GW - 72

MONITORING REPORTS

DATE:



BROWN AND CALDWELL

Suite 2500, 1415 Louisiana, Houston, TX 77002

TRANSMITTAL MEMORANDUM

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To: Roger Anderson			Subject:	Hobbs, New	Mexico Facility	
State of	State of New Mexico, Oil Conservation Division					
Energy	y, Minerals, and	Natural Reso	urces Dept.	Equipment No:		
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1	9/17/98		Final March 1998 Groundwater Sampling Report, BJ Services Company, U.S.A., Hobbs, New Mexico			
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REMARKS:

cc: Wayne Price, State of New Mexico Jo Ann Cobb, BJ Services Company, U.S.A. Clint Chamberlain, BJ Services Company, U.S.A.

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Ruhand Rexicos

Richard Rexroad

FINAL

MARCH 1998 GROUNDWATER SAMPLING REPORT HOBBS, NEW MEXICO FACILITY

BJ SERVICES COMPANY, U.S.A.

SEPTEMBER 17, 1998

FINAL MARCH 1998 GROUNDWATER SAMPLING REPORT HOBBS, NEW MEXICO FACILITY BJ SERVICES COMPANY, U.S.A.

Prepared for

BJ Services Company, U.S.A. 8701 New Trails Drive The Woodlands, Texas

BC Project Number: 2832.13

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Principal Geologist

September 17, 1998

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"This is a draft report and is not intended to be a final representation of the work done or recommendations made by Brown and Caldwell. It should not be relied upon; consult the final report."

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1.0 INTRODUCTION

Brown and Caldwell conducted field activities associated with the March 1998 quarterly groundwater sampling event at BJ Services Company, U.S.A. (BJ Services) facility located at 2708 West County Road, in Hobbs, New Mexico. The facility layout is shown in Figure 1.

The facility formerly operated an above-grade on-site fueling system. Subsurface impact near the fueling system from a diesel fuel release was first detected by the New Mexico Oil Conservation Division (NMOCD) during an on-site inspection on February 7, 1991. The fueling system was taken out of operation in July 1995. As the result of the diesel fuel release, the NMOCD has required a quarterly groundwater monitoring program to assess the hydrocarbon constituents in the groundwater. A biosparging system was activated in November 1995 to remediate soil and groundwater at the facility. A site chronology detailing the history of the fueling system, the groundwater remediation system, and previous sampling events is presented on Table 1.

During the March 1998 sampling event, groundwater samples collected from all monitor wells were analyzed for gasoline and diesel range total petroleum hydrocarbons (TPH-G and TPH-D), benzene, toluene, ethylbenzene, and total xylenes (BTEX), polynuclear aromatic hydrocarbons (PAHs), carbonate, bicarbonate, major anions, major cations, total hardness, RCRA metals, and dissolved methane. Groundwater samples collected from recently installed monitor wells MW-11A and MW-12 were also analyzed for halogenated and aromatic hydrocarbons. This report presents the results of the groundwater sampling event, a description of the field activities, and a summary of the analytical results. Also included is a groundwater potentiometric surface map, a benzene concentration map, and a hydrocarbon distribution map.

2.0 GROUNDWATER SAMPLING AND ANALYSES

Brown and Caldwell purged and sampled the groundwater monitoring wells at the facility on March 23 and 24, 1998 to determine concentrations of dissolved-phase hydrocarbons in groundwater. The following subsections describe the activities conducted during this sampling event and present the results of the groundwater analyses.

2.1 Groundwater Measurements and Sampling

Eleven monitor wells were sampled during the March 1998 sampling event. A site map depicting the locations of the monitor wells is presented as Figure 1. As noted in previous sampling reports, monitor well MW-2 can not be located and is assumed to have been destroyed during facility activities such as grading. Monitor well MW-11 could not be located during the December 1997 sampling event and is believed to have been destroyed during the course of construction activities at the site between September 12, 1997 and December 10, 1997. Monitor well MW-11 was replaced by monitor wells MW-11A and MW-12, as requested by the NMOCD in their correspondence dated February 3, 1998.

Groundwater level measurements were obtained from the monitor wells prior to purging and sampling the wells. The groundwater levels were obtained with an oil/water interface probe and recorded to the nearest 0.01 foot. A cumulative table of groundwater elevation data is presented on Table 2. The groundwater elevation data indicates that the general groundwater flow direction is to the east with a hydraulic gradient of approximately 0.006 foot/foot (ft/ft). A potentiometric surface map is presented in Figure 2. Approximately 0.25 feet of phase-separated hydrocarbons was observed in monitor well MW-4 during this sampling event; hydrocarbon sheens were observed in monitor wells MW-1 and MW-9.

Groundwater samples were collected after purging the wells with a submersible pump to remove at least three well volumes of groundwater. Field parameter measurements for pH, conductivity, and temperature were collected after each well volume was purged. Two consecutive readings within

five percent were used to indicate that groundwater had stabilized. The parameters in each monitor well typically stabilized after two well volumes had been removed; however, at least three well volumes were removed from each well.

Additional groundwater parameters were measured during the purging and sampling activities to assess the potential for natural attenuation. These parameters were dissolved oxygen (DO), dissolved ferrous iron, alkalinity, and reduction-oxidation potential (redox). The field parameter readings were recorded in the field log book and are listed on the groundwater sampling forms included in Appendix A. The field screening results for groundwater samples are presented on Table 3.

Following recovery, groundwater samples were collected from each monitor well using a new, 3-foot long, 1/2-inch I.D., disposable polyethylene bailer. Each sample was transferred to laboratory-prepared, clean glass or plastic containers sealed with Teflon®-lined lids, labeled, and placed on ice in an insulated cooler for shipment via overnight courier to the analytical laboratory. Each cooler was accompanied by completed chain-of-custody documentation.

The field measurement equipment was decontaminated prior to and after each use. Decontamination procedures consisted of washing with fresh water and a non-phosphate detergent and rinsing with deionized (DI) water. Purged water and excess water generated by equipment cleaning operations were discharged to the wastewater treatment facility at the acid dock area of the site.

2.2 Results of Groundwater Analyses

Groundwater samples collected during this sampling event were analyzed for diesel- and gasoline-range total petroleum hydrocarbons (TPH-D and TPH-D) by EPA Method 8015 Modified, polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8270, and the eight RCRA metals by EPA Method 6010/7000 series. Additionally, all samples were analyzed for groundwater quality parameters including major anions (chloride, nitrate, and sulfate), major cations (calcium,

magnesium, potassium, and sodium), hardness, carbonate, and bicarbonate. Current and cumulative analytical results for BTEX, TPH-D, and TPH-G are presented in Table 4.

Monitor wells MW-11A and MW-12, which were installed in February 1998, were sampled for halogenated and aromatic hydrocarbons by Method 8240. The remaining monitor wells were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8020. Method 8020 BTEX analysis was not performed on groundwater samples collected from monitor wells MW-11A and MW-12 in March 1998 because each of the BTEX constituents are analytical parameters within the Method 8240 suite of analytes. No halogenated and aromatic hydrocarbons other than BTEX constituents were detected in the groundwater samples collected from monitor wells MW-11A and MW-12. During future groundwater sampling events, it is therefore recommended that BTEX analysis by Method 8020 be performed in lieu of analysis for halogenated and aromatic hydrocarbons by Method 8240 for groundwater samples collected from monitor wells MW-11A and MW-12.

Laboratory analysis for dissolved methane was also performed on groundwater samples collected from each of the monitor wells at the site to further assess the potential for natural attenuation at the site.

BTEX constituent concentrations in excess of applicable laboratory detection limits were reported in 8 of the 11 groundwater samples collected during this sampling event. Benzene concentrations were below the New Mexico Water Quality Control Commission Standard of 0.01 milligrams per liter (mg/L) in monitor wells MW-5, MW-6, MW-7, MW-8, and MW-9. Figure 3 presents a benzene isoconcentration and total BTEX distribution map for the March 1998 sampling event. A total petroleum hydrocarbons distribution map for the March 1998 sampling event is presented in Figure 4. The laboratory analytical report and chain of custody record for the groundwater samples are included in Appendix B.

Table 5 presents a summary of PAHs and metals detected in this and previous groundwater sampling events at the facility. Analytical results for groundwater quality parameters are also w:\BJSERV\2832\037R.DOC

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presented in Table 5. Naphthalene is the only PAH compound that has been detected in any of the groundwater sampling events conducted at the facility. During the March 1998 groundwater sampling event, naphthalene concentrations ranged from less than the method detection limit of 0.1 (micrograms per liter) µg/L in monitor wells MW-4, MW-5, MW-6, MW-7, and MW-8 to 130 µg/L in monitor well MW-1. The detection of naphthalene at 130 µg/L in monitor well MW-1 is the only exceedance of the New Mexico Water Quality Control Commission (WQCC) groundwater standard of 30 ug/L for **PAHs** (i.e., total naphthalene monomethylnaphthalenes) during the March 1998 groundwater sampling event. Naphthalene was previously detected in monitor well MW-1 at a concentration of 230 µg/L during the August 1996 groundwater sampling event.

Inorganic constituents detected at concentrations greater than method detection limits during the March 1998 groundwater sampling event include arsenic, barium, and mercury. Arsenic was detected in 9 of the 11 groundwater samples at concentrations ranging from 0.005 mg/L in monitor well MW-9 to 0.035 mg/L in monitor well MW-10. Barium was detected in groundwater samples from each of the monitor wells. Barium concentrations ranged from 0.044 mg/L in monitor wells MW-4 and MW-5 to 0.287 mg/L in monitor well MW-10. Mercury was detected in one well, MW-8, at a concentration of 0.0003 mg/L. None of these detections exceeded applicable WQCC criteria.

The New Mexico WQCC standard of 1.6 μ g/L for fluoride was exceeded in monitor wells MW-10, MW-11A, and MW-12, where fluoride was detected at respective concentrations of 6.1 μ g/L, 2.9 μ g/L, and 4.2 μ g/L.

2.3 Natural Attenuation Evaluation

It appears that natural attenuation of dissolved phase BTEX is occurring in the vicinity of monitor wells MW-10, MW-11A, and MW-12. The primary evidence of natural attenuation is plume behavior. Concentrations of dissolved phase BTEX have stabilized subsequent to removal of a field waste tank (see Figure 1) in March 1997. Furthermore, the following lines of geochemical W:\BJSERV\2832\037R.DOC

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evidence suggest that intrinsic bioremediation, an important natural attenuation mechanism, is occurring:

- 1. DO concentrations measured in monitor wells MW-10, MW-11A, and MW-12 are depressed relative to background. DO concentrations of 0.79 mg/L, 0.92 mg/L, and 0.86 mg/L were measured in monitor wells MW-10, MW-11A, and MW-12, respectively. These concentrations are less than the measured DO concentrations of 5.96 mg/L, 4.61 mg/L, and 2.70 mg/L in monitor wells MW-5, MW-7, and MW-8, respectively, which are upgradient or cross-gradient wells believed to exhibit background conditions. DO is utilized during intrinsic bioremediation, and therefore DO concentrations should be depressed in areas where intrinsic bioremediation is occurring.
- 2. Nitrate concentrations were measured at 0.07 mg/L in monitor well MW-10 and less than 0.05 mg/L in monitor wells MW-11A and MW-12. These concentrations are less than the nitrate concentrations of 3.87 mg/L, 3.92 mg/L, and 1.84 mg/L measured in monitor wells MW-5, MW-7, and MW-8, respectively, which are believed to exhibit background conditions. Nitrate is utilized during intrinsic bioremediation after DO is depleted, and therefore nitrate concentrations should be depressed in areas where intrinsic bioremediation is occurring.
- 3. Ferrous iron was measured at concentrations of 5.0 mg/L, 7.0 mg/L, and 9.0 mg/L in monitor wells MW-10, MW-11A, and MW-12, respectively. Ferrous iron was not detected in any of the other monitor wells at the site except MW-1 and MW-4, which are located near the center of the upgradient hydrocarbon plume. When DO and nitrate are depleted, anaerobic microbes which utilize other electron acceptors become active. Ferrous iron is the reduction product of ferric iron, a common electron acceptor. Therefore, ferrous iron concentrations should increase in areas where intrinsic bioremediation is occurring. The detections of ferrous iron in monitor wells MW-1 and MW-4 suggest that intrinsic bioremediation may also be occurring in the upgradient hydrocarbon plume.
- 4. Oxidation-reduction potential (E_h) measurements of -209.4 millivolts (mV), -84.4 mV, and -87 mV were observed in monitor wells MW-10, MW-11A, and MW-12, respectively. These values are less than the theoretical E_h of -50 mV for ferric iron reduction, which suggests that iron reduction is occurring.

Methane is a reaction product generated during utilization of carbon dioxide as an electron acceptor, and its concentration should therefore increase in areas where depletion of DO, nitrate, and ferric iron has occurred. The concentration of methane is elevated in monitor well MW-10 relative to background conditions, suggesting that utilization of carbon dioxide may be occurring locally in that area.

Sulfate concentrations in monitor wells MW-10, MW-11A, and MW-12 are comparable to those observed in monitor wells MW-5, MW-7, and MW-8. It therefore appears that sulfate is not being utilized during intrinsic bioremediation, and that DO, nitrate, and ferric iron are supplying adequate electron acceptors to facilitate natural attenuation. In addition, carbon dioxide is apparently acting as an electron acceptor in the vicinity of monitor well MW-10, as indicated by elevated dissolved methane concentrations. Data regarding alkalinity, which is expected to increase during the course of bioremediation processes, is inconclusive.

It is recommended that monitoring for natural attenuation evaluation parameters continue in this area.

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3.0 REMEDIATION SYSTEM

Brown and Caldwell submitted a Remedial Action Plan (RAP) to the New Mexico OCD in May 1994. Based on the results of previous investigations conducted by Brown and Caldwell and Roberts/Schornick and Associates, Inc. (RSA), Brown and Caldwell recommended the installation of a biosparging system. The biosparging system simultaneously treats volatile and semivolatile contaminants adsorbed directly to the soil (i.e., residual) as well as contaminants present in soil moisture (i.e., dissolved phase) within the capillary fringe and vadose zone. Additionally, the biosparging system removes volatile and semivolatile contaminants from the saturated zone. The biosparging system operates by injecting air into the saturated zone and extracting air from the vadose zone through a network of wells and piping. The continuous flushing of air through the saturated zone increases the dissolved oxygen concentration in the groundwater and in soil moisture present in the capillary fringe and vadose zone. The elevated dissolved oxygen content facilitates the activities of indigenous microorganisms to accelerate biodegradation of the contaminants. The flushing of the air also strips the volatile and semivolatile contaminants.

The New Mexico OCD approved the RAP on August 11, 1994. Installation activities for the biosparging system were conducted between August 2 through 24, 1995. Nineteen combined injection/extraction wells, three vacuum extraction wells, associated piping, and one extraction blower and one injection blower were installed. An additional vapor extraction well, VE-4, was installed and connected to the vapor extraction system in April 1997.

Review of data presented in Table 4 indicates that concentrations of benzene and total BTEX have decreased in monitor wells MW-7, MW-8, MW-9, and MW-10, located in downgradient or lateral portions of the plume, during the time period from the start-up of the biosparging system in November 1995 to the present. Although an initial reduction in benzene and total BTEX concentrations was noted in monitor well MW-4, which is located in the upgradient portion of the plume, during the period immediately following installation and startup of the biosparging system in November 1995, concentrations of benzene and total BTEX have not displayed further substantial decreases since that time. Furthermore, benzene and total BTEX concentrations in

samples collected from monitor wells MW-1 and MW-3, located at or near the center of the plume, have not decreased since startup of the biosparging system. Therefore, five additional injection wells, AI-20 through AI-24, were installed in February 1998. The locations of the new injection wells are shown in the detailed diagram depicting the layout of the biosparging system which is presented as Figure 5. Injection wells AI-20 through AI-24 were installed at locations near the center of the hydrocarbon plume. These injection wells were constructed such that a 10-foot screen submergence was achieved, thereby providing treatment to an expanded vertical interval of the aquifer in the central portion of the plume. Injection wells AI-20 through AI-24 are supplied by a separate blower than the one used to supply injection wells AI-1 through AI-19 in order to avoid short-circuiting to wells with less screen submergence. Three additional vapor extraction wells, VE-5 through VE-7, were also installed in February 1998. The new injection and extraction wells were brought on-line on March 10, 1998, and operation of injection wells AI-1 through AI-19, which had been suspended on February 19, 1998, was resumed on March 24, 1998.

Concentrations of benzene and total BTEX in monitor wells MW-1, MW-3, and MW-4 measured during the March 1998 groundwater sampling event have decreased relative to those observed during the December 1997 sampling event. In monitor well MW-1, benzene concentrations dropped from 7,600 μ g/L to 4,800 μ g/L, and total BTEX concentrations dropped from 30,600 μ g/L to 15,600 μ g/L between December 1997 and March 1998. During this same time period, benzene concentrations decreased from 240 μ g/L to 140 μ g/L in monitor well MW-3, and total BTEX concentrations decreased from 1,930 μ g/L to 1,440 μ g/L. In monitor well MW-4, benzene concentrations dropped from 230 μ g/L to 150 μ g/L, and total BTEX concentrations decreased from 4,250 μ g/L to 1,550 μ g/L between December 1997 and March 1998. These decreases are likely attributable to increased air flow being applied to the aquifer through air injection wells AI-20 through AI-24.

The presence of 0.25 feet of phase-separated hydrocarbons (PSH) was noted in monitor well MW-4 during the March 1998 groundwater sampling event. PSH had not been observed in monitor well MW-4 since September 1997. Operation of the new sparging and extraction wells in the central portion of the hydrocarbon plume may have mobilized free product, resulting in its appearance in W:\BJSERV\2832\037R.DOC

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monitor well MW-4. It is believed that application of additional remediation stress and continued PSH recovery operations from monitor wells near the center of the hydrocarbon plume will ultimately result in removal of PSH from the subsurface.

The vapors recovered during the extraction process are discharged to the atmosphere in accordance with the State of New Mexico Air Quality Regulations. Following initial system startup operations, effluent air samples were collected on a monthly basis from the recovered vapors to monitor the bioremediation process and emission rate. Upon receiving a determination from the State of New Mexico that an air permit is not required, effluent air samples were collected and analyzed voluntarily on a quarterly basis through July 1997. The air samples were analyzed for TPH using EPA Method Modified 8015A (Air) and for total volatile aromatic hydrocarbons (BTEX) using EPA Method 5030/8020 (modified).

The analytical results demonstrated a significant reduction in hydrocarbon vapor concentrations and emissions rates between November 1995 and July 1997. Total BTEX concentrations decreased from 391 parts per million by volume (ppmv) in November 1995 to 17.3 ppmv in July 1997. The corresponding BTEX emissions decreased from 0.77 lb/hour to 0.03 lb/hour. TPH concentrations decreased from 1,870 ppmv in November 1995 to 65 ppmv in July 1997. The corresponding TPH-Volatile Organic Compound (VOC) emissions rates decreased from 3.21 lb/hour to 0.08 lb/hour. These emission rates were well below the regulatory limit of 10 lb/hour for VOCs. Therefore, use of a field monitoring instrument utilizing a flame ionization detector (FID) to measure the VOC concentration in the vapors commenced in September 1997. The VOC measurements collected using the FID correspond to TPH concentrations previously determined in the analytical laboratory. The VOC concentration measured using the FID during the March 1998 sampling event was 1,500 ppmv.

The TPH concentration of 1,500 ppmv measured during the March 1998 sampling event is comparable to TPH concentrations measured during the time period from November 1995 through January 1996, during the initial stages of operation of the biosparging system. The increased TPH concentration observed in the March 1998 event relative to the time period from August 1996

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through December 1997 is believed to be a result of the addition of air injection wells AI-20 through AI-24 to the biosparging system. The TPH - Volatile Organic Compound (VOC) emissions rate calculated for the March 1998 sampling event was 1.91 lb/hour. This emission rate is below the regulatory limit of 10 lb/hour for VOCs. A cumulative summary of analytical results for air emissions monitoring is included in Table 5. These results are based on both laboratory and field analyses.

Following installation of the five new injection and three new extraction wells in February 1998, full operation of the biosparging system was resumed during the March 1998 sampling event as the blower for injection wells AI-1 through AI-19 was restarted. The system was gauged after it was adjusted to optimal flow rates and stabilization occurred. The vapor extraction system was operating at 28 inches H₂O vacuum with an average flow of 150 cubic feet per minute (cfm) at 135°F during the March 1998 sampling event. The air injection system for the new injection wells, AI-20 through AI-24, was operating at an average flow of 45 cfm at 4 pounds per square inch (psi) at greater than 200°F during the March 1998 sampling event. The air injection system for the old injection wells was simultaneously operating at an average flow of 23 cfm at 3.5 psi at 150°F.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are based on information obtained during the March 1998 quarterly groundwater sampling event.

4.1 Conclusions

- Groundwater flow was to the east at an average hydraulic gradient of 0.006 ft/ft.
- Five new air injection wells, each having a screen submergence of 10 feet, were installed in the central portion of the hydrocarbon plume in February 1998 and activated prior to the March 1998 groundwater sampling event.
- Dissolved benzene and total BTEX concentrations have decreased in monitor wells MW-1, MW-3, and MW-4, which are located at or near the central portion of the plume, during the time period between December 1997 and March 1998.
- Dissolved benzene concentrations have generally decreased in the remaining monitor wells during operation of the biosparging system.
- Benzene concentrations in monitor wells MW-5, MW-6, MW-7, MW-8, and MW-9 are below the New Mexico Water Quality Control Commission standard of 0.01 mg/L.
- Monitor wells MW-11A and MW-12 were installed as replacement wells for monitor well MW-11. Sampling of these wells indicates no impact by halogenated and aromatic hydrocarbons other than BTEX constituents in the area of the former field waste tanks.
- Hydrocarbon air emissions have increased since December 1997. The current emissions rate of 1.91 lb/hr TPH is below the regulatory limit of 10 lb/hour for VOCs. The increase emissions rate may be attributed to activation of the new injection wells.

4.2 Recommendations

- Continue the quarterly groundwater sampling program and the operation and maintenance of the biosparging system.
- Continue monitoring hydrocarbon emissions on a quarterly basis using a calibrated field FID and discontinue analysis of air emissions samples in an analytical laboratory.
- Continue free product recovery operations in monitor well MW-4 and, if needed, in MW-1.

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• Analyze groundwater samples from monitor wells MW-11A and MW-12 for BTEX by Method 8020 during future groundwater sampling events.

DISTRIBUTION

Final March 1998 Groundwater Sampling Report BJ Services Company, U.S.A. Hobbs, New Mexico

September 17, 1998

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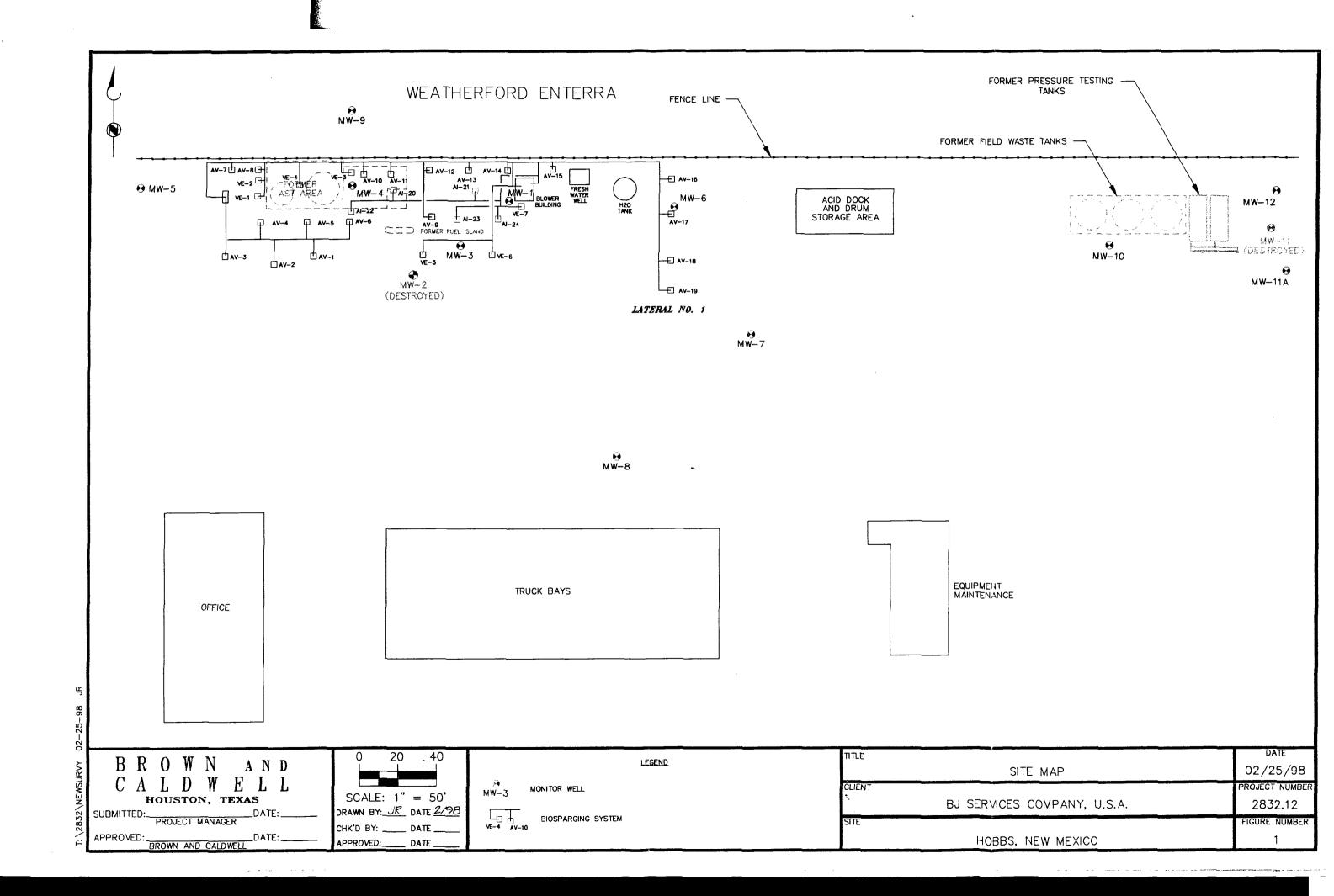
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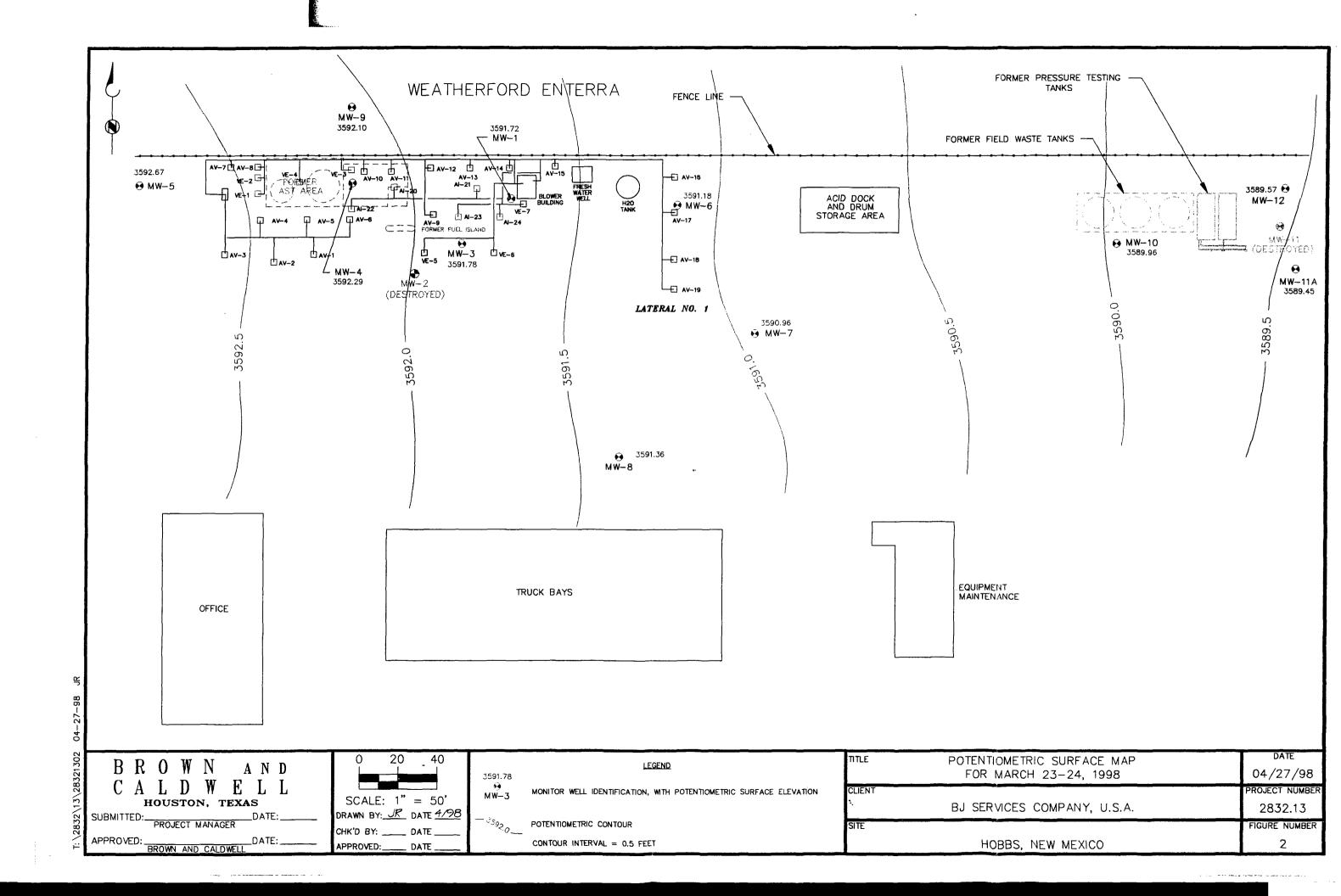
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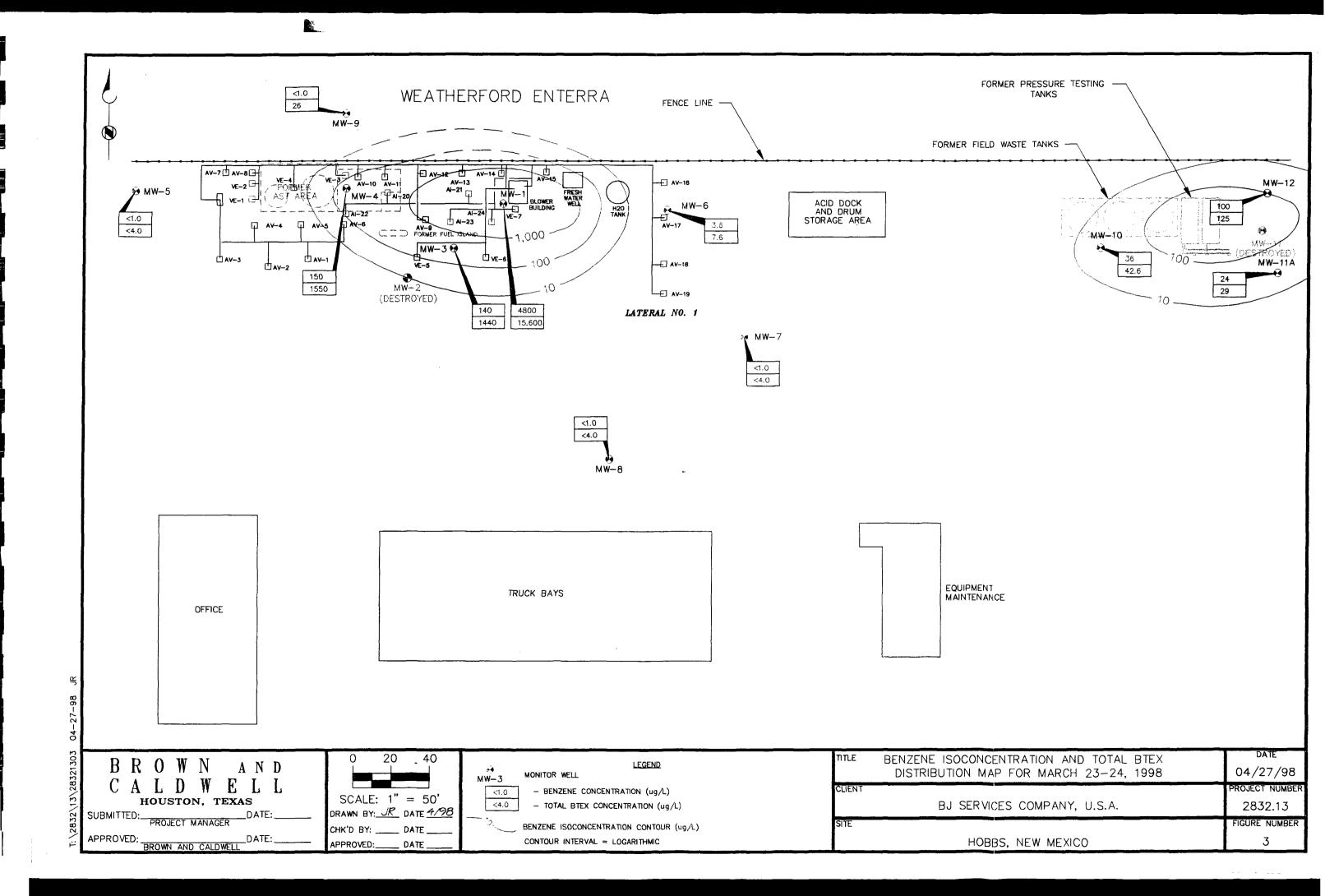
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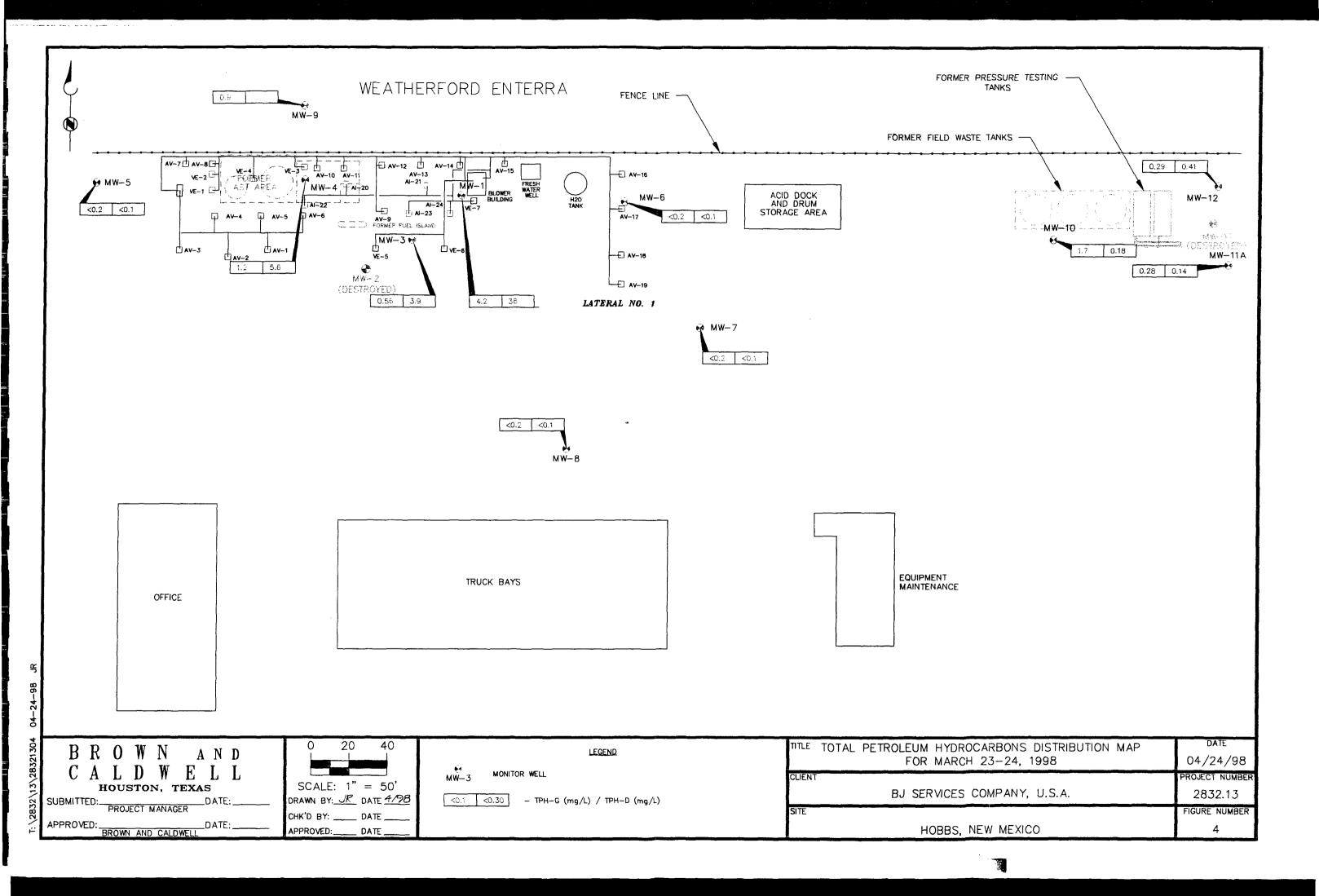
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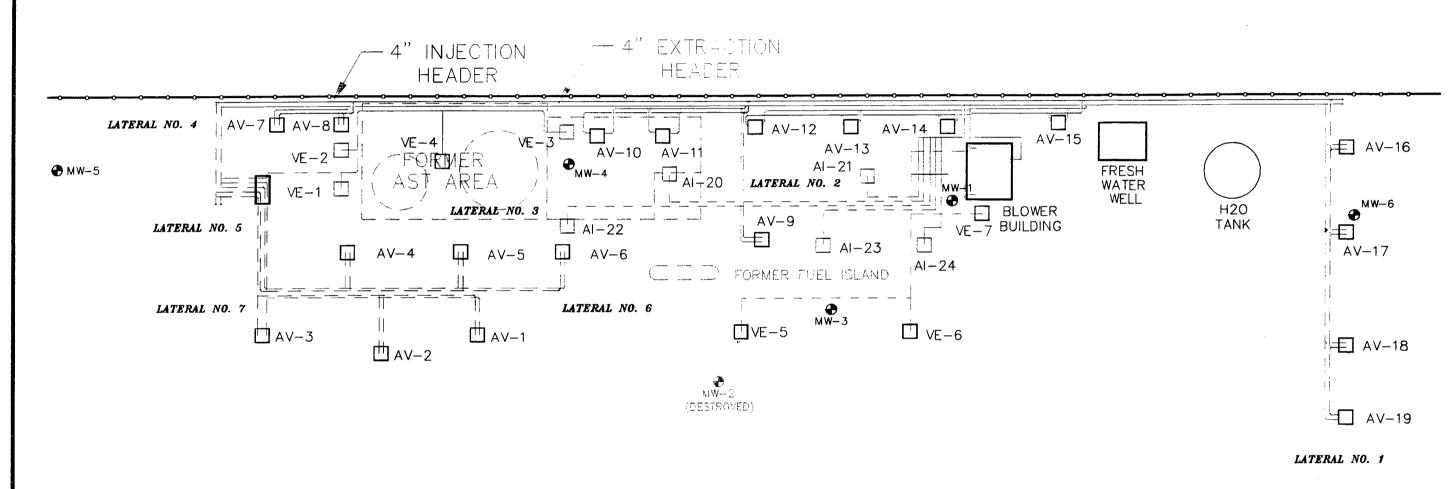






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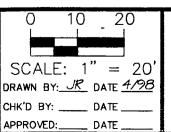
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SUBMITTED:.

