovery

Approximately 241 gallons of free product has been recovered between January 1998 and June 2002. A summary of the recovery methods and the volumes of product recovered are listed in Table 4. Figure 7 is a graph showing cumulative hydrocarbon product recovery.

VII. Groundwater Temperature

Since April 1996, temperatures have been measured in the monitoring wells. Groundwater temperatures during the past sample year ranged from 60°F at MW-2 in December 2001 to 83.1°F at MW-9 in August 2001 (Table 5). Although still elevated at some wells, temperatures during the last four sampling events have decreased compared to measurements made in 2000 and earlier.

VIII. Systems Status

Air Sparge/Vapor Extraction System

The previous contractor shut down the air sparge/vapor extraction system and above ground equipment has been removed. Based on information provided in earlier monitoring reports, the system worked as intended to reduce dissolved-phase BTEX and hydrocarbon vapors in the vicinity of the leak.

Hydrocarbon Product Recovery System

During the past year, the operation of the product recovery system was interrupted by debris entering the well through a hole in the PVC pipe. The hole was cut for installation of electric and discharge cables when a submersible pump was used several years ago for recovery of fluids. Insects (beetles) in the well vault fell into the well through the hole. The hole was sealed with a pipe clamp and the well bailed several times to remove the insects. However pieces of the exoskeleton remain floating and occasionally clog the pump float restricting its ability to move up and down with a change in fluid level. These stoppages are becoming more infrequent as fewer beetle parts are now present.

IX. Conclusions

- Benzene concentrations in downgradient well MW-3 continue to decrease. Concentrations were below WQCC and EPA standards in two of the four last analyses.

- Benzene and other BTEX constituents remain absent in MW-9. The last time these contaminants were detected in this well was the third quarter of 1999.

- Analysis of a water sample from well MW-6R (the replacement well for nearly dry MW-6), did not detect any BTEX constituents at a detection level of 0.001 mg/L.

- Based on the groundwater flow map and sample results, the leading edge of the benzene plume has reached the North refinery well and is impacting groundwater at the drinking water standard of 0.005 mg/L. This well is the refinery's auxiliary well and not pumped continuously. Because water from these wells is used for human consumption (drinking water, hand washing, showering, etc.), the wells are now monitored for BTEX on at least a quarterly basis.

- Hydrocarbon product continues to be present in RW-1 and MW-7. Hydrocarbon product was present in MW-1 until fluid levels dropped below the bottom of the well in June 2002.

- The operation of the product recovery system was sometimes intermittent due to a continuing problem with insect parts preventing the free movement of the float. A hole in the PVC well pipe has been clamped and the well bailed twice to remove floating insect parts.

- Not withstanding improvement in water quality at MW-3, the continued presence of hydrocarbon product at RW-1, and MW-1 and reappearance of product at MW-7 is troublesome. Navajo has performed extensive remedial work at the location to eliminate leaks from the oil/water separator boxes. Possible remaining sources of the problem are an unknown crude line in the area or delayed drainage of previously released oil through preferential pathways in the near-surface caliche.

X. Future Work

Navajo is continuing quarterly monitoring with the next sampling event scheduled for September 2002. Navajo is continuing to investigate the occurrence of hydrocarbon product and additional work in support of this effort could include surface excavation in the vicinity of the separator and installation of additional product recovery wells.

XI. Report Tables and Figures

Table 1. Summary of Water Level Measurements and Groundwater Elevations, Navajo Refining Company, Lea Refinery

Monitor Well No., Depth Below TOC, & Depth Below Surface (feet)	Elevation Top of Casing (TOC, feet)	Measure-ment Date	Depth to Product (feet)	Depth to Water Below TOC (feet)	Product Thickness (feet)	Corrected Depth to Water (feet)	Corrected Water Level Elev. (feet)
MW-1	3,835.67	09/10/95	102.33	95.89	6.44	90.29	3,745.38
97.5		04/22/96	102.97	96.49	6.48	90.85	3,744.82
		11/19/96	95.94	93.57	2.37	91.51	3,744.16
		02/07/97	95.54	93.39	2.15	91.52	3,744.15
		04/16/97	99.19	95.49	3.70	92.27	3,743.40
		08/14/97	99.89	96.23	3.66	93.05	3,742.62
		10/28/97	100.74	96.88	3.86	93.52	3,742.15
		01/20/98	97.48	95.07	2.41	92.97	3,742.70
		04/23/98	96.56	94.75	1.81	93.18	3,742.49
		08/04/98	100.75	97.13	3.62	93.98	3,741.69
		10/29/98	95.65	94.98	0.67	94.40	3,741.27
		02/16/99	96.21	95.35	0.86	94.60	3,741.07
		04/21/99	96.73	95.60	1.13	94.62	3,741.05
		08/16/99	97.60	96.50	1.10	95.54	3,740.13
		11/23/99	97.42	96.60	0.82	95.89	3,739.78
		01/26/00	97.25	96.37	0.88	95.60	3,740.07
		04/25/00	97.30	96.64	0.66	96.07	3,739.60
		08/14/00	96.46	96.45	0.01	96.44	3,739.23
		11/02/00	97.25	96.90	0.35	96.60	3,739.07
		02/22/01	96.51	97.03	0.52	96.58	3,739.09
		06/01/01	96.18	97.04	0.86	96.29	3,739.38
		08/28/01	96.78	97.05	0.27	96.82	3,738.85
		12/21/01	96.66	97.06	0.40	96.71	3,738.96
		03/12/02	96.61	97.08	0.47	96.67	3,739.00
		04/24/02	96.72	97.06	0.34	96.77	3,738.90
		05/11/02	96.88	97.06	0.18	96.90	3,738.77
(dry)		06/20/02	--	--	--	--	--
(dry)		08/05/02	--	--	--	--	--
Note 1: Corrected depth to water = Static DTW - (Prod. Thickness x SG), SG = 0.8665 (0.87 prior to 2001)							
Note 2: Well depth approximate -- soft bottom prevents accurate reading							
MW-2	3,834.94	09/10/95	--	89.18	0	89.18	3,745.76
98.75		04/22/96	--	89.42	0	89.42	3,745.52
		11/19/96	--	89.83	0	89.83	3,745.11
		02/07/97	--	89.71	0	89.71	3,745.23
		04/16/97	--	90.16	0	90.16	3,744.78
		08/14/97	--	91.05	0	91.05	3,743.89
		10/28/97	--	91.05	0	91.05	3,743.89
		01/20/98	--	90.79	0	90.79	3,744.15
		04/23/98	--	91.33	0	91.33	3,743.61
		08/04/98	--	92.51	0	92.51	3,742.43
		10/28/98	--	92.67	0	92.67	3,742.27
		02/16/99	--	92.83	0	92.83	3,742.11
		04/21/99	--	92.96	0	92.96	3,741.98
		08/16/99	--	94.15	0	94.15	3,740.79

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MW-2		11/23/99	--	94.16	0	94.16	3,740.78
		01/26/00	--	93.76	0	93.76	3,741.18
		04/25/00	--	93.59	0	93.59	3,741.35
		08/14/00	--	94.72	0	94.72	3,740.22
		11/02/00	--	95.05	0	95.05	3,739.89
		02/22/01	--	94.83	0	94.83	3,740.11
		05/31/01	--	95.41	0	95.41	3,739.53
		08/28/01	--	95.98	0	95.98	3,738.96
		12/19/01	--	95.37	0	95.37	3,739.57
		03/12/02	--	94.88	0	94.88	3,740.06
		06/20/02	--	96.23	0	96.23	3,738.71
MW-3	3,829.55	09/10/95	--	87.53	0	87.53	3,742.02
97.70		04/22/96	--	87.90	0	87.90	3,741.65
		11/19/96	--	88.72	0	88.72	3,740.83
		02/07/97	--	88.98	0	88.98	3,740.57
		04/16/97	--	89.00	0	89.00	3,740.55
		08/14/97	--	89.56	0	89.56	3,739.99
		10/28/97	--	89.62	0	89.62	3,739.93
		01/20/98	--	90.18	0	90.18	3,739.37
		04/23/98	--	90.58	0	90.58	3,738.97
		08/04/98	--	90.72	0	90.72	3,738.83
		10/28/98	--	91.03	0	91.03	3,738.52
		02/16/99	--	91.42	0	91.42	3,738.13
		04/21/99	--	91.42	0	91.42	3,738.13
		08/16/99	--	92.14	0	92.14	3,737.41
		11/23/99	--	92.67	0	92.67	3,736.88
		01/26/00	--	92.09	0	92.09	3,737.46
		04/25/00	--	93.25	0	93.25	3,736.30
		08/14/00	--	92.61	0	92.61	3,736.94
		11/02/00	--	92.75	0	92.75	3,736.80
		02/22/01	--	92.55	0	92.55	3,737.00
		05/31/01	--	92.95	0	92.95	3,736.60
		08/28/01	--	93.90	0	93.90	3,735.65
		12/19/01	--	93.46	0	93.46	3,736.09
		03/12/02	--	93.78	0	93.78	3,735.77
		06/20/02	--	94.33	0	94.33	3,735.22
MW-4	3,837.56	09/10/95	--	91.40	0	91.40	3,746.16
102.90		04/22/96	--	91.84	0	91.84	3,745.72
		11/19/96	--	92.67	0	92.67	3,744.89
		02/07/97	--	92.54	0	92.54	3,745.02
		04/16/97	--	92.80	0	92.80	3,744.76
		08/14/97	--	93.43	0	93.43	3,744.13
		10/28/97	--	93.73	0	93.73	3,743.83

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MW-4		01/20/98	- -	93.59	0	93.59	3,743.97
		04/23/98	- -	93.84	0	93.84	3,743.72
		08/04/98	- -	94.65	0	94.65	3,742.91
		10/28/98	- -	95.14	0	95.14	3,742.42
		02/16/99	- -	95.27	0	95.27	3,742.29
		04/21/99	- -	95.30	0	95.30	3,742.26
		08/16/99	- -	96.15	0	96.15	3,741.41
		11/23/99	- -	96.51	0	96.51	3,741.05
		01/26/00	- -	96.11	0	96.11	3,741.45
		04/25/00	- -	96.08	0	96.08	3,741.48
		08/14/00	- -	96.83	0	96.83	3,740.73
		11/02/00	- -	97.45	0	97.45	3,740.11
		02/22/01	- -	97.32	0	97.32	3,740.24
		05/31/01	- -	97.50	0	97.50	3,740.06
		08/28/01	- -	98.30	0	98.30	3,739.26
		12/19/01	- -	98.22	0	98.22	3,739.34
		03/12/02	- -	97.89	0	97.89	3,739.67
		06/20/02	- -	98.65	0	98.65	3,738.91
MW-5	3,816.88	09/10/95	- -	75.82	0	75.82	3,741.06
92.73		04/22/96	- -	74.58	0	74.58	3,742.30
		11/19/96	- -	74.95	0	74.95	3,741.93
		02/07/97	- -	75.23	0	75.23	3,741.65
		04/16/97	- -	75.43	0	75.43	3,741.45
		10/28/97	- -	76.47	0	76.47	3,740.41
		01/20/98	- -	76.71	0	76.71	3,740.17
		04/23/98	- -	76.95	0	76.95	3,739.93
		08/04/98	- -	77.74	0	77.74	3,739.14
		10/28/98	- -	78.36	0	78.36	3,738.52
		02/16/99	- -	78.25	0	78.25	3,738.63
		04/21/99	- -	78.28	0	78.28	3,738.60
		08/16/99	- -	78.85	0	78.85	3,738.03
		11/23/99	- -	79.35	0	79.35	3,737.53
		01/26/00	- -	79.37	0	79.37	3,737.51
		04/25/00	- -	79.31	0	79.31	3,737.57
		08/14/00	- -	79.85	0	79.85	3,737.03
		11/02/00	- -	80.27	0	80.27	3,736.61
		02/22/01	- -	79.93	0	79.93	3,736.95
		06/01/01	- -	79.94	0	79.94	3,736.94
		08/28/01	- -	80.64	0	80.64	3,736.24
		12/19/01	- -	80.63	0	80.63	3,736.25
		03/12/02	- -	79.96	0	79.96	3,736.92
		06/25/02	- -	80.60	0	80.60	3,736.28

Table 1. Summary of Water Level Measurements and Groundwater Elevations, Navajo Refining Company, Lea Refinery

Monitor Well No., Depth Below TOC, & Depth Below Surface (feet)	Elevation Top of Casing (TOC, feet)	Measure-ment Date	Depth to Product (feet)	Depth to Water Below TOC (feet)	Product Thickness (feet)	Corrected Depth to Water (feet)	Corrected Water Level Elev. (feet)
MW-6	3,835.50	04/22/96	--	91.18	0	91.18	3,744.32
98.63		11/19/96	--	90.64	0	90.64	3,744.86
		02/07/97	--	90.91	0	90.91	3,744.59
		04/16/97	--	92.23	0	92.23	3,743.27
		08/14/97	--	92.93	0	92.93	3,742.57
		10/28/97	--	93.23	0	93.23	3,742.27
		01/20/98	--	93.23	0	93.23	3,742.27
		04/23/98	--	93.54	0	93.54	3,741.96
		08/04/98	--	94.25	0	94.25	3,741.25
		10/28/98	--	94.48	0	94.48	3,741.02
		02/16/99	--	94.71	0	94.71	3,740.79
		04/21/99	--	94.78	0	94.78	3,740.72
		08/16/99	--	95.61	0	95.61	3,739.89
		11/23/99	--	96.03	0	96.03	3,739.47
		01/26/00	--	95.61	0	95.61	3,739.89
		04/25/00	--	95.91	0	95.91	3,739.59
		08/14/00	--	96.24	0	96.24	3,739.26
		11/02/00	--	96.68	0	96.68	3,738.82
		02/22/01	--	--	--	--	--
		06/01/01	--	96.80	0	96.80	3,738.70
		08/28/01	--	Dry	--	--	--
		09/09/01	--	97.61	0	97.61	3,737.89
		12/19/01	--	97.39	0	97.39	3,738.11
		03/12/02	--	97.18	0	97.18	3,738.32
		06/20/02	--	97.93	0	97.93	3,737.57
Note: MW-6 not measured 2/22/01. Previous map omitted RW-1 and RW-1 measured in lieu of MW-6.							
On 8/28, MW-6 was dry, moist dirt on probe, possible sanding in of well							
MW-6R		06/20/02	--	98.01	0	98.01	
109.96							
MW-7	3,835.84	04/22/96	91.19	96.56	5.37	91.89	3,743.95
102.89		11/19/96	91.34	93.13	1.79	91.57	3,744.27
		02/07/97	91.50	93.05	1.55	91.70	3,744.14
		04/16/97	91.92	95.57	3.65	92.39	3,743.45
		08/14/97	92.35	96.30	3.95	92.86	3,742.98
		10/28/97	93.85	96.38	2.53	94.18	3,741.66
		01/20/98	92.90	94.82	1.92	93.15	3,742.69
		04/23/98	93.14	94.68	1.54	93.34	3,742.50
		08/04/98	94.13	96.49	2.36	94.44	3,741.40
		10/28/98	94.42	95.49	1.07	94.56	3,741.28
		02/16/99	94.76	94.91	0.15	94.78	3,741.06
		04/21/99	94.75	94.83	0.08	94.76	3,741.08
		08/16/99	95.58	95.59	0.01	95.58	3,740.26

Table 1. Summary of Water Level Measurements and Groundwater Elevations, Navajo Refining Company, Lea Refinery

Monitor Well No., Depth Below TOC, & Depth Below Surface (feet)	Elevation Top of Casing (TOC, feet)	Measure-ment Date	Depth to Product (feet)	Depth to Water Below TOC (feet)	Product Thickness (feet)	Corrected Depth to Water (feet)	Corrected Water Level Elev. (feet)
MW-7		11/23/99	95.80	95.94	0.14	95.82	3,740.02
		01/26/00	- -	95.56	0	95.56	3,740.28
		04/25/00	- -	95.87	0	95.87	3,739.97
		08/14/00	- -	96.24	0	96.24	3,739.60
		11/02/00	- -	96.71	0	96.71	3,739.13
		02/22/01	- -	96.58	0	96.58	3,739.26
		06/01/01	96.92	97.08	0.16	96.94	3,738.90
		08/28/01	97.56	98.69	1.13	97.71	3,738.13
		12/19/02	96.83	97.10	0.27	96.87	3,738.97
		03/12/02	96.75	100.68	3.93	97.27	3,738.57
		04/24/02	96.95	101.04	4.09	97.50	3,738.34
		05/11/02	97.08	101.55	4.47	97.68	3,738.16
		06/20/02	97.37	102.38	5.01	98.04	3,737.80
		08/05/02	97.74	102.71	4.97	98.40	3,737.44
Note: Corrected depth to water = Static DTW - (Prod. Thickness x SG), SG = 0.8665 (0.87 prior to 2001)							
MW-8	3,838.09	04/22/96	- -	94.73	0	94.73	3,743.36
105.43		11/19/96	- -	95.50	0	95.50	3,742.59
		02/07/97	- -	95.50	0	95.50	3,742.59
		04/16/97	- -	95.66	0	95.66	3,742.43
		08/14/97	- -	96.25	0	96.25	3,741.84
		10/28/97	- -	96.45	0	96.45	3,741.64
		01/20/98	- -	96.68	0	96.68	3,741.41
		04/23/98	- -	96.97	0	96.97	3,741.12
		08/04/98	- -	97.52	0	97.52	3,740.57
		10/28/98	- -	97.94	0	97.94	3,740.15
		02/16/99	- -	98.14	0	98.14	3,739.95
		04/21/99	- -	98.21	0	98.21	3,739.88
		08/16/99	- -	99.02	0	99.02	3,739.07
		11/23/99	- -	99.45	0	99.45	3,738.64
		01/26/00	- -	99.05	0	99.05	3,739.04
		04/25/00	- -	99.47	0	99.47	3,738.62
		08/14/00	- -	99.68	0	99.68	3,738.41
		11/02/00	- -	100.01	0	100.01	3,738.08
		02/22/01	- -	99.81	0	99.81	3,738.28
		05/31/01	- -	100.08	0	100.08	3,738.01
		08/28/01	- -	100.96	0	100.96	3,737.13
		12/19/01	- -	100.64	0	100.64	3,737.45
		03/12/02	- -	100.52	0	100.52	3,737.57
		06/20/02	- -	101.22	0	101.22	3,736.87

Table 1. Summary of Water Level Measurements and Groundwater Elevations, Navajo Refining Company, Lea Refinery

Monitor Well No., Depth Below TOC, & Depth Below Surface (feet)	Elevation Top of Casing (TOC, feet)	Measure-ment Date	Depth to Product (feet)	Depth to Water Below TOC (feet)	Product Thickness (feet)	Corrected Depth to Water (feet)	Corrected Water Level Elev. (feet)
MW-9	3,832.82	04/22/96	--	89.60	0	89.60	3,743.22
100.82		11/19/96	--	90.34	0	90.34	3,742.48
		02/07/97	--	90.41	0	90.41	3,742.41
		04/16/97	--	90.52	0	90.52	3,742.30
		08/14/97	--	91.06	0	91.06	3,741.76
		10/28/97	--	91.27	0	91.27	3,741.55
		01/20/98	--	91.54	0	91.54	3,741.28
		04/23/98	--	91.82	0	91.82	3,741.00
		08/04/98	--	92.29	0	92.29	3,740.53
		10/28/98	--	92.70	0	92.70	3,740.12
		02/16/99	--	92.93	0	92.93	3,739.89
		04/21/99	--	93.00	0	93.00	3,739.82
		08/16/99	--	93.75	0	93.75	3,739.07
		11/23/99	--	94.24	0	94.24	3,738.58
		01/26/00	--	93.80	0	93.80	3,739.02
		04/25/00	--	94.31	0	94.31	3,738.51
		08/14/00	--	94.38	0	94.38	3,738.44
		11/02/00	--	94.73	0	94.73	3,738.09
		02/22/01	--	94.55	0	94.55	3,738.27
		03/31/01	--	94.52	0	94.52	3,738.30
		05/31/01	--	94.82	0	94.82	3,738.00
		08/28/01	--	95.71	0	95.71	3,737.11
		12/19/01	--	95.43	0	95.43	3,737.39
		03/12/02	--	95.41	0	95.41	3,737.41
		06/20/02	--	96.03	0	96.03	3,736.79
(Note: Incorrect water level measurement on 22-Feb 2001, water level off 1 ft., original reading 95.55)							
MW-10	3,831.10	04/22/96	--	87.68	0	87.68	3,743.42
98.42		11/19/96	--	88.51	0	88.51	3,742.59
		02/07/97	--	88.54	0	88.54	3,742.56
		04/16/97	--	88.68	0	88.68	3,742.42
		08/14/97	--	89.21	0	89.21	3,741.89
		10/28/97	--	89.40	0	89.40	3,741.70
		01/20/98	--	89.64	0	89.64	3,741.46
		04/23/98	--	89.90	0	89.90	3,741.20
		08/04/98	--	90.32	0	90.32	3,740.78
		10/28/98	--	90.78	0	90.78	3,740.32
		02/16/99	--	91.05	0	91.05	3,740.05
		04/21/99	--	91.07	0	91.07	3,740.03
		08/16/99	--	91.78	0	91.78	3,739.32
		11/23/99	--	92.29	0	92.29	3,738.81
		01/26/00	--	91.86	0	91.86	3,739.24
		04/25/00	--	92.37	0	92.37	3,738.73
		08/14/00	--	92.43	0	92.43	3,738.67
		11/02/00	--	94.73	0	94.73	3,736.37

Table 1. Summary of Water Level Measurements and Groundwater Elevations, Navajo Refining Company, Lea Refinery

Monitor Well No., Depth Below TOC, & Depth Below Surface (feet)	Elevation Top of Casing (TOC, feet)	Measure-ment Date	Depth to Product (feet)	Depth to Water Below TOC (feet)	Product Thickness (feet)	Corrected Depth to Water (feet)	Corrected Water Level Elev. (feet)
MW-10		02/22/01	- -	92.71	0	92.71	3,738.39
		03/31/01	- -	92.67	0	92.67	3,738.43
		05/31/01	- -	92.89	0	92.89	3,738.21
		08/28/01	- -	93.80	0	93.80	3,737.30
		12/19/01	- -	93.66	0	93.66	3,737.44
		03/12/02	- -	93.59	0	93.59	3,737.51
		06/20/02	- -	94.14	0	94.14	3,736.96
(Note: Incorrect water level measurement on 22-Feb 2001, water level off 1 ft., original reading 93.71)							
RW-1	3,835.91	02/22/01	96.56	99.76	3.20	96.99	3,738.92
109.96		06/01/01	97.37	97.87	0.50	97.44	3,738.47
		08/28/01	97.23	101.73	4.50	97.83	3,738.08
		09/10/01	97.90	99.51	1.61	98.11	3,737.80
		12/21/01	97.29	101.03	3.74	97.79	3,738.12
		04/24/02	97.73	97.98	0.25	97.76	3,738.15
		05/11/02	97.54	99.97	2.43	97.86	3,738.05
		06/24/02	97.80	101.54	3.74	98.30	3,737.61
		08/05/02	98.63	99.09	0.46	98.69	3,737.22
Note: Corrected depth to water = Static DTW - (Prod. Thickness x SG), SG = 0.8665 (0.87 prior to 2001)							
Notes:							
1. Monitoring wells MW-1 through MW-7 installed September 1995							
2. Monitoring wells MW-8 through MW-10 installed March and April 1996							
3. Monitoring well MW-6R installed May 2002							
4. Elevations surveyed by John W. West Engineering of Hobbs; measurement from north side of casing.							

Table 2. BTEX Concentrations in Groundwater, Navajo Refining Company, Lea Refinery

Monitoring Well	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total, mg/L)	Total BTEX (mg/L)
MW-1	N/S [1]	--	--	--	--	--
MW-2	09/10/95	<0.001	<0.001	<0.001	<0.001	<0.001
	04/23/96	<0.001	<0.001	<0.001	<0.001	<0.001
	08/14/97	<0.001	<0.001	<0.001	<0.001	<0.001
	10/28/98	<0.001	<0.001	<0.001	<0.001	<0.001
	11/23/99	<0.005	<0.005	<0.005	<0.005	<0.005
	11/02/00	<0.005	<0.005	<0.005	0.007	0.007
	05/31/01	<0.001	<0.001	<0.001	<0.001	<0.001
	12/19/01	<0.005	<0.005	<0.005	<0.005	<0.005
(duplicate)	12/19/01	<0.001	<0.001	<0.001	<0.001	<0.001
MW-3	09/10/95	<0.001	<0.001	<0.001	<0.001	<0.001
	04/23/96	<0.001	<0.001	<0.001	<0.001	<0.001
	11/19/96	<0.001	<0.001	<0.001	<0.001	<0.001
	11/19/96 [2]	<0.001	<0.001	<0.001	<0.001	<0.001
	01/20/97	<0.001	<0.001	<0.001	<0.001	<0.001
	04/16/97	<0.001	<0.001	<0.001	<0.001	<0.001
	08/14/97	<0.001	<0.001	<0.001	<0.001	<0.001
	10/28/97	<0.001	<0.001	<0.001	<0.001	<0.001
	01/21/98	<0.001	<0.001	<0.001	<0.001	<0.001
	04/23/98	<0.005	<0.005	<0.005	0.008	0.008
	04/23/98 [3]	<0.005	<0.005	<0.005	0.008	0.008
	10/29/98	<0.001	<0.001	<0.001	<0.001	<0.001
	02/16/99	0.006	<0.001	0.001	<0.001	0.007
	04/21/99	<0.005	<0.005	<0.005	<0.005	<0.005
	08/16/99	<0.001	<0.001	<0.001	<0.001	<0.004
	11/23/99	**0.314**	<0.005	0.005	0.102	0.421
	01/26/00	**0.482**	<0.005	0.007	0.091	0.580
	04/25/00	**0.433**	<0.005	<0.005	0.109	0.542
	08/14/00	**0.340**	<0.005	<0.005	0.137	0.477
	11/02/00	**0.208**	<0.005	<0.005	0.162	0.370
	02/22/01	**0.131**	<0.001	<0.001	0.020	0.151
	05/31/01	**0.0685**	<0.001	<0.001	0.0151	0.0836
	08/28/01	**0.037**	0.001	<0.001	0.004	0.042
	12/19/01	<0.005	<0.005	<0.005	<0.005	<0.005
	03/12/02	**0.0159**	<0.001	<0.001	<0.001	0.0159
	06/20/02	<0.001	<0.001	<0.001	<0.001	<0.001
MW-4	09/10/95	<0.001	<0.001	<0.001	<0.001	<0.001
	04/23/96	<0.001	<0.001	<0.001	<0.001	<0.001
	08/14/97	<0.001	<0.001	<0.001	<0.001	<0.001
	10/28/98	<0.001	<0.001	<0.001	<0.001	<0.001
	11/23/99	<0.005	<0.005	<0.005	<0.005	<0.005
	11/02/00	<0.005	<0.005	<0.005	0.007	0.007
	05/31/01	0.0011	<0.001	<0.001	<0.001	0.0011
	12/19/01	<0.005	<0.005	<0.005	<0.005	<0.005

Table 2. BTEX Concentrations in Groundwater, Navajo Refining Company, Lea Refinery

Monitoring Well	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total, mg/L)	Total BTEX (mg/L)
MW-5	09/10/95	<0.001	<0.001	<0.001	<0.001	<0.001
	04/23/96	<0.001	<0.001	<0.001	<0.001	<0.001
	08/14/97	<0.001	<0.001	<0.001	<0.001	<0.001
	10/28/98	<0.001	<0.001	<0.001	<0.001	<0.001
	11/23/99	<0.005	<0.005	<0.005	<0.005	<0.005
	11/02/00	<0.005	<0.005	<0.005	0.016	0.016
	06/01/01	<0.005	<0.005	<0.005	<0.005	<0.005
	12/19/01	<0.001	<0.001	<0.001	<0.001	<0.001
MW-6	09/10/95	**1.741**	0.021	**0.962**	**0.972**	3.696
	04/23/96	**1.150**	<0.001	0.599	0.462	2.211
	11/19/96	0.002	<0.001	0.011	0.002	0.015
	01/20/97	0.004	<0.001	0.003	0.007	0.014
	04/16/97	<0.001	<0.001	<0.001	<0.001	<0.001
	08/14/97	<0.001	<0.001	<0.001	<0.001	<0.001
	10/28/97	<0.001	<0.001	<0.001	<0.001	<0.001
	01/21/98	<0.001	<0.001	<0.001	<0.001	<0.001
	04/23/98	<0.001	<0.001	<0.001	<0.001	<0.001
	08/04/98	<0.001	<0.001	<0.001	<0.001	<0.001
	10/29/98	<0.001	<0.001	<0.001	<0.001	<0.001
	02/16/99	<0.001	<0.001	<0.001	<0.001	<0.001
	04/21/99	<0.001	<0.001	<0.001	<0.001	<0.001
	08/16/99	<0.001	<0.001	<0.001	<0.001	<0.001
	11/23/99	<0.005	<0.005	<0.005	<0.005	<0.005
	01/26/00	<0.005	<0.005	<0.005	<0.005	<0.005
	04/25/00	<0.005	<0.005	<0.005	<0.005	<0.005
	08/14/00	<0.005	<0.005	<0.005	0.005	0.005
	11/02/00	<0.001	<0.001	<0.001	<0.001	<0.001
	02/22/01	(Not sampled due to mislocation on map)				
	06/01/01	<0.001	<0.001	<0.001	<0.001	<0.001
	08/28/01	(Not sampled due to lack of measurable water)				
	12/19/01	<0.001	<0.001	<0.001	<0.001	<0.001
	03/12/02	0.0016	<0.001	0.0108	<0.001	0.0124
	06/12/02	(Not sampled due to lack of water; replaced by adjacent well MW-6R)				
MW-6R	06/22/02	<0.001	<0.001	<0.001	<0.001	<0.001
MW-7	08/14/00	<0.005	0.006	0.033	0.062	0.101
	11/02/00	**0.025**	0.006	0.012	<0.005	0.043
	02/22/01	<0.005	<0.005	0.032	0.101	0.133
	06/01/01 [1]	(Not sampled subesquent to 02/22/01 due to hydrocarbon product)				

Table 2. BTEX Concentrations in Groundwater, Navajo Refining Company, Lea Refinery

Monitoring Well	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total, mg/L)	Total BTEX (mg/L)
MW-8	04/23/96	0.002	<0.001	<0.001	<0.001	0.002
	11/19/96	<0.001	<0.001	<0.001	<0.001	<0.001
	11/19/96 [2]	<0.001	<0.001	<0.001	<0.001	<0.001
	01/20/97	<0.001	<0.001	<0.001	<0.001	<0.001
	04/16/97	<0.001	<0.001	<0.001	<0.001	<0.001
	08/14/97	<0.001	<0.001	<0.001	<0.001	<0.001
	10/28/97	<0.001	<0.001	<0.001	<0.001	<0.001
	01/21/98	<0.001	<0.001	<0.001	<0.001	<0.001
	04/23/98	<0.001	<0.001	<0.001	<0.001	<0.001
	08/04/98	<0.001	<0.001	<0.001	<0.001	<0.001
	10/29/98	<0.001	<0.001	<0.001	<0.001	<0.001
	02/16/99	<0.001	<0.001	<0.001	<0.001	<0.001
	04/21/99	<0.005	<0.005	<0.005	<0.005	<0.005
	08/16/99	<0.001	<0.001	<0.001	<0.001	<0.001
	11/23/99	<0.005	<0.005	<0.005	<0.005	<0.005
	01/26/00	<0.005	<0.005	<0.005	<0.005	<0.005
	04/25/00	<0.005	<0.005	<0.005	<0.005	<0.005
	08/14/00	<0.005	<0.005	<0.005	<0.005	<0.005
	11/02/00	<0.005	<0.005	<0.005	<0.005	<0.005
	02/22/01	<0.001	<0.001	<0.001	<0.001	<0.001
	05/31/01	<0.001	<0.001	<0.001	<0.001	<0.001
	08/28/01	<0.001	0.001	<0.001	<0.001	0.001
	12/19/01	<0.001	<0.001	<0.001	<0.001	<0.001
	03/12/02	<0.001	<0.001	<0.001	<0.001	<0.001
	06/20/02	<0.001	<0.001	<0.001	<0.001	<0.001
MW-9	04/23/96	**1.690**	<0.010	<0.010	<0.001	1.690
	11/19/96	**0.679**	<0.005	<0.005	<0.005	0.679
	01/20/97	**0.340**	<0.001	0.002	0.003	0.345
	04/16/97	**0.347**	<0.002	<0.002	0.007	0.354
	08/14/97	**1.680**	<0.010	<0.010	<0.010	1.680
	10/28/97	**0.516**	<0.010	<0.010	<0.010	0.516
	10/28/97 [3]	**0.474**	<0.010	<0.010	<0.010	0.474
	01/21/98	**0.146**	0.005	<0.001	0.002	0.153
	01/21/98 [3]	**0.125**	0.004	<0.001	<0.001	0.129
	04/23/98	**0.013**	<0.001	<0.001	<0.001	0.013
	04/23/98 [3]	**0.012**	<0.001	<0.001	<0.001	0.012
	08/04/98	**0.010**	<0.001	<0.001	<0.001	0.010
	08/04/98 [3]	0.007	<0.001	<0.001	<0.001	0.007
	10/29/98	0.007	0.006	<0.001	0.002	0.015
	10/29/98 [3]	0.006	0.004	0.002	0.002	0.014
	02/16/99	<0.001	0.004	0.001	0.022	0.027
	02/16/99 [3]	<0.001	0.004	0.002	0.008	0.014
	04/21/99	0.008	0.002	<0.001	0.005	0.015
	04/21/99 [3]	0.006	0.001	<0.001	0.004	0.011
	08/16/99	<0.001	<0.001	<0.001	0.002	0.002

Table 2. BTEX Concentrations in Groundwater, Navajo Refining Company, Lea Refinery

Monitoring Well	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total, mg/L)	Total BTEX (mg/L)
MW-9	11/23/99	<0.005	<0.005	<0.005	<0.005	<0.005
	01/26/00	<0.005	<0.005	<0.005	<0.005	<0.005
	04/25/00	<0.005	<0.005	<0.005	<0.005	<0.005
	08/14/00	<0.005	<0.005	<0.005	<0.005	<0.005
	11/02/00	<0.005	<0.005	<0.005	<0.005	<0.005
	02/22/01	<0.001	<0.001	<0.001	<0.001	<0.001
	05/31/01	<0.001	<0.001	<0.001	<0.001	<0.001
	05/31/01 [3]	<0.001	<0.001	<0.001	<0.001	<0.001
	08/28/01	<0.001	<0.001	<0.001	<0.001	<0.001
	12/19/01	<0.005	<0.005	<0.005	<0.005	<0.005
	03/12/02	<0.001	<0.001	<0.001	<0.001	<0.001
	06/20/02	<0.001	<0.001	<0.001	<0.001	<0.001
(Duplicate #1)	06/20/02	<0.005	<0.005	<0.005	<0.005	<0.005
MW-10	04/23/96	<0.001	<0.001	<0.001	<0.001	<0.001
	11/19/96	<0.001	<0.001	<0.001	<0.001	<0.001
	11/19/96 [2]	<0.001	<0.001	<0.001	<0.001	<0.001
	01/20/97	<0.001	<0.001	<0.001	<0.001	<0.001
	04/16/97	<0.001	<0.001	<0.001	<0.001	<0.001
	08/14/97	<0.001	<0.001	<0.001	<0.001	<0.001
	10/28/97	<0.001	<0.001	<0.001	<0.001	<0.001
	01/21/98	<0.001	<0.001	<0.001	<0.001	<0.001
	04/23/98	<0.001	<0.001	<0.001	<0.001	<0.001
	08/04/98	<0.001	<0.001	<0.001	<0.001	<0.001
	10/29/98	<0.001	<0.001	<0.001	<0.001	<0.001
	02/16/99	<0.001	<0.001	<0.001	<0.001	<0.001
	04/21/99	<0.005	<0.005	<0.005	<0.005	<0.005
	08/16/99	<0.001	<0.001	<0.001	<0.001	<0.001
	11/22/99	<0.005	<0.005	<0.005	<0.005	<0.005
	01/26/00	<0.005	<0.005	<0.005	<0.005	<0.005
	04/25/00	<0.005	<0.005	<0.005	<0.005	<0.005
	08/14/00	<0.005	<0.005	<0.005	<0.005	<0.005
	11/02/00	<0.001	<0.001	<0.001	<0.001	<0.001
	02/22/01	<0.001	<0.001	<0.001	<0.001	<0.001
	05/31/01	<0.001	<0.001	<0.001	<0.001	<0.001
	08/28/01	<0.001	<0.001	<0.001	<0.001	<0.001
	12/19/01	<0.001	<0.001	<0.001	<0.001	<0.001
	03/12/02	<0.001	<0.001	<0.001	<0.001	<0.001
(Duplicate #1)	03/12/02	<0.001	<0.001	<0.001	<0.001	<0.001
	06/20/02	<0.001	<0.001	<0.001	<0.001	<0.001
North Water Well	06/09/01	0.0051	<0.001	<0.001	<0.001	0.0051
	08/28/01	0.003	<0.001	<0.001	<0.001	0.003
	12/19/01	<0.001	<0.001	<0.001	<0.001	<0.001
	03/12/02	0.0021	<0.001	<0.001	<0.001	0.0021
	06/20/02	0.001	<0.001	<0.001	<0.001	0.001

Table 2. BTEX Concentrations in Groundwater, Navajo Refining Company, Lea Refinery

Monitoring Well	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total, mg/L)	Total BTEX (mg/L)
South Water Well	08/28/01	<0.001	<0.001	<0.001	<0.001	<0.001
	12/19/01	<0.001	<0.001	<0.001	<0.001	<0.001
	03/12/02	<0.001	<0.001	<0.001	<0.001	<0.001
	06/20/02	<0.001	<0.001	<0.001	<0.001	<0.001
System Composite	06/09/01	<0.001	<0.001	<0.001	<0.001	<0.001
Field Blank	02/22/01	<0.001	<0.001	<0.001	<0.001	<0.001
	06/01/01 [4]	<0.001	<0.001	<0.001	0.0012	0.0012
	12/19/2001 [5]	<0.001	<0.001	<0.001	<0.001	<0.004
Trip Blank	11/02/00	<0.001	<0.001	<0.001	<0.001	<0.001
	03/12/02	<0.001	<0.001	<0.001	<0.001	<0.001
NM WQCC Groundwater Standards:		**0.010**	**0.750**	**0.750**	**0.620**	**- -**

Notes:

Samples analyzed for BTEX using EPA Method 8021B.