BROWN AND CALDWELL



ππιε	MODIFIED BIOSPARGING SYSTEM	DATE 04/24/98
CLIENT	BJ SERVICES COMPANY, U.S.A.	PROJECT NUMBER 2832.33
SITE	HOBBS, NEW MEXICO	FIGURE NUMBER

TABLES

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Table 1 Site Chronology BJ Services Company, U.S.A. Hobbs, New Mexico

Date	Activity		
February 7, 1991	The State of New Mexico Oil Conservation Division (OCD) conducted an on-site inspection, including sampling of the on-site fresh water well.		
August 6, 1991	OCD requested submittal of an investigation work plan.		
September 5, 1991	Roberts/Schornick and Associates, Inc. (RSA) submitted Technical Work Plan for soil and groundwater investigation to the OCD.		
November 15, 1991	The OCD approved Technical Work Plan submitted by RSA.		
December 16, 1991	RSA sampled the fresh water well. Analytical results were submitted to the OCD.		
February 21, 1992	Western sampled the fresh water well. Analytical results were submitted to the OCD.		
July 29 - August 10, 1992	Brown and Caldwell conducted a soil and groundwater investigation according to the approved Technical Work Plan. Investigation included drilling and sampling 9 soil borings, sampling 6 handaugured soil borings, the installation and sampling of 5 monitoring wells, and the sampling of the fresh water well.		
October 12, 1992	Brown and Caldwell submitted Soil and Groundwater Investigation Report to the OCD.		
December 2, 1992	The OCD requested the installation and sampling of 4 additional monitoring wells, including a monitoring well on an adjacent property.		
April 13, 1993	Brown and Caldwell conducted a vapor extraction pilot test on existing groundwater monitoring wells.		
April 15, 1993	Brown and Caldwell installed off-site monitoring well.		
April 22, 1993	Brown and Caldwell sampled off-site monitoring well.		
May 27, 1993	Brown and Caldwell submitted a letter report documenting the installation and sampling of the off-site monitoring well to the OCD.		
June 2, 1993	Brown and Caldwell conducted a short-term aquifer test using the fresh water well at the facility.		
June 8, 1993	USTank Management, Inc. conducted a non-volumetric tank system tightness test on the diesel and unleaded gasoline aboveground storage tanks at the facility.		

Table 1 (Continued) Site Chronology BJ Services Company, U.S.A. Hobbs, New Mexico

Date	Activity	
June 21, 1993	ENSR Consulting and Engineering (ENSR), the environmental consultant of the adjacent property owner on which the off-site well is located, submitted a request to sample the off-site monitoring well.	
July 15, 1993	ENSR split one groundwater sample, collected from the off-site monitoring well, with Brown and Caldwell.	
July 30, 1993	USTank Management, Inc. submitted the tank tightness test report to Brown and Caldwell. The report indicated that both tanks and their associated piping passed.	
August 16-19, 1993	Brown and Caldwell installed two additional downgradient monitoring wells. Brown and Caldwell sampled each of the existing monitoring and the newly installed monitoring wells.	
January 26, 1994	Brown and Caldwell performed groundwater monitoring event; existing monitoring wells and the fresh water well were purged and sampled. Groundwater samples were analyzed for BTEX.	
May 6, 1994	Remedial Action Plan (RAP) submitted to the OCD.	
August 11, 1994	RAP approved by the OCD.	
May 3, 1995	Brown and Caldwell conducted the May 1995 groundwater sampling event.	
July 31, 1995	Brown and Caldwell conducted the July 1995 groundwater sampling event.	
August 2-9, 1995	Installation of biosparging system was initiated. Nineteen combined injection/extraction wells and three vacuum extraction wells were installed.	
August 14-26, 1995	Remedial Construction Services, Inc. (RCS) began construction of the biosparging system.	
September 19, 1995	Began operation of the extraction portion of the biosparging system.	
November 13, 1995	Began operation of the injection portion of the biosparging system.	
November 14, 1995	Brown and Caldwell conducted the November 1995 groundwater sampling event.	
February 23, 1996	Brown and Caldwell conducted the February 1996 groundwater sampling event.	
May 31, 1996	Brown and Caldwell conducted the May 1996 groundwater sampling event.	

Table 1 (Continued) Site Chronology BJ Services Company, U.S.A. Hobbs, New Mexico

Date	Activity
August 23, 1996	Brown and Caldwell conducted the August 1996 groundwater sampling event.
December 2, 1996	Brown and Caldwell conducted the December 1996 groundwater sampling event.
March 12, 1997	Brown and Caldwell conducted the March 1997 groundwater sampling event.
March 14, 1997	Vapor extraction well VE-4 installed.
April 1997	Vapor extraction well VE-4 connected to the vapor extraction system.
June 12, 1997	Brown and Caldwell conducted the June 1997 groundwater sampling event.
September 11-12, 1997	Brown and Caldwell conducted the September 1997 groundwater sampling event.
December 10, 1997	Brown and Caldwell conducted the December 1997 groundwater sampling event.
February 3-14, 1998	Air injection wells AI-20 through AI-24, vapor extraction wells VE-5 though VE-7, and monitor wells MW-11A and MW-12 were installed.
February 19, 1998	Operation of previously existing injection wells suspended in preparation for start-up of injection wells AI-20 through AI-24.
March 10, 1998	Operation of air injection wells AI-20 through AI-24 commenced.
March 23-24, 1998	Brown and Caldwell conducted the March 1998 groundwater sampling event.
March 24, 1998	Operation of previously existing injection wells resumed.

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitoring Well	TOC Elevation	Date Measured	Depth to GW (ft)	Free Product Thickness (ft)	GW Elevation (ft MSL)	Comments
MW-1				· · · · · · · · · · · · · · · · · · ·		
	3,647.53	8/10/92	53.22	0.00	3,594.31	(1)
	3,647.53	2/9/93	53.03	0.00	3,594.50	
	3,647.53	8/18/93	53.10	0.00	3,594.43	
	3,647.53	1/26/94	53.31	0.00	3,594.22	
	3,647.53	5/3/95	54.64	0.20	3,593.05	(2)
	3,647.53	7/31/95	54.14	0.00	3,593.39	
	3,647.53	11/14/95	53.69	0.00	3,593.84	
	3,647.53	2/23/96	54.32	0.00	3,593.21	
	3,647.53	5/31/96	54.14	0.00	3,593.39	
	3,647.53	8/23/96	56.17	0.00	3,591.36	
	3,647.53	12/2/96	55.27	0.00	3,592.26	
	3,647.53	3/12/97	55.70	0.27	3,592.05	(3)
	3,647.53	6/12/97	55.08	0.02	3,592.47	
	3,647.53	9/12/97	55.64	0.51	3,592.31	
	3,647.53	12/10/97	55.46	0.00	3,592.07	PSH Sheen
	3,647.53	3/24/98	55.81	0.00	3,591.72	PSH Sheen
MW-2			,			
	3,647.59	8/10/92	52.82	0.00	3,594.77	(1)
	3,644.84	2/9/93	49.60	0.00	3,595.24	
	3,644.84	8/18/93	49.71	0.00	3,595.13	
	3,644.84	1/26/94	49.97	0.00	3,594.87	
		5/3/95				(4)
MW-3						
	3,647.68	8/10/92	52.99	0.00	3,594.69	(1)
	3,647.68	2/9/93	52.72	0.00	3,594.96	
	3,647.68	8/18/93	52.82	0.00	3,594.86	
	3,647.68	1/26/94	53.05	0.00	3,594.63	
	3,647.68	5/3/95	54.31	0.00	3,593.37	
	3,645.00	7/31/95	51.24	0.00	3,593.76	
	3,645.00	11/14/95	51.10	0.00	3,593.90	
	3,645.00	2/23/96	51.68	0.00	3,593.32	
	3,645.00	5/31/96	51.45	0.00	3,593.55	
	3,645.00	8/23/96	51.55	0.00	3,593.45	
	3,645.00	12/2/96	52.23	0.00	3,592.77	
	3,645.00	3/12/97	52.67	0.00	3,592.33	(3)
	3,645.00	6/12/97	52.68	0.00	3,592.32	
	3,645.00	9/11/97	52.71	0.00	3,592.29	
	3,645.00	12/10/97	52.89	0.00	3,592.11	
	3,645.00	3/23/98	53.22	0.00	3,591.78	

Table printed: 22-Apr-98

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitoring Well	TOC Elevation	Date Measured	Depth to GW (ft)	Free Product Thickness (ft)	GW Elevation (ft MSL)	Comments
MW-4						-
	3,645.28	8/10/92	50.55	0.00	3,594.73	(1)
	3,645.28	2/9/93	50.26	0.00	3,595.02	
	3,645.28	8/18/93	50.38	0.00	3,594.90	
	3,645.28	1/26/94	50.90	0.30	3,594.63	
	3,645.28	5/3/95	51.51	0.45	3,594.14	
	3,645.28	7/31/95	51.74	0.26	3,593.75	
	3,645.28	11/14/95	51.03	0.00	3,594.25	
	3,645.28	2/23/96	51.65	0.01	3,593.64	
	3,645.28	5/31/96	51.48	0.00	3,593.80	
	3,645.28	8/23/96	53.49	0.00	3,591.79	
	3,645.28	12/2/96	52.32	0.00	3,592.96	
	3,645.28	3/12/97	52.74	0.05	3,592.58	(3)
	3,645.28	6/12/97	53.08	0.44	3,592.56	
	3,645.28	9/12/97	52.60	0.15	3,592.80	
	3,645.28	12/10/97	52.89	0.00	3,592.39	PSH Sheen
	3,645.28	3/24/98	53.20	0.25	3,592.29	
MW-5						
	3,647.72	8/10/92	52.38	0.00	3,595.34	(1)
	3,647.72	2/9/93	52.06	0.00	3,595.66	
	3,647.72	8/18/93	52.16	0.00	3,595.56	
	3,647.72	1/26/94	52.50	0.00	3,595.22	
	3,647.72	5/3/95	53.57	0.00	3,594.15	
	3,647.72	7/31/95	53.27	0.00	3,594.45	
	3,647.72	11/14/95	52.83	0.00	3,594.89	
	3,647.72	2/23/96	53.57	0.00	3,594.15	
	3,647.72	5/31/96	53.16	0.00	3,594.56	
	3,647.72	8/23/96	53.41	0.00	3,594.31	
	3,647.72	12/2/96	53.98	0.00	3,593.74	
	3,647.72	3/12/97	54.44	0.00	3,593.28	(3)
	3,647.72	6/12/97	54.48	0.00	3,593.24	
	3,647.72	9/12/97	54.29	0.00	3,593.43	
	3,647.72	12/10/97	54.66	0.00	3,593.06	
	3,647.72	3/23/98	55.05	0.00	3,592.67	

Table 2 Cumulative Groundwater Elevation Data Hobbs, New Mexico Facility BJ Services Company, U.S.A.

Monitoring Well	TOC Elevation	Date Measured	Depth to GW (ft)	Free Product Thickness (ft)	GW Elevation (ft MSL)	Comments
MW-6						
	3,644.74	2/9/93	50.58	0.00	3,594.16	(1)
	3,644.74	8/18/93	50.78	0.00	3,593.96	
	3,644.74	1/26/94	51.00	0.00	3,593.74	
	3,644.74	5/3/95	52.63	0.00	3,592.11	
	3,644.74	7/31/95	51.90	0.00	3,592.84	
	3,644.74	11/14/95	51.19	0.00	3,593.55	
	3,644.74	2/23/96	52.10	0.00	3,592.64	
	3,644.74	5/31/96	51.76	0.00	3,592.98	
	3,644.74	8/23/96	51.63	0.00	3,593.11	
	3,644.74	12/2/96	52.85	0.00	3,591.89	
	3,644.74	3/12/97	53.55	0.00	3,591.19	(3)
	3,644.74	6/12/97	52.08	0.00	3,592.66	
	3,644.74	9/11/97	53.72	0.00	3,591.02	
	3,644.74	12/10/97	53.27	0.00	3,591.47	
	3,644.74	3/23/98	53.56	0.00	3,591.18	
MW-7						
	3,644.55	2/9/93	50.53	0.00	3,594.02	(1)
	3,644.55	8/18/93	50.74	0.00	3,593.81	
	3,644.55	1/26/94	51.01	0.00	3,593.54	
	3,644.55	5/3/95	52.25	0.00	3,592.30	
	3,644.55	7/31/95	51.92	0.00	3,592.63	
	3,644.55	11/14/95	51.48	0.00	3,593.07	
	3,644.55	2/23/96	52.15	0.00	3,592.40	
	3,644.55	5/31/96	51.78	0.00	3,592.77	
	3,644.55	8/23/96	52.02	0.00	3,592.53	
	3,644.55	12/2/96	52.52	0.00	3,592.03	
	3,644.55	3/12/97	52.99	0.00	3,591.56	(3)
	3,644.55	6/12/97	53.08	0.00	3,591.47	
	3,644.55	9/11/97	53.00	0.00	3,591.55	
	3,644.55	12/10/97	53.28	0.00	3,591.27	
	3,644.55	3/23/98	53.59	0.00	3,590.96	

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitoring Well	TOC Elevation	Date Measured	Depth to GW (ft)	Free Product Thickness (ft)	GW Elevation (ft MSL)	Comments
MW-8						
	3,644.87	2/9/93	50.48	0.00	3,594.39	(1)
	3,644.87	8/18/93	50.67	0.00	3,594.20	
	3,644.87	1/26/94	50.96	0.00	3,593.91	
	3,644.87	5/3/95	52.15	0.00	3,592.72	
	3,644.87	7/31/95	51.77	0.00	3,593.10	
	3,644.87	11/14/95	51.37	0.00	3,593.50	
	3,644.87	2/23/96	52.17	0.00	3,592.70	
	3,644.87	5/31/96	51.55	0.00	3,593.32	
	3,644.87	8/23/96	51.92	0.00	3,592.95	
	3,644.87	12/2/96	52.43	0.00	3,592.44	
	3,644.87	3/12/97	52.93	0.00	3,591.94	(3)
	3,644.87	6/12/97	53.96	0.00	3,590.91	
	3,644.87	9/11/97	52.73	0.00	3,592.14	
	3,644.87	12/10/97	53.15	0.00	3,591.72	
	3,644.87	3/23/98	53.51	0.00	3,591.36	
MW-9						
	3,644.78	4/22/93	49.73	0.00	3,595.05	(1)
	3,644.78	7/15/93	49.65	0.00	3,595.13	
	3,644.78	8/18/93	49.85	0.00	3,594.93	
	3,644.78	1/26/94	50.02	0.00	3,594.76	
	3,644.78	5/3/95	51.35	0.00	3,593.43	
	3,644.78	7/31/95	50.97	0.00	3,593.81	
	3,644.78	11/14/95	50.43	0.00	3,594.35	
	3,644.78	2/23/96	51.12	0.00	3,593.66	
	3,644.78	5/31/96	50.89	0.00	3,593.89	
	3,644.78	8/23/96	50.98	0.00	3,593.80	
	3,644.78	12/2/96	51.58	0.00	3,593.20	
	3,644.78	3/12/97	52.21	0.05	3,592.61	(3)
	3,644.78	6/12/97	52.10	0.00	3,592.68	PSH sheen
	3,644.78	9/12/97	51.95	0.00	3,592.83	PSH Sheen
	3,644.78	12/10/97	52.37	0.00	3,592.41	slight sheen
	3,644.78	3/23/98	52.68	0.00	3,592.10	slight sheen

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitoring Well	TOC Elevation	Date Measured	Depth to GW (ft)	Free Product Thickness (ft)	GW Elevation (ft MSL)	Comments
MW-10						
	3,644.47	8/18/93	51.54	0.00	3,592.93	(1)
	3,644.47	1/26/94	51.90	0.00	3,592.57	
	3,644.47	5/3/95	52.97	0.00	3,591.50	
	3,644.47	7/31/95	52.87	0.00	3,591.60	
	3,644.47	11/14/95	52.51	0.00	3,591.96	
	3,644.47	2/23/96	53.05	0.00	3,591.42	
	3,644.47	5/31/96	52.79	0.00	3,591.68	
	3,644.47	8/23/96	53.03	0.00	3,591.44	
	3,644.47	12/2/96	53.41	0.00	3,591.06	
	3,644.47	3/12/97	54.21	0.00	3,590.26	(3)
	3,644.47	6/12/97	53.99	0.00	3,590.48	
	3,644.47	9/12/97	53.94	0.00	3,590.53	
	3,644.47	12/10/97	54.12	0.00	3,590.35	
	3,644.47	3/23/98	54.51	0.00	3,589.96	
MW-11						
	3,643.78	8/18/93	51.92	0.00	3,591.86	(1)
	3,643.78	1/26/94	52.32	0.00	3,591.46	
	3,643.78	5/3/95	53.38	0.00	3,590.40	
	3,643.78	7/31/95	53.35	0.00	3,590.43	
	3,643.78	11/14/95	52.96	0.00	3,590.82	
	3,643.78	2/23/96	53.50	0.00	3,590.28	
	3,643.78	5/31/96	53.25	0.00	3,590.53	
	3,643.78	8/23/96	53.49	0.00	3,590.29	
	3,643.78	12/2/96	53.79	0.00	3,589.99	
	3,643.78	3/12/97	53.81	0.00	3,589.97	(3)
	3,643.78	6/12/97	53.96	0.00	3,589.82	
	3,643.78	9/12/97	52.93	0.00	3,590.85	
		12/10/97				(5)
MW-11A				-		
	3,644.24	3/23/98	54.79	0.00	3,589.45	(6)
MW-12						
	3,644.29	3/23/98	54.72	0.00	3,589.57	(6)

⁽¹⁾ Top of casing elevations and groundwater elevations of all monitor wells were relative to an arbitary datum of 100.00 feet prior to March 1997 and have been converted to Mean Sea Level (MSL).

⁽²⁾ For wells with a hydrocarbon layer the groundwater elevation was calculated as follows: Groundwater Elevation ≈ (TOC elevation) - (Depth to groundwater) + [(Free product thickness) X (SG of free product)] Note: The specific gravity (SG) for the free product was 0.82.

⁽³⁾ Top of casing elevations and groundwater elevations relative to MSL after March 1997.

⁽⁴⁾ MW-2 could not be located and is assumed detroyed after January, 1994

⁽⁵⁾ MW-11 could not be located and is assumed detroyed after September 12, 1997.

⁽⁶⁾ TOC elevations for MW-11A and MW-12 estimated relative to TOC elevation for MW-10.

Table 3
Field Screening Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Date Measured	Well Volume	рН	Temperature (°C)	Conductivity (µmhos)	Redox (mV)	Dissolved Oxygen (mg/L)	Ferrous Iron (mg/L)	Alkalinity (mg/L)
MW-1									
	3/24/98	3	NR	NR	NR	NR	0.00	0.6	95
MW-3									
	3/24/98	1	7.40	19.0	1,380	-85.5	7.09		
		2	7.35	18.9	1,414	-94.6	6.26		
		3	7.34	18.9	1,424	-95.7	5.79	0.0	75
MW-4		_		!					
	3/24/98	3	NR	NR	NR	NR	5.00	2.0	300
MW-5	3/23/98		7.00	19.2	1,360	116.3	6.86		
	3/23/90	1	7.30	1		}			
		2	7.30	19.2	1,330	115.9	5.78		
		3	7.30	19.2	1,326	115.8	5.96	0.0	125
MW-6	3/23/98	1	7.64	20.5	826	108.1	5,66		
	3/23/90								
		2	7.79	20.2	1,346	108.4	5.26	0.0	75
		3	7.81	20.2	1,297	108.3	5.01	0.0	75
MW-7	3/23/98	1	6.84	20.2	1,830	114	4.83		
	3/23/30	2	6.87	20.2	1,800	112	4.69		
			i	İ				0.0	200
14144 0		3	6.88	20.2	1,790	113.7	4.61	0.0	300
MW-8	3/23/98	1	6.94	19.5	2,032	106.0	3.65		
	3/23/30	2	6.94	19.4	2,056	106.3	2.77		
		3		i	İ			0.0	95
1011 0		<u> </u>	6.94	19.4	2,051	105.4	2.70	0.0	95
MW-9	3/24/98	1	7.53	18.2	1,526	91.8	7.29		
	0/24/00	2	7.27	18.8	1,487	91.6	4.57		
		3	7.32	18.9	1,477	93	5.13	0.0	105
MW 10			7.32	10.9	1,4//	93	5.15	0.0	105
MW-10	3/23/98	1	6.87	19.8	8,007	-174.3	0.90		
	5.23.00	2	6.91	19.7	7,623	-198.3	0.83		
		3	6.96	19.6	7,730	-209.4	0.83	5.0	190
84\A/ 11 A		ა 	0.90	13.0	7,730	-209.4	0.78	5.0	190
MW-11A	3/24/98	1	7.12	19.0	3,110	-69	1.46		
	5,2 7700	2	7.08	19.0	3,440	-78	1.06		
				i				70	150
		3	7.07	19.0	3,558	-84.4	0.92	7.0	150

Table printed: 23-Apr-98

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Table 3 Field Screening Results for Groundwater Samples Hobbs, New Mexico Facility BJ Services Company, U.S.A.

Monitor Well	Date Measured	Well Volume	pН	Temperature (°C)	Conductivity (µmhos)	Redox (mV)	Dissolved Oxygen (mg/L)	Ferrous Iron (mg/L)	Alkalinity (mg/L)
MW-12			1						
	3/24/98	1	6.93	18.7	4,610	-69	1.24		
		2	6.92	18.7	4,730	-83	0.87		
		3	6.92	18.7	4,770	-87	0.86	9.0	135

MW-2 could not be located and is assumed destroyed after January, 1994.

MW-11 could not be located and is assumed destroyed after September, 1997.

NR = No Reading, electronic instrument not used due to possible hydrocarbon concentrations which could damage the detector.

Table 4
Cumulative Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

			Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G	
Well ID	Sample Date	Sample Type		microgram	ns per liter, µg/L		milligrams p	per liter, mg/l	
MW-1									
	8/10/92	Regular	5550	12090	2160	7370	NA	NA	
	2/9/93	Regular	2100	6500	1300	7400	NA	NA	
	8/19/93	Regular	3200	7300	1200	3700	NA	NA	
	1/27/94	Regular	1930	4580	672	2390	NA	NA	
	5/3/95	Regular	NSP	NSP	NSP	NSP	NA	NSP	
	8/1/95	Regular	390	1300	230	800	NA	5.7	
	11/15/95	Regular	880	1800	300	970	NA	6.8	
	2/23/96	Regular	1500	3700	620	2200	NA NA	21	
	5/31/96	Regular	1100	1700	380	990	NA	7.5	
	8/23/96	Regular	1800	3300	570	2100	NA	17	
	12/2/96	Regular	5600	9600	2100	9600	100	64	
	3/12/97	Regular	5500	9700	2600	8200	22	62	
	6/12/97	Regular	5300	34000	7500	27000	180	160	
	9/12/97	Regular	1800	4400	1000	3000	23	21	
	12/10/97	Regular	7600	12000	2800	8200	11	71	
	3/24/98	Regular	4800	7200	1200	2400	4.2	38	
MW-2									
	8/10/92	Regular	14.9	< 4	< 4	< 4	NA	NA	
	2/9/93	Regular	< 2	< 2	< 2	< 6	NA	NA	
	8/19/93	Regular	100	12	3	13	NA	NA	
	1/27/94	Regular	< 1	1.2	2	2.5	NA	NA	

Table 4
Cumulative Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

			Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
Well ID	Sample Date	Sample Type		microgram	is per liter, µg/L		milligrams p	er liter, mg/L
MW-3								
	8/10/92	Regular	304.9	2099	6760	1586	NA	NA
	2/9/93	Regular	130	< 10	< 10	190	NA	NA
	8/19/93	Regular	560	3100	630	1900	NA	NA
	1/27/94	Regular	1070	5380	510	3120	NA	NA
	5/4/95	Regular	770	3300	470	1800	NA	NA
	8/1/95	Regular	490	2900	890	1600	NA	14
	11/15/95	Regular	250	1000	180	440	NA	2.9
	2/23/96	Regular	120	810	170	560	NA	4
	5/31/96	Regular	670	3900	1200	2300	NA	15
	8/23/96	Regular	330	2200	590	1500	NA	12
	12/2/96	Regular	220	1800	670	1000	0.89	7.4
	3/12/97	Regular	370	2000	960	1400	1.8	11
	6/12/97	Regular	860	4800	1700	2600	1.9	20
	9/11/97	Regular	770	3000	1600	1900	1.6	16
	12/10/97	Regular	240	740	500	450	0.59	5.3
	3/24/98	Regular	140	630	360	310	0.56	3.9
ЛW-4								
	8/10/92	Regular	2594	10360	2160	6740	NA	NA
	2/9/93	Regular	5200	15000	2200	10000	NA	NA
	8/19/93	Regular	3000	12000	< 2000	7000	NA	NA
	1/27/94	Regular	NSP	NSP	NSP	NSP	NA	NSP
	5/3/95	Regular	NSP	NSP	NSP	NSP	NA	NSP
	8/1/95	Regular	5700	17000	3500	13000	NA	120
	11/15/95	Regular	490	1600	310	1100	NA	5.2
	2/23/96	Regular	360	2800	560	2500	NA	18
	5/31/96	Regular	84	830	280	1100	NA	6.2
	8/23/96	Regular	110	1400	430	1800	NA	9.8
	12/2/96	Regular	190	2000	1800	7200	56	43
	3/12/97	Regular	220	1500	1500	4400	27	27
	6/12/97	Regular	47	270	360	950	2.5	6.2
	9/12/97	Regular	92	840	670	2100	15	7.6
	12/10/97	Regular	230	750	970	2300	3.7	16
	3/24/98	Regular	150	510	270	620	1.2	5.6

Table 4
Cumulative Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

			Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
Well ID	Sample Date	Sample Type		microgran	ns per liter, µg/L		milligrams p	er liter, mg/
MW-5				****	<u> </u>	·····		
	8/10/92	Regular	< 4	< 4	< 4	< 4	NA	NA
	2/9/93	Regular	< 2	< 2	< 2	< 6	NA	NA
	8/10/93	Regular	< 2	< 2	< 2	< 6	NA	NA
	1/27/94	Regular	8.7	29.9	4	11.3	NA	NA
	5/3/95	Regular	3.7	5.3	0.92	4.6	NA	NA
	8/1/95	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	NA
	11/15/95	Regular	< 0.3	1.2	< 0.3	1.5	NA	NA
	2/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	NA
	5/31/96	Regular	31	86	10	20	NA	NA
	8/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	12/2/96	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	3/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	6/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	9/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	12/10/97	Regular	< 5	< 5	< 5	< 5	< 0.2	< 0.1
	3/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
/W-6								
	8/10/92	Regular	NS	NS	NS	NS	NA	NS
	2/9/93	Regular	7000	19000	3100	7200	NA	NA
	8/19/93	Regular	8100	19000	3500	6400	NA	NA
	1/27/94	Regular	7960	20200	3830	6150	NA	NA
	5/4/95	Regular	11000	17000	2900	6000	NA	NA
	8/1/95	Regular	8300	12000	2500	5100	NA	60
	11/15/95	Regular	8900	17000	2900	5500	NA	57
	2/23/96	Regular	8100	10000	2300	4000	NA	58
	5/31/96	Regular	83	150	15	51	NA	0.57
	5/31/96	Duplicate	87	160	13	47	NA	0.52
	8/23/96	Regular	31	28	9.4	7.9	NA	0.46
	12/2/96	Regular	< 1	< 1	< 1	1.7	5.6	< 0.1
	3/12/97	Regular	12	< 5	6.8	18	12	< 0.5
	6/12/97	Regular	1900	1400	410	310	7.8	7.4
	9/11/97	Regular	11	1.3	3.4	< 1	1	< 0.1
	12/10/97	Regular	3	4.2	1.2	3.9	1.7	0.14
	3/23/98	Regular	3.6	< 1	4	< 1	< 0.2	< 0.1

Table 4
Cumulative Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

			Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
Well ID	Sample Date	Sample Type		microgran	ns per liter, µg/L		milligrams p	er liter, mg
MW-7								
	8/10/92	Regular	NS	NS	NS	NS	NA	NS
	2/9/93	Regular	< 2	< 2	< 2	< 6	NA	NA
	8/19/93	Regular	< 2	3	< 2	< 2	NA	NA
	1/27/94	Regular	1.1	< 1	< 1	< 1	NA	NA
	5/3/95	Regular	52	3.4	0.67	2.8	NA	NA
	8/1/95	Regular	22	2.2	0.85	2.8	NA	< 0.1
	11/15/95	Regular	8.4	0.77	< 0.3	0.93	NA	< 0.1
	2/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	2/23/96	Duplicate	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	5/31/96	Regular	29	83	10	21	NA	0.25
	8/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	12/2/96	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	3/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	6/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	9/11/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	12/10/97	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	3/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
4W-8				****				
	8/10/92	Regular	NS	NS	NS	NS	NA	NS
	2/9/93	Regular	< 2	< 2	< 2	< 6	NA	NA
	8/19/93	Regular	< 2	< 2	< 2	< 2	NA	NA
	1/27/94	Regular	< 1	< 1	< 1	< 1	NA	NA
	5/3/95	Regular	3	4.9	0.75	3.7	NA	NA
	8/1/95	Regular	3.1	1.2	0.47	1.6	NA	< 0.00
	8/1/95	Duplicate	3.6	1.5	0.51	1.5	NA	< 0.1
	11/15/95	Regular	< 0.3	0.52	< 0.3	< 0.6	NA	< 0.1
	2/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	5/31/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	8/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	12/2/96	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	3/12/97	Regular	< 1	< 1	< 1	1.8	< 0.1	< 0.1
	6/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	9/11/97	Regular	< 1	< 1	< 1	< 1	0.1	< 0.1
	12/10/97	Regular	< 1	< 1	< 1	< 1	0.3	< 0.1
	3/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1

Table 4
Cumulative Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

				701 V1005 CO11	pun, 0.0			
			Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
Well ID	Sample Date	Sample Type		microgram	s per liter, µg/L		milligrams ;	per liter, mg/L
MW-9								
	4/22/93	Regular	570	380	< 50	870	NA	NA
•	7/15/93	Regular	121	7.3	3	458	NA	NA
	8/19/93	Regular	390	290	40	250	NA	NA
	1/27/94	Regular	327	357	51.1	293	NA	NA
	5/3/95	Regular	380	. 110	19	120	NA	NA
	8/1/95	Regular	660	410	91	310	NA	6.2
	11/15/95	Regular	240	24	11	140	NA	1.5
	11/15/95	Duplicate	170	18	10	120	NA	1.9
	2/23/96	Regular	170	18	2.3	160	NA	4.3
	5/31/96	Regular	120	16	3	200	NA	NA
	8/23/96	Regular	82	13	6	270	NA	4
	8/23/96	Duplicate	76	14	4.8	250	NA	4.4
	12/2/96	Regular	61	< 25	< 25	210	2.6	2.8
	12/2/96	Duplicate	86	13	2.4	270	3.7	2.9
	3/12/97	Regular	30	48	420	880	8.2	19
	6/12/97	Regular	4.7	2.1	11	97	2.6	2.2
	6/12/97	Duplicate	< 5	< 5	6.6	69	5.2	1.9
	9/12/97	Regular	2.1	2.3	2.1	120	1.2	1.9
	12/10/97	Regular	4.9	9	6.8	62	0.86	0.92
	3/24/98	Regular	< 1	< 1	< 1	26	0.9	1
	3/24/98	Regular	< 1	< 1	< 1	26	0.9	

Table 4
Cumulative Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

			Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
Well ID	Sample Date	Sample Type		microgran	ns per liter, µg/L		milligrams p	er liter, mg
MW-10								
	8/19/93	Regular	190	460	< 200	240	NA	NA
	1/27/94	Regular	13.4	4	5.5	33.6	NA	NA
	5/4/95	Regular	980	15	11	84	NA	NA
	8/1/95	Regular	1300	32	32	100	NA	3.6
	11/15/95	Regular	1000	. 24	15	36	NA	1.7
	2/23/96	Regular	810	23	27	44	NA	2.4
	5/31/96	Regular	700	24	34	28	NA	2
	8/23/96	Regular	290	3.4	6.4	13	NA	1.4
	12/2/96	Regular	280	1.3	17	8	0.94	0.97
	3/12/97	Regular	110	< 5	17	< 5	0.61	0.57
	6/12/97	Regular	150	12	30	< 5	0.68	< 0.5
	9/12/97	Regular	87	2.3	26	2.7	0.76	0.33
	9/12/97	Duplicate	87	2.4	26	2.8	0.79	0.33
	12/10/97	Regular	41	9.8	12	7.7	1.1	0.28
	12/10/97	Duplicate	36	8.5	10	6.7	1.2	0.24
	3/23/98	Regular	36	< 5	5.9	< 5	1.6	< 0.5
	3/23/98	Duplicate	36	< 1	5.3	1.3	1.7	0.18
MW-11								
	8/19/93	Regular	< 2	< 2	< 2	< 2	NA	NA
	1/27/94	Regular	< 1	< 1	< 1	< 1	NA	NA
	5/4/95	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	NA
	8/1/95	Regular	44	29	5.5	13	NA	0.2
	11/15/95	Regular	190	2.8	6.2	11	NA	0.4
	2/23/96	Regular	49	1.2	0.51	4	NA	0.25
	5/31/96	Regular	300	83	12	28	NA	0.8
	8/23/96	Regular	100	1.2	0.3	4.7	NA	0.26
	12/2/96	Regular	970	< 5	6	8.1	2	1.3
	3/12/97	Regular	130	< 5	13	5.8	0.42	< 0.5
	3/12/97	Duplicate	100	< 5	10	5.1	0.43	< 0.5
	6/12/97	Regular	150	23	19	< 5	1.1	0.55
	9/12/97	Regular	220	15	27	13	1	0.46
MW-11A	3/24/98	Regular	24	5	< 5	< 5	0.28	0.14
MW-12								
	3/24/98	Regular	100	11	6	8	0.29	0.41