Analyses performed by TraceAnalysis, Lubbock, Texas, unless otherwise noted

The following wells are sampled quarterly (unless hydrocarbon product is present), all others are sampled annually:

MW-1, MW-3, MW-6 (-6R), MW-7, MW-8, MW-9, MW-10, North water well, South water well

Voluntary sampling for North and South water wells began June 2001

1. N/S - Monitoring well not sampled due to presence of phase-separated hydrocarbon
2. Analyses performed by American Environmental Newtwork, Inc., Albuquerque, NM
3. Duplicate analysis
4. ShurFine distilled water
5. Magic Mountain distilled water

Table 3. Inorganic Constituents Concentrations in Groundwater, Navajo Refining Company, Lea Refinery

Monitoring Well	Sample Date	Chloride (mg/L)	Fluoride (mg/L)	Nitrate-N (mg/L)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Boron (mg/L)	Iron (mg/L)	Manganese (mg/L)	Vanadium (mg/L)
NM WQCC Groundwater Standards:		**250**	**1.6**	**10.0**	**600**	**1,000**	**0.10**	**1.0**	**0.75**	**1.0**	**0.20**	--
MW-1	N/S [1]	--	--	--	--	--	--	--	--	--	--	--
MW-2	11/02/00	93	**1.9**	3.9	69	530	<0.01	0.169	<0.5	**1.24**	0.0175	0.0134
	05/31/01	94	**1.65**	3.09	69.4	541	--	--	--	--	--	--
	12/19/01	79.0	1.57	3.38	62.8	549	<0.010	0.119	0.644	0.243	<0.02	<0.02
MW-3	11/02/00	**490**	1.1	1.0	50	**1,500**	<0.01	0.381	<0.5	**2.4**	**0.677**	<0.01
	05/31/01	**464**	1.18	<1.00	42.9	**1,310**	--	--	--	--	--	--
	12/19/01	**548**	1.01	<1.00	29.0	**1,400**	<0.010	0.389	0.555	0.952	**0.688**	<0.02
MW-4	11/02/00	23	1.6	2.8	80	370	<0.01	0.784	<0.5	**11.4**	0.18	0.0576
	05/31/01	23.4	**1.61**	2.62	73.6	368	--	--	--	--	--	--
	12/19/01	21.9	1.58	2.87	76.4	394	<0.010	0.153	0.181	0.930	<0.02	0.0266
MW-5	11/02/00	74	1.1	1.9	52	570	<0.01	0.585	<0.5	**16.4**	**0.213**	0.0665
	06/01/01	44	1.13	1.67	46.3	--	--	--	--	--	--	--
	12/19/01	68.8	1.03	1.9	49.7	603	<0.010	0.187	0.158	**1.64**	<0.02	<0.02
MW-6	11/02/00	**330**	**3.3**	<1.0	99	860	0.0939	0.122	<0.5	0.649	0.0465	0.188
	06/01/01	241	**2.99**	<1.00	68.0	--	--	--	--	--	--	--
	12/19/01	171	**3.97**	<1.00	61.4	667	0.0821	0.102	0.112	**1.11**	0.0489	0.222
MW-7	11/02/00	91	**3.3**	<1.0	72	590	0.02	0.34	<0.5	8.73	0.212	<0.01
	12/19/01 [1]	--	--	--	--	--	--	--	--	--	--	--
MW-8	11/02/00	**490**	**2.5**	7.2	110	**1,400**	<0.01	0.28	0.704	**1.96**	0.0378	0.0151
	05/31/01	**418**	**2.05**	3.82	93.7	--	--	--	--	--	--	--
	12/19/01	**397**	**1.76**	5.41	101	**1,160**	<0.010	0.132	0.676	0.180	<0.02	0.025
MW-9	11/02/00	150	**4.7**	1.0	100	750	<0.01	0.137	<0.5	**1.02**	0.06	<0.01
	05/31/01	169	**4.37**	1.51	73.4	--	--	--	--	--	--	--
	12/19/01	**269**	**3.93**	3.71	70.1	944	0.0156	0.182	0.181	0.528	0.112	0.0396

Table 3. Inorganic Constituents Concentrations in Groundwater, Navajo Refining Company, Lea Refinery

Monitoring Well	Sample Date	Chloride (mg/L)	Fluoride (mg/L)	Nitrate-N (mg/L)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Boron (mg/L)	Iron (mg/L)	Manganese (mg/L)	Vanadium (mg/L)
MW-10	11/02/00	39	1.4	3.1	94	460	<0.01	0.151	<0.5	0.907	0.0159	0.0135
	05/31/01	--	1.51	2.81	87.2	449	--	--	--	--	--	--
	12/19/01	29.8	1.49	3.09	91.2	450	<0.010	0.136	0.170	0.408	<0.02	0.0263
NM WQCC Groundwater Standards:		**250**	**1.6**	**10.0**	**600**	**1,000**	**0.10**	**1.0**	**0.75**	**1.0**	**0.20**	--
Notes:												
Data prior to 2000 not available for inclusion in this table.												
Samples 11/02/00 field filtered; others are total.												
Analyses performed by TraceAnalysis, Lubbock, Texas												
Sampling and analyses for inorganic constituents performed annually (11/02/00, 12/19/01)												
Additional sampling performed 05/31/01 and 06/01/01												
1. N/S - Monitoring well not sampled due to presence of phase-separated hydrocarbon												

Table 4. Total Fluids and Product Recovery Volumes, Navajo Refining Company, Lea Refinery

Date	Recovery Method	Cumulative Total Fluids Recovered (gallons)	Barrel Reading (feet)	Product Recovered (gallons)	Cumulative Product Recovered (gallons)
12/28/97	Sub. Pump	699,033	N/A	Unknown	Unknown
01/21/98	PRS	N/A	N/A	0.50	0.5
01/27/98	PRS	N/A	N/A	2.00	2.5
02/11/98	PRS	N/A	N/A	1.10	3.6
02/24/98	PRS	N/A	N/A	1.50	5.1
03/13/98	PRS	N/A	N/A	2.60	7.7
03/23/98	PRS	N/A	N/A	10.60	18.3
04/10/98	PRS	N/A	N/A	15.80	34.1
04/22/98	PRS	N/A	N/A	0.50	34.6
05/06/98	PRS	N/A	N/A	7.50	42.1
06/23/98	PRS	N/A	N/A	19.50	61.6
08/04/98	PRS	N/A	N/A	5.50	67.1
09/18/98	PRS	N/A	N/A	44.20	111.3
10/29/98	PRS	N/A	N/A	15.50	126.8
11/18/98	PRS	N/A	N/A	6.60	133.4
02/16/99	PRS	N/A	N/A	10.66	144.1
04/21/99	PRS	N/A	N/A	4.42	148.5
09/14/99	PRS	N/A	N/A	11.81	160.3
10/26/99	PRS	N/A	N/A	3.31	163.6
11/23/99	PRS	N/A	N/A	1.65	165.3
12/21/99	PRS	N/A	N/A	1.65	166.9
01/26/00	PRS	N/A	N/A	7.28	174.2
02/23/00	PRS	N/A	N/A	2.62	176.8
04/03/00	PRS	N/A	N/A	1.46	178.3
04/25/00	PRS	N/A	N/A	2.87	181.1
06/13/00	PRS	N/A	N/A	1.86	183.0
07/19/00	PRS	N/A	N/A	4.10	187.1
08/14/00	PRS	N/A	N/A	1.18	188.3
04/07/01	PRS	N/A	0.33	6.42	194.7
04/21/01	PRS	N/A	0.50	3.31	198.0
04/28/01	PRS	N/A	0.60	1.95	199.9
05/12/01	PRS	N/A	0.73	2.53	202.5
06/01/01	PRS	N/A	0.81	1.56	204.0
06/09/01	PRS	N/A	0.88	1.36	205.4
08/28/01	PRS	N/A	0.92	0.78	206.2
09/09/01	PRS	N/A	1.03	2.14	208.3
12/19/01	PRS	N/A	1.32	5.64	214.0
02/15/02	PRS	N/A	1.92	11.68	225.6
03/12/02	PRS	N/A	2.10	3.50	229.1
04/24/02	PRS	N/A	2.44	6.62	235.8
05/09/02	PRS	N/A	2.44	0.00	235.8
05/10/02	PRS	N/A	0.60	(barrel emptied)	
05/11/02	PRS	N/A	0.72	2.34	238.1
06/22/02	PRS	N/A	0.72	0.00	238.1
06/24/02	PRS	N/A	0.89	3.31	241.4
		Total Measured Volume of Product Recovered:			**241.4**

Notes:

Product recovery methods used:

Submersible Pump, 3/4 HP Grundfos for total fluids recovery (10/01/96 - 12/28/97)

Product Recovery System (PRS), Xitech ADJ 1000 Smart Skimmer

Volume product recovered during total fluids recovery (10/96-12/97) unknown

Volume recovered (beginning 04/01) calculated using drum diameter of 1.82 ft., or 19.46 gallons per foot barrel depth

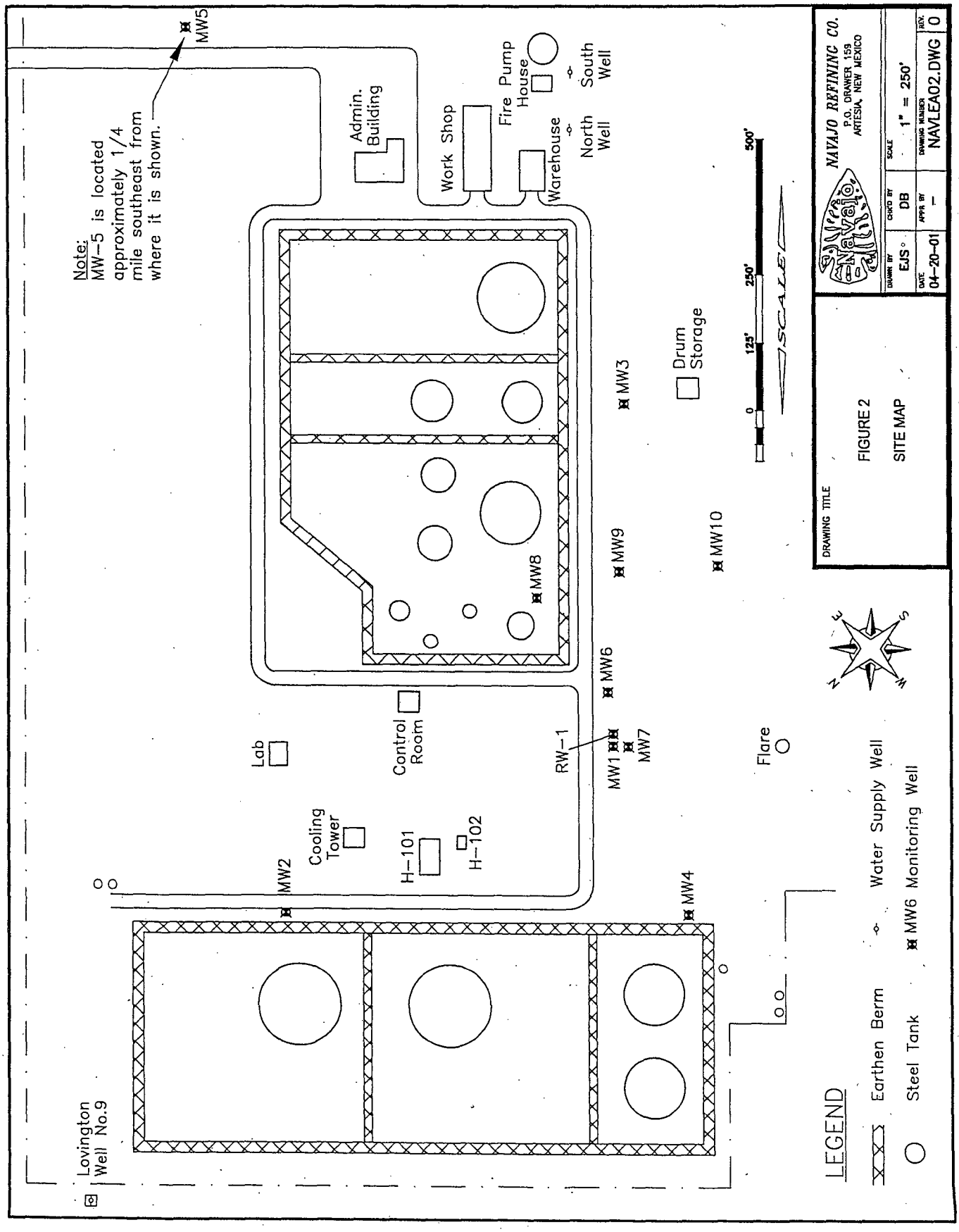
Table 5. Groundwater Temperatures (°F), 2000-2002, Navajo Refining Company, Lea Refinery

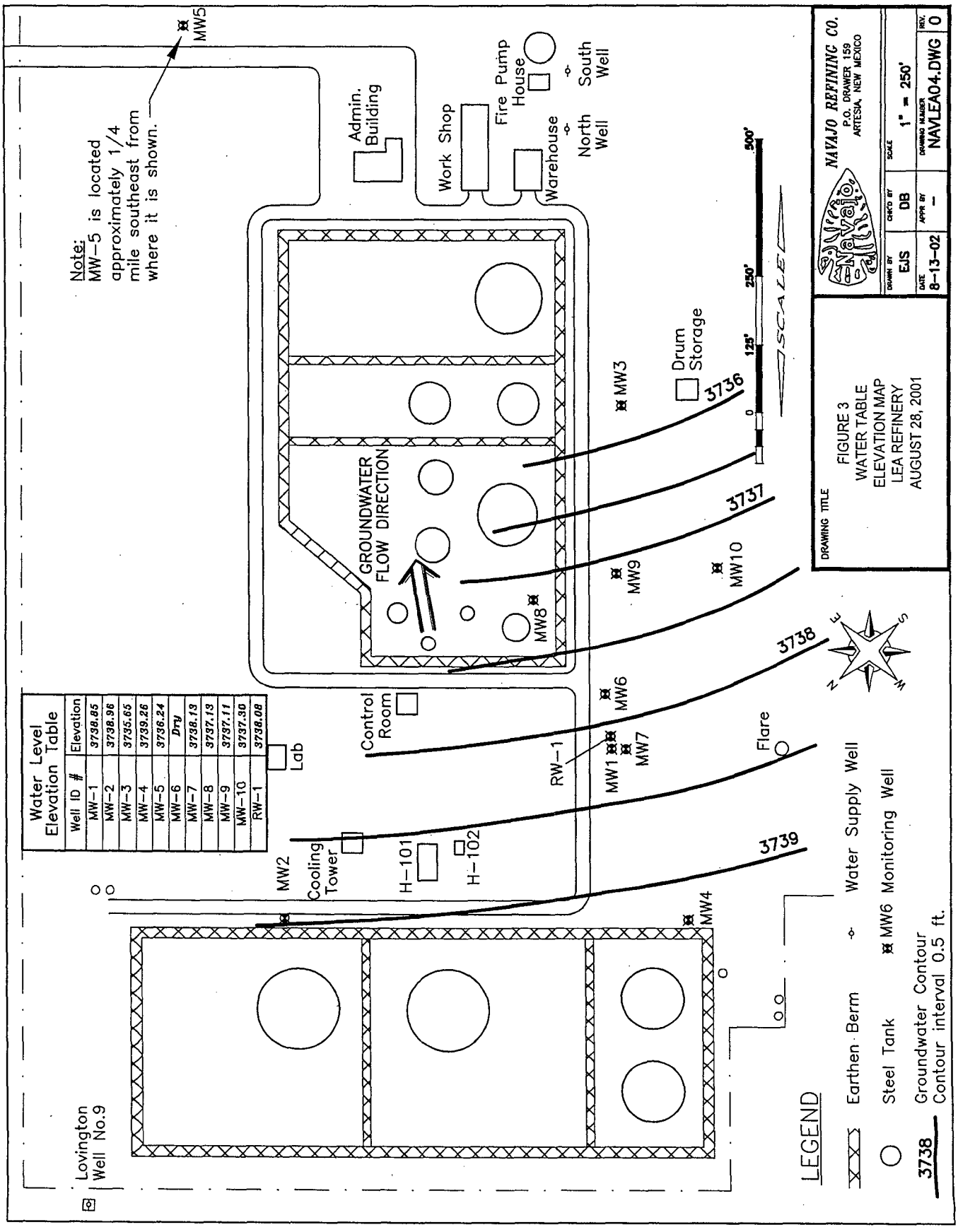
Measure-ment Date	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6 [1]	MW-7	MW-8	MW-9	MW-10
01/26/00	84	- -	64.6	- -	- -	81.3	82	69.6	77.4	66.9
04/25/00	84	- -	70.7	- -	- -	84.7	83	75.0	84.4	69.1
08/14/02	84	- -	68.7	- -	- -	85.1	81.0	76.1	81.9	70.0
11/02/00	HP	64.9	64.6	65.1	63.9	77.2	73.9	70.2	76.8	67.8
02/22/01	HP	- -	NM	- -	- -	NM	HP	NM	NM	NM
05/31/01	HP	69	69	68	67	83	HP	75	81	70
08/28/01	HP	- -	73.0	- -	- -	NS	HP	74.1	83.1	71.8
12/19/01	HP	60.0	61.4	56.8	61.4	73.7	HP	64.2	71.0	62.7
03/12/02	HP	- -	73.9	- -	- -	74.9	HP	68.9	76.3	72.5
06/20/02	HP	- -	70.4	- -	- -	NM	HP	78.1	81.7	72.6
Average:	84.0	64.6	68.5	63.3	64.1	80.0	80.0	72.4	79.3	69.3
Notes:										
Temperatures in degrees Fahrenheit										
HP - Hydrocarbon product, temperature not measured; NM - Not measured; NS - Not sampled										
1. MW-6R sampled beginning 06/20/02; water sample taken following well development, temperature not measured.										

Figure 1. Location Map
Navajo Refining Company, Lea Refinery

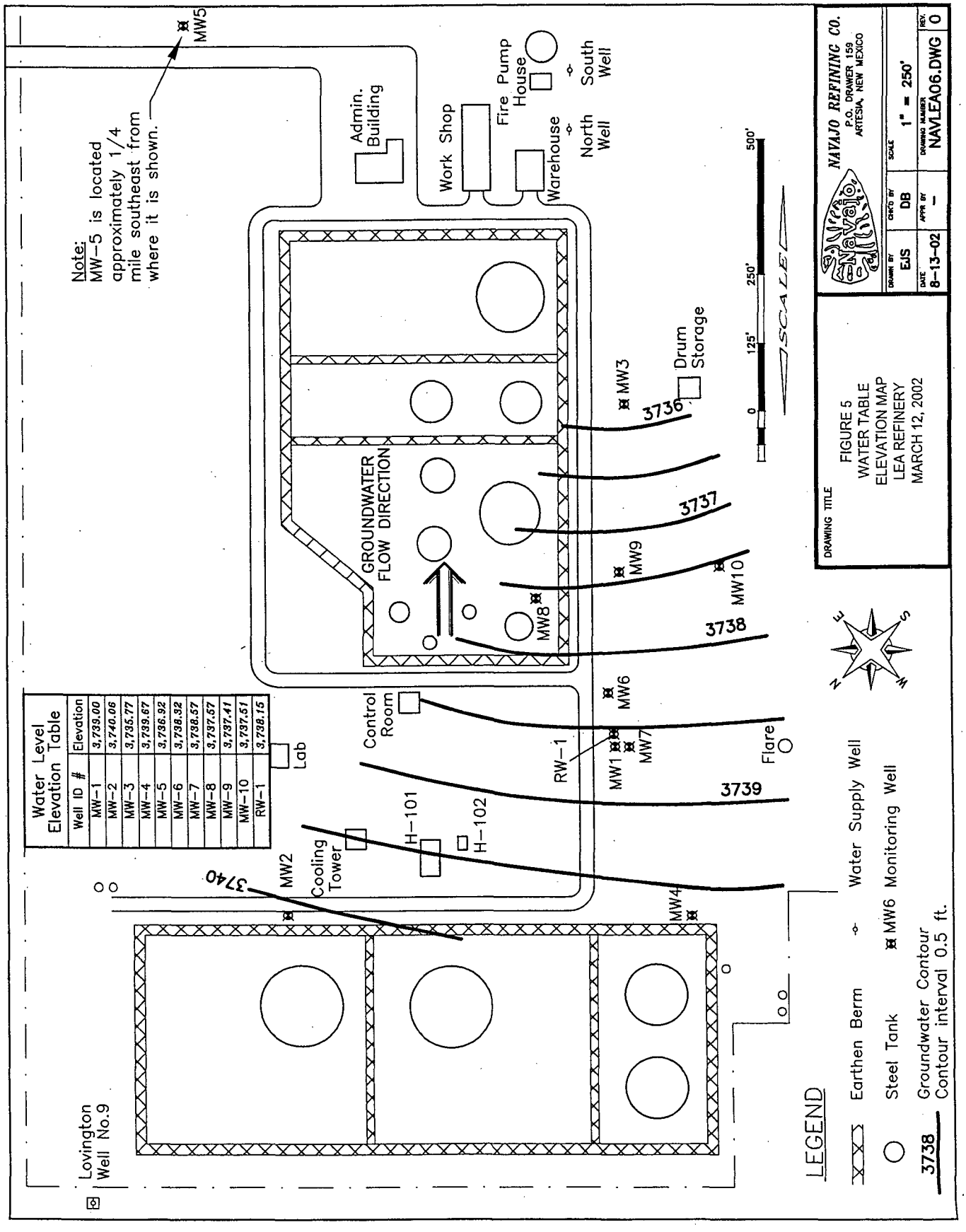
Name: LOVINGTON
Date: 6/8/2001
Scale: 1 inch equals 2000 feet

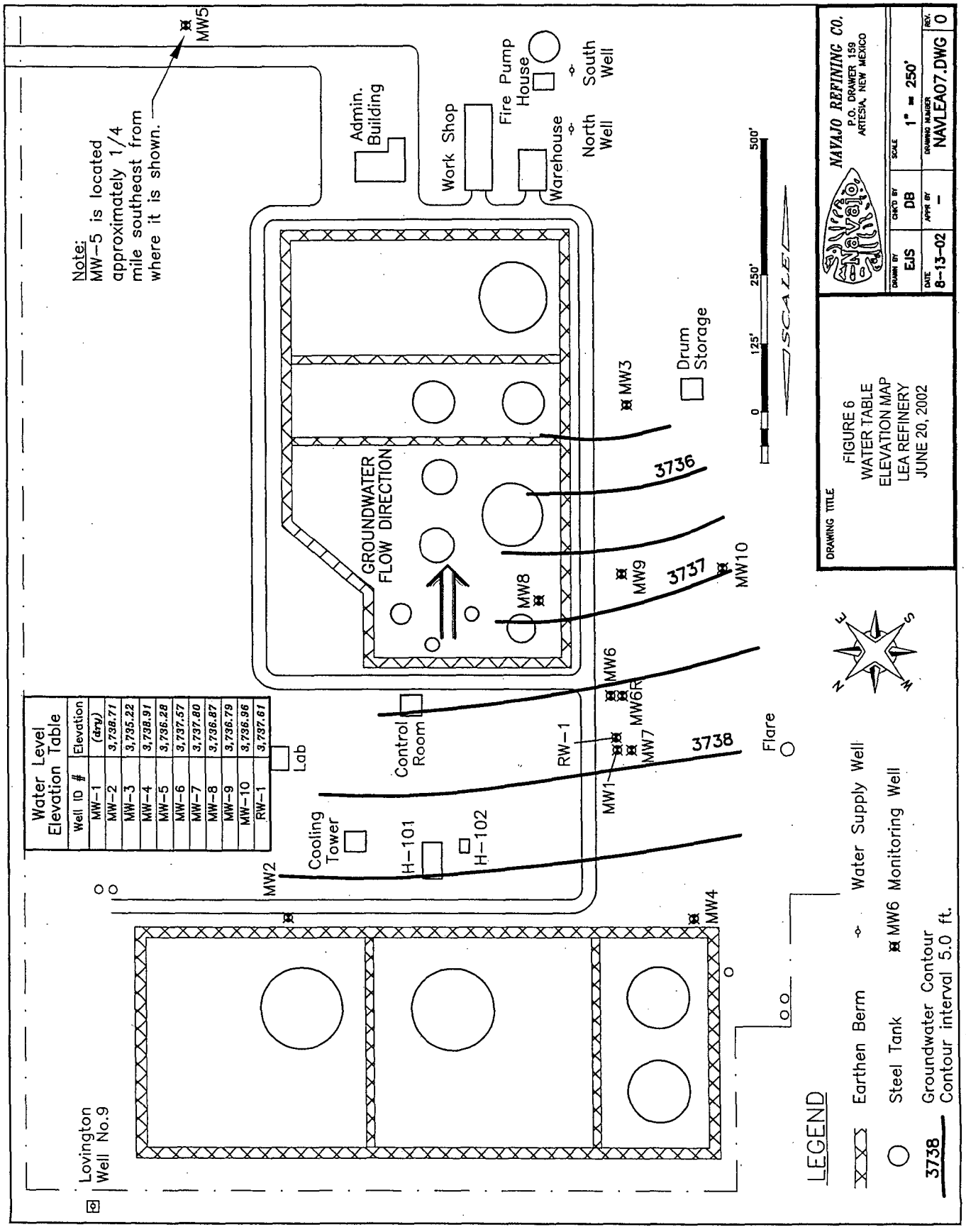
Location: 032° 52' 55.4" N 103° 17' 51.4" W
Caption: Figure 1. Location Map, Navajo Refining Co., Lea Refinery


MW5
Note:
MW-5 is located approximately 1/4 mile southeast from where it is shown.
Admin. Building
Work Shop
Fire Pump House
Warehouse
South Well
North Well
MW3
Drum Storage
MW8
MW9
MW10
MW6
MW7
MW1
RW-1
Lab
Control Room
Flare
Cooling Tower
H-101
H-102
MW2
MW4
Lovington Well No.9
LEGEND
Earthen Berm
Water Supply Well
Steel Tank
MW6 Monitoring Well
SCALE
0
125'
250'
500'
NAVAJO REFINING CO.
P.O. DRAWER 159
ARTESIA, NEW MEXICO
DRAWN BY EJS
CHK'D BY DB
APP'R BY –
DATE 04-20-01
SCALE 1" = 250'
DRAWING NUMBER NAVLEA02.DWG
REV. 0
DRAWING TITLE
FIGURE 2
SITE MAP


Note:
MW-5 is located approximately 1/4 mile southeast from where it is shown.
MW5
Admin. Building
Work Shop
Fire Pump House
South Well
North Well
Warehouse
Drum Storage
MW3
GROUNDWATER FLOW DIRECTION
MW8
MW9
MW10
MW6
MW1
MW7
RW-1
Control Room
Lab
Flare
MW2
Cooling Tower
H-101
H-102
MW4
3736
3737
3738
3739
Water Level Elevation Table
Well ID # | Elevation
MW-1 | 3738.85
MW-2 | 3738.96
MW-3 | 3735.65
MW-4 | 3739.26
MW-5 | 3736.24
MW-6 | Dry
MW-7 | 3738.13
MW-8 | 3737.13
MW-9 | 3737.11
MW-10 | 3737.30
RW-1 | 3736.08
LEGEND
Earthen Berm
Water Supply Well
Steel Tank
MW6 Monitoring Well
3738 Groundwater Contour
Contour interval 0.5 ft.
Lovington Well No.9
SCALE
0
125'
250'
500'
DRAWING TITLE
FIGURE 3
WATER TABLE
ELEVATION MAP
LEA REFINERY
AUGUST 28, 2001
NAVAJO REFINING CO.
P.O. DRAWER 159
ARTESIA, NEW MEXICO
DRAWN BY EJS
CHK'D BY DB
APPR BY -
DATE 8-13-02
SCALE 1" = 250'
DRAWING NUMBER NAVLEA04.DWG
REV. 0

MW5
Note:
MW-5 is located approximately 1/4 mile southeast from where it is shown.
Admin. Building
Work Shop
Fire Pump House
South Well
North Well
Warehouse
Drum Storage
MW3
GROUNDWATER FLOW DIRECTION
MW8
MW9
MW10
3737
3738
3739
Control Room
Lab
Cooling Tower
H-101
H-102
MW2
MW4
RW-1
MW1
MW6
MW7
Flare
Lovington Well No.9
0
125'
250'
500'
SCALE
Water Level Elevation Table
Well ID # | Elevation
MW-1 | 3738.96
MW-2 | 3739.57
MW-3 | 3736.09
MW-4 | 3739.34
MW-5 | 3736.25
MW-6 | 3738.11
MW-7 | 3738.97
MW-8 | 3737.45
MW-9 | 3737.39
MW-10 | 3737.44
RW-1 | 3738.12
LEGEND
Earthen Berm
Water Supply Well
Steel Tank
MW6 Monitoring Well
Groundwater Contour
3738
Contour interval 0.5 ft.
NAVAJO REFINING CO.
P.O. DRAWER 159
ARTESIA, NEW MEXICO
DRAWN BY EJS
CHK'D BY DB
APP'D BY –
DATE 8-13-02
SCALE 1" = 250'
DRAWING NUMBER NAVLEA05.DWG
REV. 0
DRAWING TITLE
FIGURE 4
WATER TABLE
ELEVATION MAP
LEA REFINERY
DECEMBER 19, 2001


MW5
Note:
MW-5 is located approximately 1/4 mile southeast from where it is shown.
Admin. Building
Work Shop
Fire Pump House
Warehouse
South Well
North Well
Drum Storage
MW3
3736
3737
3738
3739
3740
GROUNDWATER FLOW DIRECTION
MW8
MW9
MW10
MW6
MW1
MW7
RW-1
MW2
MW4
Control Room
Lab
Cooling Tower
H-101
H-102
Flare
Lovington Well No.9
0
125'
250'
500'
SCALE
Water Level Elevation Table
Well ID # | Elevation
MW-1 | 3,739.00
MW-2 | 3,740.06
MW-3 | 3,735.77
MW-4 | 3,739.67
MW-5 | 3,736.92
MW-6 | 3,738.32
MW-7 | 3,738.57
MW-8 | 3,737.57
MW-9 | 3,737.41
MW-10 | 3,737.51
RW-1 | 3,738.15
LEGEND
Earthen Berm
Water Supply Well
Steel Tank
MW6 Monitoring Well
3738 Groundwater Contour
Contour interval 0.5 ft.
NAVAJO REFINING CO.
P.O. DRAWER 159
ARTESIA, NEW MEXICO
DRAWN BY EJS
CHK'D BY DB
SCALE 1" = 250'
DATE 8-13-02
APPR BY -
DRAWING NUMBER NAVLEA06.DWG
REV. 0
DRAWING TITLE
FIGURE 5
WATER TABLE
ELEVATION MAP
LEA REFINERY
MARCH 12, 2002


Note:
MW-5 is located approximately 1/4 mile southeast from where it is shown.
MW5
Admin. Building
Work Shop
Fire Pump House
South Well
North Well
Warehouse
Drum Storage
MW3
GROUNDWATER FLOW DIRECTION
3736
3737
3738
MW8
MW9
MW10
MW6
MW6R
MW7
MW1
RW-1
Control Room
Lab
Cooling Tower
H-101
H-102
MW2
MW4
Flare
Lovington Well No.9
0
125'
250'
500'
SCALE
Water Level Elevation Table
Well ID # | Elevation
MW-1 | (dry)
MW-2 | 3,738.71
MW-3 | 3,735.22
MW-4 | 3,738.91
MW-5 | 3,736.28
MW-6 | 3,737.57
MW-7 | 3,737.80
MW-8 | 3,736.87
MW-9 | 3,736.79
MW-10 | 3,736.96
RW-1 | 3,737.61
LEGEND
Earthen Berm
Water Supply Well
Steel Tank
MW6 Monitoring Well
3738 Groundwater Contour
Contour interval 5.0 ft.
DRAWING TITLE
FIGURE 6
WATER TABLE
ELEVATION MAP
LEA REFINERY
JUNE 20, 2002
NAVAJO REFINING CO.
P.O. DRAWER 159
ARTESIA, NEW MEXICO
DRAWN BY EJS
CHK'D BY DB
SCALE 1" = 250'
DATE 8-13-02
APPR BY -
DRAWING NUMBER NAVLEA07.DWG
REV. 0

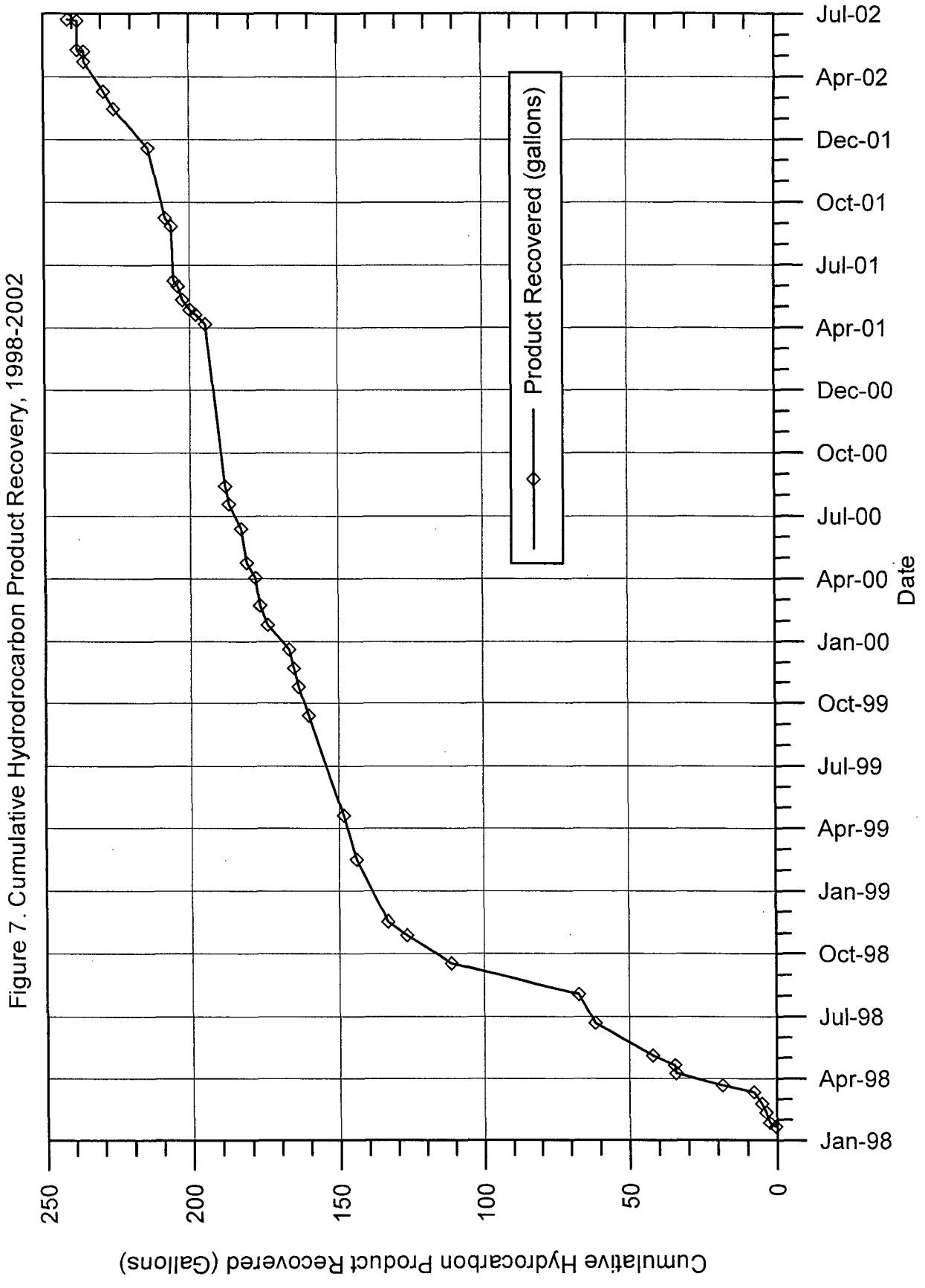


Figure 7. Cumulative Hydrodrocarbon Product Recovery, 1998-2002
Product Recovered (gallons)
Date
Jul-02
Apr-02
Dec-01
Oct-01
Jul-01
Apr-01
Dec-00
Oct-00
Jul-00
Apr-00
Jan-00
Oct-99
Jul-99
Apr-99
Jan-99
Oct-98
Jul-98
Apr-98
Jan-98
250
200
150
100
50
0
Cumulative Hydrocarbon Product Recovered (Gallons)

XII. APPENDIX
Analytical Results and Chain-of-Custody Forms

Analytical and Quality Control Report

David Boyer
Navajo Refining
501 E. Main
Artesia, NM 88210

Report Date: September 3, 2001

Order ID Number: A01082916

Project Number: N/A
Project Name: N/A
Project Location: Lea Refining

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
178201	MW-8	Water	8/28/01	9:55	8/29/01
178202	MW-10	Water	8/28/01	10:30	8/29/01
178203	MW-9	Water	8/28/01	11:05	8/29/01
178204	MW-3	Water	8/28/01	11:48	8/29/01
178205	North Water Well	Water	8/28/01	14:55	8/29/01
178206	South Water Well	Water	8/28/01	15:10	8/29/01

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 7 pages and shall not be reproduced except in its entirety including the chain of custody (COC), without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 178201 - MW-8

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13704	Date Analyzed:	8/29/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11696	Date Prepared:	8/29/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.075	mg/L	1	0.10	75	72 - 128
4-BFB		0.072	mg/L	1	0.10	72	72 - 128

Sample: 178202 - MW-10

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13704	Date Analyzed:	8/29/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11696	Date Prepared:	8/29/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.073	mg/L	1	0.10	73	72 - 128
4-BFB	[1]	0.070	mg/L	1	0.10	70	72 - 128

Sample: 178203 - MW-9

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13675	Date Analyzed:	8/28/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11668	Date Prepared:	8/28/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

[1] Low surrogate recovery due to matrix difficulties.