MW-2 destroyed after January, 1994 MW-11 destroyed after September, 1997

NA = Not Analysed NS = Not Sampled

NSP = Not Sampled due to Phase Separated Hydrocarbons

Summary of Detected Analytes for PAHs, Metals, SVOCs and Groundwater Quality Parameters Hobbs, New Mexico Facility BJ Services Company, U.S.A. Table 5

							Monite	Monitor Wells					
AnalyteName	Sample Date	MW-1	MW-3	MW-4	MW-5	MW-6	MW-7	8-WM	6-MM	MW-10	MW-11	MW-11A	MW-12
Alkalinity	mg/L												
Bicarbonate, as CaCO3													
	8/1/95	380	430	490	290	670	440	360	570	520	260	NA	NA
	8/23/96	310	310	210	270	120	400	280	390	520	430	A A	ΝΑ
	3/23-24/98	286	214	175	247	180	309	260	306	557	NA	319	451
Carbonate													
	8/1/95	< 10	< 10	< 10	< 10	< 10	> 10	< 10	< 10	< 10	01	NA	NA
	8/23/96	< 10	< 10	< 10	< 10	< 10	> 10	< 10	< 10	< 10	< 10	NA	NA
	3/23-24/98	-	-	~	-	->	-	-	-	~	Z	~	- ~
Hardness-Total as CaCO3	SaCO3												
	3/23-24/98	430	430	275	342	440	670	740	510	1450	Υ	1000	1600
Hydroxide													
	8/1/95	< 10	> 10	< 10	< 10	< 10	< 10	< 10	< 10	01 > .	> 10	A A	NA
	8/23/96	< 10	> 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	N A	NA
Anions	mg/L												
Chloride													
	8/1/95	160	150	310	130	380	310	350	110	2200	3400	A A	NA
	8/23/96	130	140	100	66	210	250	360	140	2000	2900	A'A	AN
	3/23-24/98	212	206	126	151	183	223	364	164	2390	X	940	1200
Fluoride													
	3/23-24/98	6.0	1.2	1.2	9.0	1:1	8.0	6.0	1.3	6.1	N A	2.9	4.2
Methane													
	3/23-24/98	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012	0.039	< 0.0012	0.91	Ϋ́	0.14	< 0.0012
Nitrate (Nitrogen as N)	$\widehat{\mathbf{z}}$												
	8/1/95	4.7	9.9	15	28	1.3	9.2	=	38	< 0.1	5.5	A A	NA
	8/23/96	=	7.6	9.7	12	< 0.5	10	9.8	24	< 5	11	NA	NA
	3/23-24/98	1.78	3.07	2.59	3.87	69:0	3.92	1.84	4.27	0.07	ΑN	< 0.05	< 0.05
Sulfate													
	8/1/95	150	150	210	230	6.7	180	160	150	130	230	A A	NA
	8/23/96	130	150	150	140	85	80	160	180	120	130	A A	A N
	3/23-24/98	130	180	160	190	230	310	250	230	320	NA	190	240
								•					

Summary of Detected Analytes for PAHs, Metals, SVOCs and Groundwater Quality Parameters Hobbs, New Mexico Facility BJ Services Company, U.S.A. Table 5

							Monite	Monitor Wells					
AnalyteName	Sample Date	MW-1	MW-3	MW-4	MW-5	9-MW	L-WM	WW-8	6-MM	MW-10	MW-11	MW-11 MW-11A	MW-12
Cations	mg/L												
Calcium													
	8/1/95	120	120	220	160	320	300	300	180	610	490	A A	A
	8/23/96	120	130	68	110	62	270	230	190	390	440	NA	Ϋ́
	3/23-24/98	129	122	79	601	94	208	215	142	417	NA	259	388
Magnesium													
	8/1/95	34	36	58	27	7.2	42	46	43	130	130	NA	N.
	8/23/96	120	32	21	8	28	40	48	44	84	120	N A	Ϋ́
	3/23-24/98	36	30	81	70	42	47	52	36	130	A Z	96	801
Potassium													
	8/1/95	2.4	2.6	3.5	4.2	3	3.4	5	1.4	35	46	A A	Ϋ́
	8/23/96	2.4	3	2.2	3.1	2.4	3.7	3.9	2.6	41	53	N A	Ϋ́Z
	3/23-24/98	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	20	Ϋ́	30	70
Sodium													
	8/1/8	001	93	140	110	130	95	94	86	099	2000	ΥZ	NA
	8/23/96	801	110	88	120	120	96	001	83	096	2600	NA	N A
	3/23-24/98	113	126	601	130	001	92	101	118	1090	Ϋ́Z	312	381
Metals	mg/L												}
Arsenic													
	8/1/95	0.0076	0.0043	< 0.002	0.0059	0.028	0.0033	0.0034	0.0055	0.015	9800.0	NA A	NA
	8/23/96	0.0078	9900'0	0.0059	0.0067	0.018	0.0036	0.0033	0.0044	0.028	0.011	A A	Ϋ́
	3/23-24/98	0.007	0.007	0.008	0.007	0.013	< 0.005	< 0.005	0.005	0.035	NA	0.019	0.013
Barium													
	8/1/95	690.0	0.38	0.34	0.049		0.069	0.075	0.089	0.37	0.2	N A	NA
	8/23/96	0.064	0.24	690.0	0.038	0.29	0.061	990.0	0.089	0.26	0.2	Z Y	Y Y
	3/23-24/98	0.11	0.182	0.044	0.044	0.208	0.059	0.074	990.0	0.287	N A	0.163	0.157
Cadmium													
	8/1/95	< 0.001	< 0.001	0.0052	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	Ϋ́	Α̈́N
	8/23/96	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	ž	N A
	3/23-24/98	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	NA	< 0.005	< 0.005
								_		_		-	

Summary of Detected Analytes for PAHs, Metals, SVOCs and Groundwater Quality Parameters BJ Services Company, U.S.A. Hobbs, New Mexico Facility Table 5

							Monite	Monitor Wells					
AnalyteName	Sample Date	MW-1	MW-3	MW-4	MW-5	9-MM	MW-7	8-MM	6-MM	MW-10	MW-11	MW-11 MW-11A	MW-12
Chromium													
	8/23/96	< 0.01	< 0.01	< 0.01	< 0.01	0.049	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	NA	Ϋ́
	3/23-24/98	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	N A	< 0.01	< 0.01
Mercury													
	8/23/96	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	NA	NA A
	3/23-24/98	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0003	< 0.0002	< 0.0002	Z	< 0.0002	< 0.0002
PAHs	μg/L												
Naphthalene													
	8/1/95	< 5	210	1700	<5	470	< 5	< 5	15	92	< 5	A'A	NA
	8/23/96	230	110	440	<5	< 30	< 5	< 5	< 84	< 76	< 5	X Y	Ϋ́
	3/23-24/98	130	23	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	4	∞	Ϋ́	80	Ξ
SVOCs	µg/L)	:) 5	:
2,4-Dimethylphenol													
	8/1/95	< 50	76	< 500	<5	42	< 5	< >	< 5	< >	< 5	NA	N.
	8/23/96	NA A	NA	N A	N A	A A	N A	Y Y	Y V	Ϋ́	ΑN	N A	Ϋ́
2-Methylnaphthalene	ข							_					
	8/1/95	280	62	1500	< 5	150	< 5	< 5	36	23	< 5	N A	NA
	8/23/96	NA	NA	N A	NA	N A	N A	A'N	Y V	Ϋ́	Ϋ́	Ϋ́	Ϋ́Z
2-Methylphenol													:
	8/1/95	< 50	56	< 500	< 5	< 30	< 5	<5	< 5	< >	< 5	Ϋ́N	N.A
	8/23/96	Ϋ́	NA	N A	NA	N A	NA	NA	Ϋ́	N A	NA	X A	Ϋ́
4-Methylphenol													
	8/1/95	< 80	< 20	008 >	∞ ∨	150		& V	& V	& V	8 >	Ϋ́	Ϋ́Z
	8/23/96	Ϋ́	Α̈́	NA A	NA	A A	Z	NA A	Y Z	NA	ΑN	X Y	Ϋ́Z
Bis(2-ethylhexyl)phthalate	thalate												
	8/1/95	750	< 20	00001	40	< 40	<7	<7	< 7	<7	< 7	Ϋ́Α	NA
	8/23/96	ΝA	ΝA	N A	NA	Ϋ́	AN	N A	A A	NA	NA	ΝA	Ϋ́
Phenol													
	8/1/95	< 50	< 10	< 500	< 5	< 30	< 5	< 5	< 5	8.2	< 5	AN	NA A
į	8/23/96	Ϋ́	A A	Ϋ́Z	NA AN	Ϋ́	Z Y	Ϋ́	Ϋ́Z	Y Z	Ϋ́	₹ Z	ĄZ
C. O. 1113													- :: -

MW-2 Destroyed on May 3, 1995, MW-11destroyed after September 1997.

NA= Not Analyzed.
PAHs = Polyaromatic Hydrocarbons.

Page 1 of 1

Summary of Analytical Results for Air Emissions Hobbs, New Mexico Facility BJ Services Company, U.S.A. Table 6

				C	De services company, 0.0.71.	Ville July,					
	Sample Date	Benzene	Toluene	Ethylbenzene	Xylenes	ТРН	Discharge Rate.	Benzene	Total BTEX Emission	TPH Emission	
Number			parts per n	parts per million by volume, ppmv	٨		scfm	Rate, Ib/hr	Rate, Ib/hr	Rate, lb/hr	
Extraction-1	9/19/95	062	1100	340	920	9700	132.47	1.235	5.943	16.31	
Effluent-1	9/20/95	066	2500	260	1600	16000	135.76	1.575	10.939	27.37	
Effluent-2	9/28/95	13	28	9	18	2533	123.56	0.019	0.112	3.89	
Effluent-4	11/7/95	15	58	12	36	1500	131.10	0.024	0.239	2.59	
Effluent111595-01	11/15/95	36	180	42	130	1870	133.33	0.062	0.773	3.21	
Effluent121995-01	12/19/95	10	45	F	33	530	129.64	0.016	0.191	0.89	
Effluent012996-01	1/29/96	12	61	17	53	1200	128.45	0.018	0.271	1.95	
Effluent032296-01	3/22/96	9	44	12	40	066	124.68	0.009	0.189	1.56	
Effluent042496-01	4/25/96	4	37	10	36	006	118.34	0.005	0.147	1.29	
Effluent053196-01	5/31/96	3.7	40	10	33	029	124.11	0.005	0.158	1.04	
Effluent082396-01	8/23/96	\ 5	12	V 22	v 5	200	126.18	0.007	0.047	0.31	
Effluent120296-01	12/2/96	7	<u>~</u>		, -	۷ ک	129.04	0.002	0.008	0.01	
Eff-31297-1	3/12/97	2.1	15	4.6	15	250	110.56	0.003	0.057	0.33	
Effluent070297-01	7/2/97	<u>,</u>	6.3	2.4	8.6	65	109.90	0.001	0.028	0.08	
Monitor970912	9/12/97	A A	۷ Z	NA	A A	340	105.40	N A	Ϋ́	0.39 (1)	
EFF-1-2832	12/10/97	< 0.001	0.013	0.009	0.031	210	106.27	0.000	0.000	0.28	
Monitor980324	3/24/98	NA	A N	NA	NA	1500	108.97	Υ V	N A	1.91 (1)	

Emission rates reported for 12/02/96 sampling event were calculated using the detection limits. The actual emissions are Benzene <0.001 lb/hr, BTEX: <0.01 lb/hr and TPH: <0.01 lb/hr. Table printed: 4/23/98

NA = Not analyzed

(1) All analysis on based on field FID readings.

APPENDICES

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(3)

APPENDIX A

Groundwater Sampling Forms

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"Use or disclosure of data contained on this sheet is subject to the restriction specified at the beginning of this document."

WELL ID: MW - 1

Project i	Number:			_	Task Number	·		Date	3 24	q&
Casing D	iameter		Purge Eq	uipment			Equipment (Calibration - Ti	me	
	2	inches								
1	th of Well fro	m TOC	1				рН	=	at	ా
64.6		feet			·					
	ter from TOC	;	Sample E	quipment			pH	=	at	ాల
55		feet						·		
Product L	evei from TO	С					Conductance			
		feet			1.00.0.1. (1)		Standard:		_µmhos/cm at 2	25° C
- a	Water Colum /1	ın	Analytical	Equipment (p)	H, DO, Redox, filtr	ation, etc.)				
Well Volum	59	feet					Measured Value:		_ µmhos/cm at 2	25° C
	4)						 		-	
		gal					Dissolved Oxygen			
Screened	intervai (from	(GS)					DOK	Aeter Calibrated to	- <u></u>	mg/
		feet					<u> </u>			
Time	Well Volume	Gallons Removed	ρΗ	Temp	Conductivity	Redox	Dissolved Oxygen	Visuai	Description	
1315	1	1,5								
1318	2	5.0								
1321	3	4.5								
}										
ì eo chemi	cai Parame	ters		Comments:			 			
F	errous iron: -	0,6	mg/L	1.	322 54	mple	ma-1			
Disaolve	ed Oxygen: -	0	m g/L							_
А	_Alibrato:	95	m g/L							_
	Sulfate:		mg/L							
E Wom:		· · · · · · · · · · · · · · · · · · ·		Sam pler's Si	ignature:					
sposition o	f Purge Wate	эr:								

WELLID: MW3

Groundwater Sampling Field Data Sheet

7eet 3/33/18 とこと 5/33/18 とと 5/33/18 とと 5/33/18 とと 5/33/18 とこと 5/33/18 と 5/33/18

Project Number:	Task Number:	_	Date	: 3/2 Y	15
Casing Diameter	Purge Equipment	Equipment C	Calibration - Tir	ne	
2 inches					
Total Depth of Well from TOC		pH	=	at	<u>°</u>
feet					
Static Water from TOC	Sample Equipment	ρH	8	at	<u>.c</u>
53,22 1001					
Product Level from TOC	7	Conductivity			
62,12 1001	<u> </u>	Conductance Standard:		µmhos/cm at 25°	c
Length of Water Column	Analytical Equipment (pH, DO, Redox, filtration, etc.)				
8,90 1000	1	Measured Value:		µmhos/cm at 25°	С
Well Volume					
1,5 gas		Dissolved Oxygen			
Screened interval (from GS)		DOM	leter Calibrated to:		mg/L
foot					

Time	Well Volume	Gallons Removed	рН	Temp	Conductivity	Redox	Dissolved Oxygen	Visual Description
1115	(1,5	7.46	19.0	1.380	-8.5-5	7-09	Clec
1119	2	ن . ز	7.35	18.9	1.414	-94.6	6.26	clea
1122	3	4.5	46, ۲	18.9	1,424	-95,7	5.79	cleci

Geochemical Param	eters	Comments:
Ferrous iron:		
Disaolved Oxygen:	4,2 most	
AIIC -Nitrato:	7.5 mg/L	
Sulfate:	mg/L	

PPE Worn:	Sampler's Signature:
Disposition of Purge Water:	-

WELLID: MW - 4

Project	Number:				Task Number:			Date	: <u>3/24/9</u>
Casing D)iameter		Purge Eq	uipment			Equipment C	Calibration - Ti	me
]	Z	inches	l						
Total Dep	oth of Well fro		1				pH		at °c
Static Wa	iter from TOC	foot	Sample E	nuioment			 pH	3	at "c
	, , , 0			40.0					
	evel from TO	feet C	1				Conductivity		
	.95	feet]				Conductance Standard:		μmhos/cm at 25° C
	Water Colum		Analytical	Equipment (pl	H, DO, Redox, filtra	ation, etc.)			missos cm at 52. C
	1.43	feat			•		Measured Value:		μπιhos/cm at 25° C
Well Volu	me						 		
		gel]				Dissolved Oxygen	-	
Screened	Interval (from	(GS)					00%	Aeter Calibrated to:	
		feet	<u> </u>				<u></u>		
Time	Well	Gallons	рН	Temp	Conductivity	Redox	Dissolved Oxygen	Visuai	Description
	Volume	Removed		<u> </u>			Oxygen		
1315	,							Clear	
<u></u>								Black	Clardy
1347	2							lens	Clardy
1347 1349	3	·							
									
	ical Parame			Comments:					· · · · · · · · · · · · · · · · · · ·
F	errous Iron:	p 6	mg/L	130	30 SAM	uple	ma-y		
Disaoly	red Oxygen:	5.0				•			
300 AIK	Nitrate:		mg/L	 _					
,,,,	Sulfate:		mg/L mg/L		······································				
PE Worn:				Sampler's S	ignature:				
sposition	of Purge Wate	-							
	-			_					

WELL ID: Mur

	Number:			_	Task Numbe	r:		Date: 3/23/9
Casing 0	iameter		Purge Equ	ipment			Equipment (Calibration - Time
		inches					1	
i	oth of Well fro	om TOC	7				pH	= at
64		foot	ļ				-l	
	iter from TOC		Sample Ed	quipment			pH	a at
	evel from TO	feet	-				Conductivity	
Product	ever nom 10						Conductance	
Length of	Water Colum	feet nn	Analytical (Equipment (ph	I, DO, Redox, filt	ration, etc.)	Standard:	μmhos/cm at 25° C
6	1.67	feet			•		Messured Value:	μπhos/cm at 25° C
Well Volu	7.47 me		1					
<i>[]</i>	4	gal					Dissolved Oxyger	1
	Interval (from	GS)	1				001	Meter Calibrated to:
		foot					<u> </u>	
Time	Well	Gallons	الما	T	Conductivity	Redox	Dissolved	Visual Description
Time	Volume	Removed	pH	Тетр	Conductivity	Hegox	Oxygen	Visual Description
1618	(<u> </u>	7.30	19.2	1.360	(16.3	6.86	Cleen
1622	2	1-6	7.30	19.2	1.33	115-9	5.78	Char
16 X	3	5.0	7.50	[9.2	1.326	115.8	5.96	Clear
Geochem	ical Parame	etare.		Comments:				
	errous Iron:	<u>ن</u>	mg/L	<u> Cartification</u>				
Dissolv	red Ox ygen :	3,2	mg/L					
	A I/C	45	m g/L					
	Sulfate:		mg/L					
PE Wom:			1	Sampler's Si	ignature:			
Isposition	of Purge Wat	er:						

WELL ID: MW-6

Project Number:			_	Task Numbe	r:	_	Date: 3/23/9
Casing Diameter		Purge Equ	ripment		-	Equipment (Calibration - Time
Total Depth of Well	inches from TOC					pH	= at *C
59.7 Static Water from T	(Sample Ed	uipment			pH	=at *C
53.50		_					
Product Level from	feet					Conductivity Conductance Standard:	μπhos/cm at 25° C
Length of Water Col	umn feet	Analytical E	equipment (ph	i, DO, Redox, filt	tration, etc.)	Measured Value:	μπιλου/cm at 25° C
Well Volume	gel					Dissolved Oxyger	2 6./8/4/4
	feet		·				
Time Well	Gallons e Removed	рН	Temp	Conductivity	Redox	Dissolved Oxygen	Visual Description
645 l	1.6	7.64	20,5	0.826	108.1	5.66	Cleni
652 2	2.0	7.79	ス <i>0</i> ,ス	1.340	108.4	5.24	Clear
459 3	3.0	7.81	20,2	1-297	1083	5,01	Clear
eochemical Para	meters		Comments:	1			· · · · · · · · · · · · · · · · · · ·
Ferrous iro		mg/L				· <u> </u>	
	.,						
Dissolved Oxyge	n: <u>4.0</u>	mg/L					1
Dissolved Oxyge		mg/L					
75	ə: 						

WELL ID: MW-7

Project (Number:				Task Number	:		Da	ite: _3/23/	9
Casing D	iameter		Purge Eq	zipment			Equipment (Calibration -	lime	_
Total Dep	th of Well fro	inches om TOC					рН	=	at	•0
61	64	feet								
Static Wa	ter from TOC	;	Sample E	quipment			pH	=	A1	*0
53.59 feet										
Product L	evel from TO	c					Conductivity Conductance			
1 00000 01	Water Colum	feet	Apphaical	Equipment (nh	I, DO, Redox, filt	retion etc.)	Standard:		μmhos/cm at 25°	,C
	· 0 5		Avialyucas	edabineni (br	1, DO, 11600X, IIII	alon, elc.)	ļ			
ング Well Volum		feet	-				Measured Value:		μmhos/cm at 25°	С
i										_
	ارد Interval (from	gel (GS)	1				Dissolved Oxyger		to:	mg
SCIEGING	III TO I VELLET (II ONI									<u></u>
		foot	<u> </u>				<u> </u>			
Time	Well Volume	Gallons Removed	рН	Temp	Conductivity	Redox	Dissolved Oxygen	Visua	u Description	
1505	1	1.3	6-84	20.2	1.83	114	483	Clea	<i></i>	
1507	2	2,6	6.87	20.2	1.80	112	4.69	Cles.	<u> </u>	
1511	3	40	6.88	20.2	179	113.7	4.61	Clear	-	
Geochem	ical Parame	elers		Comments:						
	errous iron:	Ö	mg/Li							
Dis sol v	ed Oxygen:	 ス. S	∑ mg/L							
	Nitrate:									
	Sulfate:	, , , , ,	> more							
PE Wom:				Sampler's Si	ignature:					7
isposition (of Purge Wat	er:								

WELL ID: MW8

Project	Number:			_	Task Number	:	-	Date: 3/23/1
Casing D	iameter		Purge Equ	ipment			Equipment (Calibration - Time
Total Dep	oth of Well fro	inches m TOC					рH	= at *C
Static Wa	ter from TOC	feet	Sample Eq	uipment		 	рН	= at *C
	evel from TO	feet C					Conductivity Conductance Standard:	μ mhos/cm at 25° C
Length of	Water Colum		Analytical E	quipment (pł	I, DO, Redox, filt	ration, etc.)		μπhos/cm at 25° C
1.	interval (from	gal IGS)					Dissolved Oxyger	1 Meter Calibrated to: mg
	· · · · · ·	foot						
Time	W e li Volume	Gallons Removed	ρΗ	Temp	Conductivity	Redox	Dissolved Oxygen	Visual Description
1541	ſ	1.5	6.94	19.5	2.052	106.0	3.65	Clear
1544	2	3-0	694	19.4	2.054	106.3	2.77	10
1552	3	4.5	G. 94	19.4	2,051	105.4	2.70	1/
3eochem	ical Parame	eters		Comments:				
F	errous tron:	٥	m g/L					
Dis solv	ed Oxygen:	1.8	толь					
AIK 95	Nitrate:		mg/L					
	Sulfate:		m g/L					
PE Wom:				Sampier's S	ignature:			
isposition o	of Purge Wat	er:		_				

WELL ID: MW-9

Project i	Number:				Task Number	·		Date	:_3/24/9
Casing Di	ameter		Purge Ed	uipment			Equipment C	alibration - Tir	ne
	2	inches							
Total Dep	th of Well fro]				pH	=	at °C
60	,41	feet					_]		
Static Wat	ter from TOC		Sample E	quipment			pH	=	at °C
	1,68	feet							
Product Le	evel from TO	C					Conductance		
		feet				,	Standard:		μmhos/cm at 25° C
-	Water Colum こう ろ	n	Analytical	Equipment (p)	i, DO, Redox, filt	ration, etc.)			
Well Volun		feet					Measured Value:		µmhos/cm at 25° C
vveii volun									
		gel	{				Dissolved Oxygen		
Screened i	intervai (from	GS)						leter Calibrated to:	mg/L
		feet				·			
Time	Well Volume	Gallons Removed	ρН	Temp	Conductivity	Redox	Dissolved Oxygen	Visual I	De s crip tion
123	(1,3	7,53	182	1,526	91.8	7,29	C/e4 54.	e slight Am
了义	2	I		1	1 1		7.> 1	cless, slisht	shoa
	3	4.0	7,32	18.9	1.477	93.0	5.13	clear	show
			·						
ieochemi	cal Parame	iters		Comments:					
F	errous Iron: -	0	mg/L						
Dis so lve	ed Ox ygen:	3,4	m g/L				·		
AIKa		105	mg/L						
	Sulfate:		mg/L		·				
PE Wom:				Sam pler's S	ignature:				
sposition o	f Purge Wate	or:							j

WELL ID: MW-10

Project	Number:			_	Task Numbe	r:	_	Date: 3-23-
Casing D	iameter		Purge Equ	ripment		 	Equipment (Calibration - Time
	γ							
Total Dec	oth of Well fro	inches om TOC	-				pH	≈ at ℃
1							1	
	374.51 feet Static Water from TOC Semple 6						pH pH	= at ℃
1	1330							<u></u>
	100 feet						Conductivity	
Froduct L							Conductance	
1	Water Colum	feet	Anabaisal		l, DO, Redox, filt	tention, etc.)	Standard:	μmhos/cm at 25° C
_		חה	Analytical	Edaibweur (br	i, DO, Neuox, III	ilaboli, etc.)		
	<u> 79</u>	feet	Į				Measured Value:	μmhos/cm at 25° C
Well Volum	1		}					
/,	4	gai					Dissolved Oxygen	l
Screened	intervai (from	1 GS)					DOA	Neter Calibrated to: mg/
		feet						
Time	Volume	Gallons Removed	рН	Temp	Conductivity	·	Dissolved Oxygen	Visual Description
קצרו	1	1,5	6-87	19.8	8.007	-174.3	0 90	115h t Stay
ΠSU	_	ک ر ن	6.91	19.7	7.623	-198.3	0.83	lish+ 9,=4
1354	3	4.5	6-90	196	7.73	-209.4	0.79	lishit god
Geo chem	ical Parami	eters	 1	Comments:				
F	errous Iron:	5,0	mg/L					
Dissolv	ed Oxygen:	1.0) mg/L					
AIK	Nitrate:	190	m g/L					
	Sulfate:		толь					
PE Worn:				Sampler's S	ignature:			
isposition o	of Purge Wat	er:		_				

Disposition of Purge Water:

WELL ID:

7547 11 A

Groundwater Sampling Field Data Sheet

we 3/23/58

Project i	Number:		<u> 2832</u>		Task Number	:		Date: 3 /2 9 /
Casing Diameter Casing Diameter Calibration - Time	Calibration - Time							
ļ	2	inches	احح	ib punj	7			
Total Dep	oth of Well fro		7				рН	= at °C
64	1.16	feet						
Static Wa	ter from TOC		3	^			pH	= at °C
5	4.79	feet	SUR	s prup				quipment Calibration - Time = at at Inductivity Inductance pumhos/cm at 25° assured Value: pumhos/cm at 25° solved Oxygen DO Meter Calibrated to: Dissolved Oxygen Visual Description If G
Product L	evel from TO	С	7					
			<u> </u>			,		μmhos/cm at 25° C
1 -		n	Analytical	Equipment (pl	I, DO, Redox, filtr	ration, etc.)		
		feet	4	,			Measured Value:	µmhos/cm at 25° C
			1					
1,	<u> </u>	gat	1.40	ALH AIR	ralin, Ly		Dissolved Oxygen	
Screened	Intervai (from	GS)	ļ				DOM	fleter Calibrated to: mg
		feet					<u> </u>	
Time	Weil	Gallons	пн	Temp	Conductivity	Redox	1	Vigual Description
111110	Volume	Removed	, pi,	101110	GORGCAVITY		Oxygen	Violati 0000/1940//
1246	1	1-5	7.12	19-0	3.11	-69	1.46	cludy
						7.0	. 1/2	
1249	2	1.5	7.08	19-0	3-44	-78	1.00	clady
1252	3	4.5	7.07	19,0	3558	-84.4	0.92	c /e; .
2000	iaal Oaraa	· · · · · · · · · · · · · · · · · · ·						
300Cnemi	icai Parame			Comments:				!
F	errous Iron:	7.0	mg/L					
Dissolv	ed Oxygen:	1 62						
1	L -	1-0	mg/L					
O 16	Nitrate:							
JME	-		mg/L					
, ,,	Sulfate:		mg/L					Ì
PE Wom:				Sampler's S	ignature:			

Disposition of Purge Water:

BR	O W N	AND C	ALD	WELL		WELL	. ID: /	42 HA12	
Grou	ndwate	r Samplii	ng Field	l Data Si	heet				- 5/8
Project	Number:	24	332		Task Number	r. <i>13</i>	_	0 c 3/2 Date: 3/24/	98
Casing D	iameter		Purge Equ		2		Equipment C	Calibration - Time]
	2	inches	50%	Pumpf				_	
	oth of Well fro	_	İ				pH	= at ℃	-{
	3.75		Sample Ed	toemoius			 pH	≕ at *C	
	4.72	-		punp			Í		1
	evel from TO		1	,			Conductivity		1
~_		feet				,	Conductance Standard:	μmhos/cm at 25° C	
. •	Water Column	חח	YSI	600 XC		ration, etc.)	Measured Value:	μπhos/cm at 25° C	
Well Volu	me		1/140	H FE, D	o Ing La		ļ		
/	.50	gel	HAC	H Alkai	12019		Dissolved Oxygen		
Screened	intervai (from	ı GS)					DOA	Neter Calibrated to: mg/L	
		foot					<u> </u>		Į
	Weil	Gallons		Temp	Conductivity	Redox	Dissolved	Visual Description	
Time	Volume	Removed	pH	, :)		Oxygen		İ
1223	1	1.5	6.93	18.7	4.61	-69	1.24	Clear	
1226	E	1-5	6.92	18.7	4.73	-83	0.87	Mady	
228	3	1.5	6.92	18.7	4.77	-87	0.86	Clardy	
Beo chem	ical Parame	eters		Comments:			 		
F	errous iron:	ý	y mg/L						
	red Oxygen: V	9	mort.						
135 NSI AIK	Nitrate:		mg/L						
,	Sulfate:		m g/L						
PE Worn:	slac	5, 8/45	ses !	Sampler's Si	ignature:				

APPENDIX B

Laboratory Analytical Report for Groundwater Samples

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"Use or disclosure of data contained on this sheet is subject to the restriction specified at the beginning of this document."



HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

April 7, 1998

Mr. Rick Rexroad BROWN AND CALDWELL 1415 Lousiana Houston, TX 77002

The following report contains analytical results for the sample(s) received at Southern Petroleum Laboratories (SPL) on March 24, 1998. The sample(s) was assigned to Certificate of Analysis No.(s) 9803B00 and analyzed for all parameters as listed on the chain of custody.

Any data flag or quality control exception associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s).

If you have any questions or comments pertaining to this data report, please do not hesitate to contact me. Please reference the above Certificate of Analysis No. during any inquiries.

Again, SPL is pleased to be of service to you. We anticipate working with you in fulfilling all your current and future analytical needs.

Southern Petroleum Laboratories

Bernadette A. Fini Project Manager



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/07/98

ertificate of Analysis No. H9-9803B00-01

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT NO: 2832.13

MATRIX: WATER

PROJECT: BJ Hobbs SITE: Hobbs, NM

SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/23/98 15:20:00

SAMPLE ID: MW-7

DATE RECEIVED: 03/24/98

		ANALYTICAL	DATA		
PARAMETER			RESULTS	DETECTION LIMIT	UNITS
Methane RSKSOP-147 Analyzed by:	JDR 04/01/98	05.27.00	ND	0.0012 P	ppm
Chloride Method 325.3 Analyzed by:	* TV		223	5	mg/L
Date:	04/04/98	09:00:00			
Fluoride Method 300.0 Analyzed by: Date:		13:00:00	0.8	0.5	mg/L
Nitrate nitro Method 353.3 Analyzed by: Date:	*	12:00:00	3.92	0.05	mg/L
Sulfate Method 375.4 Analyzed by: Date:		12:30:00	310	25	mg/L
Calcium, Disso Method 6010B Analyzed by: Date:	* * *	08:19:00	208	1	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

⁽P) - Practical Quantitation Limit

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/07/98

ertificate of Analysis No. H9-9803B00-01

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT NO: 2832.13

PROJECT: BJ Hobbs SITE: Hobbs, NM

MATRIX: WATER DATE SAMPLED: 03/23/98 15:20:00

SAMPLED BY: Brown & Caldwell SAMPLE ID: MW-7

DATE RECEIVED: 03/24/98

		ANALYTICAL	DATA		
PARAMETER			RESULTS	DETECTION LIMIT	UNITS
Potassium, Diss Method 6010B * Analyzed by: P Date: 0	** S	08:19:00	ND	20	mg/L
Magnesium, Diss Method 6010B * Analyzed by: P Date: 0	** PS	08:19:00	47	1	mg/L
Sodium, Dissolve Method 6010B * Analyzed by: Pa Date: 0	** S	08:19:00	92	5	mg/L
Dissolved Metal Method 3005A * Analyzed by: G Date: 0	** J	20:30:00	03/24/98		
Silver, Total Method 6010B * Analyzed by: Pa Date: 0	S	08:09:00	ND	0.01	mg/L
Arsenic, Total Method 7060A ** Analyzed by: JI Date: 04	M	13:14:00	ND	0.005	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/07/98

ertificate of Analysis No. H9-9803B00-01

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT NO: 2832.13

PROJECT: BJ Hobbs SITE: Hobbs, NM

MATRIX: WATER

SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/23/98 15:20:00 DATE RECEIVED: 03/24/98

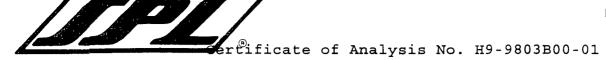
SAMPLE ID: MW-7

	ANALYTI	CAL DATA		
PARAMETER		RESULTS	DETECTION LIMIT	UNITS
Barium, Total Method 6010B *: Analyzed by: Pi Date: 03		0.059	0.005	mg/L
Cadmium, Total Method 6010B ** Analyzed by: PS Date: 03		ND	0.005	mg/L
Chromium, Total Method 6010B ** Analyzed by: PS Date: 03		ND	0.01	mg/L
Mercury, Total Method 7470 A** Analyzed by: A0 Date: 03		ND	0.0002	mg/L
Hardness-Total a Method 130.2 * Analyzed by: KS Date: 04		670	10	mg/L CaCO3
Acid Digestion-A Method 3010A ** Analyzed by: SF Date: 03	* *	03/25/98		

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.



HOUSTON LABORATORY 8880 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/07/98

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT NO: 2832.13

PROJECT: BJ Hobbs SITE: Hobbs, NM

MATRIX: WATER

SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/23/98 15:20:00

SAMPLE ID: MW-7

DATE RECEIVED: 03/24/98

ANALYTICAI	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Acid Digestion-Aqueous, GF Method 3020A *** Analyzed by: SRC Date: 03/26/98 08:30:00	03/26/98	DIMII	
Lead, Total Method 7421 *** Analyzed by: PB Date: 04/03/98 10:04:00	ND	0.005	mg/L
Selenium, Total Method 7740 *** Analyzed by: JM Date: 04/02/98 13:14:00	ND	0.005	mg/L
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: JS Date: 03/24/98 11:30:00	ND	1	mg/L
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: JS Date: 03/24/98 11:30:00	309	1	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed. ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Certificate of Analysis No. H9-9803B00-01

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

04/23/98

PROJECT: BJ Hobbs
SITE: Hobbs, NM

PROJECT NO: 2832.13
MATRIX: WATER

SAMPLED BY: Brown & Caldwell DATE SAMPLED: 03/23/98 15:20:00

SAMPLE ID: MW-7 DATE RECEIVED: 03/24/98

AN	ALYTICAL DATA			· · · · · · · · · · · · · · · · · · ·	
PARAMETER	RESU	LTS	PQL*		UNITS
Naphthalene		ND	0.1		ug/L
Acenaphthylene		ND	0.1		ug/L
Acenaphthene		ND	0.3		ug/L
Fluorene		ND	0.3		\mathtt{ug}/\mathtt{L}
Phenanthrene		ND	0.1		${\tt ug/L}$
Anthracene		ND	0.1		\mathtt{ug}/\mathtt{L}
Fluoranthene		ND	0.1		\mathtt{ug}/\mathtt{L}
Pyrene		ND	0.1		${\tt ug/L}$
Chrysene		ND	0.1		\mathtt{ug}/\mathtt{L}
Benzo (a) anthracene		ND	0.1		${\tt ug/L}$
Benzo (b) fluoranthene		ND	0.1		${\tt ug/L}$
Benzo (k) fluoranthene		ND	0.1		\mathtt{ug}/\mathtt{L}
Benzo (a) pyrene		ND	0.1		\mathtt{ug}/\mathtt{L}
Dibenzo (a,h) anthracene		ND	0.1		${\tt ug/L}$
Benzo (g,h,i) perylene		ND	0.1		ug/L
Indeno (1,2,3-cd) pyrene		ND	0.1		ug/L
SURROGATES	AMOUNT	ક		LOWER	UPPER
	SPIKED		OVERY	LIMIT	LIMIT
1-Fluoronaphthalene	0.20 ug/L	*CT3 C	50	50	150
Phenanthrene d-10	0.20 ug/L		74	50	150

ANALYZED BY: KA DATE/TIME: 04/04/98 03:30:10 EXTRACTED BY: AM DATE/TIME: 03/31/98 08:00:00

METHOD: 8310 Polynuclear Aromatic Hydrocarbons

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B00-02

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/07/98

PROJECT NO: 2832.13 PROJECT: BJ Hobbs SITE: Hobbs, NM

MATRIX: WATER

SAMPLED BY: Brown & Caldwell **DATE SAMPLED:** 03/23/98 15:55:00

SAMPLE ID: MW-8 DATE RECEIVED: 03/24/98

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Gasoline Range Organics	ND	0.1 P	mg/L
Surrogate 4-Bromofluorobenzene 1,4-Difluorobenzene Method 8015B *** for Gasoline Analyzed by: VHZ Date: 03/27/98	% Recovery 107 93		
BENZENE TOLUENE ETHYLBENZENE TOTAL XYLENE TOTAL VOLATILE AROMATIC HYDROCARBONS	ND ND ND ND ND	1.0 P 1.0 P 1.0 P 1.0 P	μg/L μg/L μg/L μg/L μg/L
Surrogate 1,4-Difluorobenzene 4-Bromofluorobenzene Method 8020A *** Analyzed by: VHZ Date: 03/27/98	% Recovery 100 93		
Total Petroleum Hydrocarbons-Diesel	ND	0.20 P	mg/L
Surrogate n-Pentacosane Method 8015B *** for Diesel Analyzed by: RR Date: 03/27/98 07:42:00	% Recovery 70		

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed. ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

⁽P) - Practical Quantitation Limit



ertificate of Analysis No. H9-9803B00-02

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/07/98

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT NO: 2832.13

PROJECT: BJ Hobbs SITE: Hobbs, NM

MATRIX: WATER

SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/23/98 15:55:00

SAMPLE ID: MW-8

DATE RECEIVED: 03/24/98

		ANALYTICAL			
PARAMETER			RESULTS	DETECTION LIMIT	UNITS
Methane RSKSOP-147 Analyzed by: Date:	JDR 04/01/98	05:40:00	0.039	0.0012 P	mqq
Chloride Method 325.3 Analyzed by: Date:		09:00:00	364	5	mg/L
Fluoride Method 300.0 Analyzed by: Date:		13:00:00	0.9	0.5	mg/L
Nitrate nitro Method 353.3 Analyzed by: Date:	*	12:00:00	1.84	0.05	mg/L
Sulfate Method 375.4 Analyzed by: Date:		12:30:00	250	25	mg/L
Calcium, Disso Method 6010B Analyzed by: Date:	***	08:19:00	215	1	mg/L

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B00-02

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/07/98

PROJECT: BJ Hobbs

PROJECT NO: 2832.13

SITE: Hobbs, NM

MATRIX: WATER

SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/23/98 15:55:00

SAMPLE ID: MW-8

DATE RECEIVED: 03/24/98

		ANALYTICAL	DATA		
PARAMETER			RESULTS	DETECTION LIMIT	UNITS
Potassium, Diss Method 6010B Analyzed by: Date: 0	* * *	08:19:00	ND	20	mg/L
Magnesium, Dis Method 6010B Analyzed by: 1 Date: 0	* * *	08:19:00	52	1	mg/L
Sodium, Dissolv Method 6010B : Analyzed by: I Date: 0	* * *	08:19:00	101	5	mg/L
Dissolved Metal Method 3005A Analyzed by: (Date: (***	20:30:00	03/24/98		
Silver, Total Method 6010B Analyzed by: I Date: (08:09:00	ND	0.01	mg/L
Arsenic, Total Method 7060A Analyzed by: 3 Date: 0		13:14:00	ND	0.005	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B00-02

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/07/98

PROJECT: BJ Hobbs

MATRIX: WATER

PROJECT NO: 2832.13

SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/23/98 15:55:00

SAMPLE ID: MW-8

SITE: Hobbs, NM

DATE RECEIVED: 03/24/98

ANALYTICA	L DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Barium, Total Method 6010B *** Analyzed by: PS Date: 03/26/98 08:09:00	0.074	0.005	mg/L
Cadmium, Total Method 6010B *** Analyzed by: PS Date: 03/26/98 08:09:00	ND	0.005	mg/L
Chromium, Total Method 6010B *** Analyzed by: PS Date: 03/26/98 08:09:00	ND	0.01	mg/L
Mercury, Total Method 7470 A*** Analyzed by: AG Date: 03/25/98 14:22:00	0.0003	0.0002	mg/L
Hardness-Total as CaCO3 Method 130.2 * Analyzed by: KS Date: 04/01/98 08:45:00	740	10	mg/L CaCO3
Acid Digestion-Aqueous, ICP Method 3010A *** Analyzed by: SRC Date: 03/25/98 08:30:00	03/25/98		

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B00-02

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/07/98

PROJECT: BJ Hobbs

PROJECT NO: 2832.13

SITE: Hobbs, NM

MATRIX: WATER

SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/23/98 15:55:00

SAMPLE ID: MW-8

DATE RECEIVED: 03/24/98

ANALYTICA	L DATA		
PARAMETER	RESULTS	DETECTION	UNITS
Acid Digestion-Aqueous, GF Method 3020A *** Analyzed by: SRC Date: 03/26/98 08:30:00	03/26/98	LIMIT	
Lead, Total Method 7421 *** Analyzed by: PB Date: 04/03/98 10:04:00	ND	0.005	mg/L
Selenium, Total Method 7740 *** Analyzed by: JM Date: 04/02/98 13:14:00	ND	0.005	mg/L
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: JS Date: 03/24/98 11:30:00	ND	1	mg/L
icarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: JS Date: 03/24/98 11:30:00	260	1	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Certificate of Analysis No. H9-9803B00-02

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

04/23/98

PROJECT: BJ Hobbs
SITE: Hobbs, NM

PROJECT NO: 2832.13
MATRIX: WATER

SAMPLED BY: Brown & Caldwell DATE SAMPLED: 03/23/98 15:55:00

SAMPLE ID: MW-8 DATE RECEIVED: 03/24/98

ALYTICAL DATA				
RES'	ULTS	PQL*		UNITS
	ND	0.1		${\tt ug/L}$
	ND	0.1		${\tt ug/L}$
	ND	0.3		${\tt ug/L}$
	ND			ug/L
	ND	0.1		ug/L
	ND	0.1		ug/L
				ug/L
				ug/L
				\mathtt{ug}/\mathtt{L}
				ug/L
	ND	0.1		ug/L
AMOUNT	ક		LOWER	UPPER
SPIKED	RECO	VERY	LIMIT	LIMIT
$0.20~\mathrm{ug/L}$	45		50	150
$0.20~\mathrm{ug/L}$		73	50	150
	AMOUNT SPIKED	ND ND ND ND ND ND ND ND ND ND ND ND ND N	RESULTS PQL* ND 0.1 ND 0.1 ND 0.3 ND 0.3 ND 0.3 ND 0.1	RESULTS PQL* ND 0.1 ND 0.1 ND 0.3 ND 0.3 ND 0.1 ND ND ND ND ND ND ND N

ANALYZED BY: KA DATE/TIME: 04/04/98 04:06:19 EXTRACTED BY: AM DATE/TIME: 03/31/98 08:00:00

METHOD: 8310 Polynuclear Aromatic Hydrocarbons

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

MI - Matrix Interference.

COMMENTS:



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

rtificate of Analysis No. H9-9803B00-03

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/07/98

PROJECT: BJ Hobbs

PROJECT NO: 2832.13

SITE: Hobbs, NM

MATRIX: WATER

SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/23/98 16:30:00 DATE RECEIVED: 03/24/98

SAMPLE ID: MW-5

ANALYTICAL	DATA				
PARAMETER	RI	ESULTS	DETEC		UNITS
Gasoline Range Organics		ND	0.1 F		mg/L
Surrogate 4-Bromofluorobenzene 1,4-Difluorobenzene Method 8015B *** for Gasoline Analyzed by: VHZ Date: 03/27/98	% Red	110 93			
BENZENE TOLUENE ETHYLBENZENE TOTAL XYLENE TOTAL VOLATILE AROMATIC HYDROCARBONS		ND ND ND ND ND	1.0 P 1.0 P 1.0 P)	μg/L μg/L μg/L μg/L μg/L
Surrogate 1,4-Difluorobenzene 4-Bromofluorobenzene Method 8020A *** Analyzed by: VHZ Date: 03/27/98	% Rec	103 93			
Total Petroleum Hydrocarbons-Diesel		ND	0.20 P		mg/L
Surrogate n-Pentacosane Method 8015B *** for Diesel	% Rec	overy 84			

ND - Not detected.

Analyzed by: RR

Date: 03/27/98 08:28:00

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed. ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.



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ertificate of Analysis No. H9-9803B00-03

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/07/98

PROJECT: BJ Hobbs

PROJECT NO: 2832.13

SITE: Hobbs, NM

MATRIX: WATER

SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/23/98 16:30:00 DATE RECEIVED: 03/24/98

SAMPLE ID: MW-5

ANALYTICAL DATA PARAMETER RESULTS DETECTION UNITS LIMIT ND 0.0012 P Methane ppm RSKSOP-147 Analyzed by: JDR Date: 04/02/98 09:08:00 Chloride 151 5 mq/LMethod 325.3 * Analyzed by: TV Date: 04/04/98 09:00:00 Fluoride 0.6 0.5 mg/L Method 300.0 * Analyzed by: EM Date: 03/25/98 13:00:00 Nitrate nitrogen(as N) 3.87 0.05 mg/L Method 353.3 * Analyzed by: EM Date: 03/25/98 12:00:00 Sulfate 190 25 mq/LMethod 375.4 * Analyzed by: EM Date: 04/02/98 12:30:00 Calcium, Dissolved 109 1 mq/LMethod 6010B *** Analyzed by: PS Date: 03/25/98 08:19:00

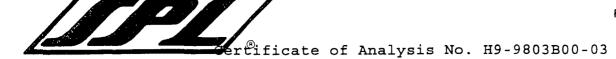
ND - Not detected.

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/07/98

PROJECT: BJ Hobbs

PROJECT NO: 2832.13

SITE: Hobbs, NM

MATRIX: WATER

SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/23/98 16:30:00

SAMPLE ID: MW-5

DATE RECEIVED: 03/24/98

ANALYTI	CAL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Barium, Total Method 6010B *** Analyzed by: PS Date: 03/26/98 08:09:00	0.044	0.005	mg/L
Cadmium, Total Method 6010B *** Analyzed by: PS Date: 03/26/98 08:09:00	ND	0.005	mg/L
Chromium, Total Method 6010B *** Analyzed by: PS Date: 03/26/98 08:09:00	ND	0.01	mg/L
Mercury, Total Method 7470 A*** Analyzed by: AG Date: 03/25/98 14:22:00	ND	0.0002	mg/L
Hardness-Total as CaCO3 Method 130.2 * Analyzed by: KS Date: 04/01/98 08:45:00	342	5	mg/L CaCO3
Acid Digestion-Aqueous, ICP Method 3010A *** Analyzed by: SRC Date: 03/25/98 08:30:00	03/25/98		

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B00-03

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/07/98

PROJECT: BJ Hobbs

PROJECT NO: 2832.13

SITE: Hobbs, NM

MATRIX: WATER

SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/23/98 16:30:00

SAMPLE ID: MW-5

DATE RECEIVED: 03/24/98

	ANALYTICAL D	ATA		
PARAMETER		RESULTS	DETECTION LIMIT	UNITS
Potassium, Dissolved Method 6010B *** Analyzed by: PS		ND	20	mg/L
Date: 03/25/9	8 08:19:00			
Magnesium, Dissolved Method 6010B *** Analyzed by: PS		20	1	mg/L
Date: 03/25/9	8 08:19:00			
Sodium, Dissolved Method 6010B *** Analyzed by: PS		130	5	mg/L
Date: 03/25/9	8 08:19:00			
Dissolved Metals Prep Method 3005A *** Analyzed by: GJ		03/24/98		
Date: 04/24/9	8 20:30:00			
Silver, Total Method 6010B *** Analyzed by: PS Date: 03/26/9	8 08:09:00	ND	0.01	mg/L
Argonia Metal		0 007	0 005	/ T
Arsenic, Total Method 7060A *** Analyzed by: JM		0.007	0.005	mg/L
Date: 04/02/9	3 13:14:00			

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/07/98

ertificate of Analysis No. H9-9803B00-03

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT NO: 2832.13

MATRIX: WATER

SITE: Hobbs, NM
SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/23/98 16:30:00

SAMPLE ID: MW-5

PROJECT: BJ Hobbs

DATE RECEIVED: 03/24/98

ANALYTIC	AL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Acid Digestion-Aqueous, GF Method 3020A *** Analyzed by: SRC Date: 03/26/98 08:30:00	03/26/98	2444	
Lead, Total Method 7421 *** Analyzed by: PB Date: 04/03/98 10:04:00	ND	0.005	mg/L
Selenium, Total Method 7740 *** Analyzed by: JM Date: 04/02/98 13:14:00	ND	0.005	mg/L
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: JS Date: 03/24/98 11:30:00	ND	1	mg/L
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: JS Date: 03/24/98 11:30:00	247	1	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.





8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Southern Petroleum Laboratories, Inc.

Certificate of Analysis Number: 98-03-B00

Approved for Release by:

Bernadette A. Fini, Project Manager

Date

Greg Grandits
Laboratory Director

Cynthia Schreiner Quality Assurance Officer

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8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B00-01

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/07/98

PROJECT: BJ Hobbs

MATRIX: WATER

PROJECT NO: 2832.13

SITE: Hobbs, NM
SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/23/98 15:20:00

SAMPLE ID: MW-7

DATE RECEIVED: 03/24/98

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Gasoline Range Organics	ND	0.1 P	mg/L
Surrogate 4-Bromofluorobenzene 1,4-Difluorobenzene Method 8015B *** for Gasoline Analyzed by: VHZ Date: 03/27/98	% Recovery 107 97		
BENZENE TOLUENE ETHYLBENZENE TOTAL XYLENE TOTAL VOLATILE AROMATIC HYDROCARBONS	ND ND ND ND ND	1.0 P 1.0 P 1.0 P 1.0 P	μg/L μg/L μg/L μg/L μg/L
Surrogate 1,4-Difluorobenzene 4-Bromofluorobenzene Method 8020A *** Analyzed by: VHZ Date: 03/27/98	% Recovery 107 90		
Total Petroleum Hydrocarbons-Diesel	ND	0.20 P	mg/L
Surrogate n-Pentacosane Method 8015B *** for Diesel Analyzed by: RR	% Recovery 84		

ND - Not detected.

Date: 03/27/98 06:56:00

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed. ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Certificate of Analysis No. H9-9803B00-03

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

04/23/98

PROJECT: BJ Hobbs
SITE: Hobbs, NM

PROJECT NO: 2832.13
MATRIX: WATER

SAMPLED BY: Brown & Caldwell DATE SAMPLED: 03/23/98 16:30:00

SAMPLE ID: MW-5 DATE RECEIVED: 03/24/98

AN	ALYTICAL DATA				
PARAMETER	RESUI	LTS	PQL*		UNITS
Naphthalene		ND	0.1		ug/L
Acenaphthylene		ND	0.1		ug/L
Acenaphthene		ND	0.3		ug/L
Fluorene		ND	0.3		ug/L
Phenanthrene		ND	0.1		ug/L
Anthracene		ND	0.1		ug/L
Fluoranthene		ND	0.1		ug/L
Pyrene		ND	0.1		ug/L
Chrysene		ND	0.1		ug/L
Benzo (a) anthracene		ND	0.1		ug/L
Benzo (b) fluoranthene		ND	0.1		ug/L
Benzo (k) fluoranthene		ND	0.1		ug/L
Benzo (a) pyrene		ND	0.1		ug/L
Dibenzo (a,h) anthracene		ND	0.1		ug/L
Benzo (g,h,i) perylene		ND	0.1		ug/L
Indeno (1,2,3-cd) pyrene		ND	0.1		ug/L
SURROGATES	AMOUNT	8		LOWER	UPPER
	SPIKED	RECOVE	RY	LIMIT	LIMIT
1-Fluoronaphthalene	0.20 ug/L	49 MI		50	150
Phenanthrene d-10	0.20 ug/L	74	:	50	150

ANALYZED BY: KA DATE/TIME: 04/04/98 04:42:29 EXTRACTED BY: AM DATE/TIME: 03/31/98 08:00:00

METHOD: 8310 Polynuclear Aromatic Hydrocarbons

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

MI - Matrix Interference.

COMMENTS:

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B00-04

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/07/98

PROJECT: BJ Hobbs
SITE: Hobbs, NM

PROJECT NO: 2832.13
MATRIX: WATER

SAMPLED BY: Brown & Caldwell DATE SAMPLED: 03/23/98 17:05:00

SAMPLE ID: MW-6 DATE RECEIVED: 03/24/98

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Gasoline Range Organics	ND	0.1 P	mg/I
Surrogate 4-Bromofluorobenzene 1,4-Difluorobenzene Method 8015B *** for Gasoline Analyzed by: VHZ Date: 03/27/98	% Recovery 100 90		
BENZENE TOLUENE ETHYLBENZENE TOTAL XYLENE TOTAL VOLATILE AROMATIC HYDROCARBONS	3.6 ND 4.0 ND 7.6	1.0 P 1.0 P	μg/I μg/I μg/I μg/I
Surrogate 1,4-Difluorobenzene 4-Bromofluorobenzene Method 8020A *** Analyzed by: VHZ Date: 03/27/98	% Recovery 100 97		
Total Petroleum Hydrocarbons-Diesel	ND	0.20 P	mg/L
Surrogate n-Pentacosane Method 8015B *** for Diesel	% Recovery 80		

Analyzed by: RR

Date: 03/30/98 07:53:00

ND - Not detected.

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed. ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B00-04

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/07/98

PROJECT: BJ Hobbs
SITE: Hobbs, NM
MATRIX: WATER

SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/23/98 17:05:00

SAMPLE ID: MW-6 DATE RECEIVED: 03/24/98

		ANALYTICAL	DATA		
PARAMETER			RESULTS	DETECTI LIMIT	ON UNITS
Methane RSKSOP-147 Analyzed by: Date:	JDR 04/02/98	09:24:00	ND	0.0012 P	ppm
Chloride Method 325.3 Analyzed by: Date:		09:00:00	183	5	mg/L
Fluoride Method 300.0 Analyzed by: Date:		13:00:00	1.1	0.5	mg/L
Nitrate nitrog Method 353.3 Analyzed by: Date:	*	12:00:00	0.69	0.05	mg/L
Sulfate Method 375.4 Analyzed by: Date:		12:30:00	230	25	mg/L
Calcium, Disso Method 6010B Analyzed by: Date:	* * *	08:19:00	94	1	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

⁽P) - Practical Quantitation Limit



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Pertificate of Analysis No. H9-9803B00-04

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/07/98

PROJECT: BJ Hobbs

PROJECT NO: 2832.13

SITE: Hobbs, NM

MATRIX: WATER

SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/23/98 17:05:00

SAMPLE ID: MW-6

DATE RECEIVED: 03/24/98

PARAMETER	ANALYTICAL	DATA RESULTS	DETECTION	UNITS
PARAMEIER		KESULIS	LIMIT	ONIIS
Potassium, Dissolved Method 6010B *** Analyzed by: PS Date: 03/25/98	08:19:00	ND	20	mg/L
Magnesium, Dissolved Method 6010B *** Analyzed by: PS Date: 03/25/98		42	1	mg/L
Date: 03/23/30	00.19.00			
Sodium, Dissolved Method 6010B *** Analyzed by: PS Date: 03/25/98	08:19:00	100	5	mg/L
Dissolved Metals Prep. Method 3005A *** Analyzed by: GJ Date: 04/24/98	20:30:00	03/24/98		
Silver, Total Method 6010B *** Analyzed by: PS Date: 03/26/98	08:09:00	ND	0.01	mg/L
Arsenic, Total Method 7060A *** Analyzed by: JM Date: 04/02/98	13:14:00	0.013	0.005	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.



8880 HC

ertificate of Analysis No. H9-9803B00-04

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/07/98

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT NO: 2832.13

MATRIX: WATER

PROJECT: BJ Hobbs SITE: Hobbs, NM

DATE SAMPLED: 03/23/98 17:05:00

SAMPLED BY: Brown & Caldwell

DATE RECEIVED: 03/24/98

SAMPLE ID: MW-6

AN	ALYTICAL DATA		
PARAMETER	RESULTS	DETECTIC LIMIT	N UNITS
Barium, Total Method 6010B *** Analyzed by: PS		0.005	mg/L
Date: 03/26/98 08:09:	00		
Cadmium, Total Method 6010B *** Analyzed by: PS Date: 03/26/98 08:09:	ND	0.005	mg/L
hromium, Total Method 6010B *** Analyzed by: PS Date: 03/26/98 08:09:		0.01	mg/L
Mercury, Total Method 7470 A*** Analyzed by: AG Date: 03/25/98 14:22:	ND	0.0002	mg/L
Mardness-Total as CaCO3 Method 130.2 * Analyzed by: KS Date: 04/01/98 08:45:	440	10	mg/L CaCO3
Acid Digestion-Aqueous, ICP Method 3010A ***	03/25/98		

ND - Not detected.

Analyzed by: SRC

Date: 03/25/98 08:30:00

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B00-04

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/07/98

PROJECT: BJ Hobbs PROJECT NO: 2832.13

SITE: Hobbs, NM MATRIX: WATER

SAMPLED BY: Brown & Caldwell

SAMPLE ID: MW-6

DATE SAMPLED: 03/23/98 17:05:00

DATE RECEIVED: 03/24/98

ANALYTICA	L DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Acid Digestion-Aqueous, GF Method 3020A *** Analyzed by: SRC Date: 03/26/98 08:30:00	03/26/98	HIMII	
Lead, Total Method 7421 *** Analyzed by: PB Date: 04/03/98 10:04:00	ND	0.005	mg/L
Selenium, Total Method 7740 *** Analyzed by: JM Date: 04/02/98 13:14:00	ND	0.005	mg/L
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: JS Date: 03/24/98 11:30:00	ND	1	mg/L
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: JS Date: 03/24/98 11:30:00	180	1	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed. ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Certificate of Analysis No. H9-9803B00-04

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

04/23/98

PROJECT: BJ Hobbs
SITE: Hobbs, NM

PROJECT NO: 2832.13
MATRIX: WATER

SAMPLED BY: Brown & Caldwell DATE SAMPLED: 03/23/98 17:05:00

SAMPLE ID: MW-6 DATE RECEIVED: 03/24/98

AN	ALYTICAL DATA				
PARAMETER	RES	JLTS	PQL*		UNITS
Naphthalene		ND	0.1		\mathtt{ug}/\mathtt{L}
Acenaphthylene		ND	0.1		\mathtt{ug}/\mathtt{L}
Acenaphthene		ND	0.3		ug/L
Fluorene		ND	0.3		\mathtt{ug}/\mathtt{L}
Phenanthrene		ND	0.1		ug/L
Anthracene		ND	0.1		ug/L
Fluoranthene		ND	0.1		ug/L
Pyrene		ND	0.1		ug/L
Chrysene		ND	0.1		ug/L
Benzo (a) anthracene		ND	0.1		ug/L
Benzo (b) fluoranthene		ND	0.1		ug/L
Benzo (k) fluoranthene		ND	0.1		ug/L
Benzo (a) pyrene		ND	0.1		ug/L
Dibenzo (a,h) anthracene		ND	0.1		ug/L
Benzo (g,h,i) perylene		ND	0.1		ug/L
Indeno (1,2,3-cd) pyrene		ND	0.1		ug/L
SURROGATES	AMOUNT	8		LOWER	UPPER
	SPIKED	RECO	VERY	LIMIT	LIMIT
1-Fluoronaphthalene	$0.20~\mathrm{ug/L}$	44	MI	50	150
Phenanthrene d-10	$0.20~\mathrm{ug/L}$		75	50	150

ANALYZED BY: KA DATE/TIME: 04/07/98 12:30:23 EXTRACTED BY: AM DATE/TIME: 03/31/98 08:00:00

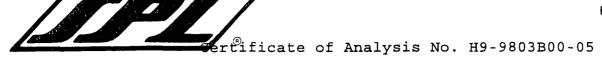
METHOD: 8310 Polynuclear Aromatic Hydrocarbons

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

MI - Matrix Interference.

COMMENTS:



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/07/98

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT: BJ Hobbs

PROJECT NO: 2832.13

SITE: Hobbs, NM MATRIX: WATER SAMPLED BY: Brown & Caldwell DATE SAMPLED: 03/23/98 18:05:00

SAMPLE ID: MW-10 DATE RECEIVED: 03/24/98

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Gasoline Range Organics	ND	0.5 P	${\tt mg/L}$
Surrogate	% Recovery		
4-Bromofluorobenzene	100		
1,4-Difluorobenzene Method 8015B *** for Gasoline Analyzed by: VHZ	87		
Date: 03/27/98			
BENZENE	36	5.0 P	μg/L
TOLUENE	ND	5.0 P	$\mu g/L$
ETHYLBENZENE	5.9	5.0 P	$\mu g/L$
TOTAL XYLENE	ND	5.0 P	μg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	41.9		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	100		
4-Bromofluorobenzene Method 8020A ***	93		
Analyzed by: VHZ			
Date: 03/27/98			
Total Petroleum Hydrocarbons-Diesel	1.6	0.20 P	mg/L
Surrogate	% Recovery		
n-Pentacosane Method 8015B *** for Diesel	82		

ND - Not detected.

Analyzed by: RR

Date: 03/27/98 09:59:00

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C24 that do not resemble a diesel pattern.(C10-C24) RR QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

ertificate of Analysis No. H9-9803B00-05

HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/07/98

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT: BJ Hobbs

SAMPLED BY: Brown & Caldwell

SITE: Hobbs, NM

SAMPLE ID: MW-10

PROJECT NO: 2832.13

JECI NO: 2032.13

DATE SAMPLED: 03/23/98 18:05:00

MATRIX: WATER

DATE RECEIVED: 03/24/98

		ANALYTICAL	DATA		
PARAMETER			RESULTS	DETECTION LIMIT	UNITS
Methane RSKSOP-147 Analyzed by: Date:	JDR 04/02/98	09:38:00	0.91	0.024 P	mqq
Chloride Method 325.3 Analyzed by: Date:		09:00:00	2390	50	mg/L
Fluoride Method 300.0 Analyzed by: Date:		13:00:00	6.1	0.5	mg/L
Witrate nitrog Method 353.3 Analyzed by: Date:	*	12:00:00	0.07	0.05	mg/L
Sulfate Method 375.4 Analyzed by: Date:		12:30:00	320	25	mg/L
Calcium, Disso Method 6010B Analyzed by:	***		417	1	mg/L

⁽P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C24 that do not resemble a diesel pattern.(C10-C24) RR QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/07/98

rtificate of Analysis No. H9-9803B00-05

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT NO: 2832.13

MATRIX: WATER

SITE: Hobbs, NM
SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/23/98 18:05:00

SAMPLE ID: MW-10

PROJECT: BJ Hobbs

DATE RECEIVED: 03/24/98

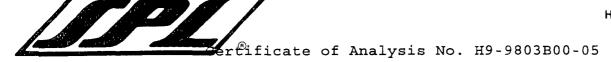
		ANALYTICAL	DATA		
PARAMETER			RESULTS	DETECTION LIMIT	UNITS
Potassium, Dis Method 6010B Analyzed by: Date:	* * *	08:19:00	20	20	mg/L
Magnesium, Dis Method 6010B Analyzed by: Date:	* * *	08:19:00	130	1	mg/L
Sodium, Dissol Method 6010B Analyzed by: Date:	***	08:19:00	1090	5	mg/L
Dissolved Meta Method 3005A Analyzed by: Date:	* * *	20:30:00	03/24/98		
Silver, Total Method 6010B Analyzed by: Date:		08:09:00	ND	0.01	mg/L
Arsenic, Total Method 7060A Analyzed by: Date:	***	13:14:00	0.035	0.005	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C24 that do not resemble a diesel pattern.(C10-C24) RR QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/07/98

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT NO: 2832.13

PROJECT: BJ Hobbs MATRIX: WATER SITE: Hobbs, NM

SAMPLED BY: Brown & Caldwell **DATE SAMPLED:** 03/23/98 18:05:00

DATE RECEIVED: 03/24/98 SAMPLE ID: MW-10

	ANALYTICAL	DATA		
PARAMETER		RESULTS	DETECTION	UNITS
Barium, Total Method 6010B *** Analyzed by: PS		0.287	0.005	mg/L
Date: 03/26/98	08:09:00			
Cadmium, Total Method 6010B *** Analyzed by: PS Date: 03/26/98	08.09.00	ND	0.005	mg/L
Chromium, Total Method 6010B *** Analyzed by: PS	00.09.00	ND	0.01	mg/L
Date: 03/26/98	08:09:00			
Mercury, Total Method 7470 A*** Analyzed by: AG Date: 03/25/98	14:22:00	ND	0.0002	mg/L
Hardness-Total as CaCO3 Method 130.2 * Analyzed by: KS Date: 04/01/98		1450	50	mg/L CaCO3

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed. ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C24 that do not resemble a diesel pattern. (C10-C24) RR

ertificate of Analysis No. H9-9803B00-05

HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/07/98

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT NO: 2832.13

MATRIX: WATER

SITE: Hobbs, NM SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/23/98 18:05:00

SAMPLE ID: MW-10

PROJECT: BJ Hobbs

DATE RECEIVED: 03/24/98

ANALYTICA	L DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Acid Digestion-Aqueous, ICP Method 3010A *** Analyzed by: SRC Date: 03/25/98 08:30:00	03/25/98	LIMIT	
Acid Digestion-Aqueous, GF Method 3020A *** Analyzed by: SRC Date: 03/26/98 08:30:00	03/26/98		
Lead, Total Method 7421 *** Analyzed by: PB Date: 04/03/98 10:04:00	ND	0.005	mg/L
Selenium, Total Method 7740 *** Analyzed by: JM Date: 04/02/98 13:14:00	ND	0.005	mg/L
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: JS Date: 03/24/98 11:30:00	ND	1	mg/L
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: JS Date: 03/24/98 11:30:00	557	1	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C24 that do not resemble a diesel pattern.(C10-C24) RR QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Certificate of Analysis No. H9-9803B00-05

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

04/23/98

PROJECT: BJ Hobbs
SITE: Hobbs, NM

PROJECT NO: 2832.13
MATRIX: WATER

SAMPLED BY: Brown & Caldwell DATE SAMPLED: 03/23/98 18:05:00

SAMPLE ID: MW-10 DATE RECEIVED: 03/24/98

λ	NALYTICAL DATA				
PARAMETER	RESU	LTS	PQL*		UNITS
Naphthalene		8	1.0		ug/L
Acenaphthylene		ND	0.1		ug/L
Acenaphthene		ND	0.3		ug/L
Fluorene		ND	0.3		ug/L
Phenanthrene		ND	0.1		\mathtt{ug}/\mathtt{L}
Anthracene		ND	0.1		\mathtt{ug}/\mathtt{L}
Fluoranthene		ND	0.1		ug/L
Pyrene		ND	0.1		\mathtt{ug}/\mathtt{L}
Chrysene		ND	0.1		\mathtt{ug}/\mathtt{L}
Benzo (a) anthracene		ND	0.1		ug/L
Benzo (b) fluoranthene		ND	0.1		${\tt ug/L}$
Benzo (k) fluoranthene		ND	0.1		ug/L
Benzo (a) pyrene		ND	0.1		\mathtt{ug}/\mathtt{L}
Dibenzo (a,h) anthracene		ND	0.1		ug/L
Benzo (g,h,i) perylene		ND	0.1		ug/L
Indeno (1,2,3-cd) pyrene		ND	0.1		ug/L
SURROGATES	AMOUNT SPIKKD	% PRC	OVERY	LOWER	UPPER LIMIT
1-Fluoronaphthalene	0.20 ug/L	icuc.	81	50	150
Phenanthrene d-10	0.20 ug/L	151	-	50	150

ANALYZED BY: KA DATE/TIME: 04/07/98 13:06:31 EXTRACTED BY: AM DATE/TIME: 03/31/98 08:00:00

METHOD: 8310 Polynuclear Aromatic Hydrocarbons

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

MI - Matrix Interference.

COMMENTS:

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B00-06

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/07/98

PROJECT: BJ Hobbs PROJECT NO: 2832.13

SITE: Hobbs, NM MATRIX: WATER

SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/23/98 18:15:00

SAMPLE ID: MW-10D DATE RECEIVED: 03/24/98

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Gasoline Range Organics	0.18	0.1 P	mg/L
Surrogate 4-Bromofluorobenzene 1,4-Difluorobenzene Method 8015B *** for Gasoline Analyzed by: VHZ Date: 03/27/98	% Recovery 113 93		
BENZENE TOLUENE ETHYLBENZENE TOTAL XYLENE TOTAL VOLATILE AROMATIC HYDROCARBONS	36 ND 5.3 1.3 42.6	1.0 P 1.0 P	μg/L μg/L μg/L μg/L μg/L
Surrogate 1,4-Difluorobenzene 4-Bromofluorobenzene Method 8020A *** Analyzed by: VHZ Date: 03/27/98	% Recovery 103 100		
Total Petroleum Hydrocarbons-Diesel	1.7	0.20 P	mg/L
Surrogate n-Pentacosane Method 8015B *** for Diesel	% Recovery		

Analyzed by: RR

Date: 03/27/98 10:45:00

(P) - Practical Quantitation Limit ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed. ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C24 that do not resemble a diesel pattern.(C10-C24) RR QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 04/02/98

Analyzed on: 04/02/98

Analyst: JM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Arsenic, Total Method 7060A ***

SPL Sample ID Number	Blank Value ug/L		Measured Concentration ug/L	% Recovery	% QC Limit ecovery Recovery	
LCS	ND	40.00	38.91	97.3	80	- 120

-9804120

Samples in batch:

9803B00-01F	9803B00-02F	9803B00-03F	9803B00-04F
9803B00-05F	9803B04-01D	9803B04-02D	9803B04-03D

9803B04-04D 9803B04-06D

COMMENTS:

LCS=SPL ID#: 97-839-200-1



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

SPL QUALITY CONTROL REPORT **

Matrix:

Aqueous

Reported on: 04/02/98

Analyzed on: 04/01/98

Analyst: K

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Hardness-Total as CaCO3
Method 130.2 *

SPL Sample ID Number	Blank Value mg/L CaC	Concentration	Measured Concentration mg/L CaC	% Recovery	QC Limits Recovery	
LCS	ND	125.5	123	98.0	98 - 103	

-9804069

Samples in batch:

9803A25-01A	9803A25-02A	9803A25-03A	9803A25-04A
9803B00-01F	9803B00-02F	9803B00-03F	9803B00-04F
9803B00-05F	9803B04-01D	9803B04-02D	9803B04-03D
9803B04-04D	9803B04-05D	9803B04-06D	9803B08-02B
9803B08-05B	9803B08-08B	9803B08-11B	

COMMENTS:

SPL LCS ID# 94453182-14



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 04/02/98 Analyzed on: 04/02/98

Analyst: JM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Arsenic, Total Method 7060A ***

SPL Sample	Method	Sample	Spike	Matrix Spike		Matrix Spike Duplicate		RPD	QC LIMITS (Advisory)	
ID Number	Blank ug/L	Result ug/L	Added ug/L	Result ug/L	Recovery %	Result ug/L	Recovery %	(%)	RPD Max	% REC
9803B04-01D	ND	12.54	40.00	51.61	97.7	50.92	96.0	1.8	20	75 -125

-9804120

Samples in batch:

9803B00-01F 9803B00-02F 9803B00-03F 9803B00-04F 9803B00-05F 9803B04-01D 9803B04-02D 9803B04-03D 9803B04-04D 9803B04-06D

COMMENTS:

LCS=SPL ID#: 97-839-200-1



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 03/25/98 Analyzed on: 03/25/98

Analyst: AG

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

> Mercury, Total Method 7470 A***

SPL Sample ID Number	Blank Value ug/L		Measured % Concentration Recovery ug/L		_	Limits covery
LCS	ND	2.00	2.01	100	80	- 120

-9803939

Samples in batch:

9803B00-01F 9803B00-05F

9803B00-02F 9803B00-06F

9803B00-03F 9803B00-04F

COMMENTS: LCS = SPL ID# 94-452-39-6



** SPL QUALITY CONTROL REPORT **

HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Matrix: Aqueous

Reported on: 03/25/98 Analyzed on: 03/25/98

Analyst:

AG

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

> Mercury, Total Method 7470 A***

SPL Sample	 Method	Sample	Spike	Matri	ix Spike		ix Spike licate	RPD	1	QC LIM Adviso	
ID Number			*	Result		Result	Recovery	(왕)	RPD Max	암	REC
9803B00-01F	ND	ND	2.00	1.92	96.0	2.08	104	8.0	20	75	-125

-9803939

Samples in batch:

9803B00-01F 9803B00-02F 9803B00-03F

9803B00-04F

9803B00-05F 9803B00-06F

COMMENTS:

LCS = SPL ID# 94-452-39-6



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

SPL QUALITY CONTROL REPORT **

Matrix:

Aqueous

Reported on: 04/03/98

Analyzed on: 04/03/98

Analyst: PB

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Lead, Total Method 7421 ***

SPL Sample ID Number	Blank Value ug/L		Measured Concentration ug/L	% Recovery	QC Limits Recovery
LCS	ND	40.0	41.7	104	80 - 120

-9804176

Samples in batch:

9803B00-01F	9803B00-02F	9803B00-03F	9803B00-04F
9803B00-05F	9803B04-01D	9803B04-02D	9803B04-03D
9803B04-04D	9803B04-06D	9803B50-08C	9803B50-12C
9803B50-14C	9803B50-16C	9803B52-25C	

COMMENTS:

LCS= SPL ID# 97-839-200-1



** SPL QUALITY CONTROL REPORT **

HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Matrix: Aqueous

Reported on: 04/03/98 Analyzed on: 04/03/98 Analyst: PB

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Lead, Total Method 7421 ***

 SPL Sample	Method	 Sample	Spike	Matr	ix Spike	,	ıx Spike licate	RPD		QC LIMITS Advisory)
 1D Number 				Result		Result ug/L	Recovery	(왕)	RPD Max	ि है REC
9803B04-01D	ND	ND	40.0	41.6	104	42.5	106	1.9	20	75 -125

-9804176

Samples in batch:

9803B00-01F	9803B00-02F	9803B00-03F	9803B00-04F
9803B00-05F	9803B04-01D	9803B04-02D	9803B04-03D
9803B04-04D	9803B04-06D	9803B50-08C	9803B50-12C
9803B50-14C	2803B50-16C	9803B52-25C	

COMMENTS:

LCS= SPL ID# 97-839-200-1



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 04/02/98 Analyzed on: 04/02/98

Analyst: JM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Selenium, Total Method 7740 ***

SPL Sample ID Number	Blank Value ug/L		Measured Concentration ug/L	% Recovery	QC Limits Recovery
LCS	ND	40.00	37.07	92.7	80 - 120

-9804121

Samples in batch:

9803B00-01F	9803B00-02F	9803B00-03F	9803B00-04F
9803B00-05F	9803B04-01D	9803B04-02D	9803B04-03D
00000001 010	00000000000		

9803B04-04D 9803B04-06D

COMMENTS:

LCS=SPL ID#: 97-839-200-1

* VALUES OUTSIDE QC RANGE DUE TO MATRIX INTERFERENCE.