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.072	mg/L	1	0.10	72	72 - 128
4-BFB	[2]	0.069	mg/L	1	0.10	69	72 - 128

Sample: 178204 - MW-3

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13704	Date Analyzed:	8/29/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11696	Date Prepared:	8/29/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.037	mg/L	1	0.001
Toluene		0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		0.004	mg/L	1	0.001
Total BTEX		0.042	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.077	mg/L	1	0.10	77	72 - 128
4-BFB		0.100	mg/L	1	0.10	100	72 - 128

Sample: 178205 - North Water Well

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13704	Date Analyzed:	8/29/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11696	Date Prepared:	8/29/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.003	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.003	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT	[3]	0.069	mg/L	1	0.10	69	72 - 128
4-BFB	[4]	0.065	mg/L	1	0.10	65	72 - 128

Sample: 178206 - South Water Well

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13704	Date Analyzed:	8/29/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11696	Date Prepared:	8/29/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001

Continued ...

[2]Low surrogate recovery due to matrix difficulties.
[3]Low surrogate recovery due to lack of mixing.
[4]Low surrogate recovery due to lack of mixing.

... Continued Sample: 178206 Analysis: BTEX

Param	Flag	Result	Units	Dilution	RDL
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT	[5]	0.068	mg/L	1	0.10	68	72 - 128
4-BFB	[6]	0.064	mg/L	1	0.10	64	72 - 128

[5]Low surrogate recovery due to lack of mixing.
[6]Low surrogate recovery due to lack of mixing.

Quality Control Report
Method Blank

Method Blank QCBatch: QC13675

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.088	mg/L	1	0.10	88	72 - 128
4-BFB		0.082	mg/L	1	0.10	82	72 - 128

Method Blank QCBatch: QC13704

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.098	mg/L	1	0.10	98	72 - 128
4-BFB		0.091	mg/L	1	0.10	91	72 - 128

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes QCBatch: QC13675

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.095	0.093	mg/L	1	0.10	<0.001	95	2	80 - 120	20
Benzene	0.091	0.091	mg/L	1	0.10	<0.001	91	0	80 - 120	20
Toluene	0.095	0.095	mg/L	1	0.10	<0.001	95	0	80 - 120	20
Ethylbenzene	0.095	0.095	mg/L	1	0.10	<0.001	95	0	80 - 120	20
M,P,O-Xylene	0.283	0.284	mg/L	1	0.30	<0.001	94	0	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.084	0.085	mg/L	1	0.10	84	85	72 - 128
4-BFB	0.084	0.084	mg/L	1	0.10	84	84	72 - 128

Laboratory Control Spikes

QCBatch: QC13704

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.100	0.102	mg/L	1	0.10	<0.001	100	2	80 - 120	20
Benzene	0.091	0.094	mg/L	1	0.10	<0.001	91	3	80 - 120	20
Toluene	0.094	0.096	mg/L	1	0.10	<0.001	94	2	80 - 120	20
Ethylbenzene	0.093	0.096	mg/L	1	0.10	<0.001	93	3	80 - 120	20
M,P,O-Xylene	0.282	0.289	mg/L	1	0.30	<0.001	94	2	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.097	0.098	mg/L	1	0.10	97	98	72 - 128
4-BFB	0.098	0.099	mg/L	1	0.10	98	99	72 - 128

Quality Control Report
Continuing Calibration Verification Standards

CCV (1)

QCBatch: QC13675

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.095	95	85 - 115	8/28/01
Benzene		mg/L	0.10	0.090	90	85 - 115	8/28/01
Toluene		mg/L	0.10	0.094	94	85 - 115	8/28/01
Ethylbenzene		mg/L	0.10	0.095	95	85 - 115	8/28/01
M,P,O-Xylene		mg/L	0.30	0.282	94	85 - 115	8/28/01

CCV (2)

QCBatch: QC13675

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.092	92	85 - 115	8/28/01
Benzene		mg/L	0.10	0.088	88	85 - 115	8/28/01
Toluene		mg/L	0.10	0.091	91	85 - 115	8/28/01
Ethylbenzene		mg/L	0.10	0.092	92	85 - 115	8/28/01
M,P,O-Xylene		mg/L	0.30	0.273	91	85 - 115	8/28/01

ICV (1)

QCBatch: QC13675

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.094	94	85 - 115	8/28/01
Benzene		mg/L	0.10	0.089	89	85 - 115	8/28/01
Toluene		mg/L	0.10	0.093	93	85 - 115	8/28/01
Ethylbenzene		mg/L	0.10	0.092	92	85 - 115	8/28/01
M,P,O-Xylene		mg/L	0.30	0.276	92	85 - 115	8/28/01

CCV (1)

QCBatch: QC13704

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.096	96	85 - 115	8/29/01
Benzene		mg/L	0.10	0.087	87	85 - 115	8/29/01
Toluene		mg/L	0.10	0.089	89	85 - 115	8/29/01
Ethylbenzene		mg/L	0.10	0.089	89	85 - 115	8/29/01
M,P,O-Xylene		mg/L	0.30	0.269	90	85 - 115	8/29/01

CCV (2)

QCBatch: QC13704

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.096	96	85 - 115	8/29/01
Benzene		mg/L	0.10	0.089	89	85 - 115	8/29/01
Toluene		mg/L	0.10	0.091	91	85 - 115	8/29/01
Ethylbenzene		mg/L	0.10	0.091	91	85 - 115	8/29/01
M,P,O-Xylene		mg/L	0.30	0.274	91	85 - 115	8/29/01

ICV (1)

QCBatch: QC13704

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.110	110	85 - 115	8/29/01
Benzene		mg/L	0.10	0.099	99	85 - 115	8/29/01
Toluene		mg/L	0.10	0.102	102	85 - 115	8/29/01
Ethylbenzene		mg/L	0.10	0.102	102	85 - 115	8/29/01
M,P,O-Xylene		mg/L	0.30	0.309	103	85 - 115	8/29/01

6701 Aberdeen Av , Ste. 9
Lubbock, Texas 79424
Tel (806) 794-1296
Fax (806) 794-1298
1 (800) 378-1296

TraceAnalysis, Inc.

McCutcheon, Suite H
El Paso, Texas 79932
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # A0108291C

Company Name: NAVAJO Refining (505) 748-3311
Address: (Street, City, Zip) P.O. Box 159 Artesia (505) 746-5421
Contact Person: David Boyer (505) 557-0510 Phone
Invoice to: (If different from above) Darrell Moore NRC 505 393-4388 FAX
Project #: Project Name:
Project Location: Lea Refinery Sampler Signature:

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCl	HNO_3	H_2SO_4	NaOH	ICE	NONE	SAMPLING: DATE	TIME	MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	Turn Around Time if different from standard	Hold
178201	MW-8	2	80ml	X				X				X		8/28	0950	X															
202	MW-10	"	"	X				X				X		"	1030	X															
03	MW-9	"	"	X				X				X		"	1100	X															
04	MW-3	"	"	X				X				X		"	1148	X															
05	Northwest Well	"	"	X				X				X		"	1458	X															
06	South Wide Well	"	"	X				X				X		"	1510	X															

Relinquished by: D.Boyer Date: 8/28 Time: 4:30PM
Received by: Date: Time:
Relinquished by: Date: Time:
Received by: Date: Time:
Relinquished by: Date: Time:
Received at Laboratory by: Date: Time:

Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C.O.C.

ORIGINAL COPY

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB USE ONLY
Intact Y / N
Headspace Y / N
Temp 4 °
Log-in Review NF

REMARKS: Copy of Results to D.Boyer

☐ Check if Special Reporting Limits Are Needed

Carrier # Bus 902 674 9224

08/15/2002 15:57 8067941298 TRACEANALYSIS PAGE 01

Analytical and Quality Control Report

David Boyer
Navajo Refining
501 E. Main
Artesia, NM 88210

Report Date: January 8, 2002

Order ID Number: A01122101

Project Number: N/A
Project Name: N/A
Project Location: Lea Refining

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
187792	MW-2	Water	12/19/01	9:55	12/20/01
187793	MW-4	Water	12/19/01	10:40	12/20/01
187794	MW-8	Water	12/19/01	11:20	12/20/01
187795	MW-10	Water	12/19/01	12:05	12/20/01
187796	MW-9	Water	12/19/01	12:46	12/20/01
187797	MW-3	Water	12/19/01	13:14	12/20/01
187798	South Water Well	Water	12/19/01	13:55	12/20/01
187799	North Water Well	Water	12/19/01	13:47	12/20/01
187800	MW-5	Water	12/19/01	14:14	12/20/01
187801	MW-6	Water	12/19/01	15:20	12/20/01
187802	Duplicate	Water	12/19/01	:	12/20/01
187803	Field Blank	Water	12/19/01	:	12/20/01

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 187792 - MW-2

Analysis: BTEX | Analytical Method: S 8021B | QC Batch: QC16977 | Date Analyzed: 12/31/01
Analyst: CG | Preparation Method: S 5030B | Prep Batch: PB16762 | Date Prepared: 12/31/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.416	mg/L	5	0.10	83	72 - 128
4-BFB		0.384	mg/L	5	0.10	77	72 - 128

Sample: 187792 - MW-2

Analysis: Ion Chromatography (IC) | Analytical Method: E 300.0 | QC Batch: QC16847 | Date Analyzed: 12/21/01
Analyst: JS | Preparation Method: N/A | Prep Batch: PB16668 | Date Prepared: 12/21/01

Param	Flag	Result	Units	Dilution	RDL
Chloride		79.0	mg/L	5	0.50
Fluoride		1.57	mg/L	5	0.20
Nitrate-N		3.38	mg/L	5	0.20
Sulfate		62.8	mg/L	5	0.50

Sample: 187792 - MW-2

Analysis: TDS | Analytical Method: E 160.1 | QC Batch: QC17045 | Date Analyzed: 12/27/01
Analyst: JS | Preparation Method: N/A | Prep Batch: PB16826 | Date Prepared: 12/26/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		549	mg/L	1	10

Sample: 187792 - MW-2

Analysis: Total Metals | Analytical Method: S 6010B | QC Batch: QC16871 | Date Analyzed: 12/26/01
Analyst: RR | Preparation Method: S 3010A | Prep Batch: PB16622 | Date Prepared: 12/21/01

Param	Flag	Result	Units	Dilution	RDL
Total Arsenic		<0.010	mg/L	1	0.01
Total Barium		0.119	mg/L	1	0.10
Total Boron		0.644	mg/L	1	0.01
Total Iron		0.243	mg/L	1	0.05
Total Manganese		<0.02	mg/L	1	0.02
Total Vanadium		<0.02	mg/L	1	0.02

Sample: 187793 - MW-4

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC16977	Date Analyzed:	12/31/01
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB16762	Date Prepared:	12/31/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.401	mg/L	5	0.10	80	72 - 128
4-BFB		0.378	mg/L	1	0.10	76	72 - 128

Sample: 187793 - MW-4

Analysis:	Ion Chromatography (IC)	Analytical Method:	E 300.0	QC Batch:	QC16847	Date Analyzed:	12/21/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB16668	Date Prepared:	12/21/01

Param	Flag	Result	Units	Dilution	RDL
Chloride		21.9	mg/L	5	0.50
Fluoride		1.58	mg/L	5	0.20
Nitrate-N		2.87	mg/L	5	0.20
Sulfate		76.4	mg/L	5	0.50

Sample: 187793 - MW-4

Analysis:	TDS	Analytical Method:	E 160.1	QC Batch:	QC17045	Date Analyzed:	12/27/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB16826	Date Prepared:	12/26/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		394	mg/L	1	10

Sample: 187793 - MW-4

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC16871	Date Analyzed:	12/26/01
Analyst:	RR	Preparation Method:	S 3010A	Prep Batch:	PB16622	Date Prepared:	12/21/01

Param	Flag	Result	Units	Dilution	RDL
Total Arsenic		<0.010	mg/L	1	0.01
Total Barium		0.153	mg/L	1	0.10
Total Boron		0.181	mg/L	1	0.01
Total Iron		0.930	mg/L	1	0.05
Total Manganese		<0.02	mg/L	1	0.02
Total Vanadium		0.0266	mg/L	1	0.02

Sample: 187794 - MW-8

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC16853	Date Analyzed:	12/27/01
Analyst:	DN	Preparation Method:	S 5030B	Prep Batch:	PB16673	Date Prepared:	12/27/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.096	mg/L	1	0.10	96	72 - 128
4-BFB		0.0982	mg/L	5	0.10	98	72 - 128

Sample: 187794 - MW-8

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC16847 Date Analyzed: 12/21/01
Analyst: JS Preparation Method: N/A Prep Batch: PB16668 Date Prepared: 12/21/01

Param	Flag	Result	Units	Dilution	RDL
Chloride	[1]	397	mg/L	50	0.50
Fluoride		1.76	mg/L	5	0.20
Nitrate-N		5.41	mg/L	5	0.20
Sulfate		101	mg/L	5	0.50

Sample: 187794 - MW-8

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC17045 Date Analyzed: 12/27/01
Analyst: JS Preparation Method: N/A Prep Batch: PB16826 Date Prepared: 12/26/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		1160	mg/L	2	10

Sample: 187794 - MW-8

Analysis: Total Metals Analytical Method: S 6010B QC Batch: QC16871 Date Analyzed: 12/26/01
Analyst: RR Preparation Method: S 3010A Prep Batch: PB16622 Date Prepared: 12/21/01

Param	Flag	Result	Units	Dilution	RDL
Total Arsenic		<0.010	mg/L	1	0.01
Total Barium		0.132	mg/L	1	0.10
Total Boron		0.676	mg/L	1	0.01
Total Iron		0.180	mg/L	1	0.05
Total Manganese		<0.02	mg/L	1	0.02
Total Vanadium		0.025	mg/L	1	0.02

Sample: 187795 - MW-10

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC16853 Date Analyzed: 12/27/01
Analyst: DN Preparation Method: S 5030B Prep Batch: PB16673 Date Prepared: 12/27/01

[1]Chloride re-ran on IC122101-3.sch (PB16670; QC16849). ICV %IA = 102; CCV %IA = 100; matrix spikes RPD = 1; %EA = 97; LCS spikes RPD = 0; %EA = 100.

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0806	mg/L	1	0.10	81	72 - 128
4-BFB		0.0867	mg/L	1	0.10	87	72 - 128

Sample: 187795 - MW-10

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC16847 Date Analyzed: 12/21/01
Analyst: JS Preparation Method: N/A Prep Batch: PB16668 Date Prepared: 12/21/01

Param	Flag	Result	Units	Dilution	RDL
Chloride		29.8	mg/L	5	0.50
Fluoride		1.49	mg/L	5	0.20
Nitrate-N		3.09	mg/L	5	0.20
Sulfate		91.2	mg/L	5	0.50

Sample: 187795 - MW-10

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC17045 Date Analyzed: 12/27/01
Analyst: JS Preparation Method: N/A Prep Batch: PB16826 Date Prepared: 12/26/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		450	mg/L	1	10

Sample: 187795 - MW-10

Analysis: Total Metals Analytical Method: S 6010B QC Batch: QC16871 Date Analyzed: 12/26/01
Analyst: RR Preparation Method: S 3010A Prep Batch: PB16622 Date Prepared: 12/21/01

Param	Flag	Result	Units	Dilution	RDL
Total Arsenic		<0.010	mg/L	1	0.01
Total Barium		0.136	mg/L	1	0.10
Total Boron		0.170	mg/L	1	0.01
Total Iron		0.408	mg/L	1	0.05
Total Manganese		<0.02	mg/L	1	0.02
Total Vanadium		0.0263	mg/L	1	0.02

Sample: 187796 - MW-9

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC16977 Date Analyzed: 12/31/01
Analyst: CG Preparation Method: S 5030B Prep Batch: PB16762 Date Prepared: 12/31/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001

Continued ...

... *Continued* Sample: 187796 Analysis: BTEX

Param	Flag	Result	Units	Dilution	RDL
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.417	mg/L	5	0.10	83	72 - 128
4-BFB		0.397	mg/L	5	0.10	79	72 - 128

Sample: 187796 - MW-9

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC16847 Date Analyzed: 12/21/01
Analyst: JS Preparation Method: N/A Prep Batch: PB16668 Date Prepared: 12/21/01

Param	Flag	Result	Units	Dilution	RDL
Chloride	[2]	269	mg/L	10	0.50
Fluoride		3.93	mg/L	5	0.20
Nitrate-N		3.71	mg/L	5	0.20
Sulfate		70.1	mg/L	5	0.50

Sample: 187796 - MW-9

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC17045 Date Analyzed: 12/27/01
Analyst: JS Preparation Method: N/A Prep Batch: PB16826 Date Prepared: 12/26/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		944	mg/L	2	10

Sample: 187796 - MW-9

Analysis: Total Metals Analytical Method: S 6010B QC Batch: QC16871 Date Analyzed: 12/26/01
Analyst: RR Preparation Method: S 3010A Prep Batch: PB16622 Date Prepared: 12/21/01

Param	Flag	Result	Units	Dilution	RDL
Total Arsenic		0.0156	mg/L	1	0.01
Total Barium		0.182	mg/L	1	0.10
Total Boron		0.181	mg/L	1	0.01
Total Iron		0.528	mg/L	1	0.05
Total Manganese		0.112	mg/L	1	0.02
Total Vanadium		0.0396	mg/L	1	0.02

Sample: 187797 - MW-3

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC16977 Date Analyzed: 12/31/01
Analyst: CG Preparation Method: S 5030B Prep Batch: PB16762 Date Prepared: 12/31/01

[2]Chloride re-ran on IC122101-3.sch (PB16670; QC16849). ICV %IA = 102; CCV %IA = 100; matrix spikes RPD = 1; %EA = 97; LCS spikes RPD = 0; %EA = 100.

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.419	mg/L	5	0.10	84	72 - 128
4-BFB		0.419	mg/L	5	0.10	84	72 - 128

Sample: 187797 - MW-3

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC16847 Date Analyzed: 12/21/01
Analyst: JS Preparation Method: N/A Prep Batch: PB16668 Date Prepared: 12/21/01

Param	Flag	Result	Units	Dilution	RDL
Chloride	[3]	548	mg/L	50	0.50
Fluoride		1.01	mg/L	5	0.20
Nitrate-N		<1.00	mg/L	5	0.20
Sulfate		29.0	mg/L	5	0.50

Sample: 187797 - MW-3

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC17045 Date Analyzed: 12/27/01
Analyst: JS Preparation Method: N/A Prep Batch: PB16826 Date Prepared: 12/26/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		1400	mg/L	2	10

Sample: 187797 - MW-3

Analysis: Total Metals Analytical Method: S 6010B QC Batch: QC16871 Date Analyzed: 12/26/01
Analyst: RR Preparation Method: S 3010A Prep Batch: PB16622 Date Prepared: 12/21/01

Param	Flag	Result	Units	Dilution	RDL
Total Arsenic		<0.010	mg/L	1	0.01
Total Barium		0.389	mg/L	1	0.10
Total Boron		0.555	mg/L	1	0.01
Total Iron		0.952	mg/L	1	0.05
Total Manganese		0.688	mg/L	1	0.02
Total Vanadium		<0.02	mg/L	1	0.02

Sample: 187798 - South Water Well

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC16853 Date Analyzed: 12/27/01
Analyst: DN Preparation Method: S 5030B Prep Batch: PB16673 Date Prepared: 12/27/01

[3]Chloride re-ran on IC122101-3.sch (PB16670; QC16849). ICV %IA = 102; CCV %IA = 100; matrix spikes RPD = 1; %EA = 97; LCS spikes RPD = 0; %EA = 100.

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0861	mg/L	1	0.10	86	72 - 128
4-BFB		0.0905	mg/L	1	0.10	90	72 - 128

Sample: 187799 - North Water Well

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC16853 Date Analyzed: 12/27/01
Analyst: DN Preparation Method: S 5030B Prep Batch: PB16673 Date Prepared: 12/27/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0876	mg/L	1	0.10	88	72 - 128
4-BFB		0.0902	mg/L	1	0.10	90	72 - 128

Sample: 187800 - MW-5

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC16853 Date Analyzed: 12/27/01
Analyst: DN Preparation Method: S 5030B Prep Batch: PB16673 Date Prepared: 12/27/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0904	mg/L	1	0.10	90	72 - 128
4-BFB		0.0945	mg/L	1	0.10	94	72 - 128

Sample: 187800 - MW-5

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC16847 Date Analyzed: 12/21/01
Analyst: JS Preparation Method: N/A Prep Batch: PB16668 Date Prepared: 12/21/01

Param	Flag	Result	Units	Dilution	RDL
Chloride		68.8	mg/L	5	0.50
Fluoride		1.03	mg/L	5	0.20
Nitrate-N		1.90	mg/L	5	0.20
Sulfate		49.7	mg/L	5	0.50

Sample: 187800 - MW-5

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC17044 Date Analyzed: 12/26/01
Analyst: JS Preparation Method: N/A Prep Batch: PB16825 Date Prepared: 12/24/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		603	mg/L	1	10

Sample: 187800 - MW-5

Analysis: Total Metals Analytical Method: S 6010B QC Batch: QC16871 Date Analyzed: 12/26/01
Analyst: RR Preparation Method: S 3010A Prep Batch: PB16622 Date Prepared: 12/21/01

Param	Flag	Result	Units	Dilution	RDL
Total Arsenic		<0.010	mg/L	1	0.01
Total Barium		0.187	mg/L	1	0.10
Total Boron		0.158	mg/L	1	0.01
Total Iron		1.64	mg/L	1	0.05
Total Manganese		<0.02	mg/L	1	0.02
Total Vanadium		<0.02	mg/L	1	0.02

Sample: 187801 - MW-6

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC16810 Date Analyzed: 12/23/01
Analyst: DN Preparation Method: S 5030B Prep Batch: PB16628 Date Prepared: 12/23/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0885	mg/L	1	0.10	88	72 - 128
4-BFB		0.0837	mg/L	1	0.10	84	72 - 128

Sample: 187801 - MW-6

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC16847 Date Analyzed: 12/21/01
Analyst: JS Preparation Method: N/A Prep Batch: PB16668 Date Prepared: 12/21/01

Param	Flag	Result	Units	Dilution	RDL
Chloride		171	mg/L	5	0.50

Continued ...

... *Continued* Sample: 187801 Analysis: Ion Chromatography (IC)

Param	Flag	Result	Units	Dilution	RDL
Fluoride		3.97	mg/L	5	0.20
Nitrate-N		<1.00	mg/L	5	0.20
Sulfate		61.4	mg/L	5	0.50

Sample: 187801 - MW-6

Analysis:	TDS	Analytical Method:	E 160.1	QC Batch:	QC17044	Date Analyzed:	12/26/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB16825	Date Prepared:	12/24/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		667	mg/L	1	10

Sample: 187801 - MW-6

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC16871	Date Analyzed:	12/26/01
Analyst:	RR	Preparation Method:	S 3010A	Prep Batch:	PB16622	Date Prepared:	12/21/01

Param	Flag	Result	Units	Dilution	RDL
Total Arsenic		0.0821	mg/L	1	0.01
Total Barium		0.102	mg/L	1	0.10
Total Boron		0.112	mg/L	1	0.01
Total Iron		1.11	mg/L	1	0.05
Total Manganese		0.0489	mg/L	1	0.02
Total Vanadium		0.222	mg/L	1	0.02

Sample: 187802 - Duplicate

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC16810	Date Analyzed:	12/23/01
Analyst:	DN	Preparation Method:	S 5030B	Prep Batch:	PB16628	Date Prepared:	12/23/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.089	mg/L	1	0.10	89	72 - 128
4-BFB		0.0796	mg/L	1	0.10	80	72 - 128

Sample: 187803 - Field Blank

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC16810	Date Analyzed:	12/23/01
Analyst:	DN	Preparation Method:	S 5030B	Prep Batch:	PB16628	Date Prepared:	12/23/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001

Continued ...

... *Continued* Sample: 187803 Analysis: BTEX

Param	Flag	Result	Units	Dilution	RDL
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0878	mg/L	1	0.10	88	72 - 128
4-BFB		0.079	mg/L	1	0.10	79	72 - 128

Quality Control Report
Method Blank

Method Blank QCBatch: QC16810

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		< 0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0865	mg/L	1	0.10	86	72 - 128
4-BFB		0.0774	mg/L	1	0.10	77	72 - 128

Method Blank QCBatch: QC16847

Param	Flag	Results	Units	Reporting Limit
Chloride		<2.0	mg/L	0.50
Fluoride		<0.2	mg/L	0.20
Nitrate-N		<0.2	mg/L	0.20
Sulfate		<2.0	mg/L	0.50

Method Blank QCBatch: QC16853

Param	Flag	Results	Units	Reporting Limit
Benzene		0.003	mg/L	0.001
Toluene		0.0036	mg/L	0.001
Ethylbenzene		0.0024	mg/L	0.001
M,P,O-Xylene		0.003	mg/L	0.001
Total BTEX		0.012	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0937	mg/L	1	0.10	94	72 - 128
4-BFB		0.096	mg/L	1	0.10	96	72 - 128

Method Blank QCBatch: QC16871

Param	Flag	Results	Units	Reporting Limit
Total Arsenic		<0.010	mg/L	0.01
Total Barium		<0.100	mg/L	0.10
Total Boron		<0.010	mg/L	0.01
Total Iron		<0.050	mg/L	0.05
Total Manganese		<0.025	mg/L	0.02
Total Vanadium		<0.025	mg/L	0.02

Method Blank

QCBatch: QC16977

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		< 0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0808	mg/L	1	0.10	81	72 - 128
4-BFB		0.0763	mg/L	1	0.10	76	72 - 128

Method Blank

QCBatch: QC17044

Param	Flag	Results	Units	Reporting Limit
Total Dissolved Solids		<10	mg/L	10

Method Blank

QCBatch: QC17045

Param	Flag	Results	Units	Reporting Limit
Total Dissolved Solids		<10	mg/L	10

Quality Control Report
Duplicate Samples

Duplicate

QCBatch: QC17044

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids		2462	2340	mg/L	1	5	8.9

Duplicate

QCBatch: QC17045

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids		1450	1400	mg/L	1	3	8.9

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes

QCBatch: QC16810

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.100	0.101	mg/L	1	0.10	<0.001	100	1	80 - 120	20
Benzene	0.101	0.102	mg/L	1	0.10	<0.001	101	1	80 - 120	20
Toluene	0.106	0.107	mg/L	1	0.10	<0.001	106	1	80 - 120	20
Ethylbenzene	0.106	0.107	mg/L	1	0.10	<0.001	106	1	80 - 120	20
M,P,O-Xylene	0.322	0.325	mg/L	1	0.30	<0.001	107	1	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.0869	0.0839	mg/L	1	0.10	87	84	72 - 128
4-BFB	0.0892	0.0869	mg/L	1	0.10	89	87	72 - 128

Laboratory Control Spikes

QCBatch: QC16847

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	12.06	12.70	mg/L	1	12.50	<2.0	96	5	90 - 110	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spikes

QCBatch: QC16853

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.0986	0.102	mg/L	1	0.10	<0.001	99	3	80 - 120	20
Benzene	0.0978	0.102	mg/L	1	0.10	0.003	95	4	80 - 120	20
Toluene	0.0995	0.103	mg/L	1	0.10	0.0036	96	3	80 - 120	20
Ethylbenzene	0.0986	0.105	mg/L	1	0.10	0.0024	96	6	80 - 120	20
M,P,O-Xylene	0.204	0.304	mg/L	1	0.30	0.003	67	4	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.0916	0.0979	mg/L	1	0.10	92	98	72 - 128
4-BFB	0.0952	0.100	mg/L	1	0.10	95	100	72 - 128

Laboratory Control Spikes

QCBatch: QC16871

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Arsenic	0.485	0.472	mg/L	1	0.50	<0.010	97	3	75 - 125	20
Total Barium	1.01	1.01	mg/L	1	1	<0.100	101	0	75 - 125	20
Total Boron	0.0537	0.0528	mg/L	1	0.05	<0.010	107	2	75 - 125	20
Total Iron	0.511	0.515	mg/L	1	0.50	<0.050	102	1	75 - 125	20
Total Manganese	0.254	0.254	mg/L	1	0.25	<0.025	102	0	75 - 125	20
Total Vanadium	0.250	0.249	mg/L	1	0.25	<0.025	100	0	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spikes

QCBatch: QC16977

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.099	0.101	mg/L	1	0.10	<0.001	99	2	80 - 120	20
Benzene	0.097	0.0994	mg/L	1	0.10	<0.001	97	2	80 - 120	20
Toluene	0.103	0.105	mg/L	1	0.10	<0.001	103	2	80 - 120	20
Ethylbenzene	0.101	0.105	mg/L	1	0.10	<0.001	101	4	80 - 120	20
M,P,O-Xylene	0.309	0.317	mg/L	1	0.30	<0.001	103	3	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.082	0.0799	mg/L	1	0.10	82	80	72 - 128
4-BFB	0.082	0.0818	mg/L	1	0.10	82	82	72 - 128

Quality Control Report
Matrix Spikes and Duplicate Spikes

Matrix Spikes

QCBatch: QC16847

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	182.48	182.11	mg/L	1	125	57.5	99	0	52 - 131	20
Fluoride	27.09	27.17	mg/L	1	25		93	0	80 - 113	20
Nitrate-N	32.96	32.42	mg/L	1	25		98	2	84 - 105	20
Sulfate	294.87	296.76	mg/L	1	125		106	1	79 - 104	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes

QCBatch: QC16871

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Arsenic	0.485	0.494	mg/L	1	0.50	<0.010	97	2	75 - 125	20

Continued ...

... *Continued*

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Barium	1.09	1.10	mg/L	1	1	0.119	109	1	75 - 125	20
Total Boron	[4] 0.670	[5] 0.656	mg/L	1	0.05	0.644	51	74	75 - 125	20
Total Iron	0.716	0.746	mg/L	1	0.50	0.243	94	6	75 - 125	20
Total Manganese	0.243	0.245	mg/L	1	0.25	<0.02	97	1	75 - 125	20
Total Vanadium	0.265	0.267	mg/L	1	0.25	<0.02	106	1	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Quality Control Report
Continuing Calibration Verification Standards

CCV (1)

QCBatch: QC16810

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.106	106	85 - 115	12/23/01
Benzene		mg/L	0.10	0.103	103	85 - 115	12/23/01
Toluene		mg/L	0.10	0.109	109	85 - 115	12/23/01
Ethylbenzene		mg/L	0.10	0.108	108	85 - 115	12/23/01
M,P,O-Xylene		mg/L	0.30	0.330	110	85 - 115	12/23/01

CCV (2)

QCBatch: QC16810

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.1033	103	85 - 115	12/23/01
Benzene		mg/L	0.10	0.1009	100	85 - 115	12/23/01
Toluene		mg/L	0.10	0.106	106	85 - 115	12/23/01
Ethylbenzene		mg/L	0.10	0.1058	105	85 - 115	12/23/01
M,P,O-Xylene		mg/L	0.30	0.3212	107	85 - 115	12/23/01

ICV (1)

QCBatch: QC16810

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.104	104	85 - 115	12/23/01
Benzene		mg/L	0.10	0.103	103	85 - 115	12/23/01
Toluene		mg/L	0.10	0.108	108	85 - 115	12/23/01
Ethylbenzene		mg/L	0.10	0.108	108	85 - 115	12/23/01
M,P,O-Xylene		mg/L	0.30	0.328	109	85 - 115	12/23/01

[4]Matrix spike recovery invalid due to matrix difficulties. LCS demonstrates process under control.
[5]Matrix spike recovery invalid due to matrix difficulties. LCS demonstrates process under control.

CCV (1) QCBatch: QC16847

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	12.28	98	90 - 110	12/21/01

ICV (1) QCBatch: QC16847

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	12.13	97	90 - 110	12/21/01

CCV (1) QCBatch: QC16853

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.101	101	85 - 115	12/27/01
Benzene		mg/L	0.10	0.0949	92	85 - 115	12/27/01
Toluene		mg/L	0.10	0.0977	94	85 - 115	12/27/01
Ethylbenzene		mg/L	0.10	0.0998	97	85 - 115	12/27/01
M,P,O-Xylene		mg/L	0.30	0.296	98	85 - 115	12/27/01

CCV (2) QCBatch: QC16853

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.096	96	85 - 115	12/27/01
Benzene		mg/L	0.10	0.099	99	85 - 115	12/27/01
Toluene		mg/L	0.10	0.101	101	85 - 115	12/27/01
Ethylbenzene		mg/L	0.10	0.101	101	85 - 115	12/27/01
M,P,O-Xylene		mg/L	0.30	0.301	100	85 - 115	12/27/01

ICV (1) QCBatch: QC16853

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.100	100	85 - 115	12/27/01
Benzene		mg/L	0.10	0.0996	97	85 - 115	12/27/01
Toluene		mg/L	0.10	0.102	98	85 - 115	12/27/01
Ethylbenzene		mg/L	0.10	0.104	102	85 - 115	12/27/01
M,P,O-Xylene		mg/L	0.30	0.213	70	85 - 115	12/27/01

CCV (1) QCBatch: QC16871

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Arsenic		mg/L	1	0.997	100	90 - 110	12/26/01
Total Barium		mg/L	2	2.02	101	90 - 110	12/26/01
Total Boron		mg/L	0.10	0.108	108	90 - 110	12/26/01
Total Iron		mg/L	1	1.03	103	90 - 110	12/26/01
Total Manganese		mg/L	0.50	0.505	101	90 - 110	12/26/01
Total Vanadium		mg/L	0.50	0.498	100	90 - 110	12/26/01

ICV (1) QCBatch: QC16871

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Arsenic		mg/L	1	1.01	101	90 - 110	12/26/01
Total Barium		mg/L	2	2.04	102	90 - 110	12/26/01
Total Boron		mg/L	0.10	0.103	103	90 - 110	12/26/01
Total Iron		mg/L	1	1.02	102	90 - 110	12/26/01
Total Manganese		mg/L	0.50	0.509	102	90 - 110	12/26/01
Total Vanadium		mg/L	0.50	0.505	101	90 - 110	12/26/01

CCV (1) QCBatch: QC16977

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0976	98	85 - 115	12/31/01
Benzene		mg/L	0.10	0.0962	96	85 - 115	12/31/01
Toluene		mg/L	0.10	0.102	102	85 - 115	12/31/01
Ethylbenzene		mg/L	0.10	0.101	101	85 - 115	12/31/01
M,P,O-Xylene		mg/L	0.30	0.307	102	85 - 115	12/31/01

CCV (2) QCBatch: QC16977

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.093	93	85 - 115	12/31/01
Benzene		mg/L	0.10	0.095	95	85 - 115	12/31/01
Toluene		mg/L	0.10	0.101	101	85 - 115	12/31/01
Ethylbenzene		mg/L	0.10	0.1	100	85 - 115	12/31/01
M,P,O-Xylene		mg/L	0.30	0.303	101	85 - 115	12/31/01

ICV (1) QCBatch: QC16977

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.103	103	85 - 115	12/31/01
Benzene		mg/L	0.10	0.099	99	85 - 115	12/31/01
Toluene		mg/L	0.10	0.104	104	85 - 115	12/31/01
Ethylbenzene		mg/L	0.10	0.104	104	85 - 115	12/31/01
M,P,O-Xylene		mg/L	0.30	0.318	106	85 - 115	12/31/01

CCV (1) QCBatch: QC17044

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	1007	100	90 - 110	12/26/01

ICV (1) QCBatch: QC17044

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	1023	102	90 - 110	12/26/01

CCV (1) QCBatch: QC17045

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	993	99	90 - 110	12/27/01

ICV (1) QCBatch: QC17045

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	986	98	90 - 110	12/27/01

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El Paso, Texas 79932
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # A0l122101

Company Name: NAVAJO Refining Co Phone #: (505) 748-3311
Address: (Street, City, Zip) P.O. Box 159 ARTESIA NM 88211 Fax #: (505) 746-5421
Contact Person: DAVID Boyer (505) 397-0510, FAX (505) 393-4388
Invoice to: (If different from above) Darrell Moore, NRC
Project #:
Project Name: Lea Refinery
Project Location: Lovington NM
Sampler Signature: [signature]

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	WATER	SOIL	AIR	SLUDGE	HCl	HNO3	H2SO4	NaOH	ICE	NONE	DATE (2001)	TIME	MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	Metals: As, B, Ba, Fe, Mn, V	Cl, F, NO3, SO4, TDS	Turn Around Time if different from standard	Hold
187792	MW-2	4	1.5L	X				X	X			X		12/19	0955		✓														✓	✓		
93	MW-4	4	"	X				X	X			X		"	1040		✓														✓	✓		
94	MW-8	4	"	X				X	X			X		"	1120		✓														✓	✓		
95	MW-10	4	"	X				X	X			X		"	1205		✓														✓	✓		
96	MW-9	4	"	X				X	X			X		"	1246		✓														✓	✓		
97	MW-3	4	"	X				X	X			X		"	1314		✓														✓	✓		
98	South Water Well	~~4~~ 2	80ml	X				X	~~X~~ NB			X		"	1335		✓														~~✓~~	~~✓~~ NB		
99	North Water Well	~~4~~ 2	80ml	X				X	~~X~~ NB			X		"	1347		✓														~~✓~~	~~✓~~ NB		
400	MW-5	4	"	X				X	X			X		"	1414		✓														✓	✓		
01	MW-6	4	"	X				X	X			X		"	1520		✓														✓	✓		
02	Duplicate	2	80ml	X				X	~~X~~ NB			X		"	—		✓																	

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
[signature]	12/20/01	0800			
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received at Laboratory by:	Date:	Time:
			[signature]	12/20/01	1200

LAB USE ONLY
Intact Y / N
Headspace Y / N
Temp 4
Log-in Review [initials]
Carrier # TNM:O 902 756 1811

REMARKS:
Results on integral [illegible]
As(0.05), B(0.20), Ba(0.20)
Fe(0.05), Mn(0.02), V(0.05)
☒ Check if Special Reporting Limits Are Needed

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1 (888) 588-3443

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # 10122101

Company Name: Navajo Refining Co
Phone #: 505-748-3311
Address: (Street, City, Zip) PO Box 159 Artesia NM
Fax #: 505-746-5421
Contact Person: David Boyer 505-397-0510, Fax 393-4388
Invoice to: (If different from above) Darrell Moore NRC
Project #:
Project Name: Lea Refinery
Project Location: Lovington NM
Sampler Signature:

LAB # LAB USE ONLY	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCl	HNO_3	H_2SO_4	NaOH	ICE	NONE	SAMPLING: DATE	TIME
8803	Field Blank	2	80ml	X				X				X		12/19	—

ANALYSIS REQUEST
(Circle or Specify Method No.)

MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH						Turn Around Time if different from standard	Hold
	✓																				

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
	12/20/01	0800			
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received at Laboratory by:	Date:	Time:
				12/20/01	200

Submission of samples constitutes agreement to Terms and Conditions listed on reverse side of C.O.C.

ORIGINAL COPY

LAB USE ONLY
Intact Y / N
Headspace Y / N
Temp 4 °
Log-in Review

REMARKS:

☐ Check If Special Reporting Limits Are Needed

Carrier # TNM&O 902 726 1851

Analytical and Quality Control Report

David Boyer
Navajo Refining
501 E. Main
Artesia, NM 88210

Report Date: March 15, 2002

Order ID Number: A02031310

Project Number: N/A
Project Name: N/A
Project Location: Lovington

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
192664	MW-8	Water	3/12/02	9:55	3/13/02
192665	MW-9	Water	3/12/02	10:45	3/13/02
192666	MW-10	Water	3/12/02	11:15	3/13/02
192667	MW-6	Water	3/12/02	12:05	3/13/02
192668	MW-3	Water	3/12/02	12:25	3/13/02
192669	North Water Well	Water	3/12/02	12:40	3/13/02
192670	South Water Well	Water	3/12/02	12:50	3/13/02
192671	Duplicate #1	Water	3/12/02	:	3/13/02
192672	Trip Blank	Water	3/12/02	:	3/13/02

0
These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed. Note: the RDL is equal to MQL for all organic analytes including TPH.

for
Dr. Blair Leftwich, Director

Analytical Report

Sample: 192664 - MW-8

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC18803	Date Analyzed:	3/13/02
Analyst:	BC	Preparation Method:	S 5030B	Prep Batch:	PB18215	Date Prepared:	3/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0955	mg/L	1	0.10	96	70 - 130
4-BFB		0.0849	mg/L	1	0.10	85	70 - 130

Sample: 192665 - MW-9

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC18803	Date Analyzed:	3/13/02
Analyst:	BC	Preparation Method:	S 5030B	Prep Batch:	PB18215	Date Prepared:	3/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0958	mg/L	1	0.10	96	70 - 130
4-BFB		0.0846	mg/L	1	0.10	85	70 - 130

Sample: 192666 - MW-10

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC18803	Date Analyzed:	3/13/02
Analyst:	BC	Preparation Method:	S 5030B	Prep Batch:	PB18215	Date Prepared:	3/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Continued ...

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0937	mg/L	1	0.10	94	70 - 130
4-BFB		0.0828	mg/L	1	0.10	83	70 - 130

Sample: 192667 - MW-6

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC18803 Date Analyzed: 3/13/02
Analyst: BC Preparation Method: S 5030B Prep Batch: PB18215 Date Prepared: 3/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0016	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		0.0108	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.0124	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0836	mg/L	1	0.10	84	70 - 130
4-BFB		0.0742	mg/L	1	0.10	74	70 - 130

Sample: 192668 - MW-3

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC18803 Date Analyzed: 3/13/02
Analyst: BC Preparation Method: S 5030B Prep Batch: PB18215 Date Prepared: 3/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0159	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.0159	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0937	mg/L	1	0.10	94	70 - 130
4-BFB		0.0895	mg/L	1	0.10	90	70 - 130

Sample: 192669 - North Water Well

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC18803 Date Analyzed: 3/13/02
Analyst: BC Preparation Method: S 5030B Prep Batch: PB18215 Date Prepared: 3/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0021	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001

Continued ...

... *Continued* Sample: 192669 Analysis: BTEX

Param	Flag	Result	Units	Dilution	RDL
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.0021	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0871	mg/L	1	0.10	87	70 - 130
4-BFB		0.0748	mg/L	1	0.10	75	70 - 130

Sample: 192670 - South Water Well

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC18803	Date Analyzed:	3/13/02
Analyst:	BC	Preparation Method:	S 5030B	Prep Batch:	PB18215	Date Prepared:	3/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0968	mg/L	1	0.10	97	70 - 130
4-BFB		0.0818	mg/L	1	0.10	82	70 - 130

Sample: 192671 - Duplicate #1

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC18803	Date Analyzed:	3/13/02
Analyst:	BC	Preparation Method:	S 5030B	Prep Batch:	PB18215	Date Prepared:	3/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0873	mg/L	1	0.10	87	70 - 130
4-BFB		0.0759	mg/L	1	0.10	76	70 - 130

Sample: 192672 - Trip Blank

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC18803	Date Analyzed:	3/13/02
Analyst:	BC	Preparation Method:	S 5030B	Prep Batch:	PB18215	Date Prepared:	3/13/02

Continued ...

... *Continued* Sample: 192672 Analysis: BTEX

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0804	mg/L	1	0.10	80	70 - 130
4-BFB		0.0716	mg/L	1	0.10	72	70 - 130

Quality Control Report
Method Blank

Method Blank

QCBatch: QC18803

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.094	mg/L	1	0.10	94	70 - 130
4-BFB		0.0798	mg/L	1	0.10	80	70 - 130

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes

QCBatch: QC18803

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.0806	0.0885	mg/L	1	0.10	<0.001	81	9	82 - 111	20
Benzene	0.0787	0.0882	mg/L	1	0.10	<0.001	79	11	86 - 106	20
Toluene	0.0745	0.0865	mg/L	1	0.10	<0.001	74	15	82 - 108	20
Ethylbenzene	0.0741	0.0861	mg/L	1	0.10	<0.001	74	15	86 - 115	20
M,P,O-Xylene	0.229	0.261	mg/L	1	0.30	<0.001	76	13	79 - 122	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.0831	0.0898	mg/L	1	0.10	83	90	70 - 130
4-BFB	0.0823	0.0879	mg/L	1	0.10	82	88	70 - 130

Quality Control Report
Continuing Calibration Verification Standards

CCV (1)

QCBatch: QC18803

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.093	93	85 - 115	3/13/02
Benzene		mg/L	0.10	0.0895	90	85 - 115	3/13/02

Continued ...

... Continued

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Toluene		mg/L	0.10	0.0854	85	85 - 115	3/13/02
Ethylbenzene	[1]	mg/L	0.10	0.0843	84	85 - 115	3/13/02
M,P,O-Xylene		mg/L	0.30	0.254	85	85 - 115	3/13/02

CCV (2)

QCBatch: QC18803

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.089	89	85 - 115	3/13/02
Benzene		mg/L	0.10	0.085	85	85 - 115	3/13/02
Toluene		mg/L	0.10	0.085	85	85 - 115	3/13/02
Ethylbenzene		mg/L	0.10	0.086	86	85 - 115	3/13/02
M,P,O-Xylene		mg/L	0.30	0.252	84	85 - 115	3/13/02

ICV (1)

QCBatch: QC18803

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0934	93	85 - 115	3/13/02
Benzene		mg/L	0.10	0.0921	92	85 - 115	3/13/02
Toluene		mg/L	0.10	0.0889	89	85 - 115	3/13/02
Ethylbenzene		mg/L	0.10	0.0873	87	85 - 115	3/13/02
M,P,O-Xylene		mg/L	0.30	0.270	90	85 - 115	3/13/02

[1]Ethylbenzene outside normal limits. Average of CCV components within acceptable range.

6701 Aberdeen Avenue, Ste. 9
Lubbock, Texas 79424
Tel (806) 794-1296
Fax (806) 794-1298
1 (800) 378-1296

TraceAnalysis, Inc.

1555 McCutcheon, Suite H
El Paso, Texas 79932
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # 402031310

Company Name: NAVAJO REFINING CO
Phone #: (505) 748-3311
Address: (Street, City, Zip) P.O. BOX 159 ARTESIA, NM 88211
Fax #: (505) 746-5421
Contact Person: DAVID BOYER SES1 (505) 397-0510, 365-4388 FAX
Invoice to: (If different from above) DARRELL MOORE NRC
Project #: Quarterly
Project Name: Lea Refining
Project Location: Lovington NM
Sampler Signature: A H Boyer

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCl	HNO_3	H_2SO_4	NaOH	ICE	NONE	SAMPLING: DATE	TIME	MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	Turn Around Time if different from standard	Hold
192664	MW-8	2	80ml	X				X				X		3/1/02	0955	X															
65	MW-9	2	"	X				X				X		"	1045	X															
66	MW-10	2	"	X				X				X		"	1115	X															
67	MW-6	2	"	X				X				X		"	1205	X															
68	MW-3	2	"	X				X				X		"	1225	X															
69	NORTH Water Well	2	"	X				X				X		"	1240	X															
70	South water Well	2	"	X				X				X		"	1250	X															
71	Duplicate #1	2	"	X				X				X		"	—	X															
72	Trip Blank	2	"	X				X				X		—	—	X															

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
A H Boyer	3/1/02	2:30PM			
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received at Laboratory by: Vicki Reeves	3/13/02	10:00AM

Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C.O.C.

ORIGINAL COPY

LAB USE ONLY

Intact Y / N
Headspace Y / N
Temp 4° °
Log-in Review MM

REMARKS:

☐ Check If Special Reporting Limits Are Needed

Carrier # TNMTO 902-806-7774

Analytical and Quality Control Report

David Boyer
Navajo Refining
501 E. Main
Artesia, NM 88210

Report Date: August 2, 2002

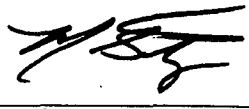
Order ID Number: A02062517

Project Number: N/A
Project Name: N/A
Project Location: Lea Refining

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
200030	MW-8	Water	6/20/02	13:55	6/25/02
200031	MW-9	Water	6/20/02	15:15	6/25/02
200032	North Water Well	Water	6/20/02	16:05	6/25/02
200033	South Water Well	Water	6/20/02	16:10	6/25/02
200034	MW-10	Water	6/20/02	17:15	6/25/02
200035	MW-3	Water	6/20/02	18:15	6/25/02
200036	MW-12	Water	6/22/02	8:15	6/25/02
200037	MW-6R	Water	6/22/02	9:05	6/25/02
200038	MW-11	Water	6/22/02	9:45	6/25/02
200039	Duplicate #1	Water	6/22/02	:	6/25/02

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed. Note: the RDL is equal to MQL for all organic analytes including TPH.
The test results contained within this report meet all requirements of LAC 33:I unless otherwise noted.



for
Dr. Blair Leftwich, Director

Analytical Report

Sample: 200030 - MW-8

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC21358	Date Analyzed:	6/25/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB20296	Date Prepared:	6/25/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.090	mg/L	1	0.10	90	70 - 130
4-BFB		0.0897	mg/L	1	0.10	90	70 - 130

Sample: 200031 - MW-9

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC21358	Date Analyzed:	6/25/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB20296	Date Prepared:	6/25/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0895	mg/L	1	0.10	90	70 - 130
4-BFB		0.0888	mg/L	1	0.10	89	70 - 130

Sample: 200032 - North Water Well

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC21358	Date Analyzed:	6/25/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB20296	Date Prepared:	6/25/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.093	mg/L	1	0.10	93	70 - 130
4-BFB		0.0899	mg/L	1	0.10	90	70 - 130

Sample: 200033 - South Water Well

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC21358 Date Analyzed: 6/25/02
Analyst: CG Preparation Method: S 5030B Prep Batch: PB20296 Date Prepared: 6/25/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0896	mg/L	1	0.10	90	70 - 130
4-BFB		0.0891	mg/L	1	0.10	89	70 - 130

Sample: 200034 - MW-10

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC21358 Date Analyzed: 6/25/02
Analyst: CG Preparation Method: S 5030B Prep Batch: PB20296 Date Prepared: 6/25/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0905	mg/L	1	0.10	90	70 - 130
4-BFB		0.0883	mg/L	1	0.10	88	70 - 130

Sample: 200035 - MW-3

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC21358 Date Analyzed: 6/25/02
Analyst: CG Preparation Method: S 5030B Prep Batch: PB20296 Date Prepared: 6/25/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0925	mg/L	1	0.10	92	70 - 130
4-BFB		0.0931	mg/L	1	0.10	93	70 - 130

Sample: 200036 - MW-12

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC21358 Date Analyzed: 6/25/02
Analyst: CG Preparation Method: S 5030B Prep Batch: PB20296 Date Prepared: 6/25/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0917	mg/L	1	0.10	92	70 - 130
4-BFB		0.089	mg/L	1	0.10	89	70 - 130

Sample: 200037 - MW-6R

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC21358 Date Analyzed: 6/25/02
Analyst: CG Preparation Method: S 5030B Prep Batch: PB20296 Date Prepared: 6/25/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0898	mg/L	1	0.10	90	70 - 130
4-BFB		0.0883	mg/L	1	0.10	88	70 - 130

Sample: 200038 - MW-11

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC21592 Date Analyzed: 6/27/02
Analyst: DN Preparation Method: S 5030B Prep Batch: PB20483 Date Prepared: 6/27/02

Param	Flag	Result	Units	Dilution	RDL
MTBE		<0.005	mg/L	5	0.001
Benzene		1.13	mg/L	5	0.001
Toluene		0.0253	mg/L	5	0.001
Ethylbenzene		0.144	mg/L	5	0.001
M,P,O-Xylene		0.0944	mg/L	5	0.001

Continued ...

... *Continued* Sample: 200038 Analysis: BTEX

Param	Flag	Result	Units	Dilution	RDL
Total BTEX		1.39	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0923	mg/L	5	0.10	92	70 - 130
4-BFB		0.0967	mg/L	5	0.10	96	70 - 130

Sample: 200039 - Duplicate #1

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC21592	Date Analyzed:	6/27/02
Analyst:	DN	Preparation Method:	S 5030B	Prep Batch:	PB20483	Date Prepared:	6/27/02

Param	Flag	Result	Units	Dilution	RDL
MTBE		<0.005	mg/L	5	0.001
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0894	mg/L	5	0.10	89	70 - 130
4-BFB		0.0857	mg/L	5	0.10	85	70 - 130

Quality Control Report
Method Blank

Method Blank

QCBatch: QC21358

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0834	mg/L	1	0.10	83	70 - 130
4-BFB		0.084	mg/L	1	0.10	84	70 - 130

Method Blank

QCBatch: QC21592

Param	Flag	Results	Units	Reporting Limit
MTBE		<0.001	mg/L	0.001
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		< 0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0926	mg/L	1	0.10	92	70 - 130
4-BFB		0.0869	mg/L	1	0.10	86	70 - 130

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes

QCBatch: QC21358

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.0896	0.0897	mg/L	1	0.10	<0.001	90	0	70 - 130	20
Benzene	0.0941	0.0933	mg/L	1	0.10	<0.001	94	1	70 - 130	20
Toluene	0.0941	0.0911	mg/L	1	0.10	<0.001	94	3	70 - 130	20
Ethylbenzene	0.0944	0.0934	mg/L	1	0.10	<0.001	94	1	70 - 130	20
M,P,O-Xylene	0.284	0.280	mg/L	1	0.30	<0.001	95	1	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.0879	0.0858	mg/L	1	0.10	88	86	70 - 130
4-BFB	0.0912	0.0887	mg/L	1	0.10	91	89	70 - 130

Laboratory Control Spikes

QCBatch: QC21592

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.0938	0.0954	mg/L	1	0.10	<0.001	93	1	70 - 130	20
Benzene	0.0934	0.0958	mg/L	1	0.10	<0.001	93	2	70 - 130	20
Toluene	0.0905	0.0933	mg/L	1	0.10	<0.001	90	3	70 - 130	20
Ethylbenzene	0.0906	0.0939	mg/L	1	0.10	<0.001	90	3	70 - 130	20
M,P,O-Xylene	0.271	0.283	mg/L	1	0.30	<0.001	90	4	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.091	0.093	mg/L	1	0.10	91	93	70 - 130
4-BFB	0.0906	0.0938	mg/L	1	0.10	90	93	70 - 130

Quality Control Report
Continuing Calibration Verification Standards

CCV (1)

QCBatch: QC21358

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0901	90	85 - 115	6/25/02
Benzene		mg/L	0.10	0.0906	91	85 - 115	6/25/02
Toluene		mg/L	0.10	0.0891	89	85 - 115	6/25/02
Ethylbenzene		mg/L	0.10	0.0895	90	85 - 115	6/25/02
M,P,O-Xylene		mg/L	0.30	0.269	90	85 - 115	6/25/02

CCV (2)

QCBatch: QC21358

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.092	92	85 - 115	6/25/02
Benzene		mg/L	0.10	0.092	92	85 - 115	6/25/02
Toluene		mg/L	0.10	0.0898	89	85 - 115	6/25/02
Ethylbenzene		mg/L	0.10	0.0902	90	85 - 115	6/25/02
M,P,O-Xylene		mg/L	0.30	0.27	90	85 - 115	6/25/02

ICV (1) QCBatch: QC21358

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0894	89	85 - 115	6/25/02
Benzene		mg/L	0.10	0.0952	95	85 - 115	6/25/02
Toluene		mg/L	0.10	0.0933	93	85 - 115	6/25/02
Ethylbenzene		mg/L	0.10	0.0949	94	85 - 115	6/25/02
M,P,O-Xylene		mg/L	0.30	0.285	95	85 - 115	6/25/02

CCV (1) QCBatch: QC21592

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0887	88	85 - 115	6/27/02
Benzene		mg/L	0.10	0.0901	90	85 - 115	6/27/02
Toluene		mg/L	0.10	0.0878	87	85 - 115	6/27/02
Ethylbenzene		mg/L	0.10	0.0891	89	85 - 115	6/27/02
M,P,O-Xylene		mg/L	0.30	0.266	88	85 - 115	6/27/02

CCV (2) QCBatch: QC21592

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0915	91	85 - 115	6/27/02
Benzene		mg/L	0.10	0.0902	90	85 - 115	6/27/02
Toluene		mg/L	0.10	0.0875	87	85 - 115	6/27/02
Ethylbenzene		mg/L	0.10	0.0882	88	85 - 115	6/27/02
M,P,O-Xylene		mg/L	0.30	0.261	87	85 - 115	6/27/02

ICV (1) QCBatch: QC21592

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0934	93	85 - 115	6/27/02
Benzene		mg/L	0.10	0.0941	94	85 - 115	6/27/02
Toluene		mg/L	0.10	0.0931	93	85 - 115	6/27/02
Ethylbenzene		mg/L	0.10	0.0931	93	85 - 115	6/27/02
M,P,O-Xylene		mg/L	0.30	0.28	93	85 - 115	6/27/02

Page 1 of 1

6701 Aberdeen Avenue, Ste. 9
Lubbock, Texas 79424
Tel (806) 794-1296
Fax (806) 794-1298
1 (800) 378-1296

TraceAnalysis, Inc.

155 McCutcheon, Suite H
El Paso, Texas 79932
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # A0206257

Company Name: NAVAJO Refinery Phone #: (505) 748-3311
Address: (Street, City, Zip) P.O. Box 159, Artesia Fax #: (505) 746-5421
Contact Person: David Boyd (505) 3970510 ??5-4588
Invoice to: (If different from above) Darrell Moore NRC
Project #: Project Name: Lea Refinery
Project Location:
Sampler Signature: D R Boyd

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCl	HNO_3	H_2SO_4	NaOH	ICE	NONE	SAMPLING: DATE (2002)	TIME	MTBE 8021B/602	BTEX 8021B/602
200030	MW-8	2	80ml	X				X				X		6/20	1355		X
31	MW-9	2	"	X				X				X		"	1615		X
32	North Water Well	2	"	X				X				X		"	1605		X
33	South Water Well	2	"	X				X				X		"	1610		X
34	MW-10	2	"	X				X				X		"	1715		X
35	MW-3	2	"	X				X				X		"	1815		X
36	MW-12	2	"	X				X				X		6/22	0835		X
37	MW-6R	2	"	X				X				X		"	0905		X
38	MW-11	2	"	X				X				X		"	0945		X
39	Duplicate #1	2	"	X				X				X		—	—		X

Other analysis request columns: TPH 418.1/TX1005; PAH 8270C; Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7; TCLP Metals Ag As Ba Cd Cr Pb Se Hg; TCLP Volatiles; TCLP Semi Volatiles; TCLP Pesticides; RCI; GC/MS Vol. 8260B/624; GC/MS Semi. Vol. 8270C/625; PCB's 8082/608; Pesticides 8081A/608; BOD, TSS, pH; Turn Around Time if different from standard; Hold

Relinquished by: D R Boyd Date: 6/22/02 Time: 1115 Received by: Date: Time:
Relinquished by: Date: Time: Received by: Date: Time:
Relinquished by: Date: Time: Received at Laboratory by: Vicki Alvarez Date: 6-25-02 Time: 10:00

LAB USE ONLY
Intact (Y) / N
Headspace Y / N
Temp 4°
Log-in Review MS
Carrier # Bus 902 821 825 4

REMARKS:

☐ Check if Special Reporting Limits Are Needed

Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C.O.C.

NAVAJO REFINING COMPANY

FAX
(505) 746-5283 DIV. ORDERS
(505) 746-5481 TRUCKING
(505) 746-5458 PERSONNEL

501 EAST MAIN STREET ◦ P. O. BOX 159
ARTESIA, NEW MEXICO 88211-0159
TELEPHONE (505) 748-3311

FAX
(505) 746-5419 ACCOUNTING
(505) 746-5451 EXECUTIVE
(505) 746-5421 ENGINEERING
(505) 746-5480 P / L

October 25, 2001

Mr. Bill Olson
NM Oil Conservation Division
Environmental Bureau
2040 S. Pacheco St.
Santa Fe, NM 87505-5472

RE: Quarterly Monitoring Report-Navajo Refining Company-Lea Refinery

Dear Bill,

Enclosed, please find the last two quarterly monitoring reports from Lea Refining. We have switched from our previous contractor to Dave Boyer and Safety and Environmental Solutions, Inc. (SESI). In the switch, we may have inadvertently neglected to send OCD a copy.

If you have any questions concerning this submission, please call me at 505-748-3311. Thank you for your attention to this matter.

Sincerely,
NAVAJO REFINING COMPANY

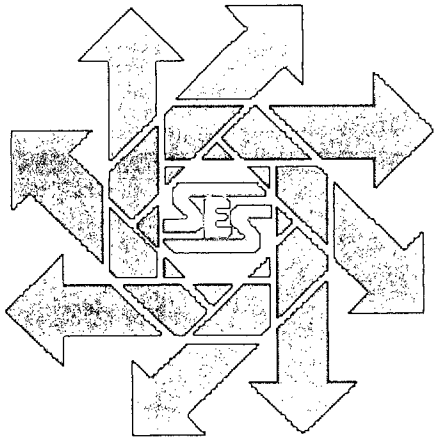
Darrell Moore

Darrell Moore
Environmental Manager for Water and Waste

Encl.

Second Quarter 2001
Groundwater Monitoring and
Remediation System Performance Report
Navajo Refining Company – Lea Refinery
Lovington, New Mexico

September 17, 2001



Prepared for:

Navajo Refining Company
P.O. Box 159
Artesia, New Mexico 88211

By:

Safety & Environmental Solutions, Inc.
703 E. Clinton, Suite 102
Hobbs, New Mexico 88240
(505) 397-0510

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I. Introduction

Safety and Environmental Solutions, Inc. (SESI) performs groundwater monitoring, sampling, and product recovery at Navajo Refining Company's Lea Refinery in Lovington, New Mexico (Figure 1). The work performed at the refinery includes quarterly measurement of water and product levels, sampling of monitor wells for water quality in accordance with the requirements of the New Mexico Oil Conservation Division (OCD), and maintenance of the hydrocarbon product recovery system installed at the facility. This quarterly report documents the second quarter sampling event conducted at the site and includes performance data for the remediation system. The groundwater sampling and monitoring events, and operation and maintenance activities for the remediation system were performed by SESI under the direction of Mr. David Boyer, P.G.

II. Procedures

The following activities were conducted to document the groundwater quality conditions and remediation system performance in accordance with the remediation work plan, and the OCD letters dated November 21, 1996 and March 26, 1998. The locations of the referenced wells are shown on Figure 2.

- Measured depth to groundwater in monitoring wells MW-1 through MW-10.
- Collected groundwater samples from MW-2, MW-3, MW-4, MW-5, MW-6, MW-8, MW-9, and MW-10 for BTEX analysis (EPA Method 8021B).
- Measured free product thickness in monitoring wells RW-1, MW-1 and MW-7 using a Solinst Interface Meter, Model 122. All three wells had a measurable thickness of free product and were not sampled.
- Collected groundwater samples from the refinery's North water well, and a composite sample from the refinery's fresh water system.

Groundwater measurement and sampling activities were conducted on May 31, June 1 and June 9, 2001. Prior to sampling, monitoring wells at the Lea Refinery were gauged for depth to groundwater and thickness of free product (phase-separated hydrocarbons) using and oil/water interface probe (Solinst Model 122).

Pursuant to the approved agency work plan, groundwater sampling for this quarterly sampling event was to be conducted only at wells MW-1, MW-3, MW-6, MW-7, MW-8, MW-9, and MW-10. However, a report providing analytical results for the fourth quarter 2000 groundwater sampling was not located at the refinery, so deviation from the schedule was thought necessary to also include wells not sampled in the previous fourth quarter. Between the time of sampling and preparation of this report, however, analytical results from the fourth quarter 2000 sampling (including analyses of metals and inorganics) were located although the previous contractor did not prepare a report.

Immediately prior to collecting groundwater samples, the monitoring wells were purged of a minimum of three well casing volumes of water using clean, decontaminated PVC

bailers. Monitoring well MW-1 was not sampled due to the presence of free product. An approximate total of 25 gallons of water was purged from those monitoring wells that were sampled. Groundwater parameters of conductivity, temperature and pH were measured during purging operations.

The BTEX water samples were transferred into air-tight, septum-sealed, 40-milliliter (ml) glass volatile organic analyte (VOA) sample vials with zero head space and preserved with HCl. Samples were placed in an ice-filled cooler immediately after collection and shipped to TraceAnalysis, Inc., in Lubbock, Texas. The samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8021B. Chain of custody (COC) forms documenting sample identification numbers, collection times, and delivery times to the laboratory were completed for each set of samples. A summary of purging and sampling methods is provided in Table 1.

III. Groundwater Elevations, Flow Direction, and Hydraulic Gradient

Groundwater elevations for the current and previous monitoring events are summarized in Table 2. The water table elevation map (potentiometric surface) and direction of groundwater flow is depicted in Figure 3.

Based on past measurements, the water table elevations have been declining at the rate of approximately 1.35 feet per year for the past five years. Depth to groundwater occurs at approximately 76 to 97 feet below ground surface across the site. The direction of flow is to the southeast with a hydraulic gradient of approximately 0.004 feet/foot, which is consistent with determinations made from previous gauging events.

IV. Distribution of Hydrocarbons in Groundwater

Analytical results for BTEX in groundwater for the current and previous sampling events are summarized in Table 3. Constituents with concentrations above the New Mexico Water Quality Control Commission (WQCC) standards are highlighted in boldface type. The laboratory reports and COC documentation for samples obtained by SESI are included in the Appendix.

Based on the most recent analytical data for samples collected by SESI on May 31, June 1, and June 9, 2001, the distribution of hydrocarbons at the Lea Refinery is described below:

- BTEX concentrations in upgradient monitoring wells MW-2 and MW-4, and down-gradient wells MW-5, MW-6, MW-8, MW-9 and MW-10 were below the laboratory detection limit and below WQCC standards except for well MW-2. Benzene was detected at 0.0011 mg/L in this upgradient well. The method reporting limit for all analyses is 0.001 mg/L except for well MW-5 (0.005 mg/L). As described above, wells MW-6, MW-8, MW-9 and MW-10 are sampled quarterly while the others listed in this group are sampled annually.

- Benzene concentrations in downgradient well MW-9 declined from a high of 1.69 mg/L in April 1996 to below the WQCC standard (0.01 mg/L) in August 1998. The benzene concentration in MW-9 has remained below the WQCC standard since 1998 and below the laboratory detection limits of 0.005 mg/L since August 1999. Results for this quarter are less than 0.001 mg/L for all BTEX constituents. Since installation and monitoring of this well began in April 1996, all BTEX constituents other than benzene have remained near or below laboratory detection limits and below WQCC standards. This well is scheduled to be sampled every quarter.

- BTEX concentrations in downgradient well MW-3 were measured at levels near or below the laboratory detection limit and below WQCC standards from the initial sampling event in September 1995 through August 1999. Since the November 1999 sampling event, the benzene concentrations in MW-3 have exceeded the WQCC standard and the xylene concentrations have exceeded the laboratory detection limit.

  It is suspected that this increase in dissolved hydrocarbons represents the downgradient movement of a limited slug of contaminants that was observed in upgradient well MW-9 during the period from April 1996 through August 1998. Based on the maximum benzene levels observed in each well, it appears that the benzene slug is migrating at approximately 0.35 feet per day and attenuating at a rate of approximately one half-life per 150 feet. At this rate the benzene slug could impact the North water supply well in approximately 3.5 years at an estimated concentration of 0.05 mg/L. It should be noted that this estimate assumes that the production from the water well occurs only in the upper 10 feet (mixing zone) of the aquifer, which is not the case for a large volume production water well.

- Samples taken from the refinery fresh water system (for drinking, worker showers, process water) showed no BTEX detection at 0.001 mg/L. However, the North water exhibited a benzene concentration of 0.0051 mg/L with other BTEX constituents not detected. Although less than the WQCC limit of 0.010 mg/L, Benzene for the north well just slightly exceeds the federal drinking water standard of 0.005 mg/L. Samples from the fresh water system will be collected at the time of the quarterly sampling, or more frequently as needed.

- Although no measurable free product had been observed in MW-7 since the January 2000 sampling event, a hydrocarbon sheen was noted during the February 2001 sampling and 0.16 ft. was measured on June 1. This well was not sampled for dissolved phase hydrocarbon.

- Monitoring wells MW-1 and RW-1 contained 0.86 feet and 0.50 ft., respectively, of hydrocarbon product and were not sampled.

IV. Total Fluids Recovery

Approximately 205.4 gallons of free product has been recovered between January 21, 1998 and June 9, 2001. A summary of the recovery methods and the volumes of product recovered are listed in Table 4.

V. Groundwater Temperature

Since April 1996, temperatures have been measured in each of the monitoring wells except for February 2001 when a working temperature meter was not available. Groundwater temperatures during this sampling event ranged from 67°F at MW-5 to 83°F at MW-6, which is near the oil/water separator. However, temperatures at MW-9 (downgradient from MW-6) and at MW-8 were also elevated (see summary of purging and sampling methods, Table 1).

VI. Systems Status

Air Sparge/Vapor Extraction System

The previous contractor shut down the air sparge/vapor extraction system and above ground equipment has been removed. Based on information provided in earlier monitoring reports, the system worked as intended to reduce dissolved-phase BTEX and hydrocarbon vapors in the vicinity of the leak.

Hydrocarbon Product Recovery System

During the second quarter, a leak in the air line to the Xitech hydrocarbon recovery skimmer pump was discovered. The leak was repaired and the pump checked for obstructions. Following gauging of water and product levels, the pump was reinstalled. During the second quarter (as of June 9), the skimmer recovered approximately 10.7 gallons of product.

VII. Conclusions

- Benzene concentrations in downgradient well MW-3 continue to decrease. The concentration measured in June 2001 (0.0685 mg/L) is 14 percent of the maximum concentration measured in January of 2000.
- Benzene and other BTEX constituents remain absent in MW-9. The last time these contaminants were detected in this well was the third quarter of 1999.
- Product thickness in RW-1, MW-1 and MW-7 on June 1 was 0.50, 0.86 and 0.16 feet, respectively.
- The operation of the product recovery system is intermittent due to a large number of beetles and other insects entering the well from the well housing. The insects and insect parts clog the filter and prevent movement of the float. The skimmer pump was removed, cleaned and reinstalled with some improvement in recovery.

- Based on the groundwater flow map and sample results, the leading edge of the benzene plume has reached the North refinery well and is impacting groundwater at the drinking water standard of 0.005 mg/L. This well is the refinery's auxiliary well and not pumped continuously. Because water from these wells is used for human consumption (drinking water, hand washing, showering, etc.), the wells will be monitored for BTEX on at least a quarterly basis, or more frequently if necessary. The installation of an additional monitor well between MW-3 and the North well should also be considered.

VIII. Future Work

The next report will be submitted to Navajo in October 2001 and will include an update on product recovery efforts together with the results of the groundwater sampling.

IX. Report Tables and Figures

Table 1. Summary of Purging and Sampling Methods, Second Quarter 2001 Groundwater Sampling, May 31-June 1, 2001.

Monitoring Well No.	Purge Method	Purge Volume (gallons)	Sampling Method [1]	Groundwater Analytes, Measurements and Comments [2]
MW-1	NS	- -	NS	Not sampled due to presence of free product
MW-2	Hand-bailed	2.5	Disposable bailer	BTEX, conductivity, pH, temperature (69°F)
MW-3	Hand-bailed	2.5	Disposable bailer	BTEX, conductivity, pH, temperature (69°F)
MW-4	Hand-bailed	2.9	Disposable bailer	BTEX, conductivity, pH, temperature (68°F)
MW-5	Hand-bailed	6.5	Disposable bailer	BTEX, conductivity, pH, temperature (67°F)
MW-6	Hand-bailed	1.1	Disposable bailer	BTEX, conductivity, pH, temperature (83°F)
MW-7	NS	- -	NS	Not sampled due to presence of free product
MW-8	Hand-bailed	2.8	Disposable bailer	BTEX, conductivity, pH, temperature (75°F)
MW-9	Hand-bailed	3.2	Disposable bailer	BTEX, conductivity, pH, temperature (81°F)
MW-10	Hand-bailed	2.9	Disposable bailer	BTEX, conductivity, pH, temperature (70°F)
RW-1	NS	- -	NS	Recovery well, not sampled due to free product
North water well	Open tap	15-20 sec.	Direct to bottles	BTEX, sample from tap at well head
System composite	Open tap	15-20 sec.	Direct to bottles	BTEX, sample from tap inside pump house

Notes:

1. NS – not sampled
2. Wells MW-2, MW-4, MW-5, not originally scheduled for sampling, were sampled as described in the text above. Results for BTEX are tabulated in this report. Partial analyses for some metals and other inorganic constituents had been completed when further analyses were discontinued. The results for metals and other inorganic constituents are not tabulated in the report, but are included with the copy of the laboratory reported reproduced in the report Appendix.