** SPL QUALITY CONTROL REPORT **

HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Matrix: Aqueous

Reported on: 04/02/98 Analyzed on: 04/02/98

Analyst: JM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Selenium, Total Method 7740 ***

 SPL Sample	Method	 Sample	 Spike	Matr:	lx Spike	•	ix Spike licate	RPD		QC LIMITS Advisory)
!	 Blank ug/L	•		:	-	Result ug/L	Recovery	(원)	RPD Max	% REC
J803B04-01D	ND	ND	40.90	21.63	54.1 #	23.39	58.5 🖈	7.8	20	75 -125

-9804121

Samples in batch:

9803B00-01F 9803B00-02F 9803B00-03F 9803B00-04F 9803B00-05F 9803B04-01D 9803B04-02D 9803B04-03D 9803B04-04D 9803B04-06D

COMMENTS:

LCS=SPL ID#: 97-839-200-1

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* VALUES OUTSIDE QC RANGE DUE TO MATRIX INTERFERENCE.



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

SPL QUALITY CONTROL REPORT **

Matrix:

Aqueous

Reported on: 03/25/98

Analyzed on: 03/24/98

Analyst:

JS

This sample was randomly selected for use in the SPL quality control program. The results are as follows:

> Carbonate, as CaCO3 Method SM 4500-CO2D **

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration mg/L	Duplicate Sample mg/L	RPD	RPD Max.
9803B00-02H	ND	ND	0	5

-9803960

Samples in batch:

9803B00-01H

9803B00-02H 9803B08-01C

9803B00-03H

9803B00-04H

9803B00-05H

9803B08-04C

9803B08-07C

9803B08-10C

COMMENTS:



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

SPL QUALITY CONTROL REPORT **

Matrix:

Aqueous

Reported on: 03/25/98

Analyzed on: 03/24/98

Analyst:

JS

This sample was randomly selected for use in the SPL quality control program. The results are as follows:

> Bicarbonate, as CaCO3 Method SM 4500-CO2D **

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration mg/L	Duplicate Sample mg/L	RPD	RPD Max.
9803B00-02H	260	259	0.4	5

-9803959

Samples in batch:

9803B00-05H

9803B00-01H 9803B00-02H 9803B00-03H 9803B00-04H

COMMENTS:



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 04/04/98 Analyzed on: 04/04/98

Analyst: TV

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Chloride
Method 325.3 *

SPL Sample ID Number	Blank Value MG/L	LCS Concentration MG/L	Measured Concentration MG/L	% Recovery	QC Limits Recovery
LCS	ND	170.0	168.39	99.1	94 - 106

-9804159

Samples in batch:

9803B00-01D	9803B00-02D	9803B00-03D	9803B00-04D
9803B00-05D	9803B04-01G	9803B04-02G	9803B04-03G
9803B04-04G	9803B04-05G	9803B04-06G	9803B58-01C
9803B58-02C	9803B60-01C	9803B60-02C	9804161-02B

9804161-03B COMMENTS:

LCS=SPL ID#94453182-13



** SPL QUALITY CONTROL REPORT **

HOUSTON LABORATORY 8880 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Matrix: Aqueous Reported on: 04/04/98 Analyzed on: 04/04/98

Analyst:

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Chloride Method 325.3 *

 SPL Sample	PL Sample Method Sample Spike		Matrix Spike 		Matrix Spike Duplicate		RPD	QC LIMITS (Advisory)		
•	:			Result		Result MG/L	Recovery	(%)	RPD Max	} REC
9803B04 - 05G	ND	42.36	50.0	92.17	99.6	91.99	99.3	0.3	5	92 -109

-9804158

Samples in batch:

0803B00-01D 7803B00-02D 9803B00-03D 9803B00-04D 9803B00-05D 9803B04-01G 9803B04-02G 9803B04-03G

9803B04-04G 9803B04-05G

COMMENTS:



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

SPL QUALITY CONTROL REPORT **

Matrix:

Aqueous

Reported on: 03/26/98

Analyzed on: 03/25/98

Analyst:

EM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

> Fluoride Method 300.0 *

SPL Sample ID Number	Blank Value mg/L		Measured Concentration mg/L	% Recovery	QC Limits Recovery	
LCS	ND	5.00	4.956	99.1	90 - 110	

-9803979

Samples in batch:

9803805-03B	9803844-01A	9803B00-01D	9803B00-02D
9803B00-03D	9803B00-04D	9803B00-05D	9803B04-01G
9803B04-02G	9803B04-03G	9803B04-04G	9803B04-05G
9803B04-06G	9803B58-01B	9803B58-02B	9803B60-01B

9803B60-02B COMMENTS:

SPL LCS#: 94453171-5



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Matrix: Agueous Reported on: 03/26/98 Analyzed on: 03/25/98 Analyst:

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

** SPL QUALITY CONTROL REPORT **

Fluoride Method 300.0 *

SPL Sample	Method	 Sample	 Spike	Matrix Spike		Matrix Spike Duplicate		RPD	QC LIMITS (Advisory)		
	 Blank mg/L	1		•		 Result mg/L	Recovery	(왕)	RPD Max	% REC	
1903805-03B	ND	0.818	2.000	2.810	99.6	2.773	97.3	1.8	20	80 -120	

-9803977

Samples in batch:

·803805-03B 0803844-01A 0803B00-01D 9803B00-02D 9803B04-01G 9403B00-05D

COMMENTS:



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 03/26/98 Analyzed on: 03/25/98

Analyst: EM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Nitrate nitrogen(as N)
Method 353.3 *

SPL Sample ID Number	Blank Value mg/L		Measured Concentration mg/L	% Recovery	QC Limits Recovery
LCS	ND	2.77	2.83	102	92 - 113

-9803A21

Samples in batch:

9803B00-01D	9803B00-02D	9803B00-03D	9803B00-04D
9803B00-05D	9803B04-01G	9803B04-02G	9803B04-03G
9803B04-04G	9803B04-05G	9803B04-06G	9803B08-01C
9803B08-04C	9803B08-07C	9803B08-10C	9803B56-02E
9803B56-03E	9803B58-02B	9803B60-01B	9803B60-02B
~ ~			

COMMENTS:

SPL LCS#: 95535172-26



** SPL QUALITY CONTROL REPORT **

HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Matrix: Aqueous

Reported on: 03/26/98 Analyzed on: 03/25/98

Analyst:

EM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Nitrate nitrogen(as N) Method 353.3 *

 SPL Sample	 Method	 Sample	Spike	Matrix Spike		Matrix Spike Duplicate		RPD	QC LIMITS (Advisory)	
 ID Number 				Result	Recovery	Result	Recovery %	(%)	RPD Max	% REC
9803B04-01G	ND	0.02	5.00	5.66	113	5.45	109	3,6	12	84 -125

-9803A20

Samples in batch:

9803B00-01D (803B00-02D 9803B00-03D 9803B00-04D 9803B00-05D 9803B04-01G 9803B04-02G 9803B04-03G

9803B04-04G 9803B04-05G

COMMENTS:



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

SPL QUALITY CONTROL REPORT **

Matrix: 1

Aqueous

Reported on: 04/02/98

Analyzed on: 04/02/98 Analyst: EM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Sulfate
Method 375.4 *

SPL Sample ID Number	Blank Value mg/L		Measured Concentration mg/L	% Recovery	QC Limits Recovery
LCS	ND	8.48	9.36	110	82 - 111

-9804090

Samples in batch:

9803B00-01D	9803B00-02D	9803B00-03D	9803B00-04D
9803B00-05D	9803B04-01G	9803B04-02G	9803B04-03G
9803B04-04G	9803B04-05G	9803B04-06G	9803B58-01B
9803B58-02B	9803B60-01B	9803B60-02B	9803D35-01A

COMMENTS:

SPL LCS#: 94453182-13



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 04/02/98 Analyzed on: 04/02/98 Analyst:

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Sulfate Method 375.4 *

SPL Sample	 Method	Sample	 Spike	Matrix Spike		Matrix Spike Duplicate		RPD	!	QC LIMITS Advisory)
IP Number			!		: -	Result mg/L	Recovery	(%)	RPD Max	% REC
9803B00-02D	ND	10.15	10.00	20.99	1108	20.60	104	3.8	9.5	84 -120

-9804089

Samples in batch:

9803B00-01D 9803B00-02D 9803B00-03D 9803B00-04D 9803B04-01G 9803B00-05D 9803B04-02G 9803B04-03G

9803B04-04G 0803D35-01A

COMMENTS:



** SPL QUALITY CONTROL REPORT **

HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Matrix: Aqueous

Reported on: 04/02/98 Analyzed on: 04/01/98

Analyst:

KS

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

> Hardness-Total as CaCO3 Method 130.2 *

SPL Sample	Method	 Sample	 Spike	Matrix Spike		Matrix Spike Duplicate		RPD	QC LIMITS (Advisory)		
ID Number	1			Result		Result mg/L	Recovery	(%)	RPD Max	8	REC
9803A25-02A	ND	48	50	96.6	97.2	96.2	96.4	0.8	20	80.7	111

- 9804067

Samples in batch:

#803A25-02A 9803A25+01A

9803A25-04A

9803B00-01F

9803B00-02F

4803B00-03F

3803B00-04F

9803B00-05F

9803B04-92D 2803B04-01D

COMMENTS:

CHAIN OF CUSTODY

AND

SAMPLE RECEIPT CHECKLIST

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B00-07

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/07/98

PROJECT: BJ Hobbs

SITE: Hobbs, NM

SAMPLED BY: Provided by SPL

SAMPLE ID: Trip Blank-1 3/13/98

PROJECT NO: 2832.13

MATRIX: WATER

DATE SAMPLED: 03/23/98

DATE RECEIVED: 03/24/98

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Gasoline Range Organics	ND	0.1 P	mg/L
Surrogate	% Recovery		
4-Bromofluorobenzene	113		
1,4-Difluorobenzene	93		
Method 8015B *** for Gasoline			
Analyzed by: HS			
Date: 03/28/98			
BENZENE	ND	1.0 P	μg/L
TOLUENE	ND	1.0 P	μg/L
ETHYLBENZENE	ND	1.0 P	μg/L
TOTAL XYLENE	ND	1.0 P	μg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	97		
4-Bromofluorobenzene	93		
Method 8020A ***			
Analyzed by: HS			
D / 02/02/02			

ND - Not detected.

Date: 03/28/98

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B00-08

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/07/98

PROJECT: BJ Hobbs

SITE: Hobbs, NM

SAMPLED BY: Provided by SPL

SAMPLE ID: Trip Blank-2 3/13/98

PROJECT NO: 2832.13

MATRIX: WATER

DATE SAMPLED: 03/23/98

DATE RECEIVED: 03/24/98

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Gasoline Range Organics	ND	0.1 P	mg/L
Surrogate	% Recovery		
4-Bromofluorobenzene	103		
1,4-Difluorobenzene	93		
Method 8015B *** for Gasoline			
Analyzed by: HS			
Date: 03/28/98			
BENZENE	ND	1.0 P	μg/L
TOLUENE	ND	1.0 P	μg/L
ETHYLBENZENE	ND	1.0 P	$\mu g/L$
TOTAL XYLENE	ND	1.0 P	$\mu g/L$
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	100		
4-Bromofluorobenzene	93		
Method 8020A ***			
Analyzed by: HS			
Date: 03/28/98			

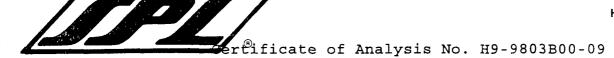
ND - Not detected.

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/07/98

PROJECT: BJ Hobbs

SITE: Hobbs, NM

SAMPLED BY: Provided by SPL

SAMPLE ID: Trip Blank-3 3/13/98

PROJECT NO: 2832.13

MATRIX: WATER

DATE SAMPLED: 03/23/98

DATE RECEIVED: 03/24/98

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Gasoline Range Organics	ND	0.1 P	mg/L
Surrogate	% Recovery		
4-Bromofluorobenzene	107		
1,4-Difluorobenzene	90		
Method 8015B *** for Gasoline			
Analyzed by: HS			
Date: 03/28/98			
BENZENE	ND	1.0 P	μg/L
TOLUENE	ND	1.0 P	$\mu g/L$
ETHYLBENZENE	ND	1.0 P	$\mu g/L$
TOTAL XYLENE	ND	1.0 P	μ g/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		μ g/L
Surrogate	% Recovery		
1,4-Difluorobenzene	100		
4-Bromofluorobenzene	93		
Method 8020A ***			
Analyzed by: HS			

ND - Not detected.

Date: 03/28/98

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

rtificate of Analysis No. H9-9803B00-10

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/07/98

PROJECT: BJ Hobbs

SITE: Hobbs, NM

SAMPLED BY: Provided by SPL

SAMPLE ID: Trip Blank-4 3/13/98

PROJECT NO: 2832.13

MATRIX: WATER

DATE SAMPLED: 03/23/98

DATE RECEIVED: 03/24/98

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Gasoline Range Organics	ND	0.1 P	mg/L
Surrogate	% Recovery		
4-Bromofluorobenzene	100		
1,4-Difluorobenzene	90		
Method 8015B *** for Gasoline			
Analyzed by: HS			
Date: 04/04/98			
BENZENE	ND	1.0 P	μg/L
TOLUENE	ND	1.0 P	$\mu g/L$
ETHYLBENZENE	ND	1.0 P	μg/L
TOTAL XYLENE	ND	1.0 P	μg/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	93		
4-Bromofluorobenzene	97		
Method 8020A ***			
Analyzed by: HS			
Date: 04/04/98			

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

⁽P) - Practical Quantitation Limit

QUALITY CONTROL

DOCUMENTATION



PL BATCH QUALITY CONTROL REPORT **

Method Modified 8015B*** for Gasoline

HOUSTON LABORATORY

8B80 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Batch Id: VARE980327094810

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Result <1>	Spike Recovery	QC Limits(**) (Mandatory) % Recovery Range
Gasoline Range Organics	ND	1.0	0.93	93.0	64 - 131

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results	Spike Added	Matrix	Spike	Matrix Duplic	Spike	MS/MSD Relative %	_	Limits(***) (Advisory)
	<2>	<3>	Result	Recovery	Result	Recovery	Difference	RPD Max.	Recovery Range
GASOLINE RANGE ORGANICS	ND	0.9	.).58	64.4	0.79	87.8	30.7	36	36 - 160

Analyst, VHZ

Sequence Date: 03/27/98

SPL IP of sample spiked: 9803B00-03A

Sample Fire ID: BEC4167.TX0

Mothod Ruank File 115:

Flank og ike Frie ib: EEC4160.TX0

Matrix Spike File ID: EEC4164.TX0

Matrix Spike Duplicate File ID: EEC4165.TX0

* = Values outside QC Range due to Matrix Interference (except RPD)

« = Data outside Method Specification limits.

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [(<1> - <2>) / <3>] x 100

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = $|(<4> - <5>)| / {(<4> + <5>) x 0.5} x 100$

(**) = Source: SPL-Houston Historical data (1st Q 197)

(***) = Source: SPL-Houston Historical Data (1st Q '97)

SAMPLES IN BATCH(SPL ID):

9803A09-03A 9803A09-05A 9803A09-06A 9803A09-07A

9803985-14A 9803A09-08A 9803B00-02A 9803B00-04A

9803B00-06A 9803B22-02A 9803B22-03A 9803B22-05A

9803B22-04A 9803B00-05A 9803B00-01A 9803B00-03A

9803A09-01A



PL BATCH QUALITY CONTROL REPORT **

Method Modified 8015B*** for Gasoline

HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Batch Id: VARE980327104110

LABORATORY CONTROL SAMPLE

S P I K E C O M P O U N D S	Method Blank Result <2>	Spike Added <3>	Blank Result <1>	Spike Recovery	QC Limits(**) (Mandatory) % Recovery Range
Gasoline Range Organics	рр	1.00	1.02	102	64 - 131

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results	Spike Added	Matrix	Spike	Matrix Duplic	S pike cate	MS/MSD Relative %		Cimits(***) (Advisory)
	·2>	<3>	Result	Recovery	Result	Recovery <5>	Difference	RPD Max.	Recovery Range
GASOLINE RANGE ORGANICS	0.41	0.9	1.29	97.8	1.19	86.7	12.0	36:	36 - 160

Analyst: HS

Paguence Date: 03/28/98

SPL ID of sample spiked: 9803B04-01A

Sample File ID: EEC4204.TX0

Method Blank File ID:

blank Spike File ID: EEC4193.TX0 Matrix Spike File ID: EEC4196.TX0

Matrix Spike Duplicate File ID: EEC4197.TX0

* = Values outside QC Range due to Matrix Interference (except RPD)

~ = Data outside Method Specification limits.

MC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [(<1> - <2>) / <3>) x 100

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = |(<4> - <5>)| / ((<4> + <5>) x 0.5] x 100

(**) = Source: SPL-Houston Historical data (1st Q '97)

***) = Source: SPL-Houston Historical Data (1st Q '97)

SAMPLES IN BATCH (SPL ID):

9803B04-03A 9803B04-01A 9803B04-02A 9803B04-11A 9803C62-03A 9803C69-04A 9803C62-01A 9803C62-02A 9803C53-02A 9803C53-01A 9803B04-06A 9803B04-05A

9803B00-07A 9803B00-08A 9803B00-09A



PL BATCH QUALITY CONTROL REPORT **

Method Modified 8015B*** for Gasoline

HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Batch Id: VARE980404034711

LABORATORY CONTROL SAMPLE

SPIKE	Method	Spike Blank Spike QC Limits(*			QC Limits(**)	
COMPOUNDS	Blank Result	Added 4:3>	Result <1>	Recovery %	(Mandatory) % Recovery Range	
Gasoline Range Organics	ND	1.0	0.85	85.0	64 - 131	

MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix.	Spike	Matrix Duplic	Spike cate	MS/MSD Relative %		Limits(***) (Advisory)
	<3.5	r3>	Result	Recovery	Result	Recovery <5>	Difference	RPD Max.	Recovery Range
GASOLINE RANGE ORGANICS	ND	0.9	0.88	97.8	0.92	102	4.20	36	36 - 160

* = Values outside QC Range due to Matrix Interference (except RPD)

" = Data outside Method Specification limits."

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

 $% Recovery = {(<1> - <2>) / <3>] x 100$

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = |(<4> - <5>)| / ((<4> + <5>) x 0.5] x 100

(**) = Source: SPL-Houston Historical data (1st Q '97)

(***) = Source: SPL-Houston Historical Data (1st Q '97)

SAMPLES IN BATCH (SPL ID):

Sequence Date: 04/04/98

Method Blank File ID:

Sample File ID: EED1189.TX0

Blank Spike File ID: EED1184.TX0

Matrix Spike File ID: EED1231.TX0

Matrix Spike Duplicate File ID: EED1232.TX0

SPL ID of sample spiked: 9804097-13A

Analyet: HS

9803E45-06A 9804131-01A 9803B00-10A 9803E45-03A



ug/L

Units:

PL BATCH QUALITY CONTROL REPORT ** Method 8020A***

HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Batch Id: VARE980327094800

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike Result Recovery <1> %		QC Limits(**) (Mandatory) % Recovery Range
MTBE	ND	50	4 9	98.0	72 - 128
Bennene	ND	50	45	90.0	61 - 119
Toluene	ИD	50	45	90.0	65 - 125
EthylBenzeno	ND	50	45	90.0	70 - 118
A Mylene	ND	50	46	92.0	72 - 117
M & P Xylene	ND	100	91	91.0	72 - 116

MATRIX SPIKES

SPIKE	Sample Results	Spike Added	Matrix	Spike	Matrix Dupli	Spike	MS/MSD Relative %		Limits(***) (Advisory)	
	<2×	<3>	Result	Recovery	Result <1>	Recovery <5>	Difference	RPD Max.	Recovery	Range
MTBE	ND	20	21	105	22	110	4.65	20	39 -	150
BENZENE	ND	20	20	100	21	105	4.88	21	32 -	164
TOLUENE	ND	20	21	105	21	105	0	20	38 -	159
ETHYLBENZENE	ND	20	21	105	21	105	0	19	52 -	142
O XYLENE	МD	20	21	1.05	21	105	0	18	53 -	143
M & P XYLENE	ND	40	41	102	42	105	2.90	17:	53 -	144

Analyst: VHZ

⊱equence Date: 03/27/98

SPL ID of sample spiked: 9803B00-01A

Sample File ID: E_C4166.TX0

Method Blank File ID:

Blank Spike File ID: E C4159.TX0

Matrix Spike File ID: E_C4162.TX0

Matrix Spike Duplicate File ID: E_C4163.TX0

* = Values outside QC Range due to Matrix Interference (except RPD)

« = Data outside Method Specification limits.

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = {(<1> - <2>) / <3>] x 100

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = |(<4> - <5>)| / [(<4> + <5>) x 0.5] x 100

(**) = Source: SPL-Houston Historical Data (1ST Q '97) (***) = Source: SPL-Houston Historical Data (1ST Q '97)

9803B00-02A 9803B00-04A 9803B00-06A 9803B22-02A SAMPLES IN BATCH (SPL ID):

9803B22-03A 9803B22-05A 9803B22-04A 9803B00-05A

9803984-06A 9803985-14A 9803B00-01A 9803B00-03A

9803985-06A 9803985-12A



"g/L

Units:

BATCH QUALITY CONTROL REPORT ** METHOD 8020

HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Batch Id: VARE980327104100

LABORATORY CONTROL SAMPLE

S P I K E C O M P O U N D S	Method Blank Result <2>	Spike Added <3>	Blank Spike Result Recovery <1> %		QC Limits(**) (Mandatory) % Recovery Range
MTBE	ND	50	45	90.0	72 - 128
Benzene	ND	50	47	94.0	61 - 119
Toluene	ND	50	47	94.0	65 - 125
Ethy!Benzone	ND	50	47	94.0	70 - 118
O Xylene	ND	50	47	94.0	72 - 117
M 5 P Xylene	ND	1.00	95	95.0	72 - 116

MATRIX SPIKES

S P 1 K E C O M P O U N D S	Sample Results	Spike Added	Matrix Spike		Matrix Spike		1		simits(***) (Advisory)
	<2>	<3>	Result	Recovery	Result	Recovery	Difference	RPD Max.	Recovery Range
MTBE	ИD	20	25	125	23	1.15	8.33	20	39 - 150
BENZENE	ND	20	23	115	20	1.00	14.0	21	32 - 164
TOLUENE	ИD	20	24	120	22	1.1.0	8.70	20	38 - 159
ETHYLHENZENE	, ND	20	24	120	22	110	8.70	19	52 - 142
O XYLENE	14	20	36	110	33	95.0	14.6	18	53 - 143
M & P XYLENE	12	40	56	110	51	97.5	12.0	17	53 - 144

Analyst: HS

Sequence Date: 03/28/98

SPL ID of sample spiked: 9803B04-05A

Sample File ID: E 24203.TX0

Method Blank File ID:

Rlank Spike File ID: E_C4192.TX0

Matrix Spike File ID: E_C4194.TXO

Matrix Spike Duplicate File ID: E C4195.TX0

* = Values outside QC Range due to Matrix Interference (except RPD)

 $\mbox{\ensuremath{\mbox{$\alpha$}}}$ = Data outside Method Specification limits.

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [(<1> ~ <2>) / <3>] x 100

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = [(<4> - <5>)] / [(<4> + <5>)] x 0.5] x 100

(**) = Source: SPL-Houston Historical Data (1st 0 '97)

(***) = Source: SPL-Houston Historical Data (1st Q '97)

SAMPLES IN BATCH (SPL ID):

9803B04-03A 9803D38-02A 9803D38-01A 9803B04-04A

3303B04-11A 9803C62-03A 9803C69-04A 9803C62-01A

9803C62-02A 9803C53-02A 9803C53-01A 9803B04-06A 9803B04-05A 9803B00-07A 9803B00-08A 9803B00-09A

J803B04-10A



PL BATCH QUALITY CONTROL REPORT **
METHOD 8020

HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Batch Id:

VARE980404034700

LABORATORY CONTROL SAMPLE

SPIKE	Method	Spike	Blank	Spike	QC Limits(**) (Mandatory) % Recovery Range		
COMPOUNDS	Blank Result	Added <3>	Result	Recovery %			
МТВЕ	ND	50	. 51	102	72 - 128		
Benzene	ND	50	54	108	61 - 119		
Toluene	ND	50	54	108	65 - 125		
EthylBenzene	ND	50	54	108	70 - 118		
O Xylene	ND	50	54	108	72 - 117		
M & P Xylene	ND	100	110	110	72 - 116		
	1			<u>L</u>	L		

MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix Spike		Matrix SpikeDuplicate		MS/MSD QC		C Limits(***) (Advisory)	
	<2>	<3>	Result <1>	Recovery	Result	Recovery	Difference	RPD Max.	Recovery Range	
MTBE	ND	20.0	20	100	22	110	9.52	20	39 - 150	
BENZENE	ND	20.0	23	115	23	115	0	21	32 - 164	
TOLUENE	ND	20.0	23	115	22	110	4.44	20	38 - 159	
ETHYLBENZENE	ND	20.0	23	115	22	110	4.44	19	52 - 142	
O XYLENE	ND	20.0	23	115	22	110	4.44	1.8	53 - 143	
M & P XYLENE	ND:	40.0	46	115	44	110	4.44	17	53 - 144	

* = Values outside QC Range due to Matrix Interference (except RPD)

« = Data outside Method Specification limits.

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

ዓ Recovery = [(<1> - <2>) / <3>] x 100

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = $[(<4> - <5>) / {(<4> + <5>) x 0.5] x 100$

(**) = Source: SPL-Houston Historical Data (1st Q '97)
(***) = Source: SPL-Houston Historical Data (1st Q '97)

SAMPLES IN BATCH (SPL ID):

Seguence Date: 04/04/98

Method Blank File ID:

Sample File ID: E_D1188.TX0

Blank Spike File ID: E_D1183.TX0

Matrix Spike File ID: E_D1229.TX0

Matrix Spike Duplicate File ID: E D1230.TX0

SPL ID of sample spiked: 9804097-12A

Analyst: HS

9804097-06A 9804097-07A 9804097-08A 9803B00-10A
9804097-01A 9803E45-03A 9804097-05A 9803E45-06A
9804097-09A 9803E45-01A 9804131-01A 9804097-14A
9804097-10A 9804097-11A 9804097-12A 9804097-13A



* SPL BATCH QUALITY CONTROL REPORT ** ethod Modified 8015B*** for Diesel

PAGE

HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Units:

mg/L

Batch Id: HPVV980327125900

BLANK SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix	Matrix Spike		Matrix Spike Duplicate			Limits(**) (Advisory)
	<2>	<3>	Result	Recovery <4>	Result <1>	Recovery <5>	Difference	RPD Max.	Recovery Range
DIESEL	ND	5.00	5.1	102	4.49	89.8	12.7	39	21 - 175

Analyst: RR

Sequence Date: 03/27/98 Method Blank File ID: Sample File ID:

Blank Spike File ID: V_C2194.TX0

Matrix Spike File ID:

Matrix Spike Duplicate File ID:

 \star = Values Outside QC Range. « = Data outside Method Specification limits.

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

Recovery = [(<1> - <2>) / <3>] x 100

Relative Percent Difference = |(<4> $^{<}<5>$ | / [(<4> + <5>) x 0.5] x 100

(**) = Source: SPL-Houston Historical Data (4th Q '97)

9803B00-01B 9803B00-02B 9803B00-03B

PAGE

HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Units:

ug/L

Batch Id: 2980330000500

BLANK SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative %		QC Limits(**) (Advisory)		
			Result	Recovery	Result	Recovery	Difference	RPD			
	<2>	<3>	<1>	<4>	<1>	<5>		Max.	Recovery	Range	
NAPHTHALENE	ND	0.50	0.39	78.0	0.40	80.0	2.53	30	33 -	122	
ACENAPHTHYLENE	ND	0.50	0.38	76.0	0.38	76.0	0	30	42 -	138	
ACENAPHTHENE	ND	0.50	0.41	82.0	0.41	82.0	0	30	25 -	123	
FLUORENE	ND	0.50	0.43	86.0	0.44	88.0	2.30	30	19 -	142	
PHENANTHRENE .	ND	0.50	0.42	84.0	0.41	82.0	2.41	30	40 -	121	
ANTHRACENE	ND	0.50	0.38	76.0	0.37	74.0	2.67	30	32 -	121	
FLUORANTHENE	ND	0.50	0.46	92.0	9.46	92.0	0	30	51 -	115	
PYRENE	ND.	0.50	0.45	90.0	0.45	90.0	0	30	45 -	117	
CHRYSENE	ND:	0.50	0.47	94.0	0.48	96.0	2.11	30	44 -	122	
BENZO (A) ANTHRACENE	ND	0.50	0.46	92.0	0.45	92.0	0	30	57 -	118	
BENZO (B) FLUORANTHENE	ИD	0.50	0.49	98.0	0.49	98.0	0	30	62 -	121	
BENZO (K) FLUORANTHENE	ND	0.50	0.50	100	0.50	100	0	30	63 -	117	
BENZO (A) PYRENE	ND	0.50	0.56	112	0.56	112	0	30	42 -	120	
DIBENZO (A,H) ANTHRACENE	ПИ	0.50	0.49	98.0	0.49	98.0	0	3.0	53 -	118	
BENZO (G.H.I) PERYLENE	ND	0.50	0.45	90.0	0.46	92.0	2.20	30	51 -	116	
INDENO (1,2,3-CD) PYRENE	ND	0.50	0.50	100	0.50	100	0	30	60 -	116	

Analyst: KA

Sequence Date: 04/02/98 Method Blank File ID:

Sample File ID:

Elank Spike File ID: 980401B\027-2901

Matrix Spike File ID:

Matrix Spike Duplicate File ID:

* = Values Outside QC Range. « = Data outside Method Specification limits.

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit
% Recovery = [(<1> - <2>) / <3>] x 100

Relative Percent Difference = |(<4> - <5>)| / [(<4> + <5>) x 0.5] x 100

(**) = Source: SPL Temporary Limits

ICF Spectroscopy method outo whally control report

ND

ND

ND

Potassium

Magnesium Manganese

Sodium Nickel Lead **Antimony** Selenium Thallium Vanadium Zinc

20.00

20.00

20.00

Matrix: DISSOLVED

Units: mg/L

24.00

24.00

24.00

Analyst: PS
HOUSTON LABORATORY
1880 INTERCHANGE DRIVE
10 OUSTON: TSANS 7054
Chacked: 1712 Sec. 2021

Date:032598 Time:0819 File Name: 032598C2

3126199

	La	boratory Co	ntroi San	nple		
Element	Mth. Blank	True Value	Result	% Recovery	Lower Limit	Upper Limit
Silver	ND	2.00	2.08	104	1.60	2.40
Aluminum						
Arsenic						
Barium	ND	2.00	2.07	103	1.60	2.40
Beryllium						
Calcium	ND	20.00	20.43	102	16.00	24.00
Cadmium	ND	2.00	1.92	96	1.60	2.40
Cobalt						
Chromium	ND	2.00	2.04	102	1.60	2.40
Copper						
1	1					

20.72

20.61

20.66

Work Orde	ers in Batch
Work Order	Fractions
98-03-B00	01E-05E
98-03-A42	01G-05G
98-03-A43	06 G-07 G

104

103

103

16.00

16.00

16.00

Matrix Spike				<u> </u>	Work Order Spiked: 9803B00-01E						
	Sample	Spike		rix Spike	· ·	ke Duplicate	OC 1	_imits	Spike	QC	
Element	Result	Added_	Result	Recovery	Result	Recovery	% Re	covery	RPD %	Limits %	
Silver	ND	10.0	9.913	99.1	10.02	100.2	80	120	1.1	20.0	
Aluminum											
Arsenic											
Barium	0.0706	10.0	10.15	100.8	10.19	101.2	80	120	0.4	20.0	
Beryllium											
Calcium	207.9	100.0	306.8	98.9	307.5	99.6	80	120	0.7	20.0	
Cadmium	ND	10.0	9.469	94.7	9.519	95.2	80	120	0.5	20.0	
Cobalt											
Chromium	0.0247	10.0	9.9	98.8	9.885	98.6	80	120	0.2	20.0	
Copper											
Iron											
Potassium	13.41	100.0	105.1	91.7	105.9	92.5	80	120	0.9	20.0	
Magnesium	46.87	100.0	148.4	101.5	149.3	102.4	80	120	0.9	20.0	
Manganese											
Sodium	92.35	100.0	196	103.7	197.5	105.2	80	120	1.4	20.0	
Nickel											
Lead											
Antimony											
Selenium											
Thallium											
Vanadium											
Zinc											

Elements Bench Spiked:ALL 10X DILUTION

ICP Spectroscopy illetnod 60/10 Quality Control Report



Vanadium Zinc

Matrix: Water

Units: mg/L

Analyst: PS TON LABORATORY

9880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 Checked: (713) 666-1901

Date:032698 Time:0809 File Name: 032698C7

3127148

mit Upper Limit	Lower Limit	% Rec	Result	True Value	Mth. Blank	Element
2.40 Wo	1.60	9	1.98	2.00	ND	Silver
						Aluminum
98-				-		Arsenic
2.40	1.60	9	1.96	2.00	ND	Barium
98-						Beryllium
						Calcium
2.40 98-	1.60	9:	1.84	2.00	ND	Cadmium
-						Barium Beryllium Calcium

Work Orde	ers in Batch
Work Order	Fractions
98 - 03-A83	21E-22A
98-03-A84	23A-24A
98-03-B00	01F-06F

Silver	ואט	2.00	1.90	99	1.00	2.40
Aluminum						
Arsenic						
Barium	ND	2.00	1.96	98	1.60	2.40
Beryllium						
Calcium						
Cadmium	ND	2.00	1.84	92	1.60	2.40
Cobalt						
Chromium	ND	2.00	1.95	98	1.60	2.40
Copper						
Iron						
Potassium						
Magnesium						
Manganese						
Sodium						
Nickel	ND	2.00	1.95	97	1.60	2.40
Lead						
Antimony						
Selenium						
Thallium						
		T				

Laboratory Control Sample

Work Order Spiked: 9803A83-21E Matrix Spike - Spike Duplicate Results

Matrix Spiki	e - Spike Di	upiicate Re	Suns		Work Orde					
	Sample	Spike	Mati	ix Spike	Matrix Spi	ke Duplicate	QCI	imits	Spike	QC
Element	Result	Added	Result	Recovery	Result	Recovery	% Re	covery	RPD %	Limits %
Silver	ND	1.0	0.9239	92.4	0.9539	95.4	80	120	3.2	20.0
Aluminum		1								
Arsenic									:	
Barium	0.0767	1.0	0.9859	90.9	1.016	93.9	80	120	3.3	20.0
Beryllium]					
Calcium										
Cadmium	ND	1.0	0.8769	87.7	0.9131	91.3	80	120	4.0	20.0
Cobalt										
Chromium	ND	1.0	0.9145	91.5	0.9518	95.2	80	120	4.0	20.0
Copper										
Iron										
Potassium										
Magnesium										
Manganese										
Sodium										
Nickel	ND	1.0	0.928	92.8	0.9438_	94.4	80	120	1.7	20.0
Lead										
Antimony										
Selenium										
Thallium										
Vanadium										
Zinc										

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SPL Houston Environmental Laboratory Sample Login Checklist

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Da		Time:				
	3-24-18		1000			
SPI	L Sample ID:					
	9803	,B00		,		
					<u>Yes</u>	No
1	Chain-of-Custody (COC) form	is prese	nt.		✓	
2	COC is properly completed.					
3	If no, Non-Conformance Works	sheet ha	s been comple	eted.		
4	Custody seals are present on the	e shippi	ng container.		/	
5	If yes, custody seals are intact.					
6	All samples are tagged or labeled	ed.			<i></i>	
7	If no, Non-Conformance Works	sheet ha	s been comple	eted.		
8	Sample containers arrived intac	ct				
9	Temperature of samples upon a	arrival:			30	y or C
10	Method of sample delivery to S	SPL: S	PL Delivery			
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		F	edEx Delivery	(airbill #)	801920221	123
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11	Method of sample disposal:	S	PL Disposal			/
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3-24-98





8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

April 9, 1998

Mr. Rick Rexroad BROWN AND CALDWELL 1415 Louisiana Houston, TX 77002

The following report contains analytical results for the sample(s) received at Southern Petroleum Laboratories (SPL) on March 23, 1998. The sample(s) was assigned to Certificate of Analysis No.(s) 9803B04 and analyzed for all parameters as listed on the chain of custody.