Table 2. Summary of Groundwater Elevations, Navajo Refining Company, Lea Refinery

Monitor Well No., Depth Below TOC, & Depth Below Surface (feet)	Elevation Top of Casing (TOC, feet)	Measure-ment Date	Depth to Product (feet)	Depth to Water Below TOC (feet)	Product Thickness (feet)	Corrected Depth to Water (feet)	Corrected Water Level Elev. (feet)
MW-1	3,835.67	09/10/95	102.33	95.89	6.44	90.29	3,745.38
97.10		04/22/96	102.97	96.49	6.48	90.85	3,744.82
97.33		11/19/96	95.94	93.57	2.37	91.51	3,744.16
		02/07/97	95.54	93.39	2.15	91.52	3,744.15
		04/16/97	99.19	95.49	3.70	92.27	3,743.40
		08/14/97	99.89	96.23	3.66	93.05	3,742.62
		10/28/97	100.74	96.88	3.86	93.52	3,742.15
		01/20/98	97.48	95.07	2.41	92.97	3,742.70
		04/23/98	96.56	94.75	1.81	93.18	3,742.49
		08/04/98	100.75	97.13	3.62	93.98	3,741.69
		10/29/98	95.65	94.98	0.67	94.40	3,741.27
		02/16/99	96.21	95.35	0.86	94.60	3,741.07
		04/21/99	96.73	95.60	1.13	94.62	3,741.05
		08/16/99	97.60	96.50	1.10	95.54	3,740.13
		11/23/99	97.42	96.60	0.82	95.89	3,739.78
		01/26/00	97.25	96.37	0.88	95.60	3,740.07
		04/25/00	97.30	96.64	0.66	96.07	3,739.60
		08/14/00	96.46	96.45	0.01	96.44	3,739.23
		11/02/00	97.25	96.90	0.35	96.60	3,739.07
		02/22/01	96.51	97.03	0.52	96.58	3,739.09
		06/01/01	96.18	97.04	0.86	96.29	3,739.38
Note 1: Corrected depth to water = Static DTW - (Prod. Thickness x SG), SG = 0.8665 (0.87 prior to 2001)							
Note 2: Well depth approximate -- soft bottom prevents accurate reading							
MW-2	3,834.94	09/10/95	- -	89.18	0	89.18	3,745.76
99.03		04/22/96	- -	89.42	0	89.42	3,745.52
99.23		11/19/96	- -	89.83	0	89.83	3,745.11
		02/07/97	- -	89.71	0	89.71	3,745.23
		04/16/97	- -	90.16	0	90.16	3,744.78
		08/14/97	- -	91.05	0	91.05	3,743.89
		10/28/97	- -	91.05	0	91.05	3,743.89
		01/20/98	- -	90.79	0	90.79	3,744.15
		04/23/98	- -	91.33	0	91.33	3,743.61
		08/04/98	- -	92.51	0	92.51	3,742.43
		10/28/98	- -	92.67	0	92.67	3,742.27
		02/16/99	- -	92.83	0	92.83	3,742.11
		04/21/99	- -	92.96	0	92.96	3,741.98
		08/16/99	- -	94.15	0	94.15	3,740.79
		11/23/99	- -	94.16	0	94.16	3,740.78
		01/26/00	- -	93.76	0	93.76	3,741.18
		04/25/00	- -	93.59	0	93.59	3,741.35
		08/14/00	- -	94.72	0	94.72	3,740.22
		11/02/00	- -	95.05	0	95.05	3,739.89
		02/22/01	- -	94.83	0	94.83	3,740.11
		05/31/01	- -	95.41	0	95.41	3,739.53

Table 2. Summary of Groundwater Elevations, Navajo Refining Company, Lea Refinery

Monitor Well No., Depth Below TOC, & Depth Below Surface (feet)	Elevation Top of Casing (TOC, feet)	Measure-ment Date	Depth to Product (feet)	Depth to Water Below TOC (feet)	Product Thickness (feet)	Corrected Depth to Water (feet)	Corrected Water Level Elev. (feet)
MW-3	3,829.55	09/10/95	--	87.53	0	87.53	3,742.02
97.98		04/22/96	--	87.90	0	87.90	3,741.65
98.26		11/19/96	--	88.72	0	88.72	3,740.83
		02/07/97	--	88.98	0	88.98	3,740.57
		04/16/97	--	89.00	0	89.00	3,740.55
		08/14/97	--	89.56	0	89.56	3,739.99
		10/28/97	--	89.62	0	89.62	3,739.93
		01/20/98	--	90.18	0	90.18	3,739.37
		04/23/98	--	90.58	0	90.58	3,738.97
		08/04/98	--	90.72	0	90.72	3,738.83
		10/28/98	--	91.03	0	91.03	3,738.52
		02/16/99	--	91.42	0	91.42	3,738.13
		04/21/99	--	91.42	0	91.42	3,738.13
		08/16/99	--	92.14	0	92.14	3,737.41
		11/23/99	--	92.67	0	92.67	3,736.88
		01/26/00	--	92.09	0	92.09	3,737.46
		04/25/00	--	93.25	0	93.25	3,736.30
		08/14/00	--	92.61	0	92.61	3,736.94
		11/02/00	--	92.75	0	92.75	3,736.80
		02/22/01	--	92.55	0	92.55	3,737.00
		05/31/01	--	92.95	0	92.95	3,736.60
MW-4	3,837.56	09/10/95	--	91.40	0	91.40	3,746.16
103.18		04/22/96	--	91.84	0	91.84	3,745.72
103.47		11/19/96	--	92.67	0	92.67	3,744.89
		02/07/97	--	92.54	0	92.54	3,745.02
		04/16/97	--	92.80	0	92.80	3,744.76
		08/14/97	--	93.43	0	93.43	3,744.13
		10/28/97	--	93.73	0	93.73	3,743.83
		01/20/98	--	93.59	0	93.59	3,743.97
		04/23/98	--	93.84	0	93.84	3,743.72
		08/04/98	--	94.65	0	94.65	3,742.91
		10/28/98	--	95.14	0	95.14	3,742.42
		02/16/99	--	95.27	0	95.27	3,742.29
		04/21/99	--	95.30	0	95.30	3,742.26
		08/16/99	--	96.15	0	96.15	3,741.41
		11/23/99	--	96.51	0	96.51	3,741.05
		01/26/00	--	96.11	0	96.11	3,741.45
		04/25/00	--	96.08	0	96.08	3,741.48
		08/14/00	--	96.83	0	96.83	3,740.73
		11/02/00	--	97.45	0	97.45	3,740.11
		02/22/01	--	97.32	0	97.32	3,740.24
		05/31/01	--	97.50	0	97.50	3,740.06

Table 2. Summary of Groundwater Elevations, Navajo Refining Company, Lea Refinery

Monitor Well No., Depth Below TOC, & Depth Below Surface (feet)	Elevation Top of Casing (TOC, feet)	Measure-ment Date	Depth to Product (feet)	Depth to Water Below TOC (feet)	Product Thickness (feet)	Corrected Depth to Water (feet)	Corrected Water Level Elev. (feet)
MW-5	3,816.88	09/10/95	--	75.82	0	75.82	3,741.06
93.01		04/22/96	--	74.58	0	74.58	3,742.30
90.00		11/19/96	--	74.95	0	74.95	3,741.93
		02/07/97	--	75.23	0	75.23	3,741.65
		04/16/97	--	75.43	0	75.43	3,741.45
		10/28/97	--	76.47	0	76.47	3,740.41
		01/20/98	--	76.71	0	76.71	3,740.17
		04/23/98	--	76.95	0	76.95	3,739.93
		08/04/98	--	77.74	0	77.74	3,739.14
		10/28/98	--	78.36	0	78.36	3,738.52
		02/16/99	--	78.25	0	78.25	3,738.63
		04/21/99	--	78.28	0	78.28	3,738.60
		08/16/99	--	78.85	0	78.85	3,738.03
		11/23/99	--	79.35	0	79.35	3,737.53
		01/26/00	--	79.37	0	79.37	3,737.51
		04/25/00	--	79.31	0	79.31	3,737.57
		08/14/00	--	79.85	0	79.85	3,737.03
		11/02/00	--	80.27	0	80.27	3,736.61
		02/22/01	--	79.93	0	79.93	3,736.95
		06/01/01	--	79.94	0	79.94	3,736.94
MW-6	3,835.50	04/22/96	--	91.18	0	91.18	3,744.32
98.92		11/19/96	--	90.64	0	90.64	3,744.86
99.12		02/07/97	--	90.91	0	90.91	3,744.59
		04/16/97	--	92.23	0	92.23	3,743.27
		08/14/97	--	92.93	0	92.93	3,742.57
		10/28/97	--	93.23	0	93.23	3,742.27
		01/20/98	--	93.23	0	93.23	3,742.27
		04/23/98	--	93.54	0	93.54	3,741.96
		08/04/98	--	94.25	0	94.25	3,741.25
		10/28/98	--	94.48	0	94.48	3,741.02
		02/16/99	--	94.71	0	94.71	3,740.79
		04/21/99	--	94.78	0	94.78	3,740.72
		08/16/99	--	95.61	0	95.61	3,739.89
		11/23/99	--	96.03	0	96.03	3,739.47
		01/26/00	--	95.61	0	95.61	3,739.89
		04/25/00	--	95.91	0	95.91	3,739.59
		08/14/00	--	96.24	0	96.24	3,739.26
		11/02/00	--	96.68	0	96.68	3,738.82
		02/22/01	--	--	--	--	--
		06/01/01	--	96.80	0	96.80	3,738.70
Note: MW-6 not measured 2/22/01. Previous map omitted RW-1 and RW-1 measured in lieu of MW-6.							

Table 2. Summary of Groundwater Elevations, Navajo Refining Company, Lea Refinery

Monitor Well No., Depth Below TOC, & Depth Below Surface (feet)	Elevation Top of Casing (TOC, feet)	Measure-ment Date	Depth to Product (feet)	Depth to Water Below TOC (feet)	Product Thickness (feet)	Corrected Depth to Water (feet)	Corrected Water Level Elev. (feet)
MW-7	3,835.84	04/22/96	91.19	96.56	5.37	91.89	3,743.95
103.28		11/19/96	91.34	93.13	1.79	91.57	3,744.27
103.51		02/07/97	91.50	93.05	1.55	91.70	3,744.14
		04/16/97	91.92	95.57	3.65	92.39	3,743.45
		08/14/97	92.35	96.30	3.95	92.86	3,742.98
		10/28/97	93.85	96.38	2.53	94.18	3,741.66
		01/20/98	92.90	94.82	1.92	93.15	3,742.69
		04/23/98	93.14	94.68	1.54	93.34	3,742.50
		08/04/98	94.13	96.49	2.36	94.44	3,741.40
		10/28/98	94.42	95.49	1.07	94.56	3,741.28
		02/16/99	94.76	94.91	0.15	94.78	3,741.06
		04/21/99	94.75	94.83	0.08	94.76	3,741.08
		08/16/99	95.58	95.59	0.01	95.58	3,740.26
		11/23/99	95.80	95.94	0.14	95.82	3,740.02
		01/26/00	--	95.56	0	95.56	3,740.28
		04/25/00	--	95.87	0	95.87	3,739.97
		08/14/00	--	96.24	0	96.24	3,739.60
		11/02/00	--	96.71	0	96.71	3,739.13
		02/22/01	--	96.58	0	96.58	3,739.26
		06/01/01	96.92	97.08	0.16	96.94	3,738.90
Note: Corrected depth to water = Static DTW - (Prod. Thickness x SG), SG = 0.8665 (0.87 prior to 2001)							
MW-8	3,838.09	04/22/96	--	94.73	0	94.73	3,743.36
105.70		11/19/96	--	95.50	0	95.50	3,742.59
102.03		02/07/97	--	95.50	0	95.50	3,742.59
		04/16/97	--	95.66	0	95.66	3,742.43
		08/14/97	--	96.25	0	96.25	3,741.84
		10/28/97	--	96.45	0	96.45	3,741.64
		01/20/98	--	96.68	0	96.68	3,741.41
		04/23/98	--	96.97	0	96.97	3,741.12
		08/04/98	--	97.52	0	97.52	3,740.57
		10/28/98	--	97.94	0	97.94	3,740.15
		02/16/99	--	98.14	0	98.14	3,739.95
		04/21/99	--	98.21	0	98.21	3,739.88
		08/16/99	--	99.02	0	99.02	3,739.07
		11/23/99	--	99.45	0	99.45	3,738.64
		01/26/00	--	99.05	0	99.05	3,739.04
		04/25/00	--	99.47	0	99.47	3,738.62
		08/14/00	--	99.68	0	99.68	3,738.41
		11/02/00	--	100.01	0	100.01	3,738.08
		02/22/01	--	99.81	0	99.81	3,738.28
		05/31/01	--	100.08	0	100.08	3,738.01

Table 2. Summary of Groundwater Elevations, Navajo Refining Company, Lea Refinery

Monitor Well No., Depth Below TOC, & Depth Below Surface (feet)	Elevation Top of Casing (TOC, feet)	Measure-ment Date	Depth to Product (feet)	Depth to Water Below TOC (feet)	Product Thickness (feet)	Corrected Depth to Water (feet)	Corrected Water Level Elev. (feet)
MW-9	3,832.82	04/22/96	--	89.60	0	89.60	3,743.22
101.10		11/19/96	--	90.34	0	90.34	3,742.48
101.34		02/07/97	--	90.41	0	90.41	3,742.41
		04/16/97	--	90.52	0	90.52	3,742.30
		08/14/97	--	91.06	0	91.06	3,741.76
		10/28/97	--	91.27	0	91.27	3,741.55
		01/20/98	--	91.54	0	91.54	3,741.28
		04/23/98	--	91.82	0	91.82	3,741.00
		08/04/98	--	92.29	0	92.29	3,740.53
		10/28/98	--	92.70	0	92.70	3,740.12
		02/16/99	--	92.93	0	92.93	3,739.89
		04/21/99	--	93.00	0	93.00	3,739.82
		08/16/99	--	93.75	0	93.75	3,739.07
		11/23/99	--	94.24	0	94.24	3,738.58
		01/26/00	--	93.80	0	93.80	3,739.02
		04/25/00	--	94.31	0	94.31	3,738.51
		08/14/00	--	94.38	0	94.38	3,738.44
		11/02/00	--	94.73	0	94.73	3,738.09
		02/22/01	--	94.55	0	94.55	3,738.27
(Note: Incorrect water level measurement on 22-Feb, water level off 1 ft., original reading 95.55)							
		03/31/01	--	94.52	0	94.52	3,738.30
		05/31/01	--	94.82	0	94.82	3,738.00
MW-10	3,831.10	04/22/96	--	87.68	0	87.68	3,743.42
98.70		11/19/96	--	88.51	0	88.51	3,742.59
98.94		02/07/97	--	88.54	0	88.54	3,742.56
		04/16/97	--	88.68	0	88.68	3,742.42
		08/14/97	--	89.21	0	89.21	3,741.89
		10/28/97	--	89.40	0	89.40	3,741.70
		01/20/98	--	89.64	0	89.64	3,741.46
		04/23/98	--	89.90	0	89.90	3,741.20
		08/04/98	--	90.32	0	90.32	3,740.78
		10/28/98	--	90.78	0	90.78	3,740.32
		02/16/99	--	91.05	0	91.05	3,740.05
		04/21/99	--	91.07	0	91.07	3,740.03
		08/16/99	--	91.78	0	91.78	3,739.32
		11/23/99	--	92.29	0	92.29	3,738.81
		01/26/00	--	91.86	0	91.86	3,739.24
		04/25/00	--	92.37	0	92.37	3,738.73
		08/14/00	--	92.43	0	92.43	3,738.67
		11/02/00	--	94.73	0	94.73	3,736.37
		02/22/01	--	92.71	0	92.71	3,738.39
(Note: Incorrect water level measurement on 22-Feb, water level off 1 ft., original reading 93.71)							
		03/31/01	--	92.67	0	92.67	3,738.43
		05/31/01	--	92.89	0	92.89	3,738.21

Table 2. Summary of Groundwater Elevations, Navajo Refining Company, Lea Refinery

Monitor Well No., Depth Below TOC, & Depth Below Surface (feet)	Elevation Top of Casing (TOC, feet)	Measure-ment Date	Depth to Product (feet)	Depth to Water Below TOC (feet)	Product Thickness (feet)	Corrected Depth to Water (feet)	Corrected Water Level Elev. (feet)
RW-1	3,835.91	02/22/01	96.56	99.76	3.20	96.99	3,738.92
108.10		06/01/01	97.37	97.87	0.50	97.44	3,738.47
108.34							
Note: Corrected depth to water = Static DTW - (Prod. Thickness x SG), SG = 0.8665 (0.87 prior to 2001)							
Notes:							
1. Monitoring wells MW-1 through MW-7 installed September 1995							
2. Monitoring wells MW-8 through MW-10 installed March and April 1996							
3. Elevations surveyed by John W. West Engineering of Hobbs; measurement from north side of casing.							

Table 3. BTEX Concentrations in Groundwater Navajo Refining Company - Lea Refinery

Monitoring Well	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total, mg/L)	Total BTEX (mg/L)
MW-1	N/S [1]	--	--	--	--	--
MW-2	09/10/95	<0.001	<0.001	<0.001	<0.001	<0.004
	04/23/96	<0.001	<0.001	<0.001	<0.001	<0.004
	08/14/97	<0.001	<0.001	<0.001	<0.001	<0.004
	10/28/98	<0.001	<0.001	<0.001	<0.001	<0.004
	11/23/99	<0.005	<0.005	<0.005	<0.005	<0.020
	11/02/00	<0.005	<0.005	<0.005	0.007	0.007
	05/31/01	<0.001	<0.001	<0.001	<0.001	<0.004
MW-3	09/10/95	<0.001	<0.001	<0.001	<0.001	<0.004
	04/23/96	<0.001	<0.001	<0.001	<0.001	<0.004
	11/19/96	<0.001	<0.001	<0.001	<0.001	<0.004
	11/19/96 [2]	<0.001	<0.001	<0.001	<0.001	<0.004
	01/20/97	<0.001	<0.001	<0.001	<0.001	<0.004
	04/16/97	<0.001	<0.001	<0.001	<0.001	<0.004
	08/14/97	<0.001	<0.001	<0.001	<0.001	<0.004
	10/28/97	<0.001	<0.001	<0.001	<0.001	<0.004
	01/21/98	<0.001	<0.001	<0.001	<0.001	<0.004
	04/23/98	<0.005	<0.005	<0.005	0.008	0.008
	04/23/98 [3]	<0.005	<0.005	<0.005	0.008	0.008
	10/29/98	<0.001	<0.001	<0.001	<0.001	<0.004
	02/16/99	0.006	<0.001	0.001	<0.001	0.007
	04/21/99	<0.005	<0.005	<0.005	<0.005	<0.020
	08/16/99	<0.001	<0.001	<0.001	<0.001	<0.004
	11/23/99	**0.314**	<0.005	0.005	0.102	0.421
	01/26/00	**0.482**	<0.005	0.007	0.091	0.580
	04/25/00	**0.433**	<0.005	<0.005	0.109	0.542
	08/14/00	**0.340**	<0.005	<0.005	0.137	0.477
	11/02/00	**0.208**	<0.005	<0.005	0.162	0.370
	02/22/01	**0.131**	<0.001	<0.001	0.020	0.151
	05/31/01	**0.0685**	<0.001	<0.001	0.0151	0.0836
MW-4	09/10/95	<0.001	<0.001	<0.001	<0.001	<0.004
	04/23/96	<0.001	<0.001	<0.001	<0.001	<0.004
	08/14/97	<0.001	<0.001	<0.001	<0.001	<0.004
	10/28/98	<0.001	<0.001	<0.001	<0.001	<0.004
	11/23/99	<0.005	<0.005	<0.005	<0.005	<0.020
	11/02/00	<0.005	<0.005	<0.005	0.007	0.007
	05/31/01	0.0011	<0.001	<0.001	<0.001	0.0011
MW-5	09/10/95	<0.001	<0.001	<0.001	<0.001	<0.004
	04/23/96	<0.001	<0.001	<0.001	<0.001	<0.004
	08/14/97	<0.001	<0.001	<0.001	<0.001	<0.004
	10/28/98	<0.001	<0.001	<0.001	<0.001	<0.004
	11/23/99	<0.005	<0.005	<0.005	<0.005	<0.020
	11/02/00	<0.005	<0.005	<0.005	0.016	0.016
	06/01/01	<0.005	<0.005	<0.005	<0.005	<0.020

Table 3. BTEX Concentrations in Groundwater Navajo Refining Company - Lea Refinery

Monitoring Well	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total, mg/L)	Total BTEX (mg/L)
MW-6	09/10/95	**1.741**	0.021	**0.962**	**0.972**	3.696
	04/23/96	**1.150**	<0.001	0.599	0.462	2.211
	11/19/96	0.002	<0.001	0.011	0.002	0.015
	01/20/97	0.004	<0.001	0.003	0.007	0.014
	04/16/97	<0.001	<0.001	<0.001	<0.001	<0.004
	08/14/97	<0.001	<0.001	<0.001	<0.001	<0.004
	10/28/97	<0.001	<0.001	<0.001	<0.001	<0.004
	01/21/98	<0.001	<0.001	<0.001	<0.001	<0.004
	04/23/98	<0.001	<0.001	<0.001	<0.001	<0.004
	08/04/98	<0.001	<0.001	<0.001	<0.001	<0.004
	10/29/98	<0.001	<0.001	<0.001	<0.001	<0.004
	02/16/99	<0.001	<0.001	<0.001	<0.001	<0.004
	04/21/99	<0.001	<0.001	<0.001	<0.001	<0.004
	08/16/99	<0.001	<0.001	<0.001	<0.001	<0.004
	11/23/99	<0.005	<0.005	<0.005	<0.005	<0.020
	01/26/99	<0.005	<0.005	<0.005	<0.005	<0.020
	04/25/99	<0.005	<0.005	<0.005	<0.005	<0.020
	08/14/99	<0.005	<0.005	<0.005	0.005	0.005
	11/02/00	<0.001	<0.001	<0.001	<0.001	<0.004
	02/22/01	(Not sampled due to mislocation on map)				
	06/01/01	<0.001	<0.001	<0.001	<0.001	<0.004
MW-7	08/14/00	<0.005	0.006	0.033	0.062	0.101
	11/02/00	**0.025**	0.006	0.012	<0.005	0.043
	02/22/01	<0.005	<0.005	0.032	0.101	0.133
	06/01/01 [1]	--	--	--	--	--
MW-8	04/23/96	0.002	<0.001	<0.001	<0.001	0.002
	11/19/96	<0.001	<0.001	<0.001	<0.001	<0.004
	11/19/96 [2]	<0.001	<0.001	<0.001	<0.001	<0.004
	01/20/97	<0.001	<0.001	<0.001	<0.001	<0.004
	04/16/97	<0.001	<0.001	<0.001	<0.001	<0.004
	08/14/97	<0.001	<0.001	<0.001	<0.001	<0.004
	10/28/97	<0.001	<0.001	<0.001	<0.001	<0.004
	01/21/98	<0.001	<0.001	<0.001	<0.001	<0.004
	04/23/98	<0.001	<0.001	<0.001	<0.001	<0.004
	08/04/98	<0.001	<0.001	<0.001	<0.001	<0.004
	10/29/98	<0.001	<0.001	<0.001	<0.001	<0.004
	02/16/99	<0.001	<0.001	<0.001	<0.001	<0.004
	04/21/99	<0.005	<0.005	<0.005	<0.005	<0.020
	08/16/99	<0.001	<0.001	<0.001	<0.001	<0.004
	11/23/99	<0.005	<0.005	<0.005	<0.005	<0.020
	01/26/00	<0.005	<0.005	<0.005	<0.005	<0.020
	04/25/00	<0.005	<0.005	<0.005	<0.005	<0.020
	08/14/00	<0.005	<0.005	<0.005	<0.005	<0.020
	11/02/00	<0.005	<0.005	<0.005	<0.005	<0.020
	02/22/01	<0.001	<0.001	<0.001	<0.001	<0.004
	05/31/01	<0.001	<0.001	<0.001	<0.001	<0.004

Table 3. BTEX Concentrations in Groundwater Navajo Refining Company - Lea Refinery

Monitoring Well	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total, mg/L)	Total BTEX (mg/L)
MW-9	04/23/96	**1.690**	<0.010	<0.010	<0.001	1.690
	11/19/96	**0.679**	<0.005	<0.005	<0.005	0.679
	01/20/97	**0.340**	<0.001	0.002	0.003	0.345
	04/16/97	**0.347**	<0.002	<0.002	0.007	0.354
	08/14/97	**1.680**	<0.010	<0.010	<0.010	1.680
	10/28/97	**0.516**	<0.010	<0.010	<0.010	0.516
	10/28/97 [3]	**0.474**	<0.010	<0.010	<0.010	0.474
	01/21/98	**0.146**	0.005	<0.001	0.002	0.153
	01/21/98 [3]	**0.125**	0.004	<0.001	<0.001	0.129
	04/23/98	**0.013**	<0.001	<0.001	<0.001	0.013
	04/23/98 [3]	**0.012**	<0.001	<0.001	<0.001	0.012
	08/04/98	**0.010**	<0.001	<0.001	<0.001	0.010
	08/04/98 [3]	0.007	<0.001	<0.001	<0.001	0.007
	10/29/98	0.007	0.006	<0.001	0.002	0.015
	10/29/98 [3]	0.006	0.004	0.002	0.002	0.014
	02/16/99	<0.001	0.004	0.001	0.022	0.027
	02/16/99 [3]	<0.001	0.004	0.002	0.008	0.014
	04/21/99	0.008	0.002	<0.001	0.005	0.015
	04/21/99 [3]	0.006	0.001	<0.001	0.004	0.011
	08/16/99	<0.001	<0.001	<0.001	0.002	0.002
	11/23/99	<0.005	<0.005	<0.005	<0.005	<0.020
	01/26/00	<0.005	<0.005	<0.005	<0.005	<0.020
	04/25/00	<0.005	<0.005	<0.005	<0.005	<0.020
	08/14/00	<0.005	<0.005	<0.005	<0.005	<0.020
	11/02/00	<0.005	<0.005	<0.005	<0.005	<0.020
	02/22/01	<0.001	<0.001	<0.001	<0.001	<0.004
	05/31/01	<0.001	<0.001	<0.001	<0.001	<0.004
	05/31/01 [3]	<0.001	<0.001	<0.001	<0.001	<0.004
MW-10	04/23/96	<0.001	<0.001	<0.001	<0.001	<0.004
	11/19/96	<0.001	<0.001	<0.001	<0.001	<0.004
	11/19/96 [2]	<0.001	<0.001	<0.001	<0.001	<0.004
	01/20/97	<0.001	<0.001	<0.001	<0.001	<0.004
	04/16/97	<0.001	<0.001	<0.001	<0.001	<0.004
	08/14/97	<0.001	<0.001	<0.001	<0.001	<0.004
	10/28/97	<0.001	<0.001	<0.001	<0.001	<0.004
	01/21/98	<0.001	<0.001	<0.001	<0.001	<0.004
	04/23/98	<0.001	<0.001	<0.001	<0.001	<0.004
	08/04/98	<0.001	<0.001	<0.001	<0.001	<0.004
	10/29/98	<0.001	<0.001	<0.001	<0.001	<0.004
	02/16/99	<0.001	<0.001	<0.001	<0.001	<0.004
	04/21/99	<0.005	<0.005	<0.005	<0.005	<0.020
	08/16/99	<0.001	<0.001	<0.001	<0.001	<0.004
	11/23/99	<0.005	<0.005	<0.005	<0.005	<0.020
	01/26/00	<0.005	<0.005	<0.005	<0.005	<0.020
	04/25/00	<0.005	<0.005	<0.005	<0.005	<0.020

Table 3. BTEX Concentrations in Groundwater Navajo Refining Company - Lea Refinery

Monitoring Well	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total, mg/L)	Total BTEX (mg/L)
MW-10	08/14/00	<0.005	<0.005	<0.005	<0.005	<0.020
	11/02/00	<0.001	<0.001	<0.001	<0.001	<0.004
	02/22/01	<0.001	<0.001	<0.001	<0.001	<0.004
	05/31/01	<0.001	<0.001	<0.001	<0.001	<0.004
North Water Well	06/09/01	0.0051	<0.001	<0.001	<0.001	0.0051
System Composite	06/09/01	<0.001	<0.001	<0.001	<0.001	<0.004
Field Blank	02/22/01	<0.001	<0.001	<0.001	<0.001	<0.004
	06/01/01 [4]	<0.001	<0.001	<0.001	0.0012	0.0012
Trip Blank	11/02/00	<0.001	<0.001	<0.001	<0.001	<0.004
NM WQCC Groundwater Standards:		**0.010**	**0.750**	**0.750**	**0.620**	**- -**
Notes:						
Samples analyzed for BTEX using EPA Method 8021B.						
Analyses performed by TraceAnalysis, Lubbock, Texas, unless otherwise noted						
1. N/S - Monitoring well not sampled due to presence of phase-separated hydrocarbon						
2. Analyses performed by American Environmental Newtwork, Inc., Albuquerque, NM						
3. Duplicate analysis						
4. ShurFine distilled water						

Table 4. Total Fluids and Product Recovery Volumes, Navajo Refining Company, Lea Refinery

Date	Recovery Method	Cumulative Total Fluids Recovered (gallons)	Barrel Reading (feet)	Product Recovered (gallons)	Cumulative Product Recovered (gallons)
12/28/97	Sub. Pump	699,033	N/A	Unknown	Unknown
01/21/98	PRS	N/A	N/A	0.50	0.5
01/27/98	PRS	N/A	N/A	2.00	2.5
02/11/98	PRS	N/A	N/A	1.10	3.6
02/24/98	PRS	N/A	N/A	1.50	5.1
03/13/98	PRS	N/A	N/A	2.60	7.7
03/23/98	PRS	N/A	N/A	10.60	18.3
04/10/98	PRS	N/A	N/A	15.80	34.1
04/22/98	PRS	N/A	N/A	0.50	34.6
05/06/98	PRS	N/A	N/A	7.50	42.1
06/23/98	PRS	N/A	N/A	19.50	61.6
08/04/98	PRS	N/A	N/A	5.50	67.1
09/18/98	PRS	N/A	N/A	44.20	111.3
10/29/98	PRS	N/A	N/A	15.50	126.8
11/18/98	PRS	N/A	N/A	6.60	133.4
02/16/99	PRS	N/A	N/A	10.66	144.1
04/21/99	PRS	N/A	N/A	4.42	148.5
09/14/99	PRS	N/A	N/A	11.81	160.3
10/26/99	PRS	N/A	N/A	3.31	163.6
11/23/99	PRS	N/A	N/A	1.65	165.3
12/21/99	PRS	N/A	N/A	1.65	166.9
01/26/00	PRS	N/A	N/A	7.28	174.2
02/23/00	PRS	N/A	N/A	2.62	176.8
04/03/00	PRS	N/A	N/A	1.46	178.3
04/25/00	PRS	N/A	N/A	2.87	181.1
06/13/00	PRS	N/A	N/A	1.86	183.0
07/19/00	PRS	N/A	N/A	4.10	187.1
08/14/00	PRS	N/A	N/A	1.18	188.3
04/07/01	PRS	N/A	0.33	6.42	194.7
04/21/01	PRS	N/A	0.50	3.31	198.0
04/28/01	PRS	N/A	0.60	1.95	199.9
05/12/01	PRS	N/A	0.73	2.53	202.5
06/01/01	PRS	N/A	0.81	1.56	204.0
06/09/01	PRS	N/A	0.88	1.36	205.4
			Total Measured Volume of Product Recovered:		**205.4**

Notes:

Product recovery methods used:

Submersible Pump, 3/4 HP Grundfos for total fluids recovery (10/01/96 - 12/28/97)

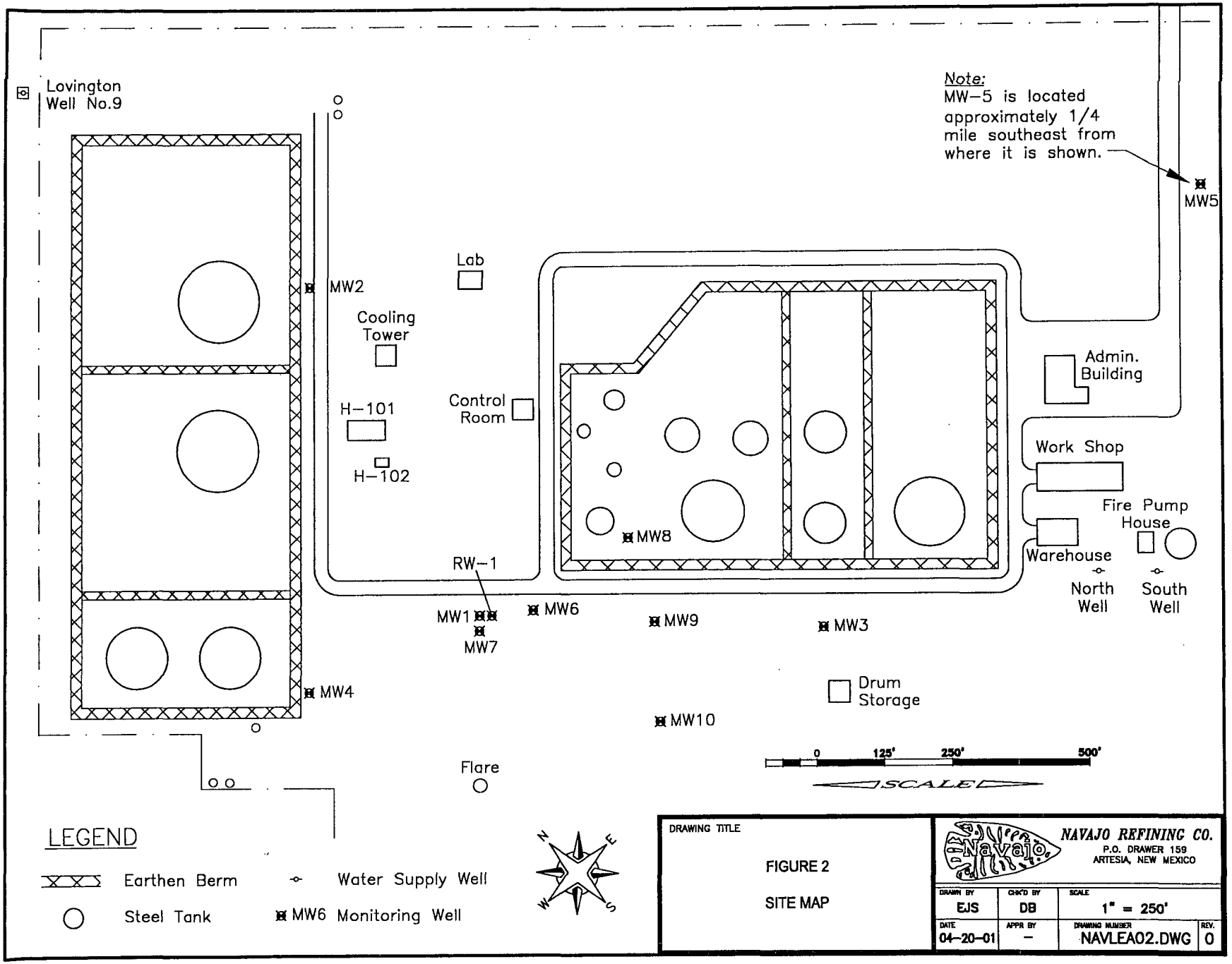
Product Recovery System (PRS), Xitech ADJ 1000 Smart Skimmer

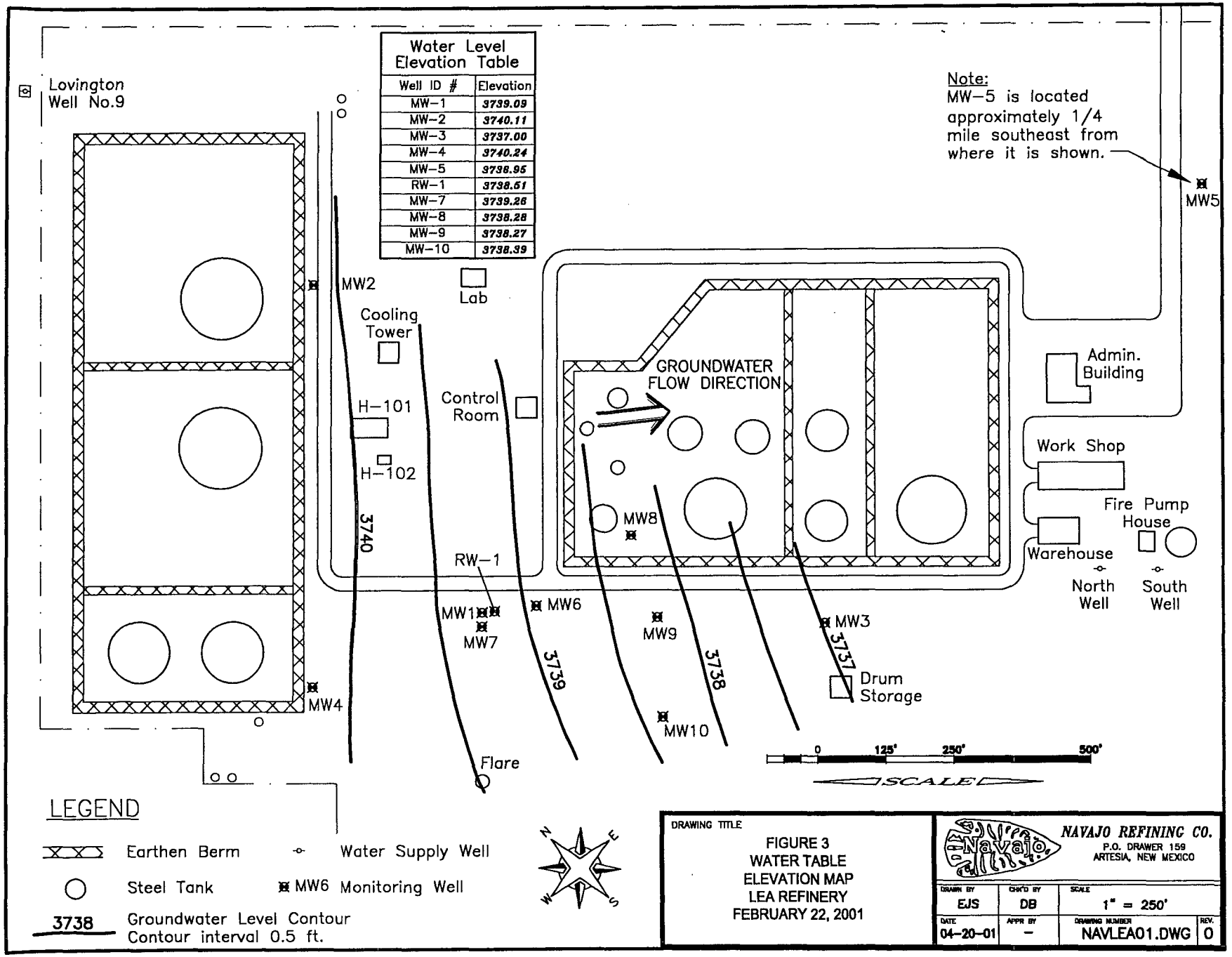
Volume product recovered during total fluids recovery (10/96-12/97) unknown

Volume recovered (beginning 04/01) calculated using drum diameter of 1.82 ft., or 19.46 gallons per foot barrel depth

Name: LOVINGTON
Date: 6/8/2001
Scale: 1 inch equals 2000 feet

Location: 032° 52' 54.6" N 103° 17' 58.0" W
Caption: Figure 1. Location Map, Navajo Refining Co., Lea Refinery


Lovington
Well No.9
Note:
MW-5 is located approximately 1/4 mile southeast from where it is shown.
MW5
MW2
Lab
Cooling Tower
H-101
H-102
Control Room
Admin. Building
Work Shop
Fire Pump House
Warehouse
North Well
South Well
MW8
RW-1
MW1
MW7
MW6
MW9
MW3
MW4
MW10
Drum Storage
Flare
0
125'
250'
500'
SCALE
LEGEND
Earthen Berm
Steel Tank
Water Supply Well
MW6 Monitoring Well
N
E
S
W
DRAWING TITLE
FIGURE 2
SITE MAP
NAVAJO REFINING CO.
P.O. DRAWER 159
ARTESIA, NEW MEXICO
DRAWN BY
EJS
CH'D BY
DB
SCALE
1" = 250'
DATE
04-20-01
APPR BY
-
DRAWING NUMBER
NAVLEA02.DWG
REV.
0


Water Level Elevation Table
Well ID # | Elevation
MW-1 | 3739.09
MW-2 | 3740.11
MW-3 | 3737.00
MW-4 | 3740.24
MW-5 | 3738.95
RW-1 | 3738.51
MW-7 | 3739.26
MW-8 | 3738.28
MW-9 | 3738.27
MW-10 | 3738.39
Note: MW-5 is located approximately 1/4 mile southeast from where it is shown.
Lovington Well No.9
MW2
Lab
Cooling Tower
H-101
H-102
Control Room
GROUNDWATER FLOW DIRECTION
Admin. Building
Work Shop
Fire Pump House
Warehouse
North Well
South Well
MW5
MW8
RW-1
MW1
MW7
MW6
MW9
MW3
MW4
MW10
Drum Storage
Flare
3740
3739
3738
3737
0 125' 250' 500'
SCALE
LEGEND
Earthen Berm
Water Supply Well
Steel Tank
MW6 Monitoring Well
3738 Groundwater Level Contour
Contour interval 0.5 ft.
N E S W
DRAWING TITLE
FIGURE 3
WATER TABLE
ELEVATION MAP
LEA REFINERY
FEBRUARY 22, 2001
NAVAJO REFINING CO.
P.O. DRAWER 159
ARTESIA, NEW MEXICO
DRAWN BY EJS
CHK'D BY DB
SCALE 1" = 250'
DATE 04-20-01
APPR BY -
DRAWING NUMBER NAVLEA01.DWG
REV. 0

APPENDIX
Analytical Results and Chain-of-Custody

Analytical and Quality Control Report

David Boyer
Navajo Refining
501 E. Main
Artesia, NM 88210

Report Date: September 3, 2001

Order ID Number: A01060407

Project Number: N/A
Project Name: N/A
Project Location: Lea Refining

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
172381	MW-2	Water	5/31/01	12:20	6/2/01
172382	MW-4	Water	5/31/01	13:15	6/2/01
172383	MW-3	Water	5/31/01	14:10	6/2/01
172384	MW-10	Water	5/31/01	14:50	6/2/01
172385	MW-8	Water	5/31/01	15:55	6/2/01
172386	MW-9	Water	5/31/01	16:50	6/2/01
172387	MW-5	Water	6/1/07	10:20	6/2/01
172388	MW-6	Water	6/1/07	11:20	6/2/01
172389	Duplicate 1	Water	5/31/01	:	6/2/01
172390	Field Blank	Water	5/31/01	18:30	6/2/01

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

Michael Abel for
Dr. Blair Leftwich, Director

Analytical Report

Sample: 172381 - MW-2

Analysis:	Alkalinity	Analytical Method:	E 310.1	QC Batch:	QC11715	Date Analyzed:	6/5/01
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB10013	Date Prepared:	6/5/01

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		232	mg/L as CaCo3	1	1
Total Alkalinity		232	mg/L as CaCo3	1	1

Sample: 172381 - MW-2

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC11761	Date Analyzed:	6/6/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB10059	Date Prepared:	6/6/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0923	mg/L	1	0.10	92	72 - 128
4-BFB		0.0803	mg/L	1	0.10	80	72 - 128

Sample: 172381 - MW-2

Analysis:	Conductivity	Analytical Method:	SM 2510B	QC Batch:	QC11751	Date Analyzed:	6/6/01
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB10053	Date Prepared:	6/6/01

Param	Flag	Result	Units	Dilution	RDL
Specific Conductance		904	μMHOS/cm	1	

Sample: 172381 - MW-2

Analysis:	Hg, Total	Analytical Method:	S 7470A	QC Batch:	QC11676	Date Analyzed:	6/5/01
Analyst:	SSC	Preparation Method:	N/A	Prep Batch:	PB09989	Date Prepared:	6/5/01

Param	Flag	Result	Units	Dilution	RDL
Total Mercury		<0.0002	mg/L	1	0.0002

Sample: 172381 - MW-2

Analysis:	Ion Chromatography (IC)	Analytical Method:	E 300.0	QC Batch:	QC11647	Date Analyzed:	6/2/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB09968	Date Prepared:	6/2/01

Param	Flag	Result	Units	Dilution	RDL
CL		94.0	mg/L	5	0.50
Fluoride		1.65	mg/L	5	0.20
Nitrate-N		3.09	mg/L	5	0.20
Sulfate		69.4	mg/L	5	0.50

Sample: 172381 - MW-2

Analysis:	Salts	Analytical Method:	S 6010B	QC Batch:	QC12044	Date Analyzed:	6/12/01
Analyst:	LB	Preparation Method:	E 3005 A	Prep Batch:	PB10066	Date Prepared:	6/7/01

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		111	mg/L	1.10	0.50
Dissolved Magnesium		14.2	mg/L	1.10	0.50
Dissolved Potassium		2.82	mg/L	1.10	0.50
Dissolved Sodium		54.8	mg/L	1.10	0.50

Sample: 172381 - MW-2

Analysis:	TDS	Analytical Method:	E 160.1	QC Batch:	QC11650	Date Analyzed:	6/5/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB09969	Date Prepared:	6/4/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		541	mg/L	1	10

Sample: 172381 - MW-2

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC11834	Date Analyzed:	6/8/01
Analyst:	LDB	Preparation Method:	E 3010A	Prep Batch:	PB10135	Date Prepared:	6/12/01

Param	Flag	Result	Units	Dilution	RDL
Total Calcium		111	mg/L	1	0.50
Total Magnesium		14.3	mg/L	1	0.50
Total Phosphorous		64.2	mg/L	1	0.05
Total Potassium		2.82	mg/L	1	0.50
Total Sodium		48.1	mg/L	1	0.50

Sample: 172381 - MW-2

Analysis:	pH	Analytical Method:	E 150.1	QC Batch:	QC11817	Date Analyzed:	6/4/01
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB10105	Date Prepared:	6/4/01

Param	Flag	Result	Units	Dilution	RDL
pH	[1]	7.4	s.u.	1	1

Sample: 172382 - MW-4

Analysis:	Alkalinity	Analytical Method:	E 310.1	QC Batch:	QC11715	Date Analyzed:	6/5/01
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB10013	Date Prepared:	6/5/01

[1]Sample run out of holding time

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		182	mg/L as CaCo3	1	1
Total Alkalinity		182	mg/L as CaCo3	1	1

Sample: 172382 - MW-4

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC11761 Date Analyzed: 6/6/01
Analyst: JW Preparation Method: E 5030B Prep Batch: PB10059 Date Prepared: 6/6/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0011	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.0011	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0923	mg/L	1	0.10	92	72 - 128
4-BFB		0.0803	mg/L	1	0.10	80	72 - 128

Sample: 172382 - MW-4

Analysis: Conductivity Analytical Method: SM 2510B QC Batch: QC11751 Date Analyzed: 6/6/01
Analyst: RS Preparation Method: N/A Prep Batch: PB10053 Date Prepared: 6/6/01

Param	Flag	Result	Units	Dilution	RDL
Specific Conductance		591	µMHOS/cm	1	

Sample: 172382 - MW-4

Analysis: Hg, Total Analytical Method: S 7470A QC Batch: QC11676 Date Analyzed: 6/5/01
Analyst: SSC Preparation Method: N/A Prep Batch: PB09989 Date Prepared: 6/5/01

Param	Flag	Result	Units	Dilution	RDL
Total Mercury		<0.0002	mg/L	1	0.0002

Sample: 172382 - MW-4

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC11647 Date Analyzed: 6/2/01
Analyst: JS Preparation Method: N/A Prep Batch: PB09968 Date Prepared: 6/2/01

Param	Flag	Result	Units	Dilution	RDL
CL		23.4	mg/L	5	0.50
Fluoride		1.61	mg/L	5	0.20
Nitrate-N		2.62	mg/L	5	0.20
Sulfate		73.6	mg/L	5	0.50

Sample: 172382 - MW-4

Analysis:	Salts	Analytical Method:	S 6010B	QC Batch:	QC12044	Date Analyzed:	6/12/01
Analyst:	LB	Preparation Method:	E 3005 A	Prep Batch:	PB10066	Date Prepared:	6/7/01

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		77	mg/L	1.10	0.50
Dissolved Magnesium		10	mg/L	1.10	0.50
Dissolved Potassium		3.11	mg/L	1.10	0.50
Dissolved Sodium		35.4	mg/L	1.10	0.50

Sample: 172382 - MW-4

Analysis:	TDS	Analytical Method:	E 160.1	QC Batch:	QC11650	Date Analyzed:	6/5/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB09969	Date Prepared:	6/4/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		368	mg/L	1	10

Sample: 172382 - MW-4

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC11834	Date Analyzed:	6/8/01
Analyst:	LDB	Preparation Method:	E 3010A	Prep Batch:	PB10135	Date Prepared:	6/12/01

Param	Flag	Result	Units	Dilution	RDL
Total Calcium		80.4	mg/L	1	0.50
Total Magnesium		9.93	mg/L	1	0.50
Total Phosphorous		3.36	mg/L	1	0.05
Total Sodium		34.9	mg/L	1	0.50

Sample: 172382 - MW-4

Analysis:	pH	Analytical Method:	E 150.1	QC Batch:	QC11817	Date Analyzed:	6/4/01
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB10105	Date Prepared:	6/4/01

Param	Flag	Result	Units	Dilution	RDL
pH	[2]	7.5	s.u.	1	1

Sample: 172383 - MW-3

Analysis:	Alkalinity	Analytical Method:	E 310.1	QC Batch:	QC11715	Date Analyzed:	6/5/01
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB10013	Date Prepared:	6/5/01

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		274	mg/L as CaCo3	1	1
Total Alkalinity		274	mg/L as CaCo3	1	1

[2]Sample run out of holding time

Sample: 172383 - MW-3

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC11761 Date Analyzed: 6/6/01
Analyst: JW Preparation Method: E 5030B Prep Batch: PB10059 Date Prepared: 6/6/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0685	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		0.0151	mg/L	1	0.001
Total BTEX		0.0836	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.091	mg/L	1	0.10	91	72 - 128
4-BFB		0.106	mg/L	1	0.10	106	72 - 128

Sample: 172383 - MW-3

Analysis: Conductivity Analytical Method: SM 2510B QC Batch: QC11751 Date Analyzed: 6/6/01
Analyst: RS Preparation Method: N/A Prep Batch: PB10053 Date Prepared: 6/6/01

Param	Flag	Result	Units	Dilution	RDL
Specific Conductance		1927	μMHOS/cm	1	

Sample: 172383 - MW-3

Analysis: Hg, Total Analytical Method: S 7470A QC Batch: QC11677 Date Analyzed: 6/5/01
Analyst: SSC Preparation Method: N/A Prep Batch: PB09989 Date Prepared: 6/5/01

Param	Flag	Result	Units	Dilution	RDL
Total Mercury		<0.0002	mg/L	1	0.0002

Sample: 172383 - MW-3

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC11647 Date Analyzed: 6/2/01
Analyst: JS Preparation Method: N/A Prep Batch: PB09968 Date Prepared: 6/2/01

Param	Flag	Result	Units	Dilution	RDL
CL	[3]	464	mg/L	50	0.50
Fluoride		1.18	mg/L	5	0.20
Nitrate-N		<1.00	mg/L	5	0.20
Sulfate		42.9	mg/L	5	0.50

Sample: 172383 - MW-3

Analysis: Salts Analytical Method: S 6010B QC Batch: QC12044 Date Analyzed: 6/12/01
Analyst: LB Preparation Method: E 3005 A Prep Batch: PB10066 Date Prepared: 6/7/01

[3]Chloride was re-ran on IC060501-2.sch (PB10065; QC11767). ICV %IA = 94; CCV %IA = 93; matrix spikes RPD = 0; matrix spikes %EA = 89; blank spikes RPD = 1; blank spikes %EA = 94.

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		269	mg/L	1.10	0.50
Dissolved Magnesium		33.4	mg/L	1.10	0.50
Dissolved Potassium		5.3	mg/L	1.10	0.50
Dissolved Sodium		66.5	mg/L	1.10	0.50

Sample: 172383 - MW-3

Analysis:	TDS	Analytical Method:	E 160.1	QC Batch:	QC11650	Date Analyzed:	6/5/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB09969	Date Prepared:	6/4/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		1310	mg/L	2	10

Sample: 172383 - MW-3

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC11834	Date Analyzed:	6/8/01
Analyst:	LDB	Preparation Method:	E 3010A	Prep Batch:	PB10135	Date Prepared:	6/12/01

Param	Flag	Result	Units	Dilution	RDL
Total Calcium		267	mg/L	1	0.50
Total Magnesium		33.2	mg/L	1	0.50
Total Potassium		5.32	mg/L	1	0.50
Total Sodium		63.6	mg/L	1	0.50

Sample: 172383 - MW-3

Analysis:	pH	Analytical Method:	E 150.1	QC Batch:	QC11817	Date Analyzed:	6/4/01
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB10105	Date Prepared:	6/4/01

Param	Flag	Result	Units	Dilution	RDL
pH	[4]	7.1	s.u.	1	1

Sample: 172384 - MW-10

Analysis:	Alkalinity	Analytical Method:	E 310.1	QC Batch:	QC11715	Date Analyzed:	6/5/01
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB10013	Date Prepared:	6/5/01

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		190	mg/L as CaCo3	1	1
Total Alkalinity		190	mg/L as CaCo3	1	1

Sample: 172384 - MW-10

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC11761	Date Analyzed:	6/6/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB10059	Date Prepared:	6/6/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001

Continued ...

[4]Sample run out of holding time

... *Continued* Sample: 172384 Analysis: BTEX

Param	Flag	Result	Units	Dilution	RDL
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0938	mg/L	1	0.10	93	72 - 128
4-BFB		0.0825	mg/L	1	0.10	82	72 - 128

Sample: 172384 - MW-10

Analysis: Conductivity Analytical Method: SM 2510B QC Batch: QC11751 Date Analyzed: 6/6/01
Analyst: RS Preparation Method: N/A Prep Batch: PB10053 Date Prepared: 6/6/01

Param	Flag	Result	Units	Dilution	RDL
Specific Conductance		703	μMHOS/cm	1	

Sample: 172384 - MW-10

Analysis: Hg, Total Analytical Method: S 7470A QC Batch: QC11677 Date Analyzed: 6/5/01
Analyst: SSC Preparation Method: N/A Prep Batch: PB09989 Date Prepared: 6/5/01

Param	Flag	Result	Units	Dilution	RDL
Total Mercury		<0.0002	mg/L	1	0.0002

Sample: 172384 - MW-10

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC11647 Date Analyzed: 6/2/01
Analyst: JS Preparation Method: N/A Prep Batch: PB09968 Date Prepared: 6/2/01

Param	Flag	Result	Units	Dilution	RDL
Sulfate		87.2	mg/L	5	0.50
Fluoride		1.51	mg/L	5	0.20
Nitrate-N		2.81	mg/L	5	0.20

Sample: 172384 - MW-10

Analysis: Salts Analytical Method: S 6010B QC Batch: QC12044 Date Analyzed: 6/12/01
Analyst: LB Preparation Method: E 3005 A Prep Batch: PB10066 Date Prepared: 6/7/01

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		89.3	mg/L	1.10	0.50
Dissolved Magnesium		11.6	mg/L	1.10	0.50
Dissolved Potassium		2.92	mg/L	1.10	0.50
Dissolved Sodium		43	mg/L	1.10	0.50

Sample: 172384 - MW-10

Analysis:	TDS	Analytical Method:	E 160.1	QC Batch:	QC11650	Date Analyzed:	6/5/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB09969	Date Prepared:	6/4/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		449	mg/L	1	10

Sample: 172384 - MW-10

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC11834	Date Analyzed:	6/8/01
Analyst:	LDB	Preparation Method:	E 3010A	Prep Batch:	PB10135	Date Prepared:	6/12/01

Param	Flag	Result	Units	Dilution	RDL
Total Calcium		86.3	mg/L	1	0.50
Total Magnesium		11.1	mg/L	1	0.50
Total Potassium		2.81	mg/L	1	0.50
Total Sodium		41.6	mg/L	1	0.50

Sample: 172384 - MW-10

Analysis:	pH	Analytical Method:	E 150.1	QC Batch:	QC11817	Date Analyzed:	6/4/01
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB10105	Date Prepared:	6/4/01

Param	Flag	Result	Units	Dilution	RDL
pH	[5]	7.5	s.u.	1	1

Sample: 172385 - MW-8

Analysis:	Alkalinity	Analytical Method:	E 310.1	QC Batch:	QC11715	Date Analyzed:	6/5/01
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB10013	Date Prepared:	6/5/01

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		278	mg/L as CaCo3	1	1
Total Alkalinity		278	mg/L as CaCo3	1	1

Sample: 172385 - MW-8

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC11761	Date Analyzed:	6/6/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB10059	Date Prepared:	6/6/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

[5] Sample run out of holding time

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.094	mg/L	1	0.10	94	72 - 128
4-BFB		0.0802	mg/L	1	0.10	80	72 - 128

Sample: 172385 - MW-8

Analysis: Conductivity Analytical Method: SM 2510B QC Batch: QC11751 Date Analyzed: 6/6/01
Analyst: RS Preparation Method: N/A Prep Batch: PB10053 Date Prepared: 6/6/01

Param	Flag	Result	Units	Dilution	RDL
Specific Conductance		2081	μMHOS/cm	1	

Sample: 172385 - MW-8

Analysis: Hg, Total Analytical Method: S 7470A QC Batch: QC11677 Date Analyzed: 6/5/01
Analyst: SSC Preparation Method: N/A Prep Batch: PB09989 Date Prepared: 6/5/01

Param	Flag	Result	Units	Dilution	RDL
Total Mercury		<0.0002	mg/L	1	0.0002

Sample: 172385 - MW-8

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC11647 Date Analyzed: 6/2/01
Analyst: JS Preparation Method: N/A Prep Batch: PB09968 Date Prepared: 6/2/01

Param	Flag	Result	Units	Dilution	RDL
CL	[6]	418	mg/L	50	0.50
Fluoride		2.05	mg/L	5	0.20
Nitrate-N		3.82	mg/L	5	0.20
Sulfate		93.7	mg/L	5	0.50

Sample: 172385 - MW-8

Analysis: Salts Analytical Method: S 6010B QC Batch: QC12044 Date Analyzed: 6/12/01
Analyst: LB Preparation Method: E 3005 A Prep Batch: PB10066 Date Prepared: 6/7/01

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		103	mg/L	1.10	0.50
Dissolved Magnesium		12.8	mg/L	1.10	0.50
Dissolved Potassium		12.3	mg/L	1.10	0.50
Dissolved Sodium		250	mg/L	1.10	0.50

Sample: 172385 - MW-8

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC11651 Date Analyzed: 6/5/01
Analyst: JS Preparation Method: N/A Prep Batch: PB09969 Date Prepared: 6/4/01

[6]Chloride was re-ran on IC060501-2.sch (PB10065; QC11767). ICV %IA = 94; CCV %IA = 93; matrix spikes RPD = 0; matrix spikes %EA = 89; blank spikes RPD = 1; blank spikes %EA = 94.

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		<10	mg/L	1	10

Sample: 172385 - MW-8

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC11834	Date Analyzed:	6/8/01
Analyst:	LDB	Preparation Method:	E 3010A	Prep Batch:	PB10135	Date Prepared:	6/12/01

Param	Flag	Result	Units	Dilution	RDL
Total Calcium		105	mg/L	1	0.50
Total Manganese		12.3	mg/L	1	0.02
Total Potassium		11.8	mg/L	1	0.50
Total Sodium		265	mg/L	1	0.50

Sample: 172385 - MW-8

Analysis:	pH	Analytical Method:	E 150.1	QC Batch:	QC11817	Date Analyzed:	6/4/01
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB10105	Date Prepared:	6/4/01

Param	Flag	Result	Units	Dilution	RDL
pH	[7]	7.2	s.u.	1	1

Sample: 172386 - MW-9

Analysis:	Alkalinity	Analytical Method:	E 310.1	QC Batch:	QC11715	Date Analyzed:	6/5/01
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB10013	Date Prepared:	6/5/01

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		262	mg/L as CaCo3	1	1
Total Alkalinity		262	mg/L as CaCo3	1	1

Sample: 172386 - MW-9

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC11761	Date Analyzed:	6/6/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB10059	Date Prepared:	6/6/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0931	mg/L	1	0.10	93	72 - 128
4-BFB		0.0807	mg/L	1	0.10	80	72 - 128

[7] Sample run out of holding time

Sample: 172386 - MW-9

Analysis:	Conductivity	Analytical Method:	SM 2510B	QC Batch:	QC11751	Date Analyzed:	6/6/01
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB10053	Date Prepared:	6/6/01

Param	Flag	Result	Units	Dilution	RDL
Specific Conductance		1215	μMHOS/cm	1	

Sample: 172386 - MW-9

Analysis:	Hg, Total	Analytical Method:	S 7470A	QC Batch:	QC11677	Date Analyzed:	6/5/01
Analyst:	SSC	Preparation Method:	N/A	Prep Batch:	PB09989	Date Prepared:	6/5/01

Param	Flag	Result	Units	Dilution	RDL
Total Mercury		<0.0002	mg/L	1	0.0002

Sample: 172386 - MW-9

Analysis:	Ion Chromatography (IC)	Analytical Method:	E 300.0	QC Batch:	QC11647	Date Analyzed:	6/2/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB09968	Date Prepared:	6/2/01

Param	Flag	Result	Units	Dilution	RDL
CL		169	mg/L	5	0.50
Fluoride		4.37	mg/L	5	0.20
Nitrate-N		1.51	mg/L	5	0.20
Sulfate		73.4	mg/L	5	0.50

Sample: 172386 - MW-9

Analysis:	Salts	Analytical Method:	S 6010B	QC Batch:	QC12079	Date Analyzed:	6/20/01
Analyst:	LDB	Preparation Method:	E 3005 A	Prep Batch:	PB10067	Date Prepared:	6/7/01

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		32.6	mg/L	1.10	0.50
Dissolved Magnesium		3.74	mg/L	1.10	0.50
Dissolved Potassium		6.84	mg/L	1.10	0.50
Dissolved Sodium		177	mg/L	1.10	0.50

Sample: 172386 - MW-9

Analysis:	TDS	Analytical Method:	E 160.1	QC Batch:	QC11651	Date Analyzed:	6/5/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB09969	Date Prepared:	6/4/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		<10	mg/L	1	10

Sample: 172386 - MW-9

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC11834	Date Analyzed:	6/8/01
Analyst:	LDB	Preparation Method:	E 3010A	Prep Batch:	PB10135	Date Prepared:	6/12/01

Continued ...

... *Continued* Sample: 172386 Analysis: Total Metals

Param	Flag	Result	Units	Dilution	RDL
Total Calcium		34.7	mg/L	1	0.50
Total Magnesium		3.68	mg/L	1	0.50
Total Potassium		6.60	mg/L	1	0.50
Total Sodium		195	mg/L	1	0.50

Sample: 172386 - MW-9

Analysis: pH Analytical Method: E 150.1 QC Batch: QC11817 Date Analyzed: 6/4/01
Analyst: RS Preparation Method: N/A Prep Batch: PB10105 Date Prepared: 6/4/01

Param	Flag	Result	Units	Dilution	RDL
pH	[8]	7.8	s.u.	1	1

Sample: 172387 - MW-5

Analysis: Alkalinity Analytical Method: E 310.1 QC Batch: QC11715 Date Analyzed: 6/5/01
Analyst: RS Preparation Method: N/A Prep Batch: PB10013 Date Prepared: 6/5/01

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		316	mg/L as CaCo3	1	1
Total Alkalinity		316	mg/L as CaCo3	1	1

Sample: 172387 - MW-5

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC11761 Date Analyzed: 6/6/01
Analyst: JW Preparation Method: E 5030B Prep Batch: PB10059 Date Prepared: 6/6/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.42	mg/L	5	0.10	84	72 - 128
4-BFB		0.366	mg/L	5	0.10	73	72 - 128

Sample: 172387 - MW-5

Analysis: Conductivity Analytical Method: SM 2510B QC Batch: QC11751 Date Analyzed: 6/6/01
Analyst: RS Preparation Method: N/A Prep Batch: PB10053 Date Prepared: 6/6/01

[8] Sample run out of holding time

Param	Flag	Result	Units	Dilution	RDL
Specific Conductance		802	µMHOS/cm	1	

Sample: 172387 - MW-5

Analysis: Hg, Total Analytical Method: S 7470A QC Batch: QC11677 Date Analyzed: 6/5/01
Analyst: SSC Preparation Method: N/A Prep Batch: PB09989 Date Prepared: 6/5/01

Param	Flag	Result	Units	Dilution	RDL
Total Mercury		0.00184	mg/L	1	0.0002

Sample: 172387 - MW-5

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC11647 Date Analyzed: 6/2/01
Analyst: JS Preparation Method: N/A Prep Batch: PB09968 Date Prepared: 6/2/01

Param	Flag	Result	Units	Dilution	RDL
CL		44.0	mg/L	5	0.50
Fluoride		1.13	mg/L	5	0.20
Nitrate-N		1.67	mg/L	5	0.20
Sulfate		46.3	mg/L	5	0.50

Sample: 172387 - MW-5

Analysis: Salts Analytical Method: S 6010B QC Batch: QC12079 Date Analyzed: 6/20/01
Analyst: LDB Preparation Method: E 3005 A Prep Batch: PB10067 Date Prepared: 6/7/01

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		93.6	mg/L	1.10	0.50
Dissolved Magnesium		12.1	mg/L	1.10	0.50
Dissolved Potassium		3.44	mg/L	1.10	0.50
Dissolved Sodium		50.6	mg/L	1.10	0.50

Sample: 172387 - MW-5

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC11651 Date Analyzed: 6/5/01
Analyst: JS Preparation Method: N/A Prep Batch: PB09969 Date Prepared: 6/4/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		<10	mg/L	1	10

Sample: 172387 - MW-5

Analysis: Total Metals Analytical Method: S 6010B QC Batch: QC11834 Date Analyzed: 6/8/01
Analyst: LDB Preparation Method: E 3010A Prep Batch: PB10135 Date Prepared: 6/12/01

Param	Flag	Result	Units	Dilution	RDL
Total Calcium		139	mg/L	1	0.50
Total Magnesium		18.3	mg/L	1	0.50
Total Potassium		5.05	mg/L	1	0.50
Total Sodium		60.3	mg/L	1	0.50

Sample: 172387 - MW-5

Analysis:	pH	Analytical Method:	E 150.1	QC Batch:	QC11817	Date Analyzed:	6/4/01
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB10105	Date Prepared:	6/4/01

Param	Flag	Result	Units	Dilution	RDL
pH	[9]	7.3	s.u.	1	1

Sample: 172388 - MW-6

Analysis:	Alkalinity	Analytical Method:	E 310.1	QC Batch:	QC11715	Date Analyzed:	6/5/01
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB10013	Date Prepared:	6/5/01

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		162	mg/L as CaCo3	1	1
Total Alkalinity		162	mg/L as CaCo3	1	1

Sample: 172388 - MW-6

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC11761	Date Analyzed:	6/6/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB10059	Date Prepared:	6/6/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0909	mg/L	1	0.10	90	72 - 128
4-BFB		0.0792	mg/L	1	0.10	79	72 - 128

Sample: 172388 - MW-6

Analysis:	Conductivity	Analytical Method:	SM 2510B	QC Batch:	QC11751	Date Analyzed:	6/6/01
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB10053	Date Prepared:	6/6/01

Param	Flag	Result	Units	Dilution	RDL
Specific Conductance		1262	μMHOS/cm	1	

Sample: 172388 - MW-6

Analysis:	Hg, Total	Analytical Method:	S 7470A	QC Batch:	QC11677	Date Analyzed:	6/5/01
Analyst:	SSC	Preparation Method:	N/A	Prep Batch:	PB09989	Date Prepared:	6/5/01

Param	Flag	Result	Units	Dilution	RDL
Total Mercury		0.00053	mg/L	1	0.0002

[9]Sample run out of holding time

Sample: 172388 - MW-6

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC11647 Date Analyzed: 6/2/01
Analyst: JS Preparation Method: N/A Prep Batch: PB09968 Date Prepared: 6/2/01

Param	Flag	Result	Units	Dilution	RDL
CL		241	mg/L	5	0.50
Fluoride		2.99	mg/L	5	0.20
Nitrate-N		<1.00	mg/L	5	0.20
Sulfate		68.0	mg/L	5	0.50

Sample: 172388 - MW-6

Analysis: Salts Analytical Method: S 6010B QC Batch: QC12079 Date Analyzed: 6/20/01
Analyst: LDB Preparation Method: E 3005 A Prep Batch: PB10067 Date Prepared: 6/7/01

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		16.9	mg/L	1.10	0.50
Dissolved Magnesium		2.28	mg/L	1.10	0.50
Dissolved Potassium		2.74	mg/L	1.10	0.50
Dissolved Sodium		187	mg/L	1.10	0.50

Sample: 172388 - MW-6

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC11651 Date Analyzed: 6/5/01
Analyst: JS Preparation Method: N/A Prep Batch: PB09969 Date Prepared: 6/4/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		<10	mg/L	1	10

Sample: 172388 - MW-6

Analysis: Total Metals Analytical Method: S 6010B QC Batch: QC11834 Date Analyzed: 6/8/01
Analyst: LDB Preparation Method: E 3010A Prep Batch: PB10135 Date Prepared: 6/12/01

Param	Flag	Result	Units	Dilution	RDL
Total Calcium		23.3	mg/L	1	0.50
Total Magnesium		2.74	mg/L	1	0.50
Total Potassium		2.73	mg/L	1	0.50
Total Sodium		210	mg/L	1	0.50

Sample: 172388 - MW-6

Analysis: pH Analytical Method: E 150.1 QC Batch: QC11817 Date Analyzed: 6/4/01
Analyst: RS Preparation Method: N/A Prep Batch: PB10105 Date Prepared: 6/4/01

Param	Flag	Result	Units	Dilution	RDL
pH	[10]	7.9	s.u.	1	1

[10] *Sample run out of holding time*

Sample: 172389 - Duplicate 1

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC11761 Date Analyzed: 6/6/01
Analyst: JW Preparation Method: E 5030B Prep Batch: PB10059 Date Prepared: 6/6/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0905	mg/L	1	0.10	90	72 - 128
4-BFB		0.0785	mg/L	1	0.10	78	72 - 128

Sample: 172390 - Field Blank

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC11769 Date Analyzed: 6/6/01
Analyst: JW Preparation Method: E 5030B Prep Batch: PB10060 Date Prepared: 6/6/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		0.0012	mg/L	1	0.001
Total BTEX		0.0012	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0919	mg/L	1	0.10	91	72 - 128
4-BFB		0.0793	mg/L	1	0.10	79	72 - 128

Quality Control Report
Method Blank

Method Blank QCBatch: QC11647

Param	Flag	Results	Units	Reporting Limit
CL		<2.0	mg/L	0.50
Fluoride		<0.2	mg/L	0.20
Nitrate-N		<0.2	mg/L	0.20
Sulfate		<2.0	mg/L	0.50

Method Blank QCBatch: QC11650

Param	Flag	Results	Units	Reporting Limit
Total Dissolved Solids		<10	mg/L	10

Method Blank QCBatch: QC11651

Param	Flag	Results	Units	Reporting Limit
Total Dissolved Solids		<10	mg/L	10

Method Blank QCBatch: QC11676

Param	Flag	Results	Units	Reporting Limit
Total Mercury		<0.0002	mg/L	0.0002

Method Blank QCBatch: QC11677

Param	Flag	Results	Units	Reporting Limit
Total Mercury		<0.0002	mg/L	0.0002

Method Blank QCBatch: QC11715

Param	Flag	Results	Units	Reporting Limit
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1
Bicarbonate Alkalinity		<4.0	mg/L as CaCo3	1
Total Alkalinity		<4.0	mg/L as CaCo3	1

Method Blank QCBatch: QC11751

Param	Flag	Results	Units	Reporting Limit
Specific Conductance		4.47	μMHOS/cm	

Method Blank QCBatch: QC11761

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0998	mg/L	1	0.10	99	72 - 128
4-BFB		0.0891	mg/L	1	0.10	89	72 - 128

Method Blank QCBatch: QC11769

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0957	mg/L	1	0.10	95	72 - 128
4-BFB		0.0819	mg/L	1	0.10	81	72 - 128

Method Blank QCBatch: QC11834

Param	Flag	Results	Units	Reporting Limit
Total Calcium		<0.5	mg/L	0.50
Total Magnesium		<0.5	mg/L	0.50
Total Potassium		<0.5	mg/L	0.50
Total Sodium		<0.5	mg/L	0.50

Method Blank QCBatch: QC12079

Param	Flag	Results	Units	Reporting Limit
Dissolved Calcium		<0.5	mg/L	0.50
Dissolved Magnesium		<0.5	mg/L	0.50
Dissolved Potassium		0.6	mg/L	0.50
Dissolved Sodium		0.6	mg/L	0.50

Quality Control Report
Duplicate Samples

Duplicate QCBatch: QC11650

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids		2590	2500	mg/L	1	3	8.9

Duplicate QCBatch: QC11715

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Hydroxide Alkalinity		<1.0	<1.0	mg/L as CaCo3	1	0	7
Carbonate Alkalinity		<1.0	<1.0	mg/L as CaCo3	1	0	7
Bicarbonate Alkalinity		162	162	mg/L as CaCo3	1	0	7
Total Alkalinity		162	162	mg/L as CaCo3	1	0	7

Duplicate QCBatch: QC11751

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Specific Conductance		1239	1262	μMHOS/cm	1	1	5.9

Duplicate QCBatch: QC11817

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
pH		7.9	7.9	s.u.	1	0	0.99

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes QCBatch: QC11647

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
CL	11.58	11.55	mg/L	1	12.50	<2.0	92	0	90 - 110	20

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Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Fluoride	2.33	2.35	mg/L	1	2.50	<0.2	93	0	90 - 110	20
Nitrate-N	2.33	2.35	mg/L	1	2.50	<0.2	93	0	90 - 110	20
Sulfate	11.43	11.79	mg/L	1	12.50	<2.0	91	3	90 - 110	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spikes

QCBatch: QC11676

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Mercury	0.00108	0.00107	mg/L	1	0.001	<0.0002	108	0	84 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spikes

QCBatch: QC11677

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Mercury	0.00108	0.00107	mg/L	1	0.001	<0.0002	108	0	84 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spikes

QCBatch: QC11761

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.104	0.104	mg/L	1	0.10	<0.001	104	0	80 - 120	20
Benzene	0.0981	0.099	mg/L	1	0.10	<0.001	98	0	80 - 120	20
Toluene	0.0986	0.0998	mg/L	1	0.10	<0.001	98	1	80 - 120	20
Ethylbenzene	0.099	0.1	mg/L	1	0.10	<0.001	99	1	80 - 120	20
M,P,O-Xylene	0.284	0.288	mg/L	1	0.30	<0.001	94	1	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.102	0.102	mg/L	1	0.10	102	102	72 - 128
4-BFB	0.101	0.101	mg/L	1	0.10	101	101	72 - 128

Laboratory Control Spikes

QCBatch: QC11769

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.0973	0.0915	mg/L	1	0.10	<0.001	97	6	80 - 120	20
Benzene	0.102	0.0926	mg/L	1	0.10	<0.001	102	9	80 - 120	20
Toluene	0.102	0.0927	mg/L	1	0.10	<0.001	102	9	80 - 120	20

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Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Ethylbenzene	0.102	0.0921	mg/L	1	0.10	<0.001	102	10	80 - 120	20
M,P,O-Xylene	0.293	0.265	mg/L	1	0.30	<0.001	97	10	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.0993	0.0955	mg/L	1	0.10	99	95	72 - 128
4-BFB	0.101	0.0961	mg/L	1	0.10	101	96	72 - 128

Laboratory Control Spikes

QCBatch: QC12079

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Dissolved Calcium	90.5	87.8	mg/L	1	100	<0.5	90	3	75 - 125	20
Dissolved Magnesium	86.3	82.3	mg/L	1	100	<0.5	86	4	75 - 125	20
Dissolved Potassium	91.3	88.1	mg/L	1	100	0.6	91	3	75 - 125	20
Dissolved Sodium	88.6	85.4	mg/L	1	100	0.6	88	3	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Quality Control Report
Matrix Spikes and Duplicate Spikes

Matrix Spikes

QCBatch: QC11647

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
CL	296.05	298.16	mg/L	1	62.50	241	88	3	52 - 131	20
Fluoride	13.98	15.35	mg/L	1	12.50	2.99	87	11	80 - 113	20
Nitrate-N	12.14	12.00	mg/L	1	12.50	<1.00	97	1	84 - 105	20
Sulfate	127.85	124.85	mg/L	1	62.50	68.0	95	5	79 - 104	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes

QCBatch: QC11676

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Mercury	0.00106	0.00106	mg/L	1	0.001	<0.0002	106	0	84 - 127	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes

QCBatch: QC11677

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Mercury	0.00113	0.00083	mg/L	1	0.001	<0.0002	113	30	84 - 127	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes

QCBatch: QC11834

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Phosphorous	5.40	5.19	mg/L	1	1	64.2	0	0	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes

QCBatch: QC12079

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Dissolved Calcium	677	655	mg/L	1	100	541	136	17	75 - 125	20
Dissolved Magnesium	358	308	mg/L	1	100	176	182	31	75 - 125	20
Dissolved Potassium	190	168	mg/L	1	100	29.7	160	14	75 - 125	20
Dissolved Sodium	2437	2309	mg/L	1	100	2303	134	182	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Quality Control Report
Continuing Calibration Verification Standards

CCV (1)

QCBatch: QC11647

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Bromide		mg/L	2.50	2.46	98	90 - 110	6/2/01
CL		mg/L	12.50	11.52	92	90 - 110	6/2/01
Fluoride		mg/L	2.50	2.28	91	90 - 110	6/2/01
Nitrate-N		mg/L	2.50	2.34	93	90 - 110	6/2/01
Sulfate		mg/L	12.50	11.73	93	90 - 110	6/2/01

ICV (1)

QCBatch: QC11647

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Bromide		mg/L	2.50	2.37	94	90 - 110	6/2/01
CL		mg/L	12.50	12.42	99	90 - 110	6/2/01

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Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Fluoride		mg/L	2.50	2.31	92	90 - 110	6/2/01
Nitrate-N		mg/L	2.50	2.37	94	90 - 110	6/2/01
Sulfate		mg/L	12.50	11.84	94	90 - 110	6/2/01

CCV (1) QCBatch: QC11650

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	983	98	90 - 110	6/5/01

ICV (1) QCBatch: QC11650

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	985	98	90 - 110	6/5/01

CCV (1) QCBatch: QC11676

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Mercury		mg/L	0.001	0.00099	99	80 - 120	6/5/01

ICV (1) QCBatch: QC11676

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Mercury		mg/L	0.001	0.0011	110	80 - 120	6/5/01

CCV (1) QCBatch: QC11677

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Mercury		mg/L	0.001	0.00088	88	80 - 120	6/5/01

ICV (1) QCBatch: QC11677

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Mercury		mg/L	0.001	0.0011	110	80 - 120	6/5/01

CCV (1) QCBatch: QC11715

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0	<1.0	0	90 - 110	6/5/01
Carbonate Alkalinity		mg/L as CaCo3	0	220	0	90 - 110	6/5/01
Bicarbonate Alkalinity		mg/L as CaCo3	0	24	0	90 - 110	6/5/01
Total Alkalinity		mg/L as CaCo3	250	244	97	90 - 110	6/5/01

ICV (1) QCBatch: QC11715

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0	<1.0	0	90 - 110	6/5/01
Carbonate Alkalinity		mg/L as CaCo3	0	228	0	90 - 110	6/5/01
Bicarbonate Alkalinity		mg/L as CaCo3	0	18	0	90 - 110	6/5/01
Total Alkalinity		mg/L as CaCo3	250	246	98	90 - 110	6/5/01

CCV (1) QCBatch: QC11751

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Specific Conductance		μMHOS/cm	1412	1400	99	90 - 110	6/6/01

ICV (1) QCBatch: QC11751

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Specific Conductance		μMHOS/cm	1402	1392	99	90 - 110	6/6/01

CCV (1) QCBatch: QC11761

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0967	96	85 - 115	6/6/01
Benzene		mg/L	0.10	0.1	100	85 - 115	6/6/01

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Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Toluene		mg/L	0.10	0.1	100	85 - 115	6/6/01
Ethylbenzene		mg/L	0.10	0.101	101	85 - 115	6/6/01
M,P,O-Xylene		mg/L	0.30	0.29	96	85 - 115	6/6/01

CCV (2)

QCBatch: QC11761

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0931	93	85 - 115	6/6/01
Benzene		mg/L	0.10	0.0955	95	85 - 115	6/6/01
Toluene		mg/L	0.10	0.0957	95	85 - 115	6/6/01
Ethylbenzene		mg/L	0.10	0.0958	95	85 - 115	6/6/01
M,P,O-Xylene		mg/L	0.30	0.276	92	85 - 115	6/6/01

ICV (1)

QCBatch: QC11761

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.111	111	85 - 115	6/6/01
Benzene		mg/L	0.10	0.102	102	85 - 115	6/6/01
Toluene		mg/L	0.10	0.102	102	85 - 115	6/6/01
Ethylbenzene		mg/L	0.10	0.103	103	85 - 115	6/6/01
M,P,O-Xylene		mg/L	0.30	0.296	98	85 - 115	6/6/01

CCV (1)

QCBatch: QC11769

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.084	84	85 - 115	6/6/01
Benzene		mg/L	0.10	0.0859	85	85 - 115	6/6/01
Toluene		mg/L	0.10	0.0859	85	85 - 115	6/6/01
Ethylbenzene		mg/L	0.10	0.0854	85	85 - 115	6/6/01
M,P,O-Xylene		mg/L	0.30	0.245	81	85 - 115	6/6/01

CCV (2)

QCBatch: QC11769

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0948	94	85 - 115	6/6/01
Benzene		mg/L	0.10	0.0939	93	85 - 115	6/6/01

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Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Toluene		mg/L	0.10	0.094	94	85 - 115	6/6/01
Ethylbenzene		mg/L	0.10	0.0949	94	85 - 115	6/6/01
M,P,O-Xylene		mg/L	0.30	0.272	90	85 - 115	6/6/01

ICV (1) QCBatch: QC11769

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0864	86	85 - 115	6/6/01
Benzene		mg/L	0.10	0.0968	96	85 - 115	6/6/01
Toluene		mg/L	0.10	0.0972	97	85 - 115	6/6/01
Ethylbenzene		mg/L	0.10	0.0974	97	85 - 115	6/6/01
M,P,O-Xylene		mg/L	0.30	0.279	93	85 - 115	6/6/01

ICV (1) QCBatch: QC11817

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
pH		s.u.	7	7.0	100	-0.1 s.u. - +0.1 s.u.	6/4/01

CCV (1) QCBatch: QC11834

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Phosphorous		mg/L	1	0.91	0	90 - 110	6/8/01

ICV (1) QCBatch: QC11834

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Phosphorous		mg/L	1	1.01	0	90 - 110	6/8/01

CCV (1) QCBatch: QC12079

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	25	25	100	90 - 110	6/20/01

Continued ...