Your sample MW-12 and MW-1 (SPL ID: 9803B04-01 and -05) were randomly selected for the use in SPL's quality control program for the Total Selenium by method 7740. The Matrix Spike (MS) and Matrix Spike Duplicate (MSD) recoveries were out of the advisable QC limits, due to matrix interference. However, in both batches a Laboratory Control Sample was analyzed and all recoveries were within the advisable QC limits.

Any other data flag or quality control exception associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s).

If you have any questions or comments pertaining to this data report, please do not hesitate to contact me. Please reference the above Certificate of Analysis No. during any inquiries.

Again, SPL is pleased to be of service to you. We anticipate working with you in fulfilling all your current and future analytical needs.

Southern Petroleum Laboratories

Bernadette A. Fini

Project Manager



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Southern Petroleum Laboratories, Inc.

Certificate of Analysis Number: 98-03-B04

Approved for Release by:

Bernadette A. Fini, Project Manager

Date

Greg Grandits
Laboratory Director

Cynthia Schreiner Quality Assurance Officer

The attached analytical data package may not be reproduced except in full without the express written approval of this laboratory.



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-01

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT NO: 2832.13

MATRIX: WATER

PROJECT: BJ Hobbs
SITE: Hobbs, NM

SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/24/98 12:30:00

SAMPLE ID: MW-12

DATE RECEIVED: 03/25/98

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Gasoline Range Organics	0.41	0.1 P	mg/L
Surrogate 4-Bromofluorobenzene 1,4-Difluorobenzene Method 8015B *** for Gasoline Analyzed by: HS Date: 03/28/98	% Recovery 113 97		
Total Petroleum Hydrocarbons-Diesel	0.29	0.20 P	mg/L
Surrogate n-Pentacosane Method 8015B *** for Diesel Analyzed by: RR Date: 03/27/98 11:31:00	% Recovery 56		
Methane RSKSOP-147 Analyzed by: JDR Date: 04/02/98 10:46:00	ND	0.0012 P	ppm
Silver, Total Method 6010B *** Analyzed by: PS Date: 03/27/98 08:49:00	ND	0.01	mg/L

(P) - Practical Quantitation Limit ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C24 that do not resemble a diesel pattern.(C10-C24) RR

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-01

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT NO: 2832.13

MATRIX: WATER

SITE: Hobbs, NM
SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/24/98 12:30:00

SAMPLE ID: MW-12

PROJECT: BJ Hobbs

DATE RECEIVED: 03/25/98

	ANALYTICAL DATA		
PARAMETER	RESULT	S DETECT LIMIT	TION UNITS
Arsenic, Total Method 7060A *** Analyzed by: JM Date: 04/02/98	0.013	3 0.005	mg/L
Barium, Total Method 6010B *** Analyzed by: PS Date: 03/27/98		7 0.005	mg/L
Cadmium, Total Method 6010B *** Analyzed by: PS Date: 03/27/98	NI 08:49:00	0.005	mg/L
Chromium, Total Method 6010B *** Analyzed by: PS Date: 03/27/98		0.01	mg/L
Mercury, Total Method 7470 A*** Analyzed by: AG Date: 03/31/98		0.0002	mg/L
Hardness-Total as CaCO3 Method 130.2 * Analyzed by: KS Date: 04/01/98		50	mg/L CaCO3

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-01

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT: BJ Hobbs

SAMPLED BY: Brown & Caldwell

PROJECT NO: 2832.13

PRODUCT NO. 2032.1.

DATE SAMPLED: 03/24/98 12:30:00

SITE: Hobbs, NM MATRIX: WATER

SAMPLE ID: MW-12 DATE RECEIVED: 03/25/98

ANALYTIC	AL DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Acid Digestion-Aqueous, ICP Method 3010A *** Analyzed by: SRC Date: 03/26/98 07:30:00	03/26/98	LIMII	
Acid Digestion-Aqueous, GF Method 3020A *** Analyzed by: SRC Date: 03/26/98 08:30:00	03/26/98		
Lead, Total Method 7421 *** Analyzed by: PB Date: 04/03/98 10:04:00	ND	0.005	mg/L
Selenium, Total Method 7740 *** Analyzed by: JM Date: 04/02/98 13:14:00	ND	0.005	mg/L
Calcium, Dissolved Method 6010B *** Analyzed by: PS Date: 03/31/98 08:07:00	* 388	1	mg/L
Potassium, Dissolved Method 6010B *** Analyzed by: PS Date: 03/31/98 08:07:00	70	20	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-01

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DDA TEGE NA 0000 10

PROJECT: BJ Hobbs
SITE: Hobbs, NM
MATRIX: WATER

SAMPLED BY: Brown & Caldwell DATE SAMPLED: 03/24/98 12:30:00

SAMPLE ID: MW-12 DATE RECEIVED: 03/25/98

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Magnesium, Dissolved Method 6010B *** Analyzed by: PS Date: 03/31/98 08:07:00	108		mg/I
Sodium, Dissolved Method 6010B *** Analyzed by: PS Date: 04/01/98 08:04:00	381	5	mg/L
Dissolved Metals Prep. Method 3005A *** Analyzed by: GJ Date: 03/25/98 17:00:00	03/25/98		
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: TW Date: 03/25/98 12:00:00	ND	1	mg/L
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: TW Date: 03/25/98 12:00:00	451	1	mg/L
Chloride Method 325.3 * Analyzed by: TV Date: 04/04/98 09:00:00	1200	50	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-01

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT NO: 2832.13

PROJECT: BJ Hobbs SITE: Hobbs, NM

MATRIX: WATER

SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/24/98 12:30:00

SAMPLE ID: MW-12

DATE RECEIVED: 03/25/98

		ANALYTICA	AL DATA		
PARAMETER			RESULTS	DETECTION LIMIT	UNITS
Fluoride Method 300.0 Analyzed by: Date:		13:00:00	4.2	0.5	mg/L
Nitrate nitro Method 353.3 Analyzed by:	*	12.00.00	ND	0.05	mg/L
Sulfate Method 375.4 Analyzed by:	*		240	25	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C24 that do not resemble a diesel pattern. (C10-C24) RR

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B04-01

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

04/08/98

PROJECT: BJ Hobbs PROJECT NO: 2832.13

SITE: Hobbs, NM MATRIX: WATER
SAMPLED BY: Brown & Caldwell DATE SAMPLED: 03/24/98 12:30:00

SAMPLE ID: MW-12 DATE RECEIVED: 03/25/98

ANALYTICA	L DATA		
PARAMETER	RESULTS	PQL*	UNITS
Acetone	ND	100	ug/L
Benzene	100	5	ug/L
Bromodichloromethane	ND	5	ug/L
Bromoform	ND	5	ug/L
Bromomethane	ND	10	ug/L
2-Butanone	ND	20	ug/L
Carbon Disulfide	ND	5	ug/L
Carbon Tetrachloride	ND	5	ug/L
Chlorobenzene	ND	5	ug/L
Chloroethane	ND	10	ug/L
2-Chloroethylvinylether	ND	10	ug/L
Chloroform	ND	5	ug/L
Chloromethane	ND	10	ug/L
Dibromochloromethane	ND	5	ug/L
1,1-Dichloroethane	ND	5	ug/L
1,1-Dichloroethene	ND	5	ug/L
1,2-Dichloroethane	ND	5	ug/L
cis-1,2-Dichloroethene	ND	5	ug/L
trans-1,2-Dichloroethene	ND	5	ug/L
total-1,2-Dichloroethene	ND	5	ug/L
1,2-Dichloropropane	ND	5	ug/L
cis-1,3-Dichloropropene	ND	5	ug/L
trans-1,3-Dichloropropene	ND	5	ug/L
Ethylbenzene	6	5	ug/L
2-Hexanone	ND	10	ug/L
Methylene Chloride	ND	5	ug/L
4-Methyl-2-Pentanone	ND	10	ug/L
Styrene	ND	5	ug/L
1,1,2,2-Tetrachloroethane	ND	5	ug/L
Tetrachloroethene	ND	5	ug/L
Toluene	11	5	ug/L
1,1,1-Trichloroethane	ND	5	ug/L
1,1,2-Trichloroethane	ND	5	ug/L
Trichloroethene	ND	5	ug/L
Trichlorofluoromethane	ND	5	ug/L
Vinyl Acetate	ND	10	ug/L
Vinyl Chloride	ND	10	ug/L
Xylenes (total)	8	5	ug/L

METHOD: 8240, Volatile Organics - Water (continued on next page)

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B04-01

Brown and Caldwell

SAMPLE ID: MW-12

SURROGATES	AMOUNT SPIKED	% RECOVERY	LOWER LIMIT	UPPER LIMIT
1,2-Dichloroethane-d4	50 ug/L	100	76	114
Toluene-d8	50 ug/L	102	88	110
4-Bromofluorobenzene	50 ug/L	100	86	115

ANALYZED BY: JC DATE/TIME: 03/31/98 23:09:00

METHOD: 8240, Volatile Organics - Water

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS: Sample contains petroleum hydrocarbons from C10-C24

that do not resemble a diesel pattern.(C10-C24) RR

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B04-01

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

04/08/98

PROJECT: BJ Hobbs PROJECT NO: 2832.13

SITE: Hobbs, NM MATRIX: WATER

SAMPLED BY: Brown & Caldwell

SAMPLE ID: MW-12

DATE SAMPLED: 03/24/98 12:30:00

DATE RECEIVED: 03/25/98

		·	<u></u>		
AN	ALYTICAL DATA				
PARAMETER	RES	ULTS	PQL*		UNITS
Naphthalene		11	2.0		ug/L
Acenaphthylene		ND	0.1		ug/L
Acenaphthene		ND	0.3		ug/L
Fluorene		ND	0.3		ug/L
Phenanthrene		ND	0.1		ug/L
Anthracene		ND	0.1		ug/L
Fluoranthene		ND	0.1		ug/L
Pyrene		ND	0.1		ug/L
Chrysene		ND	0.1		ug/L
Benzo (a) anthracene		ND	0.1		ug/L
Benzo (b) fluoranthene		ND	0.1		ug/L
Benzo (k) fluoranthene		ND	0.1		ug/L
Benzo (a) pyrene		ND	0.1		ug/L
Dibenzo (a,h) anthracene		ND	0.1		ug/L
Benzo (g,h,i) perylene		ND	0.1		${\tt ug/L}$
Indeno (1,2,3-cd) pyrene		ND	0.1		ug/L
SURROGATES	AMOUNT	%		LOWER	UPPER
	SPIKED	RECO	VERY	LIMIT	LIMIT
1-Fluoronaphthalene	$0.20~\mathrm{ug/L}$		77	50	150
Phenanthrene d-10	0.20 ug/L		85	50	150

ANALYZED BY: KA DATE/TIME: 04/07/98 23:56:40 EXTRACTED BY: AM DATE/TIME: 03/31/98 08:00:00

METHOD: 8310 Polynuclear Aromatic Hydrocarbons

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-02

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT NO: 2832.13

PROJECT: BJ Hobbs MATRIX: WATER SITE: Hobbs, NM

DATE SAMPLED: 03/24/98 13:00:00 SAMPLED BY: Brown & Caldwell

DATE RECEIVED: 03/25/98 SAMPLE ID: MW-11A

ANALYTICAL	חמדמ		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Gasoline Range Organics	0.14		mg/L
Surrogate 4-Bromofluorobenzene 1,4-Difluorobenzene Method 8015B *** for Gasoline Analyzed by: HS Date: 03/28/98	% Recovery 107 90		
Total Petroleum Hydrocarbons-Diesel	0.28	0.20 P	mg/L
Surrogate n-Pentacosane Method 8015B *** for Diesel Analyzed by: RR Date: 03/28/98 12:16:00	% Recovery 60		
Methane RSKSOP-147 Analyzed by: JDR Date: 04/02/98 10:59:00	0.14	0.0024 P	ppm
Silver, Total Method 6010B *** Analyzed by: PS Date: 03/27/98 08:49:00	ND	0.01	mg/L

⁽P) - Practical Quantitation Limit ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed. ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C24 that do not resemble a diesel pattern. (C10-C24) RR

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-02

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT: BJ Hobbs

SITE: Hobbs, NM

PROJECT NO: 2832.13

MATRIX: WATER

SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/24/98 13:00:00

SAMPLE ID: MW-11A DATE RECEIVED: 03/25/98

	ANALYTICAL	DATA		
PARAMETER		RESULTS	DETECTION LIMIT	UNITS
Arsenic, Total Method 7060A *** Analyzed by: JM Date: 04/02/98	13:14:00	0.019		mg/L
Barium, Total Method 6010B *** Analyzed by: PS Date: 03/27/98	08:49:00	0.163	0.005	mg/L
Cadmium, Total Method 6010B *** Analyzed by: PS Date: 03/27/98		ND	0.005	mg/L
Chromium, Total Method 6010B *** Analyzed by: PS Date: 03/27/98	08:49:00	ND	0.01	mg/L
Mercury, Total Method 7470 A*** Analyzed by: AG Date: 03/31/98	13:44:00	ND	0.0002	mg/L
Hardness-Total as CaCC Method 130.2 * Analyzed by: KS Date: 04/01/98		1000	50	mg/L CaCO3

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-02

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT: BJ Hobbs

SAMPLE ID: MW-11A

SAMPLED BY: Brown & Caldwell

SITE: Hobbs, NM

PROJECT NO: 2832.13

OECT NO. 2052.13

MATRIX: WATER

MATRIX: W

DATE SAMPLED: 03/24/98 13:00:00

DATE RECEIVED: 03/25/98

ANALYTICA	L DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Acid Digestion-Aqueous, ICP Method 3010A *** Analyzed by: SRC Date: 03/26/98 07:30:00	03/26/98	HIMIT	
Acid Digestion-Aqueous, GF Method 3020A *** Analyzed by: SRC Date: 03/26/98 08:30:00	03/26/98		
Lead, Total Method 7421 *** Analyzed by: PB Date: 04/03/98 10:04:00	ND	0.005	mg/L
Selenium, Total Method 7740 *** Analyzed by: JM Date: 04/02/98 13:14:00	ND	0.005	mg/L
Calcium, Dissolved Method 6010B *** Analyzed by: PS Date: 03/31/98 08:07:00	259	1	mg/L
Potassium, Dissolved Method 6010B *** Analyzed by: PS Date: 03/31/98 08:07:00	30	20	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-02

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT NO: 2832.13

SITE: Hobbs, NM MATRIX: WATER SAMPLED BY: Brown & Caldwell **DATE SAMPLED:** 03/24/98 13:00:00

DATE RECEIVED: 03/25/98

SAMPLE ID: MW-11A

PROJECT: BJ Hobbs

ANALYTICAL DATA					
PARAMETER	RESULTS	DETECTION LIMIT	UNITS		
Magnesium, Dissolved Method 6010B *** Analyzed by: PS Date: 03/31/98 08:07:00	96	1	mg/L		
Sodium, Dissolved Method 6010B *** Analyzed by: PS Date: 04/01/98 08:04:00	312	5	mg/L		
Dissolved Metals Prep. Method 3005A *** Analyzed by: GJ Date: 03/25/98 17:00:00	03/25/98				
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: TW Date: 03/25/98 12:00:00	ND	1	mg/L		
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: TW Date: 03/25/98 12:00:00	319	1	mg/L		
Chloride Method 325.3 * Analyzed by: TV Date: 04/04/98 09:00:00	940	50	mg/L		

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C24 that do not resemble a diesel pattern. (C10-C24) RR QUALITY ASSURANCE: These analyses are performed in accordance

with EPA quidelines for quality assurance.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-02

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT NO: 2832.13

PROJECT: BJ Hobbs

MATRIX: WATER

SITE: Hobbs, NM

SAMPLE ID: MW-11A

DATE SAMPLED: 03/24/98 13:00:00

SAMPLED BY: Brown & Caldwell

DATE RECEIVED: 03/25/98

		ANALYTICA	L DATA		
PARAMETER			RESULTS	DETECTION LIMIT	UNITS
Fluoride			2.9	0.5	${\tt mg/L}$
Method 300.0 *	*				
Analyzed by: H	EM				
Date: (03/25/98	13:00:00			
Nitrate nitroge	en(as N)		ND	0.05	mg/L
Method 353.3 *					
Analyzed by: E					
Date: 0	03/25/98	12:00:00			
Sulfate			190	25	mg/L
Method 375.4 *	ł .				
Analyzed by: E	EΜ				
Date: 0	04/02/98	12:30:00			

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed. ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C24

that do not resemble a diesel pattern. (C10-C24) RR

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B04-02

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

04/08/98

PROJECT: BJ Hobbs PROJECT NO: 2832.13

SITE: Hobbs, NM MATRIX: WATER

SAMPLED BY: Brown & Caldwell

SAMPLE ID: MW-11A

DATE SAMPLED: 03/24/98 13:00:00

DATE RECEIVED: 03/25/98

Acetone ND 100 u Benzene 24 5 u	ITS g/L g/L g/L g/L
Benzene 24 5 u	g/L g/L g/L
	g/L g/L
	g/L g/L
	g/L
	g/L
	g/L
	g/L
	g/L
Chloroethane ND 10 u	g/L
2-Chloroethylvinylether ND 10 u	g/L
Chloroform ND 5 u	g/L
Chloromethane ND 10 u	g/L
Dibromochloromethane ND 5 u	J/L
1,1-Dichloroethane ND 5 u	g/L
	3/L
	g/L
	g/L
	g/L
total-1,2-Dichloroethene ND 5 u	g/L
	g/L
	$\frac{1}{2}$
	a\r
	i/L
	g/L
	d\r
	g/L
	7/L
	g/L
, ,	g/L
	3/L
· · · · · · · · · · · · · · · · · · ·	3/L
	7/L
• ·	7/L

METHOD: 8240, Volatile Organics - Water (continued on next page)

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B04-02

Brown and Caldwell

SAMPLE ID: MW-11A

SURROGATES	AMOUNT SPIKED	% RECOVERY	LOWER LIMIT	UPPER LIMIT
1,2-Dichloroethane-d4	50 ug/L	96	76	114
Toluene-d8	50 ug/L	98	88	110
4-Bromofluorobenzene	50 ug/L	100	86	115

ANALYZED BY: JC DATE/TIME: 03/31/98 23:36:00

METHOD: 8240, Volatile Organics - Water

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS: Sample contains petroleum hydrocarbons from C10-C24 that do not resemble a diesel pattern.(C10-C24) RR

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE SAMPLED: 03/24/98 13:00:00

ertificate of Analysis No. H9-9803B04-02

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

SAMPLED BY: Brown & Caldwell

04/08/98

PROJECT: BJ Hobbs PROJECT NO: 2832.13

SITE: Hobbs, NM MATRIX: WATER

SAMPLE ID: MW-11A DATE RECEIVED: 03/25/98

ΔN	ALYTICAL DATA			·	
PARAMETER		ULTS	PQL*		UNITS
Naphthalene		0.8	0.1		ug/L
Acenaphthylene		ND	0.1		ug/L
Acenaphthene		ND	0.3		ug/L
Fluorene		ND	0.3		ug/L
Phenanthrene		ND	0.1		ug/L
Anthracene		ND	0.1		ug/L
Fluoranthene		ND	0.1		ug/L
Pyrene		ND	0.1		ug/L
Chrysene		ND	0.1		ug/L
Benzo (a) anthracene		ND	0.1		ug/L
Benzo (b) fluoranthene		ND	0.1		ug/L
Benzo (k) fluoranthene		ND	0.1		ug/L
Benzo (a) pyrene		ND	0.1		ug/L
Dibenzo (a,h) anthracene		ND	0.1		ug/L
Benzo (g,h,i) perylene		ND	0.1		ug/L
Indeno (1,2,3-cd) pyrene		ND	0.1		ug/L
SURROGATES	AMOUNT	%		LOWER	UPPER
	SPIKED	RECC	VERY	LIMIT	LIMIT
1-Fluoronaphthalene	0.20 ug/L		78	50	150
Phenanthrene d-10	$0.20~\mathrm{ug/L}$	1	.14	50	150

ANALYZED BY: KA DATE/TIME: 04/08/98 00:32:46 EXTRACTED BY: AM DATE/TIME: 03/31/98 08:00:00

METHOD: 8310 Polynuclear Aromatic Hydrocarbons

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B04-03

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/08/98

PROJECT: BJ Hobbs **PROJECT NO: 2832.13**

MATRIX: WATER SITE: Hobbs, NM SAMPLED BY: Brown & Caldwell **DATE SAMPLED:** 03/24/98 10:00:00

SAMPLE ID: MW-9 DATE RECEIVED: 03/25/98

ANALYTICAL	DATA			
PARAMETER	I	RESULTS	DETECTION LIMIT	UNITS
Gasoline Range Organics		1.0	0.1 P	mg/L
Surrogate 4-Bromofluorobenzene 1,4-Difluorobenzene Method 8015B *** for Gasoline Analyzed by: HS Date: 03/28/98	% Re	117 100		
BENZENE TOLUENE ETHYLBENZENE TOTAL XYLENE TOTAL VOLATILE AROMATIC HYDROCARBONS		ND ND ND 26 26	1.0 P 1.0 P 1.0 P 1.0 P	μg/L μg/L μg/L μg/L μg/L
Surrogate 1,4-Difluorobenzene 4-Bromofluorobenzene Method 8020A *** Analyzed by: HS Date: 03/28/98	% R€	110 120		
Total Petroleum Hydrocarbons-Diesel		0.90	0.20 P	mg/L
Surrogate n-Pentacosane Method 8015B *** for Diesel	% Re	ecovery 48		

Analyzed by: RR

Date: 03/27/98 10:45:00

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-03

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT: BJ Hobbs

PROJECT NO: 2832.13

MATRIX: WATER

SITE: Hobbs, NM SAMPLED BY: Brown & Caldwell **DATE SAMPLED:** 03/24/98 10:00:00

SAMPLE ID: MW-9 DATE RECEIVED: 03/25/98

PARAMETER		ANALYTICAL	DATA RESULTS	DETECTION LIMIT	UNITS
Methane RSKSOP-147 Analyzed by: Date:	JDR 04/02/98	11:27:00	ND	0.0012 P	ppm
Silver, Total Method 6010B Analyzed by: Date:		08:49:00	ND	0.01	mg/L
Arsenic, Total Method 7060A Analyzed by: Date:	***	13:14:00	0.005	0.005	mg/L
Barium, Total Method 6010B Analyzed by: Date:		08:49:00	0.066	0.005	mg/L
Cadmium, Total Method 6010B Analyzed by: Date:	***	08:49:00	ND	0.005	mg/L

ND - Not detected.

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed. ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C24 that do not resemble a diesel pattern. (C10-C24) RR

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-03

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT: BJ Hobbs

PROJECT NO: 2832.13

PROJECT NO: 2832.13

SITE: Hobbs, NM MATRIX: WATER
SAMPLED BY: Brown & Caldwell DATE SAMPLED: 03/24/98 10:00:00

SAMPLE ID: MW-9

DATE RECEIVED: 03/25/98

ANALYTICAL DATA PARAMETER RESULTS DETECTION UNITS LIMIT Chromium, Total ND 0.01 mg/L Method 6010B *** Analyzed by: PS Date: 03/27/98 08:49:00 Mercury, Total ND 0.0002 mg/L Method 7470 A*** Analyzed by: AG Date: 03/31/98 13:44:00 Hardness-Total as CaCO3 510 10 mg/L CaCO3 Method 130.2 * Analyzed by: KS Date: 04/01/98 08:45:00 03/26/98 Acid Digestion-Aqueous, ICP Method 3010A *** Analyzed by: SRC Date: 03/26/98 07:30:00 03/26/98 Acid Digestion-Aqueous, GF Method 3020A *** Analyzed by: SRC Date: 03/26/98 08:30:00

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C24 that do not resemble a diesel pattern.(C10-C24) RR

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B04-03

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/08/98

PROJECT: BJ Hobbs PROJECT NO: 2832.13

SITE: Hobbs, NM MATRIX: WATER

SAMPLED BY: Brown & Caldwell

SAMPLE ID: MW-9

DATE SAMPLED: 03/24/98 10:00:00

DATE RECEIVED: 03/25/98

ANALYTICAL DATA PARAMETER RESULTS DETECTION UNITS LIMIT Lead, Total ND 0.005 mg/L Method 7421 *** Analyzed by: PB Date: 04/03/98 10:04:00 Selenium, Total ND 0.005 mg/L Method 7740 *** Analyzed by: JM Date: 04/02/98 13:14:00 Calcium, Dissolved 142 1. mq/LMethod 6010B *** Analyzed by: PS Date: 03/31/98 08:07:00 Potassium, Dissolved ND20 mq/L Method 6010B *** Analyzed by: PS Date: 03/31/98 08:07:00 Magnesium, Dissolved 36 1 mg/L Method 6010B *** Analyzed by: PS Date: 03/31/98 08:07:00 Sodium, Dissolved 118 5 mq/L Method 6010B *** Analyzed by: PS Date: 04/01/98 08:04:00

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-03

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT: BJ Hobbs

PROJECT NO: 2832.13

MATRIX: WATER

SITE: Hobbs, NM
SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/24/98 10:00:00

SAMPLE ID: MW-9

DATE RECEIVED: 03/25/98

		ANALYTICA	L DATA		
PARAMETER			RESULTS	DETECTION LIMIT	UNITS
Dissolved Meta Method 3005A Analyzed by: Date:	***	17:00:00	03/25/98	LIMII	
Chloride Method 325.3 Analyzed by: Date:		09:00:00	164	5	mg/L
luoride Method 300.0 Analyzed by: Date:		13:00:00	1.3	0.5	mg/L
itrate nitrog Method 353.3 Analyzed by: Date:	*	12:00:00	4.27	0.05	mg/L
Sulfate Method 375.4 Analyzed by: Date:		12:30:00	230	25	mg/L

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C24 that do not resemble a diesel pattern.(C10-C24) RR

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B04-03

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

04/08/98

PROJECT: BJ Hobbs PROJECT NO: 2832.13

SITE: Hobbs, NM MATRIX: WATER

SAMPLED BY: Brown & Caldwell

SAMPLE ID: MW-9

DATE SAMPLED: 03/24/98 10:00:00

DATE RECEIVED: 03/25/98

A	NALYTICAL DATA				
PARAMETER	RES	ULTS	PQL*		UNITS
Naphthalene		4	2.0		\mathtt{ug}/\mathtt{L}
Acenaphthylene		ND	0.1		ug/L
Acenaphthene		ND	0.3		ug/L
Fluorene		ND	0.3		ug/L
Phenanthrene		ND	0.1		ug/L
Anthracene		ND	0.1		ug/L
Fluoranthene		ND	0.1		ug/L
Pyrene		ND	0.1		ug/L
Chrysene		ND	0.1		ug/L
Benzo (a) anthracene		ND	0.1		ug/L
Benzo (b) fluoranthene		ND	0.1		${ t ug/L}$
Benzo (k) fluoranthene		ND	0.1		ug/L
Benzo (a) pyrene		ND	0.1		${ t ug/L}$
Dibenzo (a,h) anthracene		ND	0.1		ug/L
Benzo (g,h,i) perylene		ND	0.1		ug/L
Indeno (1,2,3-cd) pyrene		ND	0.1		ug/L
SURROGATES	AMOUNT	8		LOWER	UPPER
1 Dlugwonanhthalans	SPIKED		VERY	LIMIT	LIMIT
1-Fluoronaphthalene	0.20 ug/L		.14 MT	50 50	150
Phenanthrene d-10	0.20 ug/L	161	IAI T	50 	150

ANALYZED BY: KA DATE/TIME: 04/08/98 01:08:51 EXTRACTED BY: AM DATE/TIME: 03/31/98 08:00:00

METHOD: 8310 Polynuclear Aromatic Hydrocarbons

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

MI - Matrix Interference.

COMMENTS:

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-04

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT: BJ Hobbs PROJECT NO: 2832.13

SITE: Hobbs, NM MATRIX: WATER SAMPLED BY: Brown & Caldwell DATE SAMPLED: 03/24/

SAMPLED BY: Brown & Caldwell

SAMPLE ID: MW-3

DATE SAMPLED: 03/24/98 11:30:00

DATE RECEIVED: 03/25/98

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Gasoline Range Organics	3.9	0.5 P	mg/L
Surrogate	% Recovery		
4-Bromofluorobenzene	107		
1,4-Difluorobenzene	100		
Method 8015B *** for Gasoline Analyzed by: HS Date: 03/29/98			
BENZENE	140	1.0 P	μg/L
TOLUENE	630	5.0 P	$\mu g/L$
ETHYLBENZENE	360	1.0 P	μg/L
TOTAL XYLENE	310	1.0 P	μ g/L
TOTAL VOLATILE AROMATIC HYDROCARBONS	1440		$\mu g/L$
Surrogate	% Recovery		
1,4-Difluorobenzene	107		
4-Bromofluorobenzene	100		
Method 8020A ***			
Analyzed by: HS			
Date: 03/28/98			
Total Petroleum Hydrocarbons-Diesel	0.56	0.20 P	mg/L
Surrogate	% Recovery		
n-Pentacosane	84		
Method 8015B *** for Diesel			

(P) - Practical Quantitation Limit

Date: 03/30/98 07:08:00

Analyzed by: RR

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-04

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT: BJ Hobbs

PROJECT NO: 2832.13

MATRIX: WATER

SITE: Hobbs, NM SAMPLED BY: Brown & Caldwell **DATE SAMPLED:** 03/24/98 11:30:00

SAMPLE ID: MW-3 DATE RECEIVED: 03/25/98

PARAMETER		ANALYTICAL	DATA	RESULTS	DETECTION	UNITS
				KIDOLIO	LIMIT	ONLIB
Methane RSKSOP-147	TDD			ND	0.0012 P	ppm
Analyzed by: Date:	04/02/98	12:08:00				
Silver, Total Method 6010B				ND	0.01	mg/L
Analyzed by: Date:	03/27/98	08:49:00				
Arsenic, Total Method 7060A	* * *			0.007	0.005	mg/L
Analyzed by: Date:	04/02/98	13:14:00	•			
Barium, Total Method 6010B Analyzed by:				0.182	0.005	mg/L
	03/27/98	08:49:00				
Cadmium, Total Method 6010B Analyzed by:	***			ND	0.005	mg/L
Date:	03/27/98	08:49:00				

ND - Not detected.