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Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Magnesium		mg/L	25	23.8	95	90 - 110	6/20/01
Dissolved Potassium		mg/L	25	25.3	101	90 - 110	6/20/01
Dissolved Sodium		mg/L	25	25.1	100	90 - 110	6/20/01

ICV (1) QCBatch: QC12079

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	25	25.5	102	95 - 105	6/20/01
Dissolved Magnesium		mg/L	25	24.5	98	95 - 105	6/20/01
Dissolved Potassium		mg/L	25	24.4	97	95 - 105	6/20/01
Dissolved Sodium		mg/L	25	24.5	98	95 - 105	6/20/01

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1 (800) 378-1296

TraceAnalysis, Inc.

155 McCutcheon, Suite H
El Paso, Texas 79932
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # A0106040?

Company Name: NAVAJO REFINING Co Phone #: (505) 748-3311

Address: (Street, City, Zip) 501 E. MAIN ArTesia NM 88210 Fax #: (505) 746-5421

Contact Person: David Boyer (505) 397-0510, 393-4388 FAX

Invoice to: (If different from above) Darrell Moore - NRC

Project #: Lea Refinery Project Name:

Project Location: Lovington NM Sampler Signature: [signature]

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	WATER	SOIL	AIR	SLUDGE	HCl	HNO_3	H_2SO_4	NaOH	ICE	NONE	DATE (2001)	TIME	MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	Metals (see Remarks)	Water Chemistry (see Remarks)	N. Toxic	Turn Around Time if different from standard	Hold
172381	MW-2	5	—	X				X	X			X		5/31	1220		X		X												X	X	X		
82	MW-4	5	—	X				X	X			X		"	1315		X		X												X	X	X		
83	MW-3	5	—	X				X	X			X		"	1410		X		X												X	X	X		
84	MW-10	5	—	X				X	X			X		"	1450		X		X												X	X	X		
85	MW-8	5	—	X				X	X			X		"	1555		X		X												X	X	X		
86	MW-9	5	—	X				X	X			X		"	1650		X		X												X	X	X		
87	MW-5	5	—	X				X	X			X		6/01	1020		X		X												X	X	X		
88	MW-6	5	—	X				X	X			X		6/01	1120		X		X												X	X	X		
NR																																			
89	Duplicate #1	3	—	X				X	X			X		—	—		X		X																
90	Field Blank	2	40ml	X				X				X		5/31	1830		X																		

Do Not Run All. Run BTEX ~~[struck]~~ only + report analyses already run on Dup'd 6-6-01

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
[signature]	6/1/01	1530			
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received at Laboratory by:	Date:	Time:
			[signature]	06/02/01	1000

LAB USE ONLY

Intact Y / N

Headspace Y / N

Temp 2

Log-in Review [initials]

REMARKS:
NMOCD List of Metals & Water chemistry-List to be FAXED
Copy of Results to D Boyer
P.O. Box 1613 Hobbs 88241

☐ Check if Special Reporting Limits Are Needed

Carrier # [signature] 9025919496

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
155 McCutcheon, Suite H El Paso, Texas 79932 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

Analytical and Quality Control Report

Darrell Moore
Navajo Refining
501 E. Main
Artesia, NM 88210

Report Date: June 15, 2001

Order ID Number: A01061201

Project Number: N/A
Project Name: N/A
Project Location: Lovington

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
173058	North Water Well	Water	6/9/01	11:15	6/12/01
173059	Water System Composite	Water	6/9/01	11:40	6/12/01

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 173058 - North Water Well

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC11962 Date Analyzed: 6/14/01
Analyst: CG Preparation Method: E 5030B Prep Batch: PB10242 Date Prepared: 6/14/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0051	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.0051	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.107	mg/L	1	0.10	107	72 - 128
4-BFB		0.0883	mg/L	1	0.10	88	72 - 128

Sample: 173059 - Water System Composite

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC11962 Date Analyzed: 6/14/01
Analyst: CG Preparation Method: E 5030B Prep Batch: PB10242 Date Prepared: 6/14/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.108	mg/L	1	0.10	108	72 - 128
4-BFB		0.09	mg/L	1	0.10	90	72 - 128

Report Date: June 15, 2001 | Order Number: A01061201 | Page Number: 3 of 4
N/A | N/A | Lovington

Quality Control Report
Method Blank

Method Blank

QCBatch: QC11962

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.106	mg/L	1	0.10	106	72 - 128
4-BFB		0.0836	mg/L	1	0.10	83	72 - 128

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes

QCBatch: QC11962

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.0983	0.0972	mg/L	1	0.10	<0.001	98	1	80 - 120	20
Benzene	0.11	0.105	mg/L	1	0.10	<0.001	110	4	80 - 120	20
Toluene	0.105	0.1	mg/L	1	0.10	<0.001	105	4	80 - 120	20
Ethylbenzene	0.104	0.099	mg/L	1	0.10	<0.001	104	4	80 - 120	20
M,P,O-Xylene	0.31	0.294	mg/L	1	0.30	<0.001	103	5	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.103	0.101	mg/L	1	0.10	103	101	72 - 128
4-BFB	0.0957	0.0937	mg/L	1	0.10	95	93	72 - 128

Quality Control Report
Continuing Calibration Verification Standards

CCV (1)

QCBatch: QC11962

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0976	97	85 - 115	6/14/01
Benzene		mg/L	0.10	0.111	111	85 - 115	6/14/01

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Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Toluene		mg/L	0.10	0.106	106	85 - 115	6/14/01
Ethylbenzene		mg/L	0.10	0.104	104	85 - 115	6/14/01
M,P,O-Xylene		mg/L	0.30	0.312	104	85 - 115	6/14/01

CCV (2) QCBatch: QC11962

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.1	100	85 - 115	6/14/01
Benzene		mg/L	0.10	0.113	113	85 - 115	6/14/01
Toluene		mg/L	0.10	0.108	108	85 - 115	6/14/01
Ethylbenzene		mg/L	0.10	0.106	106	85 - 115	6/14/01
M,P,O-Xylene		mg/L	0.30	0.316	105	85 - 115	6/14/01

ICV (1) QCBatch: QC11962

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0982	98	85 - 115	6/14/01
Benzene		mg/L	0.10	0.105	105	85 - 115	6/14/01
Toluene		mg/L	0.10	0.101	101	85 - 115	6/14/01
Ethylbenzene		mg/L	0.10	0.0996	99	85 - 115	6/14/01
M,P,O-Xylene		mg/L	0.30	0.296	98	85 - 115	6/14/01

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TraceAnalysis, Inc.

155 McCutcheon, Suite H
El Paso, Texas 79932
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # A0106120 1

Company Name: NAVAJO Refining Co Phone #: (505) 748-3311

Address: (Street, City, Zip) P.O. Box 159 Artesia NM Fax #: (505) 746-5421

Contact Person: David Boyer SESI Hobbs (505) 397-0510

Invoice to: (If different from above) Darrell Moore NRC (FAX) 393-4388 SESI

Project #:

Project Name: NAVAJO LEA Refinery

Project Location: Lovington, NM

Sampler Signature: D. G. Boyer

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCl	HNO_3	H_2SO_4	NaOH	ICE	NONE	SAMPLING (2001): DATE	TIME	MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	Turn Around Time if different from standard	Hold
178058	North Water Well	2	80ml	X				X				X		6/9	1115		X															
59	Water System Composite	2	"	X				X				X		6/9	1140		X															

Relinquished by: D. G. Boyer Date: 6/11/01 Time: 2:30PM
Received by: Date: Time:

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

Relinquished by: Date: Time:
Received at Laboratory by: Vicki Alvarez Date: 6-12-01 Time: 9:30A

LAB USE ONLY
Intact (Y) N
Headspace Y (N)
Temp 4
Log-in Review MK

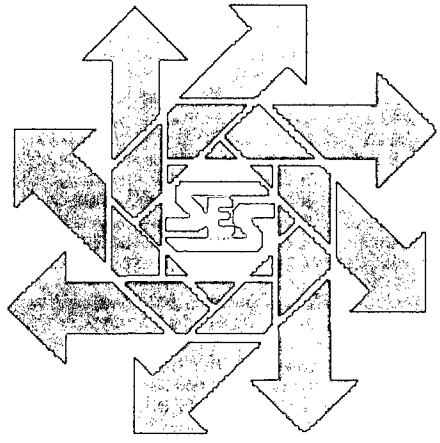
REMARKS:
Copy of Results to D Boyer SESI, P.O. Box 1613 Hobbs 88241
6/15/01

☐ Check if Special Reporting Limits Are Needed

Carrier # FNMFD 902 629 060 3

First Quarter 2001
Groundwater Monitoring and
Remediation System Performance Report
Navajo Refining Company – Lea Refinery
Lovington, New Mexico

May 25, 2001



Prepared for:

Navajo Refining Company
P.O. Box 159
Artesia, New Mexico 88211

By:

Safety & Environmental Solutions, Inc.
703 E. Clinton, Suite 102
Hobbs, New Mexico 88240
(505) 397-0510

TABLE OF CONTENTS

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I. Introduction

Safety and Environmental Solutions, Inc. (SESI) has been awarded the contract for groundwater monitoring, sampling, and product recovery at Navajo Refining Company's Lea Refinery in Lovington, New Mexico (Figure 1). The work to be performed at the refinery includes quarterly measurement of water and product levels, sampling of monitor wells for water quality in accordance with the requirements of the New Mexico Oil Conservation Division, and maintenance of the hydrocarbon product recovery system installed at the facility. This quarterly report documents the latest sampling event conducted at the site and includes performance data for the remediation system. The groundwater sampling and monitoring events, and operation and maintenance activities for the remediation system were performed by SESI under the direction of Mr. David Boyer, P.G.

II. Procedures

The following activities were conducted to document the groundwater quality conditions and remediation system performance in accordance with the remediation work plan, and the OCD letters dated November 21, 1996 and March 26, 1998. The locations of the referenced wells are shown on Figure 2.

- Measured depth to groundwater in monitoring wells MW-1 through MW-5 and MW-7 through MW-10.
- Collected groundwater samples from MW-3, MW-7, MW-8, MW-9, and MW-10 for BTEX analysis (EPA Method 8021B).
- Measured free product thickness in monitoring wells RW-1, MW-1 and MW-7 using a Solinst Interface Meter, Model 122.

Groundwater measurement and sampling activities were conducted on February 22, 2001. Prior to sampling, monitoring wells at the Lea Refinery were gauged for depth to groundwater and thickness of free product (phase-separated hydrocarbons) using and oil/water interface probe (Solinst Model 122).

Immediately prior to collecting groundwater samples, monitoring wells MW-3, MW-7, MW-8, MW-9 and MW-10 were purged of a minimum of three well casing volumes of water using clean, decontaminated PVC bailers. Monitoring well MW-1 was not sampled due to the presence of free product. Monitoring well MW-6 was not sampled due to its location being confused with recovery well RW-1 and RW-1 not being located on the site map included with earlier reports. Monitoring wells MW-2, MW-4, and MW-5 were not sampled during this quarterly sampling event but will be sampled during the annual sampling event, which will be conducted in the second quarter this year. An approximate total of 15 gallons of water was purged from those monitoring wells that were sampled. Groundwater parameters of conductivity and pH were measured during purging operations.

The BTEX water samples were transferred into air-tight, septum-sealed, 40-milliliter (ml) glass volatile organic analyte (VOA) sample vials with zero head space and preserved with HCl. Samples were placed in an ice-filled cooler immediately after collection and shipped to TraceAnalysis, Inc., in Lubbock, Texas. The samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8021B. Chain of custody (COC) forms documenting sample identification numbers, collection times, and delivery times to the laboratory were completed for each set of samples. A summary of purging and sampling methods is provided in the table below.

Summary of Purging and Sampling Methods, First Quarter 2001
Sampling Event, February 22, 2001.

Monitoring Well No.	Purge Method	Purge Volume (gallons)	Sampling Method	Groundwater Analytes and Comments
MW-1	NS	- -	NS	Not sampled due to presence of free product
MW-2	NS	- -	NS	Sampled only on annual frequency (fourth quarter)
MW-3	Hand-bailed	2.8	Disposable bailer	BTEX, conductivity, pH
MW-4	NS	- -	NS	Sampled only on annual frequency (fourth quarter)
MW-5	NS	- -	NS	Sampled only on annual frequency (fourth quarter)
MW-6	NS	- -	NS	Not sampled due to inaccurate map, confused with RW-1
MW-7	Hand-bailed	3.2	Disposable bailer	BTEX, conductivity, pH
MW-8	Hand-bailed	3.3	Disposable bailer	BTEX, conductivity, pH
MW-9	Hand-bailed	2.9	Disposable bailer	BTEX, conductivity, pH
MW-10	Hand-bailed	2.7	Disposable bailer	BTEX, conductivity, pH
RW-1	NS	- -	NS	Recovery well, not sampled due to free product

Notes: NS – not sampled, no temperature measurement due to unavailability of working thermometer

III. Groundwater Elevations, Flow Direction, and Hydraulic Gradient

Groundwater elevations for the current and previous monitoring events are summarized in Table 1. The water table elevation map (potentiometric surface) and direction of groundwater flow is depicted in Figure 3.

Based on past measurements, the water table elevations have been declining at the rate of approximately 1.35 feet per year for the past five years. Depth to groundwater occurs at approximately 76 to 97 feet below ground surface across the site. The direction of flow is to the southeast with a hydraulic gradient of approximately 0.004 feet/foot, which is consistent with determinations made from previous gauging events.

IV. Distribution of Hydrocarbons in Groundwater

Analytical results for BTEX in groundwater for the current and previous sampling events are summarized in Table 3. Constituents with concentrations above the New Mexico Water Quality Control Commission (WQCC) standards are highlighted in boldface type. The laboratory reports and COC documentation for samples obtained by SESI are

included in the Appendix.

Based on the most recent analytical data for samples collected by SESI on February 22, 2001, the distribution of hydrocarbons at the Lea Refinery is described below:

- BTEX concentrations in upgradient monitoring wells MW-2 and MW-4, and downgradient wells MW-5, MW-8, and MW-10 have remained at levels below the laboratory detection limit and below WQCC standards. Pursuant to the OCD-approved Discharge Plan, only MW-8 and MW-10 were sampled during the first quarter 2001; all five of these wells are scheduled to be sampled during the annual sampling event.

- Monitoring well MW-6 was not sampled this quarter due to mislocation on the site map. However, based on earlier sampling, benzene concentrations in this downgradient well have declined from a high of 1.74 mg/L in September 1995 to below detection level in April of 1997. Benzene and other BTEX constituents have remained at or below laboratory detection limits and below WQCC standards since that time. This well is scheduled to be sampled every quarter.

- Benzene concentrations in downgradient well MW-9 declined from a high of 1.69 mg/L in April 1996 to below the WQCC standard (0.01 mg/L) in August 1998. The benzene concentration in MW-9 has remained below the WQCC standard since 1998 and below the laboratory detection limits of 0.005 mg/L since August 1999. Since installation and monitoring of this well began in April 1996, all BTEX constituents other than benzene have remained near or below laboratory detection limits and below WQCC standards. This well is scheduled to be sampled every quarter.

- BTEX concentrations in downgradient well MW-3 were measured at levels near or below the laboratory detection limit and below WQCC standards from the initial sampling event in September 1995 through August 1999. Since the November 1999 sampling event, the benzene concentrations in MW-3 have exceeded the WQCC standard and the xylene concentrations have exceeded the laboratory detection limit. It is suspected that this increase in dissolved hydrocarbons represents the downgradient movement of a limited slug of contaminants that was observed in upgradient well MW-9 during the period from April 1996 through August 1998. Based on the maximum benzene levels observed in each well, it appears that the benzene slug is migrating at approximately 0.35 feet per day and attenuating at a rate of approximately one half-life per 150 feet. At this rate the benzene slug could impact the north water supply well in approximately 3.5 years at an estimated concentration of 0.05 mg/L. It should be noted that this estimate assumes that the production from the water well occurs only in the upper 10 feet (mixing zone) of the aquifer, which is not the case for a large volume production water well.

- Although no measurable free product had been observed in MW-7 since the January 2000 sampling event, a hydrocarbon sheen was noted during the February 2001 sampling. Nonetheless, the well was sampled and the laboratory results show the presence of ethylbenzene and xylenes, though at levels below the WQCC standards.

- Monitoring well MW-1 contained 0.52 feet of hydrocarbon product and was not sampled.

IV. Total Fluids Recovery

Approximately 194.7 gallons of free product has been recovered between January 21, 1998 and April 7, 2001. A summary of the recovery methods and the volumes of product recovered are listed in Table 3.

V. Groundwater Temperature

Since April 1996, temperatures have been measured in each of the monitoring wells except for the most recent sampling (February 2001) when a working temperature meter was not available. Groundwater temperatures will again be measured during the second quarter sampling and a discussion of the results will be included in the next report.

VI. Systems Status

Air Sparge/Vapor Extraction System

The previous contractor shut down the air sparge/vapor extraction system and aboveground equipment has been removed. Based on information provided in earlier monitoring reports, the system worked as intended to reduce dissolved-phase BTEX and hydrocarbon vapors in the vicinity of the leak.

Hydrocarbon Product Recovery System

At the time of the first visit to the site, the Xitech hydrocarbon recovery skimmer pump was partially disassembled with the pump head down hole and the screen at the surface. The pump was retrieved from the well, and the pump and screen cleaned of oil. The pump was returned to the manufacturer for servicing. The reconditioned pump was reinstalled on March 23 and by March 26 it had pumped about five gallons into a storage barrel. On March 31, the pump setting was repositioned and the pumping duration changed. As of April 7, the skimmer had recovered approximately 6.4 gallons of product since reinstallation.

VII. Conclusions

- Benzene concentrations in downgradient well MW-3 continue to decrease. The benzene of 0.131 mg/L measured in February 2001 is 25 percent of the maximum concentration measured in January of 2000.

- Benzene and other BTEX constituents remain absent in MW-9. The last time these contaminants were detected in this well was the third quarter of 1999.

- Monitor well MW-6 was not sampled due its being improperly located on the site map and being confused with RW-1, which was not shown on the map available at the time of sampling.

- Product thickness in RW-1 and MW-1 on February 22 was 3.20 and 0.52 feet, respectively. No product was observed in MW-7 on that date.

- The product recovery system was not in operation at the time of SESI's first visit to the refinery. The skimmer pump was removed, cleaned and sent to the manufacturer for servicing. The pump was reinstalled on March 23.

- Based on the groundwater flow map, the original benzene plume is migrating toward the North and South refinery wells and is likely to impact these wells within the next two to three years. If the water from these wells is used for human consumption (drinking water, hand washing, showering, etc.), they wells should be monitored for BTEX on at least a quarterly basis. The installation of an additional monitor well between MW-3 and the North well should also be considered.

VIII. Future Work

The next report will be submitted to Navajo in July 2001 and will include an update on product recovery efforts together with the results of the groundwater sampling.

IX. Report Tables and Figures

Table 1. Summary of Groundwater Elevations, Navajo Refining Company, Lea Refinery

Monitor Well No., Depth Below TOC, & Depth Below Surface (feet)	Elevation Top of Casing (TOC, feet)	Ground Level Elevation (feet)	Measure-ment Date	Depth to Product (feet)	Depth to Water Below TOC (feet)	Product Thickness (feet)	Corrected Depth to Water (feet)	Corrected Water Level Elev. (feet)
MW-1	3,835.67	3,835.90	09/10/95	102.33	95.89	6.44	90.29	3,745.38
97.10			04/22/96	102.97	96.49	6.48	90.85	3,744.82
97.33			11/19/96	95.94	93.57	2.37	91.51	3,744.16
			02/07/97	95.54	93.39	2.15	91.52	3,744.15
			04/16/97	99.19	95.49	3.70	92.27	3,743.40
			08/14/97	99.89	96.23	3.66	93.05	3,742.62
			10/28/97	100.74	96.88	3.86	93.52	3,742.15
			01/20/98	97.48	95.07	2.41	92.97	3,742.70
			04/23/98	96.56	94.75	1.81	93.18	3,742.49
			08/04/98	100.75	97.13	3.62	93.98	3,741.69
			10/29/98	95.65	94.98	0.67	94.40	3,741.27
			02/16/99	96.21	95.35	0.86	94.60	3,741.07
			04/21/99	96.73	95.60	1.13	94.62	3,741.05
			08/16/99	97.60	96.50	1.10	95.54	3,740.13
			11/23/99	97.42	96.60	0.82	95.89	3,739.78
			01/26/00	97.25	96.37	0.88	95.60	3,740.07
			04/25/00	97.30	96.64	0.66	96.07	3,739.60
			08/14/00	96.46	96.45	0.01	96.44	3,739.23
			11/02/00	97.25	96.90	0.35	96.60	3,739.07
			02/22/01	96.51	97.03	0.52	96.58	3,739.09
Note 1: Corrected depth to water = Static DTW - (Prod. Thickness x SG), SG = 0.8665 (0.87 prior to 2001)								
Note 2: Well depth approximate -- soft bottom prevents accurate reading								
MW-2	3,834.94	3,835.14	09/10/95	- -	89.18	0	89.18	3,745.76
99.03			04/22/96	- -	89.42	0	89.42	3,745.52
99.23			11/19/96	- -	89.83	0	89.83	3,745.11
			02/07/97	- -	89.71	0	89.71	3,745.23
			04/16/97	- -	90.16	0	90.16	3,744.78
			08/14/97	- -	91.05	0	91.05	3,743.89
			10/28/97	- -	91.05	0	91.05	3,743.89
			01/20/98	- -	90.79	0	90.79	3,744.15
			04/23/98	- -	91.33	0	91.33	3,743.61
			08/04/98	- -	92.51	0	92.51	3,742.43
			10/28/98	- -	92.67	0	92.67	3,742.27
			02/16/99	- -	92.83	0	92.83	3,742.11
			04/21/99	- -	92.96	0	92.96	3,741.98
			08/16/99	- -	94.15	0	94.15	3,740.79
			11/23/99	- -	94.16	0	94.16	3,740.78
			01/26/00	- -	93.76	0	93.76	3,741.18
			04/25/00	- -	93.59	0	93.59	3,741.35
			08/14/00	- -	94.72	0	94.72	3,740.22
			11/02/00	- -	95.05	0	95.05	3,739.89
			02/22/01	- -	94.83	0	94.83	3,740.11

Table 1. Summary of Groundwater Elevations, Navajo Refining Company, Lea Refinery

Monitor Well No., Depth Below TOC, & Depth Below Surface (feet)	Elevation Top of Casing (TOC, feet)	Ground Level Elevation (feet)	Measure-ment Date	Depth to Product (feet)	Depth to Water Below TOC (feet)	Product Thickness (feet)	Corrected Depth to Water (feet)	Corrected Water Level Elev. (feet)
MW-3	3,829.55	3,829.83	09/10/95	- -	87.53	0	87.53	3,742.02
97.98			04/22/96	- -	87.90	0	87.90	3,741.65
98.26			11/19/96	- -	88.72	0	88.72	3,740.83
			02/07/97	- -	88.98	0	88.98	3,740.57
			04/16/97	- -	89.00	0	89.00	3,740.55
			08/14/97	- -	89.56	0	89.56	3,739.99
			10/28/97	- -	89.62	0	89.62	3,739.93
			01/20/98	- -	90.18	0	90.18	3,739.37
			04/23/98	- -	90.58	0	90.58	3,738.97
			08/04/98	- -	90.72	0	90.72	3,738.83
			10/28/98	- -	91.03	0	91.03	3,738.52
			02/16/99	- -	91.42	0	91.42	3,738.13
			04/21/99	- -	91.42	0	91.42	3,738.13
			08/16/99	- -	92.14	0	92.14	3,737.41
			11/23/99	- -	92.67	0	92.67	3,736.88
			01/26/00	- -	92.09	0	92.09	3,737.46
			04/25/00	- -	93.25	0	93.25	3,736.30
			08/14/00	- -	92.61	0	92.61	3,736.94
			11/02/00	- -	92.75	0	92.75	3,736.80
			02/22/01	- -	92.55	0	92.55	3,737.00
MW-4	3,837.56	3,837.85	09/10/95	- -	91.40	0	91.40	3,746.16
103.18			04/22/96	- -	91.84	0	91.84	3,745.72
103.47			11/19/96	- -	92.67	0	92.67	3,744.89
			02/07/97	- -	92.54	0	92.54	3,745.02
			04/16/97	- -	92.80	0	92.80	3,744.76
			08/14/97	- -	93.43	0	93.43	3,744.13
			10/28/97	- -	93.73	0	93.73	3,743.83
			01/20/98	- -	93.59	0	93.59	3,743.97
			04/23/98	- -	93.84	0	93.84	3,743.72
			08/04/98	- -	94.65	0	94.65	3,742.91
			10/28/98	- -	95.14	0	95.14	3,742.42
			02/16/99	- -	95.27	0	95.27	3,742.29
			04/21/99	- -	95.30	0	95.30	3,742.26
			08/16/99	- -	96.15	0	96.15	3,741.41
			11/23/99	- -	96.51	0	96.51	3,741.05
			01/26/00	- -	96.11	0	96.11	3,741.45
			04/25/00	- -	96.08	0	96.08	3,741.48
			08/14/00	- -	96.83	0	96.83	3,740.73
			11/02/00	- -	97.45	0	97.45	3,740.11
			02/22/01	- -	97.32	0	97.32	3,740.24

Table 1. Summary of Groundwater Elevations, Navajo Refining Company, Lea Refinery

Monitor Well No., Depth Below TOC, & Depth Below Surface (feet)	Elevation Top of Casing (TOC, feet)	Ground Level Elevation (feet)	Measure-ment Date	Depth to Product (feet)	Depth to Water Below TOC (feet)	Product Thickness (feet)	Corrected Depth to Water (feet)	Corrected Water Level Elev. (feet)
MW-5	3,816.88	3,813.87	09/10/95	- -	75.82	0	75.82	3,741.06
93.01			04/22/96	- -	74.58	0	74.58	3,742.30
90.00			11/19/96	- -	74.95	0	74.95	3,741.93
			02/07/97	- -	75.23	0	75.23	3,741.65
			04/16/97	- -	75.43	0	75.43	3,741.45
			10/28/97	- -	76.47	0	76.47	3,740.41
			01/20/98	- -	76.71	0	76.71	3,740.17
			04/23/98	- -	76.95	0	76.95	3,739.93
			08/04/98	- -	77.74	0	77.74	3,739.14
			10/28/98	- -	78.36	0	78.36	3,738.52
			02/16/99	- -	78.25	0	78.25	3,738.63
			04/21/99	- -	78.28	0	78.28	3,738.60
			08/16/99	- -	78.85	0	78.85	3,738.03
			11/23/99	- -	79.35	0	79.35	3,737.53
			01/26/00	- -	79.37	0	79.37	3,737.51
			04/25/00	- -	79.31	0	79.31	3,737.57
			08/14/00	- -	79.85	0	79.85	3,737.03
			11/02/00	- -	80.27	0	80.27	3,736.61
			02/22/01	- -	79.93	0	79.93	3,736.95
MW-6	3,835.50	3,835.70	04/22/96	- -	91.18	0	91.18	3,744.32
98.92			11/19/96	- -	90.64	0	90.64	3,744.86
99.12			02/07/97	- -	90.91	0	90.91	3,744.59
			04/16/97	- -	92.23	0	92.23	3,743.27
			08/14/97	- -	92.93	0	92.93	3,742.57
			10/28/97	- -	93.23	0	93.23	3,742.27
			01/20/98	- -	93.23	0	93.23	3,742.27
			04/23/98	- -	93.54	0	93.54	3,741.96
			08/04/98	- -	94.25	0	94.25	3,741.25
			10/28/98	- -	94.48	0	94.48	3,741.02
			02/16/99	- -	94.71	0	94.71	3,740.79
			04/21/99	- -	94.78	0	94.78	3,740.72
			08/16/99	- -	95.61	0	95.61	3,739.89
			11/23/99	- -	96.03	0	96.03	3,739.47
			01/26/00	- -	95.61	0	95.61	3,739.89
			04/25/00	- -	95.91	0	95.91	3,739.59
			08/14/00	- -	96.24	0	96.24	3,739.26
			11/02/00	- -	96.68	0	96.68	3,738.82
			02/22/01	- -	- -	- -	- -	- -
Note: MW-6 not measured 2/22/01. Previous map omitted RW-1 and RW-1 measured in lieu of MW-6.								
MW-7	3,835.84	3,836.07	04/22/96	91.19	96.56	5.37	91.89	3,743.95
103.28			11/19/96	91.34	93.13	1.79	91.57	3,744.27
103.51			02/07/97	91.50	93.05	1.55	91.70	3,744.14
			04/16/97	91.92	95.57	3.65	92.39	3,743.45
			08/14/97	92.35	96.30	3.95	92.86	3,742.98

Table 1. Summary of Groundwater Elevations, Navajo Refining Company, Lea Refinery

Monitor Well No., Depth Below TOC, & Depth Below Surface (feet)	Elevation Top of Casing (TOC, feet)	Ground Level Elevation (feet)	Measure-ment Date	Depth to Product (feet)	Depth to Water Below TOC (feet)	Product Thickness (feet)	Corrected Depth to Water (feet)	Corrected Water Level Elev. (feet)
MW-7			10/28/97	93.85	96.38	2.53	94.18	3,741.66
			01/20/98	92.90	94.82	1.92	93.15	3,742.69
			04/23/98	93.14	94.68	1.54	93.34	3,742.50
			08/04/98	94.13	96.49	2.36	94.44	3,741.40
			10/28/98	94.42	95.49	1.07	94.56	3,741.28
			02/16/99	94.76	94.91	0.15	94.78	3,741.06
			04/21/99	94.75	94.83	0.08	94.76	3,741.08
			08/16/99	95.58	95.59	0.01	95.58	3,740.26
			11/23/99	95.80	95.94	0.14	95.82	3,740.02
			01/26/00	- -	95.56	0	95.56	3,740.28
			04/25/00	- -	95.87	0	95.87	3,739.97
			08/14/00	- -	96.24	0	96.24	3,739.60
			11/02/00	- -	96.71	0	96.71	3,739.13
			02/22/01	- -	96.58	0	96.58	3,739.26
Note: Corrected depth to water = Static DTW - (Prod. Thickness x SG), SG = 0.8665 (0.87 prior to 2001)								
MW-8	3,838.09	3,834.42	04/22/96	- -	94.73	0	94.73	3,743.36
105.70			11/19/96	- -	95.50	0	95.50	3,742.59
102.03			02/07/97	- -	95.50	0	95.50	3,742.59
			04/16/97	- -	95.66	0	95.66	3,742.43
			08/14/97	- -	96.25	0	96.25	3,741.84
			10/28/97	- -	96.45	0	96.45	3,741.64
			01/20/98	- -	96.68	0	96.68	3,741.41
			04/23/98	- -	96.97	0	96.97	3,741.12
			08/04/98	- -	97.52	0	97.52	3,740.57
			10/28/98	- -	97.94	0	97.94	3,740.15
			02/16/99	- -	98.14	0	98.14	3,739.95
			04/21/99	- -	98.21	0	98.21	3,739.88
			08/16/99	- -	99.02	0	99.02	3,739.07
			11/23/99	- -	99.45	0	99.45	3,738.64
			01/26/00	- -	99.05	0	99.05	3,739.04
			04/25/00	- -	99.47	0	99.47	3,738.62
			08/14/00	- -	99.68	0	99.68	3,738.41
			11/02/00	- -	100.01	0	100.01	3,738.08
			02/22/01	- -	99.81	0	99.81	3,738.28
MW-9	3,832.82	3,833.06	04/22/96	- -	89.60	0	89.60	3,743.22
101.10			11/19/96	- -	90.34	0	90.34	3,742.48
101.34			02/07/97	- -	90.41	0	90.41	3,742.41
			04/16/97	- -	90.52	0	90.52	3,742.30
			08/14/97	- -	91.06	0	91.06	3,741.76
			10/28/97	- -	91.27	0	91.27	3,741.55
			01/20/98	- -	91.54	0	91.54	3,741.28
			04/23/98	- -	91.82	0	91.82	3,741.00
			08/04/98	- -	92.29	0	92.29	3,740.53
			10/28/98	- -	92.70	0	92.70	3,740.12

Table 1. Summary of Groundwater Elevations, Navajo Refining Company, Lea Refinery

Monitor Well No., Depth Below TOC, & Depth Below Surface (feet)	Elevation Top of Casing (TOC, feet)	Ground Level Elevation (feet)	Measure-ment Date	Depth to Product (feet)	Depth to Water Below TOC (feet)	Product Thickness (feet)	Corrected Depth to Water (feet)	Corrected Water Level Elev. (feet)
MW-9			02/16/99	- -	92.93	0	92.93	3,739.89
			04/21/99	- -	93.00	0	93.00	3,739.82
			08/16/99	- -	93.75	0	93.75	3,739.07
			11/23/99	- -	94.24	0	94.24	3,738.58
			01/26/00	- -	93.80	0	93.80	3,739.02
			04/25/00	- -	94.31	0	94.31	3,738.51
			08/14/00	- -	94.38	0	94.38	3,738.44
			11/02/00	- -	94.73	0	94.73	3,738.09
			02/22/01	- -	94.55	0	94.55	3,738.27
(Note: Incorrect water level measurement on 22-Feb, water level off 1 ft., original reading 95.55)								
			03/31/01	- -	94.52	0	94.52	3,738.30
MW-10	3,831.10	3,831.34	04/22/96	- -	87.68	0	87.68	3,743.42
98.70			11/19/96	- -	88.51	0	88.51	3,742.59
98.94			02/07/97	- -	88.54	0	88.54	3,742.56
			04/16/97	- -	88.68	0	88.68	3,742.42
			08/14/97	- -	89.21	0	89.21	3,741.89
			10/28/97	- -	89.40	0	89.40	3,741.70
			01/20/98	- -	89.64	0	89.64	3,741.46
			04/23/98	- -	89.90	0	89.90	3,741.20
			08/04/98	- -	90.32	0	90.32	3,740.78
			10/28/98	- -	90.78	0	90.78	3,740.32
			02/16/99	- -	91.05	0	91.05	3,740.05
			04/21/99	- -	91.07	0	91.07	3,740.03
			08/16/99	- -	91.78	0	91.78	3,739.32
			11/23/99	- -	92.29	0	92.29	3,738.81
			01/26/00	- -	91.86	0	91.86	3,739.24
			04/25/00	- -	92.37	0	92.37	3,738.73
			08/14/00	- -	92.43	0	92.43	3,738.67
			11/02/00	- -	94.73	0	94.73	3,736.37
			02/22/01	- -	92.71	0	92.71	3,738.39
(Note: Incorrect water level measurement on 22-Feb, water level off 1 ft., original reading 93.71)								
			03/31/01	- -	92.67	0	92.67	3,738.43
RW-1	3,835.91	3,836.15	02/22/01	96.56	99.76	3.20	96.99	3,738.92
108.10								
108.34								
Note: Corrected depth to water = Static DTW - (Prod. Thickness x SG), SG = 0.8665 (0.87 prior to 2001)								
Notes:								
1. Monitoring wells MW-1 through MW-7 installed September 1995								
2. Monitoring wells MW-8 through MW-10 installed March and April 1996								
3. Elevations surveyed by John W. West Engineering of Hobbs; measurement from north side of casing.								