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C18 that do not resemble a diesel pattern. (C10-C24) RR

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-04

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT NO: 2832.13

PROJECT: BJ Hobbs

MATRIX: WATER

SITE: Hobbs, NM

MAIRIA: WAIER

SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/24/98 11:30:00

SAMPLE ID: MW-3

DATE RECEIVED: 03/25/98

	ANALYTICAL	DATA		
PARAMETER		RESULTS	DETECTION LIMIT	UNITS
Chromium, Total Method 6010B *** Analyzed by: PS Date: 03/27/98 0	08:49:00	ND	0.01	mg/L
Mercury, Total Method 7470 A*** Analyzed by: AG Date: 03/31/98 1	_3:44:00	ND	0.0002	mg/L
Hardness-Total as CaCO3 Method 130.2 * Analyzed by: KS Date: 04/01/98 0	08:45:00	430	10	mg/L CaCO3
Acid Digestion-Aqueous, Method 3010A *** Analyzed by: SRC Date: 03/26/98 0		03/26/98		
Acid Digestion-Aqueous, Method 3020A *** Analyzed by: SRC Date: 03/26/98 0		03/26/98		

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C18 that do not resemble a diesel pattern.(C10-C24) RR

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-04

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT: BJ Hobbs

SITE: Hobbs, NM

SAMPLE ID: MW-3

PROJECT NO: 2832.13

OLCI NO. 2052.15

MATRIX: WATER

SAMPLED BY: Brown & Caldwell DATE SAMPLED: 03/24/98 11:30:00

DATE RECEIVED: 03/25/98

	ANALYTICAL D	ATA		
PARAMETER		RESULTS	DETECTION LIMIT	UNITS
Lead, Total Method 7421 *** Analyzed by: PB Date: 04/03/98	10:04:00	ND	0.005	mg/L
Selenium, Total Method 7740 *** Analyzed by: JM Date: 04/02/98	13:14:00	ND	0.005	mg/L
Calcium, Dissolved Method 6010B *** Analyzed by: PS Date: 03/31/98	08:07:00	122	1	mg/L
Potassium, Dissolved Method 6010B *** Analyzed by: PS Date: 03/31/98	08:07:00	ND	20	mg/L
Magnesium, Dissolved Method 6010B *** Analyzed by: PS Date: 03/31/98	08:07:00	30	1	mg/L
Sodium, Dissolved Method 6010B *** Analyzed by: PS Date: 04/01/98	08:04:00	126	5	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

DATE SAMPLED: 03/24/98 11:30:00

ertificate of Analysis No. H9-9803B04-04

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

SAMPLED BY: Brown & Caldwell

PROJECT: BJ Hobbs PROJECT NO: 2832.13

SITE: Hobbs, NM MATRIX: WATER

SAMPLE ID: MW-3 DATE RECEIVED: 03/25/98

ANALYTICAL DATA						
PARAMETER			RESULTS	DETECTION LIMIT	UNITS	
Dissolved Meta Method 3005A Analyzed by: Date:	***	17:00:00	03/25/98	HIMIT		
Chloride Method 325.3 Analyzed by:	*		206	5	mg/L	
Fluoride Method 300.0 Analyzed by:	*		1.2	0.5	mg/L	
Nitrate nitrog Method 353.3 Analyzed by:	gen(as N)		3.07	0.05	mg/L	
Sulfate Method 375.4 Analyzed by: Date:		12:30:00	180	25	mg/L	

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C18 that do not resemble a diesel pattern.(C10-C24) RR

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B04-04

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

04/08/98

PROJECT: BJ Hobbs PROJECT NO: 2832.13

SITE: Hobbs, NM MATRIX: WATER
SAMPLED BY: Brown & Caldwell DATE SAMPLED: 03/24/98 11:30:00

SAMPLE ID: MW-3 DATE RECEIVED: 03/25/98

AN	ALYTICAL DATA				
PARAMETER	RES	ULTS	PQL*		UNITS
Naphthalene		23	5.0		ug/L
Acenaphthylene		ND	0.1		ug/L
Acenaphthene		ND	0.3		ug/L
Fluorene		ND	0.3		ug/L
Phenanthrene		ND	0.1		ug/L
Anthracene		ND	0.1		ug/L
Fluoranthene		ND	0.1		ug/L
Pyrene		ND	0.1		ug/L
Chrysene		ND	0.1		ug/L
Benzo (a) anthracene		ND	0.1		ug/L
Benzo (b) fluoranthene		ND	0.1		ug/L
Benzo (k) fluoranthene		ND	0.1		\mathtt{ug}/\mathtt{L}
Benzo (a) pyrene		ND	0.1		ug/L
Dibenzo (a,h) anthracene		ND	0.1		ug/L
Benzo (g,h,i) perylene		ND	0.1		ug/L
Indeno (1,2,3-cd) pyrene		ND	0.1		ug/L
SURROGATES	AMOUNT	8		LOWER	UPPER
1-Fluoronaphthalene	SPIKED 0.20 ug/L		32	LIMIT 50	LIMIT 150
Phenanthrene d-10	0.20 ug/L		78	50	150

ANALYZED BY: KA DATE/TIME: 04/08/98 01:44:55 EXTRACTED BY: AM DATE/TIME: 03/31/98 08:00:00

METHOD: 8310 Polynuclear Aromatic Hydrocarbons

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-05

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT NO: 2832.13

SITE: Hobbs, NM MATRIX: WATER SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/24/98 13:22:00

SAMPLE ID: MW-1

PROJECT: BJ Hobbs

DATE RECEIVED: 03/25/98

ANALYTICAL	DATA RESULTS	DETECTION	UNITS
	11200210	LIMIT	011210
Gasoline Range Organics	38	2 P	mg/L
Surrogate 4-Bromofluorobenzene 1,4-Difluorobenzene Method 8015B *** for Gasoline Analyzed by: HS Date: 03/29/98	% Recovery 112 99		
BENZENE TOLUENE ETHYLBENZENE TOTAL XYLENE TOTAL VOLATILE AROMATIC HYDROCARBONS	4800 7200 1200 2400 15600		μg/L μg/L μg/L μg/L μg/L
Surrogate 1,4-Difluorobenzene 4-Bromofluorobenzene Method 8020A *** Analyzed by: HS Date: 03/29/98	% Recovery 101 103		
Total Petroleum Hydrocarbons-Diesel	4.2	1.00 P	mg/L
Surrogate n-Pentacosane Method 8015B *** for Diesel	% Recovery 80		

Analyzed by: RR

Date: 03/28/98 12:16:00

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-05

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT NO: 2832.13

Nampty - Wampp

SITE: Hobbs, NM

MATRIX: WATER

SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/24/98 13:22:00

SAMPLE ID: MW-1

PROJECT: BJ Hobbs

DATE RECEIVED: 03/25/98

PARAMETER		ANALYTICAL	DATA	RESULTS	DETECTION	UNITS
Methane RSKSOP-147 Analyzed by:	JDR 04/02/98	12.20.00		ND	LIMIT 0.0012 P	mqq
Silver, Total Method 6010B Analyzed by:	***			ND	0.01	mg/L
Arsenic, Tota Method 7060A Analyzed by: Date:	* * *	13:14:00		0.007	0.005	mg/L
Barium, Total Method 6010B Analyzed by: Date:		08:18:00		0.110	0.005	mg/L
Cadmium, Total Method 6010B Analyzed by: Date:	* * *	08:18:00		ND	0.005	mg/L

ND - Not detected.

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C20 that do not resemble a diesel pattern.(C10-C24) RR

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B04-05

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/08/98

PROJECT: BJ Hobbs

SITE: Hobbs, NM

SAMPLED BY: Brown & Caldwell

SAMPLE ID: MW-1

PROJECT NO: 2832.13

MATRIX: WATER

DATE SAMPLED: 03/24/98 13:22:00

DATE RECEIVED: 03/25/98

ANALYTICAL DATA						
PARAMETER		RESULTS	DETECTION LIMIT	UNITS		
Chromium, Total Method 6010B *** Analyzed by: PS Date: 03/30/98	08:18:00	ND	0.01	mg/L		
Mercury, Total Method 7470 A*** Analyzed by: AG Date: 03/31/98	13:44:00	ND	0.0002	mg/L		
Hardness-Total as CaCO3 Method 130.2 * Analyzed by: KS Date: 04/01/98		430	10	mg/L CaCO3		
Acid Digestion-Aqueous, Method 3010A *** Analyzed by: GJ Date: 03/27/98		03/27/98				
Acid Digestion-Aqueous, Method 3020A *** Analyzed by: GJ Date: 03/27/98		03/27/98				

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C20 that do not resemble a diesel pattern.(C10-C24) RR

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-05

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT: BJ Hobbs

SAMPLED BY: Brown & Caldwell

SITE: Hobbs, NM

PROJECT NO: 2832.13

MATRIX: WATER

DATE SAMPLED: 03/24/98 13:22:00

	ANALYTICAL DAT	ľA		
PARAMETER		RESULTS	DETECTION LIMIT	UNITS
Lead, Total Method 7421 *** Analyzed by: JM Date: 03/31/98	14:13:00	ND	0.005	mg/L
Selenium, Total Method 7740 *** Analyzed by: JM Date: 04/02/98	13:14:00	ND	0.005	mg/L
Calcium, Dissolved Method 6010B *** Analyzed by: PS Date: 03/31/98	08:07:00	129	1	mg/L
Potassium, Dissolved Method 6010B *** Analyzed by: PS Date: 03/31/98	08:07:00	ND	20	mg/L
Magnesium, Dissolved Method 6010B *** Analyzed by: PS Date: 03/31/98	08:07:00	36	1	mg/L
Sodium, Dissolved Method 6010B *** Analyzed by: PS Date: 04/01/98	08:04:00	113	5	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C20 that do not resemble a diesel pattern. (C10-C24) RR QUALITY ASSURANCE: These analyses are performed in accordance

with EPA guidelines for quality assurance.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-05

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT: BJ Hobbs

SAMPLED BY: Brown & Caldwell

SITE: Hobbs, NM

PROJECT NO: 2832.13

MATRIX: WATER

DATE SAMPLED: 03/24/98 13:22:00

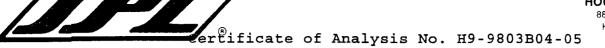
SAMPLE ID: MW-1 DATE RECEIVED: 03/25/98

ANALYTICAL DATA						
PARAMETER	RESULTS	DETECTION	UNITS			
Dissolved Metals Prep. Method 3005A *** Analyzed by: GJ Date: 03/25/98 17:00:00	03/25/98	LIMIT				
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: TW Date: 03/25/98 12:00:00	ND	1	mg/L			
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: TW Date: 03/25/98 12:00:00	286	1	mg/L			
Chloride Method 325.3 * Analyzed by: TV Date: 04/04/98 09:00:00	212	5	mg/L			
Fluoride Method 300.0 * Analyzed by: EM Date: 03/25/98 13:00:00	0.9	0.5	mg/L			
Witrate nitrogen(as N) Method 353.3 * Analyzed by: EM Date: 03/25/98 12:00:00	1.78	0.05	mg/L			

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT: BJ Hobbs SITE: Hobbs, NM

PROJECT NO: 2832.13

MATRIX: WATER

SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/24/98 13:22:00

SAMPLE ID: MW-1

DATE RECEIVED: 03/25/98

ANALYTICAL DATA

PARAMETER RESULTS **DETECTION** UNITS LIMIT Sulfate 130 25 mq/L

Method 375.4 * Analyzed by: EM

Date: 04/02/98 12:30:00

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C20

that do not resemble a diesel pattern.(C10-C24) RR

50

D

150

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B04-05

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

04/08/98

PROJECT: BJ Hobbs PROJECT NO: 2832.13

SITE: Hobbs, NM MATRIX: WATER

SAMPLED BY: Brown & Caldwell

SAMPLE ID: MW-1

DATE SAMPLED: 03/24/98 13:22:00

DATE RECEIVED: 03/25/98

AA	ALYTICAL DATA			
PARAMETER	RESULTS	PQL*	•	UNITS
Naphthalene	130	10.0		ug/L
Acenaphthylene	ND	10.0		ug/L
Acenaphthene	ND	10.0		ug/L
Fluorene	ND	10.0		ug/L
Phenanthrene	ND	10.0		ug/L
Anthracene	ND	10.0		ug/L
Fluoranthene	ND	10.0		ug/L
Pyrene	ND	10.0		ug/L
Chrysene	ND	10.0		ug/L
Benzo (a) anthracene	ND	10.0		ug/L
Benzo (b) fluoranthene	ND	10.0		ug/L
Benzo (k) fluoranthene	ND	10.0		ug/L
Benzo (a) pyrene	ND	10.0		ug/L
Dibenzo (a,h) anthracene	ND	10.0		ug/L
Benzo (g,h,i) perylene	ND	10.0		ug/L
Indeno (1,2,3-cd) pyrene	ND	10.0		ug/L
SURROGATES	AMOUNT	%	LOWER	UPPER
	SPIKED R	ECOVERY	LIMIT	LIMIT
1-Fluoronaphthalene	0.20 ug/L	D	50	150

0.20 ug/L

ANALYZED BY: KA DATE/TIME: 04/08/98 02:21:05 EXTRACTED BY: AM DATE/TIME: 03/31/98 08:00:00

METHOD: 8310 Polynuclear Aromatic Hydrocarbons

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

Phenanthrene d-10

D - Diluted, control limits not applicable.

COMMENTS:

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B04-06

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/08/98

PROJECT: BJ Hobbs PROJECT NO: 2832.13

SITE: Hobbs, NM MATRIX: WATER

SAMPLED BY: Brown & Caldwell

SAMPLE ID: MW-4

DATE SAMPLED: 03/24/98 13:50:00

DATE RECEIVED: 03/25/98

ANALYTICAL			
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Gasoline Range Organics	5.6	0.5 P	mg/L
Surrogate	% Recovery		
4-Bromofluorobenzene	113		
1,4-Difluorobenzene	113		
Method 8015B *** for Gasoline			
Analyzed by: HS Date: 03/29/98			
bacc. 03/23/30			
BENZENE	150	5.0 P	$\mu g/L$
TOLUENE	510	5.0 P	μg/L
ETHYLBENZENE	270	5.0 P	μ g/L
TOTAL XYLENE	620	5.0 P	$\mu g/L$
TOTAL VOLATILE AROMATIC HYDROCARBONS	1550		$\mu g/L$
Surrogate	% Recovery		
1,4-Difluorobenzene	107		
4-Bromofluorobenzene Method 8020A ***	100		
Analyzed by: HS			
Date: 03/29/98			
Total Petroleum Hydrocarbons-Diesel	1.2	0.20 P	mg/L
Surrogate	% Recovery		
n-Pentacosane	84		
Method 8015B *** for Diesel			

(P) - Practical Quantitation Limit

Date: 03/28/98 01:03:00

Analyzed by: RR

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C24 that do not resemble a diesel pattern.(C10-C24) RR QUALITY ASSURANCE: These analyses are performed in accordance with EPA quidelines for quality assurance.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-06

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT NO: 2832.13

MATRIX: WATER

SITE: Hobbs, NM
SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/24/98 13:50:00

SAMPLE ID: MW-4

PROJECT: BJ Hobbs

DATE RECEIVED: 03/25/98

		ANALYTICAL	DATA		
PARAMETER			RESULTS		UNITS
Methane RSKSOP-147 Analyzed by:		10.00	ND	LIMIT 0.0012 P	ppm
Date:	04/02/98	12:33:00			
Silver, Total Method 6010B Analyzed by:	PS		ND	0.01	mg/L
Date:	03/27/98	08:49:00			
Arsenic, Tota Method 7060A Analyzed by:	*** JM		0.008	0.005	mg/L
Date:	04/02/98	13:14:00			
Barium, Total Method 6010B Analyzed by:	PS		0.044	0.005	mg/L
Date:	03/27/98	08:49:00			
Cadmium, Total Method 6010B Analyzed by:	***		ND	0.005	mg/L
Date:	03/27/98	08:49:00			

ND - Not detected.

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C24 that do not resemble a diesel pattern.(C10-C24) RR

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-06

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT: BJ Hobbs
SITE: Hobbs, NM

PROJECT NO: 2832.13

MATRIX: WATER

SAMPLED BY: Brown & Caldwell DATE SAMPLED: 03/24/98 13:50:00

SAMPLE ID: MW-4 DATE RECEIVED: 03/25/98

	ANALYTICAL	DATA		
PARAMETER		RESULTS	DETECTION LIMIT	UNITS
Chromium, Total Method 6010B *** Analyzed by: PS Date: 03/27/98	08:49:00	ND	0.01	mg/L
Mercury, Total Method 7470 A*** Analyzed by: AG Date: 03/31/98	13:44:00	ND	0.0002	mg/L
Hardness-Total as CaCO3 Method 130.2 * Analyzed by: KS Date: 04/01/98		275	5	mg/L CaCO3
cid Digestion-Aqueous, Method 3010A *** Analyzed by: SRC Date: 03/26/98		03/26/98		
cid Digestion-Aqueous, Method 3020A *** Analyzed by: SRC Date: 03/26/98		03/26/98		

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C24 that do not resemble a diesel pattern.(C10-C24) RR

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-06

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT NO: 2832.13

MATRIX: WATER SITE: Hobbs, NM SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/24/98 13:50:00

SAMPLE ID: MW-4

PROJECT: BJ Hobbs

DATE RECEIVED: 03/25/98

	ANALYTICAL I	DATA		
PARAMETER		RESULTS	DETECTION LIMIT	UNITS
Lead, Total Method 7421 *** Analyzed by: PB Date: 04/03/98	10:04:00	ND	0.005	mg/L
Selenium, Total Method 7740 *** Analyzed by: JM Date: 04/02/98	13:14:00	ND	0.005	mg/L
Calcium, Dissolved Method 6010B *** Analyzed by: PS Date: 03/31/98	08:07:00	79	1	mg/L
Potassium, Dissolved Method 6010B *** Analyzed by: PS Date: 03/31/98	08:07:00	ND	20	mg/L
Magnesium, Dissolved Method 6010B *** Analyzed by: PS Date: 03/31/98	08:07:00	18	1	mg/L
Sodium, Dissolved Method 6010B *** Analyzed by: PS Date: 04/01/98	08:04:00	109	5	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C24 that do not resemble a diesel pattern.(C10-C24) RR QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

DATE SAMPLED: 03/24/98 13:50:00

ertificate of Analysis No. H9-9803B04-06

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT: BJ Hobbs **PROJECT NO:** 2832.13

SITE: Hobbs, NM MATRIX: WATER SAMPLED BY: Brown & Caldwell

SAMPLE ID: MW-4 DATE RECEIVED: 03/25/98

ANALYT	'ICAL DATA		
PARAMETER	RESULTS	DETECTION	UNIT
Dissolved Metals Prep. Method 3005A *** Analyzed by: GJ Date: 03/25/98 17:00:00	03/25/98	LIMIT	
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: TW Date: 03/25/98 12:00:00	ND	1	mg/I
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: TW Date: 03/25/98 12:00:00	175	1	mg/L
Chloride Method 325.3 * Analyzed by: TV Date: 04/04/98 09:00:00	126	2	mg/L
Fluoride Method 300.0 * Analyzed by: EM Date: 03/25/98 13:00:00	1.2	0.5	mg/L
Nitrate nitrogen(as N) Method 353.3 * Analyzed by: EM Date: 03/25/98 12:00:00	2.59	0.05	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C24 that do not resemble a diesel pattern. (C10-C24) RR QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B04-06

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/08/98

PROJECT: BJ Hobbs

PROJECT NO: 2832.13

SITE: Hobbs, NM

MATRIX: WATER

SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/24/98 13:50:00

SAMPLE ID: MW-4

DATE RECEIVED: 03/25/98

ANALYTICAL DATA

PARAMETER RESULTS DETECTION UNITS LIMIT
Sulfate 160 25 mg/L

Method 375.4 *
Analyzed by: EM

Date: 04/02/98 12:30:00

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: Sample contains petroleum hydrocarbons from C10-C24

that do not resemble a diesel pattern. (C10-C24) RR

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B04-06

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

04/08/98

PROJECT: BJ Hobbs PROJECT NO: 2832.13

SITE: Hobbs, NM MATRIX: WATER

SAMPLED BY: Brown & Caldwell

SAMPLE ID: MW-4

DATE SAMPLED: 03/24/98 13:50:00

DATE RECEIVED: 03/25/98

ANA	LYTICAL DATA			
PARAMETER	RESULT	'S	PQL*	UNITS
Naphthalene	V	ID	0.1	ug/L
Acenaphthylene	D.	ID	0.1	ug/L
Acenaphthene	. N	1D	0.3	ug/L
Fluorene	ν	ID	0.3	ug/L
Phenanthrene	N	1D	0.1	ug/L
Anthracene	V.	ID	0.1	ug/L
Fluoranthene	V	ID	0.1	ug/L
Pyrene	N	ID	0.1	ug/L
Chrysene	ν	ID	0.1	ug/L
Benzo (a) anthracene	V	ID	0.1	ug/L
Benzo (b) fluoranthene	N	ID	0.1	ug/L
Benzo (k) fluoranthene	N	ID	0.1	ug/L
Benzo (a) pyrene	N	ID	0.1	ug/L
Dibenzo (a,h) anthracene	N	ID	0.1	ug/L
Benzo (g,h,i) perylene	N	ID	0.1	ug/L
Indeno (1,2,3-cd) pyrene	N	ID	0.1	ug/L
SURROGATES	AMOUNT	8	LOWE	R UPPER

SURROGATES	AMOUNT SPIKED	% RECOVERY	LOWER LIMIT	UPPER LIMIT
1-Fluoronaphthalene	$0.20~{ m ug/L}$	73	50	150
Phenanthrene d-10	0.20 ug/L	90	50	150

ANALYZED BY: KA DATE/TIME: 04/04/98 02:54:02 EXTRACTED BY: AM DATE/TIME: 03/30/98 08:00:00

METHOD: 8310 Polynuclear Aromatic Hydrocarbons

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B04-07

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/08/98

PROJECT: BJ Hobbs

PROJECT NO: 2832.13

SITE: Hobbs, NM

MATRIX: WATER

SAMPLED BY: Brown & Caldwell

DATE SAMPLED: 03/24/98 12:05:00

SAMPLE ID: MW-9

DATE RECEIVED: 03/25/98

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: TW Date: 03/25/98 12:00:00	ND	1	mg/L
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: TW Date: 03/25/98 12:00:00	306	1	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-08

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT NO: 2832.13

WARDING. 2032.13

MATRIX: WATER

DATE SAMPLED: 03/24/98 12:10:00

SAMPLE ID: MW-3

SITE: Hobbs, NM

PROJECT: BJ Hobbs

SAMPLED BY: Brown & Caldwell

DATE RECEIVED: 03/25/98

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Carbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: TW Date: 03/25/98 12:00:00	ND	1	mg/L
Bicarbonate, as CaCO3 Method SM 4500-CO2D ** Analyzed by: TW Date: 03/25/98 12:00:00	214	1	mg/L

ND - Not detected.

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B04-09

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

04/08/98

PROJECT: BJ Hobbs SITE: Hobbs, NM SAMPLED BY: Provided by SPL SAMPLE ID: Trip Blank-1 PROJECT NO: 2832.13

MATRIX: WATER

DATE SAMPLED: 03/24/98

DATE RECEIVED: 03/25/98

ANALYTICAL DATA						
PARAMETER	RESULTS	PQL*	UNITS			
Acetone	ND	100	\mathtt{ug}/\mathtt{L}			
Benzene	ND	5	ug/L			
Bromodichloromethane	ND	5	ug/L			
Bromoform	ND	5	ug/L			
Bromomethane	ND	10	${ t ug/L}$			
2-Butanone	ND	20	ug/L			
Carbon Disulfide	ND	5	\mathtt{ug}/\mathtt{L}			
Carbon Tetrachloride	ND	5	\mathtt{ug}/\mathtt{L}			
Chlorobenzene	ND	5	${ t ug/L}$			
Chloroethane	ND	10	ug/L			
2-Chloroethylvinylether	ND	10	ug/L			
Chloroform	ND	5	ug/L			
Chloromethane	ND	10	ug/L			
Dibromochloromethane	ND	5	\mathtt{ug}/\mathtt{L}			
1,1-Dichloroethane	ND	5	${ t ug/L}$			
1,1-Dichloroethene	ND	5	${ t ug/L}$			
1,2-Dichloroethane	ND	5	${\tt ug/L}$			
cis-1,2-Dichloroethene	ND	5	\mathtt{ug}/\mathtt{L}			
trans-1,2-Dichloroethene	ND	5	ug/L			
total-1,2-Dichloroethene	ND	5	ug/L			
1,2-Dichloropropane	ND	5	ug/L			
cis-1,3-Dichloropropene	ND	5	ug/L			
trans-1,3-Dichloropropene	ND	5	ug/L			
Ethylbenzene	ND	5	ug/L			
2-Hexanone	ND	10	ug/L			
Methylene Chloride	ND	5	${ m ug/L}$			
4-Methyl-2-Pentanone	ND	10	ug/L			
Styrene	ND	5	ug/L			
1,1,2,2-Tetrachloroethane	ND	5	ug/L			
Tetrachloroethene	ND	5	ug/L			
Toluene	ND	5	${\tt ug/L}$			
1,1,1-Trichloroethane	ND	5	\mathtt{ug}/\mathtt{L}			
1,1,2-Trichloroethane	ND	5	ug/L			
Trichloroethene	ND	5	ug/L			
Trichlorofluoromethane	ND	5	${\tt ug/L}$			
Vinyl Acetate	ND	10	ug/L			
Vinyl Chloride	ND	10	ug/L			
Xylenes (total)	ND	5	${\tt ug/L}$			

METHOD: 8240, Volatile Organics - Water (continued on next page)

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B04-09

Brown and Caldwell

SAMPLE ID: Trip Blank-1

SURROGATES	AMOUNT SPIKED	% RECOVERY	LOWER LIMIT	UPPER LIMIT
1,2-Dichloroethane-d4	50 ug/L	100	76	114
Toluene-d8	50 ug/L	98	88	110
4-Bromofluorobenzene	50 ug/L	96	86	115

ANALYZED BY: JC DATE/TIME: 04/01/98 00:02:00

METHOD: 8240, Volatile Organics - Water

NOTES: * - Practical Quantitation Limit ND - Not Detected

NA - Not Analyzed

COMMENTS:



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

DATE: 04/08/98

ertificate of Analysis No. H9-9803B04-10

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

PROJECT NO: 2832.13

PROJECT: BJ Hobbs
SITE: Hobbs, NM
SAMPLED BY: Provided by SPL
SAMPLE ID: Trip Blank-2

MATRIX: WATER
DATE SAMPLED: 03/24/98
DATE RECEIVED: 03/25/98

ANALYTIC			
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
BENZENE	ND	1.0 P	$\mu { m g}/{ m L}$
TOLUENE	ND	1.0 P	$\mu { m g}/{ m L}$
ETHYLBENZENE	ND	1.0 P	$\mu g/L$
TOTAL XYLENE	ND	1.0 P	$\mu { m g}/{ m L}$
TOTAL VOLATILE AROMATIC HYDROCARBO	NS ND		$\mu { m g/L}$
Surrogate	% Recovery		
1,4-Difluorobenzene	100		
4-Bromofluorobenzene Method 8020A ***	93		

ND - Not detected.

Analyzed by: HS

Date: 03/28/98

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

ertificate of Analysis No. H9-9803B04-11

Brown and Caldwell 1415 Louisiana Houston, TX 77002 ATTN: Rick Rexroad

DATE: 04/08/98

PROJECT: BJ Hobbs SITE: Hobbs, NM SAMPLED BY: Provided by SPL SAMPLE ID: Trip Blank-3 PROJECT NO: 2832.13
MATRIX: WATER
DATE SAMPLED: 03/24/98
DATE RECEIVED: 03/25/98

ANALYTICAL	DATA		
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
Gasoline Range Organics	ND	0.1 P	mg/L
Surrogate	% Recovery		
4-Bromofluorobenzene	110		
1,4-Difluorobenzene	93		
Method 8015B *** for Gasoline			
Analyzed by: HS			
Date: 03/28/98			
BENZENE	ND	1.0 P	μg/L
TOLUENE	ND	1.0 P	$\mu g/L$
ETHYLBENZENE	ND	1.0 P	$\mu { m g}/{ m L}$
TOTAL XYLENE	ND	1.0 P	$\mu { m g}/{ m L}$
TOTAL VOLATILE AROMATIC HYDROCARBONS	ND		μg/L
Surrogate	% Recovery		
1,4-Difluorobenzene	100		
4-Bromofluorobenzene	97		
Method 8020A ***			
Analyzed by: HS			
Date: 03/28/98			

ND - Not detected.

(P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA

**Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.

***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY CONTROL

DOCUMENTATION

ЗΑ WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: SPL

Contract:

Lab Code:

Case No.: 9803B04 SAS No.:

SDG No.:

Matrix Spike - EPA Sample No.: MW-12

COMPOUND	SPIKE	SAMPLE	MS	MS	QC.
	ADDED	CONCENTRATION	CONCENTRATION	%	LIMITS
	(ug/L)	(ug/L)	(ug/L)	REC #	REC.
1,1-Dichloroethene Trichloroethene Benzene Toluene Chlorobenzene	50	0	47	94	61-145
	50	0	46	92	71-120
	50	100	140	80	76-127
	50	11	54	86	76-125
	50	0	44	88	75-130

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC L: RPD	MITS REC.
1,1-Dichloroethene Trichloroethene Benzene Toluene Chlorobenzene	50	53	106	12	14	61-145
	50	48	96	4	14	71-120
	50	140	80	0	11	76-127
	50	57	92	7	13	76-125
	50	47	94	7	13	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 5 outside limits Spike Recovery: 0 out of 10 outside limits

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Data File: /var/chem/n.i/n980331a.b/n090tl2.d

Report Date: 01-Apr-1998 07:28

SPL Houston Labs

RECOVERY REPORT

Client Name:

Sample Matrix: LIQUID

Lab Smp Id: LCS Level: LOW

Data Type: MS DATA

SpikeList File: 8260 water.spk

Sublist File: 8260.sub Method File: /var/chem/n.i/n980331a.b/n8260w.m Misc Info: N090W2//N090CW2

Client	SDG:	n980331

Fraction: VOA

Operator: JC

SampleType: METHSPIKE

Quant Type: ISTD

SPIKE COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
8 1,1-Dichloroethene	50	59	118.00	61-145
29 Trichloroethene	50	51	102.00	71-120
25 Benzene	50	50	100.00	76-127
37 Toluene	50	48	96.00	76-125
45 Chlorobenzene	50	48	96.00	75-130

SURROGATE COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
\$ 21 1,2-Dichloroethane	50	50	100.00	76-114
\$ 36 Toluene-d8	50	49	98.00	88-110
\$ 56 Bromofluorobenzene	50	50	100.00	86-115



SPL Blank QC Report

page

 Matrix: Aqueous
 Reported on: 04/01/98 16:38

 Sample ID: VLBLK
 Analyzed on: 03/31/98 22:43

Batch: N980331122724 Analyst: JC

METHOD 8260/8240 N090B02

Compound	Result	Detection Limit	Units
Chloromethane	ND	10	ug/L
Vinyl Chloride	ND	10	ug/L
Bromomethane	ND	10	ug/L
Chloroethane	ND	10	ug/L
Trichlorofluoromethane	ND	5	ug/L
Acetone	ND	100	ug/L
1,1-Dichloroethene	ND	5	ug/L
Methylene Chloride	ND	5	ug/L
Carbon Disulfide	ND	5 5	ug/L
trans-1,2-Dichloroethene	ND	5	ug/L
1,1-Dichloroethane	ND	5	ug/L
Vinyl Acetate	ND	10	ug/L
2-Butanone	ND	20	ug/L
cis-1,2-Dichloroethene	ND	5	ug/L
1,2-Dichloroethene (total)	ND	5	ug/L
Chloroform	ND	5 5 5	ug/L
1,1,1-Trichloroethane	ND	5	ug/L
1,2-Dichloroethane	ND		ug/L
Benzene	ND	5	ug/L
Carbon Tetrachloride	ND	5	ug/L
1,2-Dichloropropane	ND	5	ug/L
Trichloroethene	ND	5	ug/L
Bromodichloromethane	ND	5	ug/L
2-Chloroethylvinylether	ND	10	ug/L
-Methyl-2-Pentanone	ND	10	ug/L
cis-1,3-Dichloropropene	ND	5 -	ug/L
trans-1,3-Dichloropropene	ND	ר <u>ו</u>	ug/L
Toluene	ND ND	5 5 5	ug/L
1,1,2-Trichloroethane	ND ND	10	ug/L
2-Hexanone Dibromochloromethane	ND ND	5	ug/L
Tetrachloroethene	ND ND	5	ug/L
Chlorobenzene	ND	5	ug/L ug/L
Ethylbenzene	ND	5	ug/L

Notes

ND - Not detected.



SPL Blank QC Report

page

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Reported on: 04/01/98 16:38 Analyzed on: 03/31/98 22:43

Analyst: JC

Matrix: Aqueous
Sample ID: VLBLK
Batch: N980331122724

METHOD 8260/8240 N090B02

Compound	Result	Detection Limit	Units
Bromoform Styrene Kylene (Total) 1,1,2,2-Tetrachloroethane	ND	5	ug/L
	ND	5	ug/L
	ND	5	ug/L
	ND	5	ug/L

Surrogate	Result	QC Criteria	Units
1,2-Dichloroethane-d4	96	88-110	% Recovery
Toluene-d8	100		% Recovery
Bromofluorobenzene	100		% Recovery

Samples in Batch 9803B04-01 9803B04-02 9803B04-09 Notes

ND - Not detected.



SPL BATCH QUALITY CONTROL REPORT **

Method Modified 8015B*** for Gasoline

HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Matrix: Aq Units: mg

mg/L

Batch Id: VARE980327104110

LABORATORY CONTROL SAMPLE

S P I K E C O M P O U N D S	Method Blank Result <2>	Spike Added <3>	Blank Result <1>	Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
Gasoline Range Organics	ND	1.00	1.02	102	64 - 131

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results	Spike Added	Matrix	Spike	Matrix Dupli	Spike cate	MS/MSD Relative %		imits(***) (Advisory)
	<2>	<3>	Result <1>	Recovery <4>	Result <1>	Recovery <5>	Difference	RPD Max.	Recovery Range
GASOLINE RANGE ORGANICS	0.41	0.9	1.29	97.8	1.19	86.7	12.0	36	36 - 160

Analyst: HS

Sequence Date: 03/28/98

SPL ID of sample spiked: 9803B04-01A

Sample File ID: EEC4204.TX0

Method Blank File ID:

Blank Spike File ID: EEC4193.TX0

Matrix Spike File ID: EEC4196.TX0

Matrix Spike Duplicate File ID: EEC4197.TX0

* = Values outside QC Range due to Matrix Interference (except RPD)

« = Data outside Method Specification limits.

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [(<1> - <2>) / <3>] x 100

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = |(<4> - <5>)| / [(<4> + <5>) x 0.5] x 100

(**) = Source: SPL-Houston Historical data (1st Q '97)

(***) = Source: SPL-Houston Historical Data (1st Q '97)

SAMPLES IN BATCH(SPL ID):

9803B04-03A 9803B04-01A 9803B04-02A 9803B04-11A 9803C62-03A 9803C69-04A 9803C62-01A 9803C62-02A 9803C53-02A 9803C53-01A 9803B04-06A 9803B04-05A 9803B00-07A 9803B00-08A 9803B00-09A



SPL BATCH QUALITY CONTROL REPORT **

Method Modified 8015B*** for Gasoline

HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Matrix: Aqueous Units: mg/L

Batch Id: VARE980329120200

LABORATORY CONTROL SAMPLE

S P I K E C O M P O U N D S	Method Blank Result <2>	Spike Added <3>	Blank Result <1>	Spike Recovery %	QC Limits(**) (Mandatory) % Recovery Range
Gasoline Range Organics	ND	1.0	1.0	100	64 - 131

MATRIX SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix	Spike	Matrix Dupli	Spike	MS/MSD Relative %			
	<2>	<3>	Result <1>	Recovery <4>	Result <1>	Recovery <5>	Difference	RPD Max.	Recovery Range	
GASOLINE RANGE ORGANICS	ND.	0.9	0.77	85.6	1.0	111	25.8	36	36 - 160	

Analyst: HS

Sequence Date: 03/29/98

SPL ID of sample spiked: 9803C28-02A

Sample File ID: EEC4234.TXO

Method Blank File ID:

Blank Spike File ID: EEC4226.TXO Matrix Spike File ID: EEC4229.TXO

Matrix Spike Duplicate File ID: EEC4230.TX0

* = Values outside QC Range due to Matrix Interference (except RPD)

« = Data outside Method Specification limits.

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = ((<1> - <2>)) / <3>] x 100

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = |(<4> - <5>)| / [(<4> + <5>) x 0.5] x 100

(**) = Source: SPL-Houston Historical data (1st Q '97)

(***) = Source: SPL-Houston Historical Data (1st Q '97)

SAMPLES IN BATCH(SPL ID):

9803C58-03A 9803C53-04A 9803C53-05A 9803C53-06A

9803C53-07A 9803C53-08A 9803C53-09A 9803C59-02A

9803C53-03A 9803C58-01A 9803B04-04A



SPL BATCH QUALITY CONTROL REPORT ** Method Modified 8015B*** for Diesel

PAGE

HOUSTON LABORATORY 8880 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Units:

mg/L

Batch Id: HPVV980327125900

BLANK SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix	Spike	MatrixDupli	Spike	MS/MSD Relative %		Limits(**) (Advisory)
	<2>	<3>	Result	Recovery	Result	Recovery	Difference	RPD Max.	Recovery Range
DIESEL	ND	5.00	5.1	102	4.49	89.8	12.7	39	21 - 175

Analyst: RR

Sequence Date: 03/27/98 Method Blank File ID: Sample File ID:

Blank Spike File ID: V_C2194.TX0

Matrix Spike File 1D:

Matrix Spike Duplicate File ID:

 \star = Values Outside QC Range. « = Data outside Method Specification limits.

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not'Detected/Below Detection Limit

% Recovery = [(<1> - <2>) / <3>] x 100

Relative Percent Difference = |(<4> - <5>)| / [(<4> + <5>) x 0.5] x 100

(**) = Source: SPL-Houston Historical Data (4th Q '97)

SAMPLES IN BATCH(SPL ID):

9803B00-05B 9803B00-06B 9803B04-01B 9803B04-02B

9803B04-03B 9803B04-05B 9803B04-06B 9803B04-04B 9803B00-04B 9803987-01B 980326SFB1 9803B81-01A

9803B00-01B 9803B00-02B 9803B00-03B



SPL BATCH QUALITY CONTROL REPORT **

PAGE

HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Units:

ug/L

Batch Id: 2980401181600

BLANK SPIKES

S P I K E C O M P O U N D S	Sample Results	Spike Added	Matrix	Spike	Matrix Duplio	Spike	MS/MSD Relative %		Limits(**) (Advisory)	
			Result	Recovery	Result	Recovery	Difference	RPD		
	<2>	<3>	<1>	<4>	<1>	<5>		Max.	Recovery	Range
NAPHTHALENE	ND	0.50	0.45	90.0	0.44	88.0	2.25	30	33 -	122
ACENAPHTHYLENE	ND	0.50	0.43	86.0	0.41	82.0	4.76	30	42 -	138
ACENAPHTHENE	ND	0.50	0.47	94.0	0.45	90.0	4.35	30	25 -	123
FLUORENE	ND	0.50	0.48	96.0	0.47	94.0	2.11	30	19 -	142
PHENANTHRENE	ND	0.50	0.49	98.0	0.49	98.0	0	30	40 -	121
ANTHRACENE	ND	0.50	0.44	88.0	0.44	88.0	0	30	32 -	121
FLUORANTHENE	ND	0.50	0.52	104	0.51	102	1.94	30	51 -	115
PYRENE	ND	0.50	0.51	102	0.49	98.0	4.00	30	45 -	117
CHRYSENE	ND	0.50	0.50	100	0.49	98.0	2.02	30	44 -	122
BENZO (A) ANTHRACENE	ND	0.50	0.48	96.0	0.47	94.0	2.11	30	57 -	118
BENZO (B) FLUORANTHENE	ND:	0.50	υ.51	102	0.50	100	1.98	30	62 -	121
BENZO (K) FLUORANTHENE	ND	0.50	0.52	104	0.50	100	3.92	30	63 -	117
BENZO (A) PYRENE	ND	0.50	0.58	116	0.57	114	1.74	30	42 -	120
DIBENZO (A,H) ANTHRACENE	ND	0.50	0.49	98.0	0.48	96.0	2.06	30	53 -	118
BENZO (G,H,I) PERYLENE	ND	0.50	0.43	86.0	0.46	92.0	6.74	30	51 -	116
INDENO (1,2,3-CD) PYRENE	ND:	0.50	0.52	104	0.50	100	3.92	30	60 -	116

Analyst: KA

Sequence Date: 04/07/98 Method Blank File ID:

Sample File ID:

Blank Spike File ID: 980406A\023-2301

Matrix Spike File ID:

Matrix Spike Duplicate File ID:

* = Values Outside QC Range. « = Data outside Method Specification limits.

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [(<1> - <2>) / <3>] x 100

Relative Percent Difference = |(<4> - <5>)| / [(<4> + <5>) x 0.5] x 100

(**) = Source: SPL Temporary Limits

ICE Spectroscopy Method outo Quality Control Report



Matrix: Water

Units: mg/L

Analyst: PS
HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
Checkene: (713) 850,0901

Date:032798 Time:0849 File Name: 032798C5

3/30/95

	La							
Element	Mth. Blank	True Value	Result	% Recovery	Lower Limit	Upper Limit	Work Orde	ers in Batch
Silver	ND	2.00	2.04	102	1.60	2.40	Work Order	Fractions
Aluminum							, -	
Arsenic							98-03-B04	01D-04D
Barium	ND	2.00	2.03	101	1.60	2.40		06D
Beryllium								
Calcium	ND	20.00	20.51	103	16.00	24.00	98-03-B69	03B
Cadmium	ND	2.00	1.93	97	1.60	2.40		
Cobalt							98-03-C21	01 A
Chromium	ND	2.00	2.02	101	1.60	2.40		
Copper	ND	2.00	2.03	101	1.60	2.40	98-03-B50	08C
Iron	ND	2.00	2.03	101	1.60	2.40		12C
Potassium	ND	20.00	19.25	96	16.00	24.00		14C
Magnesium	ND	20.00	20.45	102	16.00	24.00		16C
Manganese								
Sodium							98-03-B52	25C
Nickel	ND	2.00	2.03	101	1.60	2.40		
Lead								
Antimony								
Selenium								
Thallium								
Vanadium								
Zinc	ND	2.00	2.03	101	1.60	2.40		

Work Order Sniked: 9803B04-01D Matrix Snike - Snike Dunlicate Results

Matrix Spike	<u>e - Spike Du</u>	iplicate Re	sults		Work Order Spiked: 9803B04-01D							
	Sample	Spike	Mati	ix Spike	Matrix Sp	ike Duplicate		QC L	imits	Spike		QC
Element	Result	Added	Result	Recovery	Result	Recovery		% Re	covery	RPD %		Limits %
Silver	ND	1.0	1.036	103.6	0.9728	97.3		80	120	6.3		20.0
Aluminum												
Arsenic												
Barium	0.1574	1.0	1.179	102.2	1.104	94.7		80	120	7.6		20.0
Beryllium												
Calcium	397.2	10.0	407.7	105.0	385.1	0.0	*	80	120	200.0	**	20.0
Cadmium	ND	1.0	1.004	100.4	0.939	93.9		80	120	6.7		20.0
Cobait												
Chromium	ND	1.0	1.005	100.5	0.941	94.1		80	120	6.6		20.0
Copper	ND	1.0	1.038	103.8	0.9702	97.0		80	120	6.8		20.0
Iron	13.21	1.0	14.44	123.0 *	13.53	32.0	*	80	120	117.4	**	20.0
Potassium	67.35	10.0	78.6	112.5	73.73	63.8	*	80	120	55.2	**	20.0
Magnesium	110	10.0	120.8	108.0	114	40.0	*	80	120	91.9	**	20.0
Manganese												
Sodium												
Nickel	ND .	1.0	1	100.0	0.9366	93.7		80	120	6.5		20.0
Lead												
Antimony												
Selenium												
Thallium												
Vanadium												
Zinc	0.0264	1.0	1.048	102.2	0.9765	95.0		80	120	7.3	\Box	20.0

^{*} Values Outside QC Range Due To Matrix Interference.

^{**} Values Outside QC Range.

Specificacopy metriod outo Quality Control Report



Matrix: Water

Units: mg/L

Analyst: PS

Chackage - Section

Date:033098 Time:0818 File Name: 033098C4

3/3111

Laboratory Control Sample

	Laboratory Control Sample													
Element	Mth. Blank	True Value	Result	% Recovery	Lower Limit	Upper Limit								
Silver	ND	2.00	2.00	100	1.60	2.40								
Aluminum														
Arsenic														
Barium	ND	2.00	1.98	99	1.60	2.40								
Beryllium														
Calcium														
Cadmium	ND	2.00	1.96	98	1.60	2.40								
Cobalt														
Chromium	ND	2.00	2.02	101	1.60	2.40								
Copper						l								
lron														
Potassium														
Magnesium														
Manganese														
Sodium														
Nickel														
Lead														
Antimony														
Selenium														
Thallium														
Vanadium														
Zinc.														

Work Orders in Batch
Work Order Fractions

98-03-B04 05D

Matrix Spike - Spike Duplicate Results Work Order Spiked: 9803B04-05D

Matrix Spike	e - Spike Di				Work Order Spiked: 9803B04-05D					
	Sample	Spike	Matr	ix Spike	1	ike Duplicate	QC L	imits	Spike	QC
Element	Result	Added	Result	Recovery	Result	Recovery	⊥% Red	covery	RPD %	Limits %
Silver	ND	1.0	0.996	99.6	0.9899	99.0	80	120	0.6	20.0
Aluminum										
Arsenic										
Barium	0.1105	1.0	1.086	97.6	1.076	96.6	80	120	1.0	20.0
Beryllium										
Calcium										
Cadmium	ND	1.0	0.9664	96.6	0.9599	96.0	80	120	0.7	20.0
Cobalt										
Chromium	DИ	1.0	0.9878	98.8	0.9807	98.1	80	120	0.7	20.0
Copper										
Iron										
Potassium										
Magnesium										
Manganese										
Sodium										
Nickel										
Lead		_								
Antimony										
Selenium										
Thallium										
Vanadium										
Zinc										



Zinc

Matrix: DISSOLVED

Units: mg/L

Date:040198 Time:0804 File Name: 040198C3

Analyst: PS
HOUSTON LABORATORY

8880 INTERCHANGE PRIVE
HOUSTON, TEXAS 77054
Checker (713) 660 0001

Laboratory Control Sample

Element	Mth. Blank	True Value	Result	% Recovery	Lower Limit	Upper Limit
Silver	ND	2.00	2.00	100	1.60	2.40
Aluminum						
Arsenic						
Barium	ND	2.00	2.01	100	1.60	2.40
Beryllium						
Calcium						
Cadmium	ND	2.00	1.94	97	1.60	2.40
Cobalt						
Chromium	ND	2.00	2.02	101	1.60	2.40
Copper						
lron						
Potassium						
Magnesium						
Manganese						
Sodium	ND	20.00	20.09	100	16.00	24.00
Nickel						
Lead						
Antimony						
Selenium			-			
Thallium						
Vanadium						

Work Orde	ers in Batch
Work Order	Fractions
98-03-B04	01E-06E

98-03-C32 01G

Matrix Spike - Spike Duplicate Results Work Order Spiked: 9803B04-01E

Matrix Spike	e - Spike Di	uplicate Re	Suits		Work Order Spikea: 9803B04-01E					
	Sample	Spike	Mati	ix Spike	Matrix Sp	ike Duplicate	QCI	imits	Spike	QC
Element	Result	Added	Result	Recovery	Result	Recovery	∫% Re	covery	RPD %	Limits %
Silver	ND	10.0	10.4	104.0	10.38	103.8	80	120	0.2	20.0
Aluminum										
Arsenic										
Barium	0.1347	10.0	10.2	100.7	10.1	99.7	80	120	1.0	20.0
Beryllium										
Calcium										
Cadmium	0.0358	10.0	9.952	99.2	9.905	98.7	80	120	0.5	20.0
Cobalt										
Chromium	0.0279	10.0	10.16	101.3	10.14	101.1	80	120	0.2	20.0
Copper										
Iron										
Potassium										
Magnesium										
Manganese										
Sodium	381.2	100.0	491.7	110.5	485.8	104.6	80	120	5.5	20.0
Nickel										
Lead										
Antimony										
Selenium										
Thallium										
Vanadium										
Zinc										

ICE Spectroscopy metriod outo squarry control report



Matrix: DISSOLVED

Units: mg/L

Analyst: PS HOUSTON LABORATORY

Checked:

Date:033198 Time:0807 File Name: 033198C3

411110

Laboratory Control Sample

		boratory Col				
Element	Mth Blank	True Value	Result	% Recovery	Lower Limit	Upper Limit
Silver						
Aluminum						
Arsenic			<u>-</u>			
Barium						
Beryllium						
Calcium	ND	20.00	20.24	101	16.00	24.00
Cadmium						
Cobalt						
Chromium						
Copper						
Iron						
Potassium	ND	20.00	19.73	99	16.00	24.00
Magnesium	ND	20.00	19.97	100	16.00	24.00
Manganese						
Sodium						
Nickel						
Lead						
Antimony						
Selenium						
Thallium						
Vanadium						
Zinc						

Work Orders in Batch Work Order Fractions

98-03-B04 01E-06E

Matrix Spike						r Spiked: 980				
	Sample	Spike		rix Spike		ike Duplicate	ī	imits.	Spike	QC
Element	Result	Added	Result	Recovery	Result	Recovery	% Red	covery	RPD %	Limits %
Silver										
Aluminum								1		
Arsenic										
Barium										
Beryllium										
Calcium	388.5	100.0	472.1	83.6	491.6	103.1	80	120	20.9	** 20.0
Cadmium										
Cobalt										
Chromium										
Copper										
Iron										
Potassium	72.83	100.0	162.6	89.8	164.8	92.0	80	120	2.4	20.0
Magnesium	108.4	100.0	201.8	93.4	209.3	100.9	80	120	7.7	20.0
Manganese										
Sodium										
Nickel										
Lead										
Antimony										
Selenium										
Thallium										
Vanadium										
Zinc		·····					ĺ			

Elements Bench Spiked:ALL 10X DILUTION

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^{**} Values Outside QC Range.



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

SPL QUALITY CONTROL REPORT **

Matrix: Aqueous Reported on: 04/02/98

Analyzed on:

04/02/98

Analyst:

JM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

> Arsenic, Total Method 7060A ***

SPL Sample ID Number	Blank Value ug/L		Measured Concentration ug/L	% Recovery		Limits covery
LCS	ND	40.00	38.91	97.3	80	- 120

-9804120

Samples in batch:

9803B00-03F 9803B00-04F 9803B00-01F 9803B00-02F 9803B00-05F 9803B04-02D 9803B04-03D 9803B04-01D 9803B04-06D

9803B04-04D

COMMENTS:



** SPL QUALITY CONTROL REPORT **

HOUSTON LABORATORY 8880 INTERCHANGE DRIVE

HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Matrix: Aqueous

Reported on: 04/02/98 Analyzed on: 04/02/98

Analyst: JM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Arsenic, Total Method 7060A ***

SPL Sample	Method	 Sample	Spike	Matr:	ix Spike		ix Spike licate	RPD	!	QC LIMITS Advisory)
ID Number		 Result ug/L	!	Result ug/L	•	Result ug/L	Recovery %	(%)	RPD Max	% REC
9803B04-01D	ND	1.2.54	40.00	51.61	97.7	50.92	96.0	1.8	20	75 -125

-9804120

Samples in batch:

9803B00-01F 9803B00-02F 9803B00-03F 9803B00-04F 9803B00-05F 9803B04-01D 9803B04-02D 9803B04-03D 9803B04-04D 9803B04-06D

COMMENTS:



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

* SPL QUALITY CONTROL REPORT **

Matrix:

Aqueous

Reported on:

04/02/98

Analyzed on:

04/02/98

Analyst:

JM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Arsenic, Total Method 7060A ***

SPL Sample ID Number	Blank Value ug/L		Measured Concentration ug/L	% Recovery	QC Limits Recovery
LCS	ND	40.00	39.58	99.0	80 - 120

-9804122

Samples in batch:

9803B04-05D

COMMENTS:



** SPL QUALITY CONTROL REPORT **

HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Matrix: Aqueous

Reported on: 04/02/98 Analyzed on: 04/02/98 Analyst: JM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Arsenic, Total Method 7060A ***

	 Method	 Sample	 Spike	Matrix Spike		Matrix Spike Duplicate		RPD	QC LIMITS (Advisory)		
ID Number 			•	Result ug/L	Recovery	Result ug/L	Recovery	(%)	RPD Max	8	REC
9803B04-05D	ND	7.36	40.00	50.21	107	55.36	120	12	20	75	-125

-9804122

Samples in batch:

9803B04-05D

COMMENTS:



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

SPL QUALITY CONTROL REPORT **

Matrix:

Aqueous

Reported on: 03/31/98

Analyzed on:

03/31/98

Analyst:

AG

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

> Mercury, Total Method 7470 A***

SPL Sample ID Number	Blank Value ug/L	1	Measured Concentration ug/L	% Recovery	QC Limits Recovery
LCS	ND	2.00	1.97	98.5	80 - 120

-9803B86

Samples in batch:

9803B04-01D

9803B04-02D

9803B04-03D

9803B04-04D

9803B04-05D

9803B04-06D

COMMENTS:

LCS = SPL ID# 94-452-39-6



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 03/31/98 Analyzed on: 03/31/98 Analyst: AG

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Mercury, Total Method 7470 A***

SPL Sample	 Method	 Sample	Spike	Matr:	ix Spike	:	ix Spike licate	RPD	1	QC LI Advis	MITS
ID Number	1			Result ug/L	Recovery	Result ug/L	Recovery	(%)	RPD Max]	REC
9803B04-01D	ND	ND	2.00	2.17	108	2.07	104	3.8	20	75	-125

-9803B86

Samples in batch:

9803B04-01D

3803B04-02D

9803B04-03D 9803B04-04D

9803B04-05D 9303B04-06D

COMMENTS:

LCS = SPL ID# 94-452-39-6



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

SPL QUALITY CONTROL REPORT **

Matrix:

Aqueous

Reported on:

04/03/98

Analyzed on:

04/03/98

Analyst:

PΒ

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Lead, Total
Method 7421 ***

SPL Sample ID Number	Blank Value ug/L	,	Measured Concentration ug/L	% Recovery	QC Limits Recovery
LCS	ND	40.0	41.7	104	80 - 120

-9804176

Samples in batch:

9803B00-01F	9803B00-02F	9803B00-03F	9803B00-04F
9803B00-05F	9803B04-01D	9803B04-02D	9803B04-03D
9803B04-04D	9803B04-06D	9803B50-08C	9803B50-12C
9803B50-14C	9803B50-16C	9803B52-25C	

COMMENTS:



** SPL QUALITY CONTROL REPORT **

HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Matrix: Aqueous

Reported on: 04/03/98 Analyzed on: 04/03/98

Analyst: PE

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Lead, Total Method 7421 ***

SPL Sample	Method	 Sample	 Spike	Matr	ix Spike	1	ix Spike licate	RPD	1		MITS sory)
 ID Number 	:	:		Result		Result ug/L	Recovery %	(%)	RPD Max	9	REC
9803B04-01D	ND	ND	40.0	41.6	104	42.5	106	1.9	20	75	-125

-9804176

Samples in batch:

9803B00-01F	9803B00-02F	9803B00-03F	9803B00-04F
9803B00-05F	9803B04-01D	9803B04-02D	9803B04-03D
9803B04-04D	9803B04-06D	9803B50-08C	9803B50-12C
0000000 140	393200 160	2002052 250	

COMMENTS:



9880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

SPL QUALITY CONTROL REPORT **

Matrix:

Aqueous

Reported on:

03/31/98

Analyzed on:

03/31/98

Analyst:

JM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Lead, Total
Method 7421 ***

SPL Sample ID Number	Blank Value ug/L		Measured Concentration ug/L	% Recovery	QC Limits Recovery
LCS	ND	40.0	36.2	90.5	80 - 120

-9804007

Samples in batch:

9803B04-05D

9803D18-01C

COMMENTS:



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous Reported on: 03/31/98 Analyzed on: 03/31/98 Analyst: JM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

> Lead, Total Method 7421 ***

 SPL Sample	 Method	Sample	Spike	Matrix Spike		Matrix Spike Duplicate		RPD		QC LIMITS (Advisory)	
ID Number 	 Blank ug/L			Result ug/L		Result ug/L	Recovery	(육)	RPD Max	ુ	REC
9803D18-01C	ND	ND	40.0	35.2	88.0	35.5	88.8	0.9	20	75	-125

-9804007

Samples in batch:

COMMENTS:

LCS = SPL ID# 97-839-200-1



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

* SPL QUALITY CONTROL REPORT **

Matrix:

Aqueous

Reported on:

04/02/98

Analyzed on:

04/02/98

Analyst:

JM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Selenium, Total Method 7740 ***

SPL Sample ID Number	Blank Value ug/L		Measured Concentration ug/L	% Recovery	QC Limits Recovery
LCS	ND	40.00	37.07	92.7	80 - 120

-9804121

Samples in batch:

9803B00-05F	9803B04-01D	9803B04-02D	9803B04-03D
9803B00-01F	9803B00-02F	9803B00-03F	9803B00-04F

9803B04-04D

9803B04-06D

COMMENTS:

LCS=SPL ID#: 97-839-200-1

* VALUES OUTSIDE QC RANGE DUE TO MATRIX INTERFERENCE.



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

SPL QUALITY CONTROL REPORT **

Matrix:

Aqueous

Reported on: 04/02/98

Analyzed on: 04/02/98

Analyst:

JM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

> Selenium, Total Method 7740 ***

SPL Sample ID Number	Blank Value ug/L		Measured Concentration ug/L	% Recovery	QC Limits Recovery	
LCS	ND	40.00	39.10	97.8	80 - 120	

-9804123

Samples in batch:

9803B04-05D

COMMENTS:

LCS=SPL ID#: 97-839-200-1

* VALUES OUTSIDE QC RANGE DUE TO MATRIX INTERFERENCE.

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** VALUES OUTSIDE QC RANGE.



HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Matrix: Aqueous Reported on: 04/02/98 Analyzed on: 04/02/98

Analyst:

This sample was randomly selected for use in the SPL quality control $% \left(1\right) =\left(1\right) \left(1\right) +\left(1\right) \left(1\right) \left(1\right) +\left(1\right) \left(program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

> Selenium, Total Method 7740 ***

SPL Sample	Method	Sample	Spike	Matr	ix Spike	!	ix Spike licate	RPD		QC LIMITS Advisory)
ID Number		 Result ug/L	!	Result ug/L		Result ug/L	Recovery	(%)	RPD Max	% REC
9803B04-01D	ND	ND	40.00	21.63	54.1 🛊	23.39	58.5 X	7.8	20	75 -125

-9804121

Samples in batch:

3803B00-04F 9803B00-01F 9803B00-02F 9803B00-03F 9803B00-05F 9803B04-01D 9803B04-02D 9803B04-03D 9803B04-04D 9803B04-06D

COMMENTS:

LCS=SPL ID#: 97 839-200-1

 \star VALUES OUTSIDE QC RANGE DUE TO MATRIX INTERFERENCE.



HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Matrix: Aqueous

Reported on: 04/02/98 Analyzed on: 04/02/98

Analyst: JN

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Selenium, Total Method 7740 ***

 SPL Sample	Method	 Sample	Spike	 Matr: 	ix Spike		lx Spike licate	RPD	:	QC LIMITS Advisory)
 ID Number 	•	 Result ug/L		Result		Result	Recovery	(%)	RPD Max	% REC
9803B04-05D	ND	ND	10.00	8.46	21.2 💥	15.68	39.2 💃	60 ¾¾	20	75 -125

-9804123

Samples in batch:

9803B04~05D

COMMENTS:

LCS=SPL ID#: 97-839-200-1

- * VALUES OUTSIDE QC RANGE DUE TO MATRIX INTERFERENCE.
- ** VALUES OUTSIDE OC RANGE.



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

* SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 04/02/98 Analyzed on: 04/01/98

Analyst: KS

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Hardness-Total as CaCO3
Method 130.2 *

SPL Sample ID Number	Blank Value mg/L CaC	Concentration	Measured Concentration mg/L CaC	% Recovery	QC Limits Recovery
LCS	ND	125.5	123	98.0	98 - 103

-9804069

Samples in batch:

9803A25-01A	9803A25-02A	9803A25-03A	9803A25-04A
9803B00-01F	9803B00-02F	9803B00-03F	9803B00-04F
9803B00-05F	9803B04-01D	9803B04-02D	9803B04-03D
9803B04-04D	9803B04-05D	9803B04-06D	9803B08-02B
9803B08-05B	9803B08-08B	9803B08-11B	
COMMENTS:			

SPL LCS ID# 94453182-14



HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Matrix: Aqueous

Reported on: 04/02/98 Analyzed on: 04/01/98

Analyst: KS

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Hardness-Total as CaCO3
Method 130.2 *

 SPL Sample	Method	Sample	 Spike	Matr:	Matrix Spike		Matrix Spike Duplicate		QC LIMITS (Advisory)	
ID Number		1		Result		Result mg/L	Recovery	(%)	RPD Max	REC
9803A25-02A	ND	48	50	96.6	97.2	96.2	96.4	0.8	20	80.7 -111

-9804067

Samples in batch:

 9803A25-01A
 9803A25-02A
 9803A25-04A
 9803B00-01F

 9803B00-02F
 9803B00-03F
 9803B00-04F
 9803B00-05F

9803B04-01D 9803B04-02D



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 04/02/98 Analyzed on: 04/01/98

Analyst: KS

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Hardness-Total as CaCO3 Method 130.2 *

 SPL Sample	Method	 Sample	 Spike	Matrix Spike		Matrix Spike Duplicate		RPD		QC LIMITS (Advisory)	
ID Number	1		 Added mg/L	Result		Result	Recovery	(%)	RPD Max	% REC	
9803 A25-03A	ND	53.6	50	101.8	96.4	100.4	93.6	3.0	20	80.7 -111	

-9804068

Samples in batch:

9803B04-03D 9803B04-05D 9803B04-05D 9803B04-06D 9803B08-02B 9803B08-05B 9803B08-08B

9803B08-11B



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

SPL QUALITY CONTROL REPORT **

Matrix:

Aqueous

Reported on: 03/25/98

Analyzed on: 03/25/98

Analyst:

TW

This sample was randomly selected for use in the SPL quality control program. The results are as follows:

> Carbonate, as CaCO3 Method SM 4500-CO2D **

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration mg/L	Duplicate Sample mg/L	RPD	RPD Max.
9803B04-01F	ND	ND	0	5

-9803962

Samples in batch:

9803B04-01F

9803B04-02F

9803B04-05F

9803B04-06F

9803B04-07A

9803B04-08A



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

SPL QUALITY CONTROL REPORT **

Matrix:

Aqueous

Reported on: 03/25/98

Analyzed on:

03/25/98

Analyst:

TW

This sample was randomly selected for use in the SPL quality control program. The results are as follows:

> Bicarbonate, as CaCO3 Method SM 4500-CO2D **

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration mg/L	Duplicate Sample mg/L	RPD	RPD Max.
9803B04-01F	451	453	0.4	5

-9803961

Samples in batch:

9803B04-01F

9803B04-02F

9803B04-05F 9803B04-06F

9803B04-07A

9803B04-08A



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 04/04/98 Analyzed on: 04/04/98

Analyst:

TV

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Chloride
Method 325.3 *

SPL Sample ID Number	Blank Value MG/L		Measured Concentration MG/L	% Recovery	QC Limits Recovery
LCS	ND	170.0	168.39	99.1	94 - 106

-9804159

Samples in batch:

9803B00-01D	9803B00-02D	9803B00-03D	9803B00-04D
9803B00-05D	9803B04-01G	9803B04-02G	9803B04-03G
9803B04-04G	9803B04-05G	9803B04-06G	9803B58-01C
9803B58-02C	9803B60-01C	9803B60-02C	9804161 - 02B

9804161-03B

COMMENTS:

LCS=SPL ID#94453182-13



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

SPL QUALITY CONTROL REPORT **

Matrix: Aqueous Reported on: 04/04/98 Analyzed on: 04/04/98

Analyst:

TV

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Chloride Method 325.3 *

SPL Sample	Method	Sample	Spike	Matr	ix Spike	1	ix Spike licate	RPD	1		IMITS sory)
ID Number		Result MG/L	Added MG/L	Result MG/L	Recovery %	Result MG/L	Recovery %	(%)	RPD Max		% REC
9803B04-05G	ND	42.36	50.0	92.17	99.6	91.99	99.3	0.3	5	92	-109

-9804158

Samples in batch:

9803B00-01D 9803B00-02D 9803B00-03D 9803B00-04D 9803B00-05D 9803B04-01G 9803B04-02G 9803B04-03G 9803B04-04G 9803B04-05G



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

Matrix: Aqueous Reported on: 04/04/98 Analyzed on: 04/04/98 ΤV

Analyst:

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

> Chloride Method 325.3 *

SPL Sample	Method	Sample	Spike	Matr	ix Spike	1	ix Spike licate	RPD	1	QC L1 Advis	
ID Number	Blank MG/L	Result MG/L	Added MG/L	Result MG/L		Result MG/L	Recovery %	(%)	RPD Max	2	REC
9804164-058	ND	39.17	50.0	90.40	102	88.62	98.9	3.1	5	92	-109

-9804160

Samples in batch:

9803B60-01C 9803B04-06G 9803B58-01C 9803B58-02C 9803860-02C 9804161-03B 9804164-05B 9804161-02B

COMMENTS: LCS=SPL ID#94453182-13



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

* SPL QUALITY CONTROL REPORT **

Matrix:

Aqueous

Reported on:

03/26/98

Analyzed on:

03/25/98

Analyst:

EM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Fluoride Method 300.0 *

SPL Sample ID Number	Blank Value mg/L		Measured Concentration mg/L	% Recovery	QC Limits Recovery
LCS	ND	5.00	4.956	99.1	90 - 110

-9803979

Samples in batch:

9803805-03B	9803844-01A	9803B00-01D	9803B00-02D
9803B00-03D	9803B00-04D	9803B00-05D	9803B04-01G
9803B04-02G	9803B04-03G	9803B04-04G	9803B04-05G
9803B04-06G	9803B58-01B	9803B58-02B	9803B60-01B
9803B60-02B			

COMMENTS:

SPL LCS#: 94453171-5



HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Matrix: Aqueous Reported on: 03/26/98 Analyzed on: 03/25/98

Analyst: EM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

> Fluoride Method 300.0 *

SPL Sample	 Method	 Sample	 Spike	Matrix Spike		Matrix Spike Duplicate		RPD	QC LIMITS (Advisory)		
ID Number	1	:	:	Result		Result mg/L	Recovery	(왕)	RPD Max	9	REC
9803805-03B	ND	0.818	2.000	2.810	99.6	2.773	97.8	1.8	20	80	-120

-9803977

Samples in batch:

9803805-038 9803844-01A 9803B00-01D 9803B00-02D 9803B00-03D 9803B00~04D 9803B04~03G 9803B00-05D 9803B04-01G

9803B04-02G



HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Matrix:

Aqueous

Reported on: 03/26/98 Analyzed on: 03/25/98

Analyst:

ΞM

This sample was randomly selected for use in the $\ensuremath{\mathtt{SPL}}$ quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

> Fluoride Method 300.0 *

SPL Sample	Method	 Sample	Spike	Matr	ix Spike		íx Spíke licate	RPD		QC LI Advis	
 ID Number 	!	1		Result mg/L	Recovery	Result	Recovery	(%)	RPD Max	ş:	REC
9803B60-02B	ND	ND .	5.000	4.667	93.3	4.596	91.9	1.5	20	80	-120

-9803980

Samples in batch:

9803B04-04G 9803B58-02B

9803B04-05G 9803B60-01B 9803B60-02B

9803B04-06G

9803B58-01B



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* SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 03/26/98 Analyzed on: 03/25/98

Analyst: EM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Nitrate nitrogen(as N)
Method 353.3 *

SPL Sample ID Number	Blank Value mg/L		Measured Concentration mg/L	% Recovery	QC Limits Recovery
LCS	ND	2.77	2.83	102	92 - 113

-9803A21

Samples in batch:

9803B00-01D	9803B00-02D	9803B00-03D	9803B00-04D
9803B00-05D	9803B04-01G	9803B04-02G	9803B04-03G
9803B04-04G	9803B04-05G	9803B04-06G	9803B08-01C
9803B08-04C	9803B08-07C	9803B08-10C	9803B56-02E
9803B56-03E	9803B58-02B	9803B60-01B	9803B60-02B

COMMENTS:

SPL LCS#: 95535172-26



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

** SPL QUALITY CONTROL REPORT **

atrix: Aqueous

Reported on: 03/26/98 Analyzed on: 03/25/98

Analyst: EM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Nitrate nitrogen(as N)
Method 353.3 *

SPL Sample	 Method	 Sample	Spike	Matr	ix Spike	•	ix Spike licate	RPD	•	QC LIMITS Advisory)
 ID Number 	:	1	 Added ing/L	Result	Recovery	Result	Recovery	(왕)	RPD Max	% REC
9803B04-01G	ND	0.02	5.00	5.66	113	5.45	109	3.6	12	84 -125

-9803A20

Samples in batch:

9803B00-01D 9803B00-02D 9803B00-03D 9803B00-04D 9803B00-05D 9803B04-01G 9803B04-02G 9803B04-03G

9803B04-04G 9803B04-05G



HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Matrix:

Aqueous

Reported on: 03/26/98 Analyzed on: 03/25/98

Analyst:

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

> Nitrate nitrogen(as N) Method 353.3 *

 SPL Sample	Method	 Sample	 Spike	Matr:	Matríx Spike		Matrix Spike Duplicate		QC LIMITS (Advisory)		
 ID Number	!	 Result mg/L	[Result		Result	Recovery	(%)	RPD Max	ક	REC
9803B58-02B	ND	1.64	5.00	7.33	114	6.91	105	8.2	12	84	-125

-9803A22

Samples in batch:

9803B08-01C 9803B04-06G

9803B08-04C

9803B08-07C

9803B08-10C

9803B56-02E

٦,

9803B56-03E 9803B58-02B

9803B60-01B 9803B60-02B



8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

SPL QUALITY CONTROL REPORT **

Matrix: Aqueous

Reported on: 04/02/98

Analyzed on: 04/02/98

Analyst: EM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Sulfate Method 375.4 *

SPL Sample ID Number	Blank Value mg/L	LCS Concentration mg/L	Measured Concentration mg/L	% Recovery		Limits covery
LCS	ND	8.48	9.36	110	82	- 111

-9804090

Samples in batch:

9803B00-01D	9803B00-02D	9803B00-03D	9803B00~04D
9803B00-05D	9803B04-01G	9803B04-02G	9803B04-03G
9803B04-04G	9803B04-05G	9803B04-06G	9803B58-01B
9803B58-02B	9803B60-01B	9803B60-02B	9803D35-01A

COMMENTS:

SPL LCS#: 94453182-13



HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON. TEXAS 77054 PHONE (713) 660-0901

Matrix: Aqueous

Reported on: 04/02/98 Analyzed on: 04/02/98

Analyst: EM

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Sulfate Method 375.4 *

SPL Sample	 Method	Sample	 Spike	Matr	ix Spike	1	ix Spike licate	RPD	:	QC LI Advis	
ID Number	1			Result		Result mg/L	Recovery	(%)	RPD Max	25	REC
9803B00-02D	ND	10.15	10.00	20.99	108	20.60	1.04	3.8	9.5	84	-120

-9804089

Samples in batch:

9803B00-01D 9803B00-02D 9803B00-03D 9803B00-04D 9803B00-05D 9803B04-01G 9803B04-02G 9803B04-03G

9803B04-04G 9803D35-01A



HOUSTON LABORATORY

8880 INTERCHANGE DRIVE HOUSTON, TEXAS 77054 PHONE (713) 660-0901

Matrix:

Aqueous

Reported on: 04/02/98 Analyzed on: 04/02/98

Analyst: EM

This sample was randomly selected for use in the SPL quality control $% \left(1\right) =\left(1\right) \left(1\right) +\left(1\right) \left(1\right) \left(1\right) +\left(1\right) \left(program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

> Sulfate Method 375.4 *

SPL Sample	 Method	 Sample	Spike	Matr:	ix Spike	•	ix Spike licate	RPD		QC LIM Advisc	
ID Number	•		 Added mg/L	1	-	Result mg/L	Recovery	(왕)	RPD Max	9)0	REC
9803B60-01B	ND	11.33	10.00	22.55	112	23.00	117	4.4	9.5	84	-120

-9804091

Samples in batch:

9803B04-05G 9803B60-01B 9803B04-06G

9803B58-01B

9803B58-02B

9803B60-02B

CHAIN OF CUSTODY

AND

SAMPLE RECEIPT CHECKLIST

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Client Contact: R. Rextoc					3 190)GL2			, M	الم	8		57	
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Invoice To: 13 C				em=	selc	dil lit	HCI			· H	ΗЬ					
SAMPLE ID	DATE	TIME	comp gr		P=I					41	'd					
1- MW	86/62/5	1322	7	3	0	b! 少	1 94	01	×	7	×	×				×
p-nu	-	1350		4	7	-	-	*	×	*	7	×		×	ر بر	\ \ \
They blank				-	-		-	N	×		-			-	-	
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Client/Consultant Remarks:	 - -			Lab	Laboratory remarks:	arks:					Phy	7	-1	Intact?	à	Z
				_							7	_	Ţ	Temp:	3	\
Requested TAT	Special Repor	Special Reporting Requirements		Fax Results	<u></u>	Raw	Raw Data	Specia	Special Detection Limits (specify)	n Limits	(specify):			<u> </u>	l review	PM review (initial):
'	Sta	Standard QC	7E	Level 3 QC		Level	Level 4 OC							_		
24hr 🔲 72hr 🗍	1. Relinquishe	1. Relinquished by Sampler.	X	١		date 3/	86/12	time /	720	2. Received by:	red by:					
48hr Standard	3. Relinquished by:	d by:				date	-	time		4. Received by	ved by:					
Other 🔲	5. Relinquished by:	d by:				dare.	35-56	time Do	00	6. Keerin	6. Received by Laboratory:	boralory		R		
8880 Interchange Drive, Houston, TX 77054 (713) 660-0901	Houston,	TX 77054 (713) 660	-0901			500 /	\mbass	ador C	affery	Parkwa	ly, Scol	It, LA 7	70583	(318) 2	500 Ambassador Caffery Parkway, Scott, LA 70583 (318) 237-4775
459-Hughes Drive, Traverse City, MI 49684 (616) 947-5777	rerse City, N	AI 49684 (t	616) 947.	-5777		J .	1501	E. Oraı	ngetho	гре Ау	1501 E. Orangethorpe Avenue, Fullerton, CA 92631	ullerto	n, CA	92631	(714)	(714) 447-6868

SPL Houston Environmental Laboratory

Sample Login Checklist

 Dat	e:	Time:				
	3-25-58		1000			
5PI	L Sample ID:					
n	980	3 B04				
			•			
					Yes	<u>No</u>
l	Chain-of-Custody (COC) form	n is pre	esent.			
2	COC is properly completed.					
3	If no, Non-Conformance Wor	ksheet	has been compl	eted.		
4	Custody seals are present on t	he ship	pping container.		/	
5	If yes, custody seals are intact				✓ ·	
6	All samples are tagged or label	led.			/	
7	If no, Non-Conformance Wor	ksheet	has been compl	eted.		
8	Sample containers arrived inta	act	-		✓	
9	Temperature of samples upon	3° x	3 12 3 25 C			
10	Method of sample delivery to	SPL:	SPL Delivery			
			Client Delivery			
			FedEx Delivery	80192022 1340		
ì			Other:	8019202	801920221330	
11	Method of sample disposal:		SPL Disposal			/
ļ			HOLD			
<u>.</u>			Return to Clie	nt		
	Λ				· · · · · · · · · · · · · · · · · · ·	
Nai	me:	4		Date:	-25-1	8