Table 2. BTEX Concentrations in Groundwater, Navajo Refining Company, Lea Refinery

Monitoring Well	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total, mg/L)	Total BTEX (mg/L)
MW-2	09/10/95	<0.001	<0.001	<0.001	<0.001	<0.004
	04/23/96	<0.001	<0.001	<0.001	<0.001	<0.004
	08/14/97	<0.001	<0.001	<0.001	<0.001	<0.004
	10/28/98	<0.001	<0.001	<0.001	<0.001	<0.004
	11/23/99	<0.005	<0.005	<0.005	<0.005	<0.020
	11/02/00	<0.005	<0.005	<0.005	0.007	0.007
MW-3	09/10/95	<0.001	<0.001	<0.001	<0.001	<0.004
	04/23/96	<0.001	<0.001	<0.001	<0.001	<0.004
	11/19/96	<0.001	<0.001	<0.001	<0.001	<0.004
	11/19/96[1]	<0.001	<0.001	<0.001	<0.001	<0.004
	01/20/97	<0.001	<0.001	<0.001	<0.001	<0.004
	04/16/97	<0.001	<0.001	<0.001	<0.001	<0.004
	08/14/97	<0.001	<0.001	<0.001	<0.001	<0.004
	10/28/97	<0.001	<0.001	<0.001	<0.001	<0.004
	01/21/98	<0.001	<0.001	<0.001	<0.001	<0.004
	04/23/98	<0.005	<0.005	<0.005	0.008	0.008
	04/23/98[2]	<0.005	<0.005	<0.005	0.008	0.008
	10/29/98	<0.001	<0.001	<0.001	<0.001	<0.004
	02/16/99	0.006	<0.001	0.001	<0.001	0.007
	04/21/99	<0.005	<0.005	<0.005	<0.005	<0.020
	08/16/99	<0.001	<0.001	<0.001	<0.001	<0.004
	11/23/99	**0.314**	<0.005	0.005	0.102	0.421
	01/26/00	**0.482**	<0.005	0.007	0.091	0.580
	04/25/00	**0.433**	<0.005	<0.005	0.109	0.542
	08/14/00	**0.340**	<0.005	<0.005	0.137	0.477
	11/02/00	**0.208**	<0.005	<0.005	0.162	0.370
	02/22/01	**0.131**	<0.001	<0.001	0.020	0.151
MW-4	09/10/95	<0.001	<0.001	<0.001	<0.001	<0.004
	04/23/96	<0.001	<0.001	<0.001	<0.001	<0.004
	08/14/97	<0.001	<0.001	<0.001	<0.001	<0.004
	10/28/98	<0.001	<0.001	<0.001	<0.001	<0.004
	11/23/99	<0.005	<0.005	<0.005	<0.005	<0.020
	11/02/00	<0.005	<0.005	<0.005	0.007	0.007
MW-5	09/10/95	<0.001	<0.001	<0.001	<0.001	<0.004
	04/23/96	<0.001	<0.001	<0.001	<0.001	<0.004
	08/14/97	<0.001	<0.001	<0.001	<0.001	<0.004
	10/28/98	<0.001	<0.001	<0.001	<0.001	<0.004
	11/23/99	<0.005	<0.005	<0.005	<0.005	<0.020
	11/02/00	<0.005	<0.005	<0.005	0.016	0.016

Table 2. BTEX Concentrations in Groundwater, Navajo Refining Company, Lea Refinery

Monitoring Well	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total, mg/L)	Total BTEX (mg/L)
MW-6	09/10/95	**1.741**	0.021	**0.962**	**0.972**	3.696
	04/23/96	**1.150**	<0.001	0.599	0.462	2.211
	11/19/96	0.002	<0.001	0.011	0.002	0.015
	01/20/97	0.004	<0.001	0.003	0.007	0.014
	04/16/97	<0.001	<0.001	<0.001	<0.001	<0.004
	08/14/97	<0.001	<0.001	<0.001	<0.001	<0.004
	10/28/97	<0.001	<0.001	<0.001	<0.001	<0.004
	01/21/98	<0.001	<0.001	<0.001	<0.001	<0.004
	04/23/98	<0.001	<0.001	<0.001	<0.001	<0.004
	08/04/98	<0.001	<0.001	<0.001	<0.001	<0.004
	10/29/98	<0.001	<0.001	<0.001	<0.001	<0.004
	02/16/99	<0.001	<0.001	<0.001	<0.001	<0.004
	04/21/99	<0.001	<0.001	<0.001	<0.001	<0.004
	08/16/99	<0.001	<0.001	<0.001	<0.001	<0.004
	11/23/99	<0.005	<0.005	<0.005	<0.005	<0.020
	01/26/99	<0.005	<0.005	<0.005	<0.005	<0.020
	04/25/99	<0.005	<0.005	<0.005	<0.005	<0.020
	08/14/99	<0.005	<0.005	<0.005	0.005	0.005
	11/02/00	<0.001	<0.001	<0.001	<0.001	<0.004
	02/22/01	(Not sampled due to mislocation on map)				
MW-7	08/14/00	<0.005	0.006	0.033	0.062	0.101
	11/02/00	**0.025**	0.006	0.012	<0.005	0.043
	02/22/01	<0.005	<0.005	0.032	0.101	0.133
MW-8	04/23/96	0.002	<0.001	<0.001	<0.001	0.002
	11/19/96	<0.001	<0.001	<0.001	<0.001	<0.004
	11/19/96[1]	<0.001	<0.001	<0.001	<0.001	<0.004
	01/20/97	<0.001	<0.001	<0.001	<0.001	<0.004
	04/16/97	<0.001	<0.001	<0.001	<0.001	<0.004
	08/14/97	<0.001	<0.001	<0.001	<0.001	<0.004
	10/28/97	<0.001	<0.001	<0.001	<0.001	<0.004
	01/21/98	<0.001	<0.001	<0.001	<0.001	<0.004
	04/23/98	<0.001	<0.001	<0.001	<0.001	<0.004
	08/04/98	<0.001	<0.001	<0.001	<0.001	<0.004
	10/29/98	<0.001	<0.001	<0.001	<0.001	<0.004
	02/16/99	<0.001	<0.001	<0.001	<0.001	<0.004
	04/21/99	<0.005	<0.005	<0.005	<0.005	<0.020
	08/16/99	<0.001	<0.001	<0.001	<0.001	<0.004
	11/23/99	<0.005	<0.005	<0.005	<0.005	<0.020
	01/26/00	<0.005	<0.005	<0.005	<0.005	<0.020
	04/25/00	<0.005	<0.005	<0.005	<0.005	<0.020
	08/14/00	<0.005	<0.005	<0.005	<0.005	<0.020
	11/02/00	<0.005	<0.005	<0.005	<0.005	<0.020
	02/22/01	<0.001	<0.001	<0.001	<0.001	<0.004

Table 2. BTEX Concentrations in Groundwater, Navajo Refining Company, Lea Refinery

Monitoring Well	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total, mg/L)	Total BTEX (mg/L)
MW-9	04/23/96	**1.690**	<0.010	<0.010	<0.001	1.690
	11/19/96	**0.679**	<0.005	<0.005	<0.005	0.679
	01/20/97	**0.340**	<0.001	0.002	0.003	0.345
	04/16/97	**0.347**	<0.002	<0.002	0.007	0.354
	08/14/97	**1.680**	<0.010	<0.010	<0.010	1.680
	10/28/97	**0.516**	<0.010	<0.010	<0.010	0.516
	10/28/97[2]	**0.474**	<0.010	<0.010	<0.010	0.474
	01/21/98	**0.146**	0.005	<0.001	0.002	0.153
	01/21/98[2]	**0.125**	0.004	<0.001	<0.001	0.129
	04/23/98	**0.013**	<0.001	<0.001	<0.001	0.013
	04/23/98[2]	**0.012**	<0.001	<0.001	<0.001	0.012
	08/04/98	**0.010**	<0.001	<0.001	<0.001	0.010
	08/04/98[2]	0.007	<0.001	<0.001	<0.001	0.007
	10/29/98	0.007	0.006	<0.001	0.002	0.015
	10/29/98[2]	0.006	0.004	0.002	0.002	0.014
	02/16/99	<0.001	0.004	0.001	0.022	0.027
	02/16/99[2]	<0.001	0.004	0.002	0.008	0.014
	04/21/99	0.008	0.002	<0.001	0.005	0.015
	04/21/99[2]	0.006	0.001	<0.001	0.004	0.011
	08/16/99	<0.001	<0.001	<0.001	0.002	0.002
	11/23/99	<0.005	<0.005	<0.005	<0.005	<0.020
	01/26/00	<0.005	<0.005	<0.005	<0.005	<0.020
	04/25/00	<0.005	<0.005	<0.005	<0.005	<0.020
	08/14/00	<0.005	<0.005	<0.005	<0.005	<0.020
	11/02/00	<0.005	<0.005	<0.005	<0.005	<0.020
	02/22/01	<0.001	<0.001	<0.001	<0.001	<0.004
MW-10	04/23/96	<0.001	<0.001	<0.001	<0.001	<0.004
	11/19/96	<0.001	<0.001	<0.001	<0.001	<0.004
	11/19/96[1]	<0.001	<0.001	<0.001	<0.001	<0.004
	01/20/97	<0.001	<0.001	<0.001	<0.001	<0.004
	04/16/97	<0.001	<0.001	<0.001	<0.001	<0.004
	08/14/97	<0.001	<0.001	<0.001	<0.001	<0.004
	10/28/97	<0.001	<0.001	<0.001	<0.001	<0.004
	01/21/98	<0.001	<0.001	<0.001	<0.001	<0.004
	04/23/98	<0.001	<0.001	<0.001	<0.001	<0.004
	08/04/98	<0.001	<0.001	<0.001	<0.001	<0.004
	10/29/98	<0.001	<0.001	<0.001	<0.001	<0.004
	02/16/99	<0.001	<0.001	<0.001	<0.001	<0.004
	04/21/99	<0.005	<0.005	<0.005	<0.005	<0.020
	08/16/99	<0.001	<0.001	<0.001	<0.001	<0.004
	11/23/99	<0.005	<0.005	<0.005	<0.005	<0.020
	01/26/00	<0.005	<0.005	<0.005	<0.005	<0.020
	04/25/00	<0.005	<0.005	<0.005	<0.005	<0.020

Table 2. BTEX Concentrations in Groundwater, Navajo Refining Company, Lea Refinery

Monitoring Well	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total, mg/L)	Total BTEX (mg/L)
MW-10	08/14/00	<0.005	<0.005	<0.005	<0.005	<0.020
	11/02/00	<0.001	<0.001	<0.001	<0.001	<0.004
	02/22/01	<0.001	<0.001	<0.001	<0.001	<0.004
Field Blank	02/22/01	<0.001	<0.001	<0.001	<0.001	<0.004
Trip Blank	11/02/00	<0.001	<0.001	<0.001	<0.001	<0.004
NM WQCC groundwater standards:		**0.010**	**0.750**	**0.750**	**0.620**	
Notes:						
Monitoring well MW-1 not sampled due to presence of phase-separated hydrocarbon						
Samples analyzed for BTEX using EPA Method 8021B.						
Analyses performed by TraceAnalysis, Lubbock, Texas, unless otherwise noted						
1. Analyses performed by American Environmental Newtwork, Inc., Albuquerque, NM						
2. Duplicate analysis						

Table 3. Total Fluids and Product Recovery Volumes, Navajo Refining Company, Lea Refinery

Date	Recovery Method	Cumulative Total Fluids Recovered (gallons)	Barrel Reading (feet)	Product Recovered (gallons)	Cumulative Product Recovered (gallons)
12/28/97	Sub. Pump	699,033	N/A	Unknown	Unknown
01/21/98	PRS	N/A	N/A	0.50	0.5
01/27/98	PRS	N/A	N/A	2.00	2.5
02/11/98	PRS	N/A	N/A	1.10	3.6
02/24/98	PRS	N/A	N/A	1.50	5.1
03/13/98	PRS	N/A	N/A	2.60	7.7
03/23/98	PRS	N/A	N/A	10.60	18.3
04/10/98	PRS	N/A	N/A	15.80	34.1
04/22/98	PRS	N/A	N/A	0.50	34.6
05/06/98	PRS	N/A	N/A	7.50	42.1
06/23/98	PRS	N/A	N/A	19.50	61.6
08/04/98	PRS	N/A	N/A	5.50	67.1
09/18/98	PRS	N/A	N/A	44.20	111.3
10/29/98	PRS	N/A	N/A	15.50	126.8
11/18/98	PRS	N/A	N/A	6.60	133.4
02/16/99	PRS	N/A	N/A	10.66	144.1
04/21/99	PRS	N/A	N/A	4.42	148.5
09/14/99	PRS	N/A	N/A	11.81	160.3
10/26/99	PRS	N/A	N/A	3.31	163.6
11/23/99	PRS	N/A	N/A	1.65	165.3
12/21/99	PRS	N/A	N/A	1.65	166.9
01/26/00	PRS	N/A	N/A	7.28	174.2
02/23/00	PRS	N/A	N/A	2.62	176.8
04/03/00	PRS	N/A	N/A	1.46	178.3
04/25/00	PRS	N/A	N/A	2.87	181.1
06/13/00	PRS	N/A	N/A	1.86	183.0
07/19/00	PRS	N/A	N/A	4.10	187.1
08/14/00	PRS	N/A	N/A	1.18	188.3
04/07/01	PRS	N/A	0.33	6.42	194.7
	Total Measured Volume of Product Recovered:				**194.7**

Notes:

Product recovery methods used:

Submersible Pump, 3/4 HP Grundfos for total fluids recovery (10/01/96 - 12/28/97)

Product Recovery System (PRS), Xitech ADJ 1000 Smart Skimmer

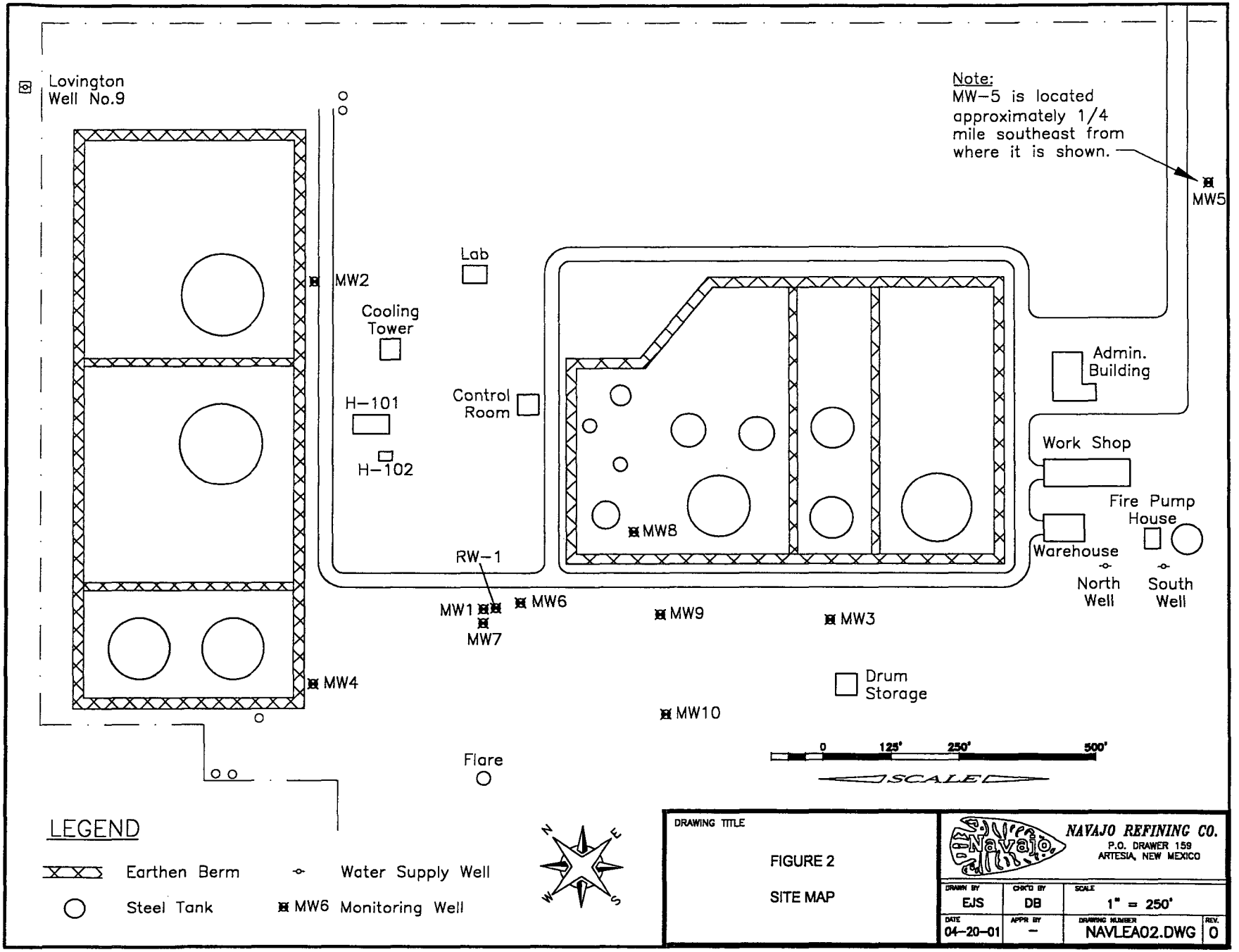
Volume product recovered during total fluids recovery (10/96-12/97) unknown

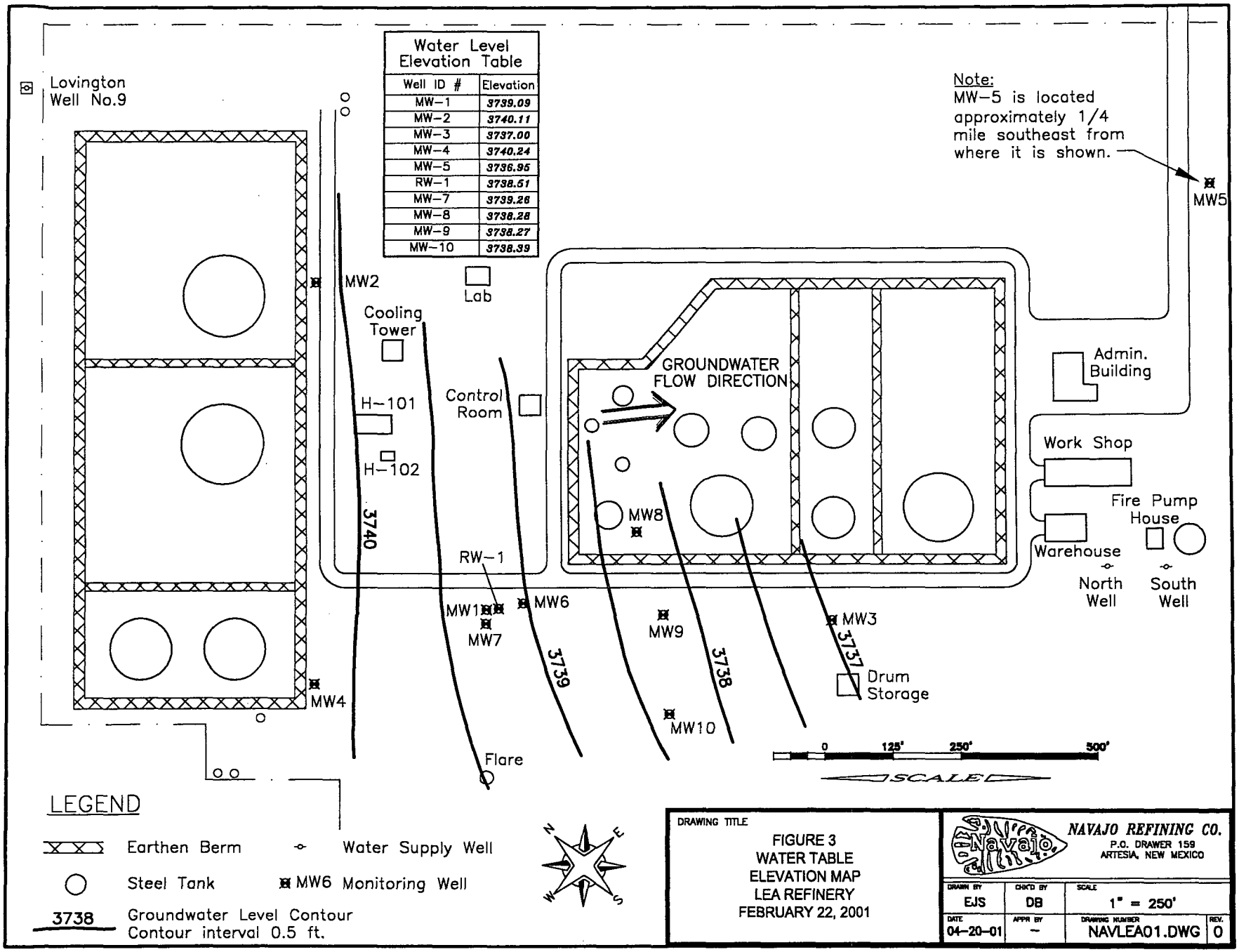
Volume recovered (beginning 04/01) calculated using drum diameter of 1.82 ft.,

or 19.46 gallons per foot barrel depth

Name: LOVINGTON
Date: 6/8/2001
Scale: 1 inch equals 2000 feet

Location: 032° 52' 54.6" N 103° 17' 58.0" W
Caption: Figure 1. Location Map, Navajo Refining Co., Lea Refinery


Lovington
Well No.9
Note:
MW-5 is located approximately 1/4 mile southeast from where it is shown.
MW5
MW2
Lab
Cooling Tower
Control Room
H-101
H-102
Admin. Building
Work Shop
Fire Pump House
Warehouse
North Well
South Well
MW8
RW-1
MW1
MW6
MW7
MW9
MW3
MW4
Drum Storage
MW10
Flare
0
125'
250'
500'
SCALE
LEGEND
Earthen Berm
Water Supply Well
Steel Tank
MW6 Monitoring Well
N
E
S
W
DRAWING TITLE
FIGURE 2
SITE MAP
NAVAJO REFINING CO.
P.O. DRAWER 159
ARTESIA, NEW MEXICO
DRAWN BY
EJS
CHK'D BY
DB
SCALE
1" = 250'
DATE
04-20-01
APPR BY
-
DRAWING NUMBER
NAVLEA02.DWG
REV.
0


Water Level Elevation Table
Well ID # | Elevation
MW-1 | 3739.09
MW-2 | 3740.11
MW-3 | 3737.00
MW-4 | 3740.24
MW-5 | 3736.95
RW-1 | 3738.51
MW-7 | 3739.26
MW-8 | 3738.28
MW-9 | 3738.27
MW-10 | 3738.39
Note:
MW-5 is located approximately 1/4 mile southeast from where it is shown.
Lovington Well No.9
MW2
Lab
Cooling Tower
H-101
H-102
Control Room
GROUNDWATER FLOW DIRECTION
Admin. Building
Work Shop
Fire Pump House
Warehouse
North Well
South Well
MW5
MW8
RW-1
MW1
MW7
MW6
MW9
MW3
MW4
MW10
Drum Storage
Flare
3740
3739
3738
3737
0
125'
250'
500'
SCALE
LEGEND
Earthen Berm
Water Supply Well
Steel Tank
MW6 Monitoring Well
3738 Groundwater Level Contour
Contour interval 0.5 ft.
N
E
S
W
DRAWING TITLE
FIGURE 3
WATER TABLE
ELEVATION MAP
LEA REFINERY
FEBRUARY 22, 2001
NAVAJO REFINING CO.
P.O. DRAWER 159
ARTESIA, NEW MEXICO
DRAWN BY EJS
CHK'D BY DB
SCALE 1" = 250'
DATE 04-20-01
APPR BY -
DRAWING NUMBER NAVLEA01.DWG
REV. 0

APPENDIX
Analytical Results and Chain-of-Custody

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
155 McCutcheon, Suite H El Paso, Texas 79932 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

Analytical and Quality Control Report

David Boyer
Safety & Environmental Solutions Inc.
P. O. Box 1613
Hobbs, NM 88240

Report Date: March 6, 2001

Order ID Number: A01022601

Project Number: N/A
Project Name: N/A
Project Location: Lea Refinery, Lovington,NM

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
165647	MW-8	Water	2/22/01	11:20	2/24/01
165648	MW-10	Water	2/22/01	11:55	2/24/01
165649	MW-9	Water	2/22/01	12:46	2/24/01
165650	MW-3	Water	2/22/01	13:42	2/24/01
165651	MW-7	Water	2/22/01	15:05	2/24/01
165652	Field Blank	Water	2/22/01	17:00	2/24/01

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 10 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 165647 - MW-8

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09462	Date Analyzed:	2/28/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB08120	Date Prepared:	3/1/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.078	mg/L	1	0.10	78	72 - 128
4-BFB		0.074	mg/L	1	0.10	74	72 - 128

Sample: 165648 - MW-10

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09463	Date Analyzed:	2/28/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB08121	Date Prepared:	3/1/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.088	mg/L	1	0.10	88	72 - 128
4-BFB		0.085	mg/L	1	0.10	85	72 - 128

Sample: 165649 - MW-9

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09463	Date Analyzed:	2/28/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB08121	Date Prepared:	3/1/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.086	mg/L	1	0.10	86	72 - 128

Continued ...

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
4-BFB		0.087	mg/L	1	0.10	87	72 - 128

Sample: 165650 - MW-3

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09463	Date Analyzed:	2/28/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB08121	Date Prepared:	3/1/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.131	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		0.02	mg/L	1	0.001
Total BTEX		0.151	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.094	mg/L	1	0.10	94	72 - 128
4-BFB		0.127	mg/L	1	0.10	127	72 - 128

Sample: 165651 - MW-7

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09529	Date Analyzed:	3/2/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB08181	Date Prepared:	3/6/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		0.032	mg/L	5	0.001
M,P,O-Xylene		0.101	mg/L	5	0.001
Total BTEX		0.133	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.46	mg/L	1	0.10	92	72 - 128
4-BFB		0.539	mg/L	1	0.10	107	72 - 128

Sample: 165652 - Field Blank

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09463	Date Analyzed:	2/28/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB08121	Date Prepared:	3/1/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.092	mg/L	1	0.10	92	72 - 128
4-BFB		0.092	mg/L	1	0.10	92	72 - 128

Quality Control Report
Method Blank

Method Blank

QCBatch: QC09462

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Spike Amount	Percent Recovery	Recovery Limit
TFT		0.087	mg/L	0.10	87	72 - 128
4-BFB		0.085	mg/L	0.10	85	72 - 128

Method Blank

QCBatch: QC09463

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Spike Amount	Percent Recovery	Recovery Limit
TFT		0.091	mg/L	0.10	91	72 - 128
4-BFB		0.09	mg/L	0.10	90	72 - 128

Method Blank

QCBatch: QC09529

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Spike Amount	Percent Recovery	Recovery Limit
TFT		0.099	mg/L	0.10	99	72 - 128
4-BFB		0.088	mg/L	0.10	88	72 - 128

Quality Control Report
Lab Control Spikes and Duplicate Spikes

LCS

QC Batch: QC09462

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.094	mg/L	1	0.10	<0.001	94		80 - 120	20
Benzene		0.102	mg/L	1	0.10	<0.001	102		80 - 120	20
Toluene		0.102	mg/L	1	0.10	<0.001	102		80 - 120	20
Ethylbenzene		0.097	mg/L	1	0.10	<0.001	97		80 - 120	20
M,P,O-Xylene		0.282	mg/L	1	0.30	<0.001	94		80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.086	mg/L	1	0.10	86	72 - 128
4-BFB		0.098	mg/L	1	0.10	98	72 - 128

LCSD

QC Batch: QC09462

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.094	mg/L	1	0.10	<0.001	94	0	80 - 120	20
Benzene		0.102	mg/L	1	0.10	<0.001	102	0	80 - 120	20
Toluene		0.102	mg/L	1	0.10	<0.001	102	0	80 - 120	20
Ethylbenzene		0.097	mg/L	1	0.10	<0.001	97	0	80 - 120	20
M,P,O-Xylene		0.281	mg/L	1	0.30	<0.001	93	0	80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.089	mg/L	1	0.10	89	72 - 128
4-BFB		0.102	mg/L	1	0.10	102	72 - 128

LCS

QC Batch: QC09463

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.103	mg/L	1	0.10	<0.001	103		80 - 120	20
Benzene		0.106	mg/L	1	0.10	<0.001	106		80 - 120	20
Toluene		0.106	mg/L	1	0.10	<0.001	106		80 - 120	20
Ethylbenzene		0.105	mg/L	1	0.10	<0.001	105		80 - 120	20
M,P,O-Xylene		0.311	mg/L	1	0.30	<0.001	103		80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.094	mg/L	1	0.10	94	72 - 128
4-BFB		0.112	mg/L	1	0.10	112	72 - 128

LCSD

QC Batch: QC09463

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.103	mg/L	1	0.10	<0.001	103	0	80 - 120	20
Benzene		0.107	mg/L	1	0.10	<0.001	107	1	80 - 120	20
Toluene		0.109	mg/L	1	0.10	<0.001	109	3	80 - 120	20
Ethylbenzene		0.108	mg/L	1	0.10	<0.001	108	3	80 - 120	20
M,P,O-Xylene		0.319	mg/L	1	0.30	<0.001	106	2	80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.095	mg/L	1	0.10	95	72 - 128
4-BFB		0.116	mg/L	1	0.10	116	72 - 128

LCS

QC Batch: QC09529

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.105	mg/L	1	0.10	<0.001	105		80 - 120	20
Benzene		0.099	mg/L	1	0.10	<0.001	99		80 - 120	20
Toluene		0.104	mg/L	1	0.10	<0.001	104		80 - 120	20
Ethylbenzene		0.104	mg/L	1	0.10	<0.001	104		80 - 120	20
M,P,O-Xylene		0.307	mg/L	1	0.30	<0.001	102		80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.1	mg/L	1	0.10	100	72 - 128
4-BFB		0.117	mg/L	1	0.10	117	72 - 128

LCSD

QC Batch: QC09529

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.105	mg/L	1	0.10	<0.001	105	0	80 - 120	20
Benzene		0.103	mg/L	1	0.10	<0.001	103	4	80 - 120	20
Toluene		0.108	mg/L	1	0.10	<0.001	108	4	80 - 120	20
Ethylbenzene		0.11	mg/L	1	0.10	<0.001	110	6	80 - 120	20
M,P,O-Xylene		0.322	mg/L	1	0.30	<0.001	107	5	80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.102	mg/L	1	0.10	102	72 - 128
4-BFB		0.118	mg/L	1	0.10	118	72 - 128

Quality Control Report
Continuing Calibration Verification Standards

CCV (1)

QC Batch: QC09462

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.109	109	85 - 115	2/28/01
Benzene		mg/L	0.10	0.106	106	85 - 115	2/28/01
Toluene		mg/L	0.10	0.109	109	85 - 115	2/28/01
Ethylbenzene		mg/L	0.10	0.105	105	85 - 115	2/28/01
M,P,O-Xylene		mg/L	0.30	0.293	97	85 - 115	2/28/01

CCV (2)

QC Batch: QC09462

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.098	98	85 - 115	2/28/01
Benzene		mg/L	0.10	0.104	104	85 - 115	2/28/01
Toluene		mg/L	0.10	0.101	101	85 - 115	2/28/01
Ethylbenzene		mg/L	0.10	0.095	95	85 - 115	2/28/01
M,P,O-Xylene		mg/L	0.30	0.28	93	85 - 115	2/28/01

ICV (1)

QC Batch: QC09462

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.11	110	85 - 115	2/28/01
Benzene		mg/L	0.10	0.106	106	85 - 115	2/28/01
Toluene		mg/L	0.10	0.107	107	85 - 115	2/28/01
Ethylbenzene		mg/L	0.10	0.102	102	85 - 115	2/28/01
M,P,O-Xylene		mg/L	0.30	0.293	97	85 - 115	2/28/01

CCV (1)

QC Batch: QC09463

Continued ...

... *Continued*

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.086	86	85 - 115	2/28/01
Benzene		mg/L	0.10	0.109	109	85 - 115	2/28/01
Toluene		mg/L	0.10	0.108	108	85 - 115	2/28/01
Ethylbenzene		mg/L	0.10	0.106	106	85 - 115	2/28/01
M,P,O-Xylene		mg/L	0.30	0.312	104	85 - 115	2/28/01

CCV (2) QC Batch: QC09463

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.098	98	85 - 115	2/28/01
Benzene		mg/L	0.10	0.106	106	85 - 115	2/28/01
Toluene		mg/L	0.10	0.103	103	85 - 115	2/28/01
Ethylbenzene		mg/L	0.10	0.098	98	85 - 115	2/28/01
M,P,O-Xylene		mg/L	0.30	0.293	97	85 - 115	2/28/01

ICV (1) QC Batch: QC09463

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.106	106	85 - 115	2/28/01
Benzene		mg/L	0.10	0.105	105	85 - 115	2/28/01
Toluene		mg/L	0.10	0.105	105	85 - 115	2/28/01
Ethylbenzene		mg/L	0.10	0.102	102	85 - 115	2/28/01
M,P,O-Xylene		mg/L	0.30	0.307	102	85 - 115	2/28/01

CCV (1) QC Batch: QC09529

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.106	106	85 - 115	3/2/01
Benzene		mg/L	0.10	0.101	101	85 - 115	3/2/01
Toluene		mg/L	0.10	0.106	106	85 - 115	3/2/01
Ethylbenzene		mg/L	0.10	0.108	108	85 - 115	3/2/01
M,P,O-Xylene		mg/L	0.30	0.318	106	85 - 115	3/2/01

CCV (2) QC Batch: QC09529

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.097	97	85 - 115	3/2/01
Benzene		mg/L	0.10	0.094	94	85 - 115	3/2/01
Toluene		mg/L	0.10	0.099	99	85 - 115	3/2/01
Ethylbenzene		mg/L	0.10	0.1	100	85 - 115	3/2/01
M,P,O-Xylene		mg/L	0.30	0.296	98	85 - 115	3/2/01

ICV (1)

QC Batch: QC09529

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.095	95	85 - 115	3/2/01
Benzene		mg/L	0.10	0.092	92	85 - 115	3/2/01
Toluene		mg/L	0.10	0.097	97	85 - 115	3/2/01
Ethylbenzene		mg/L	0.10	0.098	98	85 - 115	3/2/01
M,P,O-Xylene		mg/L	0.30	0.29	96	85 - 115	3/2/01

6701 Aberdeen Avenue, Ste. 9
Lubbock, Texas 79424
Tel (806) 794-1296
Fax (806) 794-1298
1 (800) 378-1296

TraceAnalysis, Inc.

155 McCutcheon, Suite H
El Paso, Texas 79932
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # A010 22601

Company Name: NAVAJO Refining Company
Phone #: SESI (505) 397-0510
Address: (Street, City, Zip) C/O Safety & Environ. Solutions
Fax #: (505) 393-4388
Contact Person: DAVID Boyer SESI, P.O. Box 1613, Hobbs NM 88241
Invoice to: (If different from above) Darrell Moore, NRC, P.O. Box 159 Artesia NM 88211
Project #:
Project Name:
Project Location: Lea Refinery, Lovington NM
Sampler Signature: D L Boyer

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCl	HNO_3	H_2SO_4	NaOH	ICE	NONE	SAMPLING DATE (2000)	TIME	BTEX 8021B/602
65647	MW-8	2	40ml	X				X				X		2/22	1120	X
48	MW-10	2	"	X				X				X		"	1155	X
49	MW-9	2	"	X				X				X		"	1246	X
50	MW-3	2	"	X				X				X		"	1342	X
51	MW-7 * BL	2	"	X				X				X		"	1505	X
52	Field Blank (Shurfine Distilled H2O)	2	"	X				X				X		"	1700	X

ANALYSIS REQUEST (Circle or Specify Method No.): MTBE 8021B/602; BTEX 8021B/602; TPH 418.1/TX1005; PAH 8270C; Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7; TCLP Metals Ag As Ba Cd Cr Pb Se Hg; TCLP Volatiles; TCLP Semi Volatiles; TCLP Pesticides; RCI; GC/MS Vol. 8260B/624; GC/MS Semi. Vol. 8270C/625; PCB's 8082/608; Pesticides 8081A/608; BOD, TSS, pH; Turn Around Time if different from standard; Hold

Relinquished by: D L Boyer Date: 2/23/01 Time: 1300
Received by: Date: Time:
Relinquished by: Date: Time:
Received by: Date: Time:
Relinquished by: Date: Time:
Received at Laboratory by: Susan A. Carrasco Date: 2/24/1 Time: 10:30

LAB USE ONLY
Intact (Y) N
Headspace Y / N
Temp 4 °
Log-in Review SAC

REMARKS:
Results to Boyer @ SESI
Invoice to D. Moore NRC
* ~~shown filtrate~~ BL
☐ Check If Special Reporting Limits Are Needed

Carrier # TNM10 902 550 883 3

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